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The Second Realization of the International Celestial Reference Frame by Very Long Baseline Interferometry

Presented on behalf of the IERS[1] / IVS[2] Working Group

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[2]International VLBI Service for Geodesy and Astrometry (IVS)

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The Second Realization of the International Celestial Reference Frame by Very Long Baseline Interferometry

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Alan L. Fey, David Gordon, and Christopher S. Jacobs (eds.)

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Abstract

This Technical Note describes the generation by an international team of the second realization of the International Celestial Reference Frame (ICRF2) at radio wavelengths using nearly 30 years of Very Long Baseline Interferometry (VLBI) observations. ICRF2 contains precise positions of 3414 compact radio astronomical sources, more than five times the number as in the first ICRF, hereafter ICRF1. Further, the ICRF2 is found to have a noise floor of only ≈ 40 μas, some $5-6$ times better than ICRF1, and an axis stability of ≈ 10 μas, nearly twice as stable as ICRF1. Alignment of ICRF2 with the International Celestial Reference System (ICRS) was made using 138 stable sources common to both ICRF2 and ICRF1-Ext2. Future maintenance of ICRF2 will be made using a set of 295 new "defining" sources selected on the basis of positional stability and the lack of extensive intrinsic source structure. The stability of these 295 defining sources, and their more uniform sky distribution eliminates the two largest weaknesses of ICRF1.

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1 Introduction (DG, CM)

The International Celestial Reference Frame (hereafter referred to as ICRF1) was the realization of the International Celestial Reference System (ICRS) at radio frequencies [Ma et al., 1997, 1998]. It was defined by the Very Long Baseline Interferometry (VLBI) positions of 212 "defining" compact radio sources. These positions were independent of the equator, equinox, ecliptic, and epoch, but were made consistent with the previous stellar and dynamical realizations within their respective errors. The usage of VLBI for celestial reference frames was outlined by Gontier, Feissel & Ma [1997]. The ICRF1 used most geodetic/astrometric VLBI data taken between August 1979 and July 1995, and contained 608 sources. It was adopted by the IAU in 1997 and became official on 1 January 1998 [IAU General Assembly XXIII, 1997]. Two extensions, adding 109 additional sources [Fey et al., 2004] were later made using several years of newer VLBI data, including the first of a series of Very Long Baseline Array (VLBA) Calibrator Surveys (VCS) [Beasley et al., 2002].

ICRF1 had an estimated noise floor of 250 micro-arc-seconds (μas) and an estimated axes stability of $\approx$ 20 μas. This represented roughly an order of magnitude improvement over the previous stellar celestial reference frame, the FK5 [Fricke et al., 1988]. Even so, it had its limitations and deficiencies. The distribution of defining sources was very non-uniform, with most being in the northern hemisphere. Additionally, several of the original defining sources have been found to be unstable (showing significant systematic position variations).

Significant developments and improvements in geodetic/astrometric VLBI have been made since the generation of ICRF1. Geodetic/astrometric VLBI sensitivity and quality have improved significantly due to developments such as wider single channel bandwidths, wider spanned bandwidths, receiver improvements, and better observing strategies. Also, the use of newer and more sensitive antennas and arrays, such as the 10 station VLBA, has greatly improved the sensitivity and quality of the data as well. And additional new observing programs, such as the VLBA Research and Development VLBI (RDV) sessions, the southern hemisphere celestial reference frame (CRF) sessions, the weekly large network R1 and R4 Earth Orientation Parameter (EOP) sessions, and the VCS sessions have greatly improved the quality and quantity of the available VLBI data. Also, better geophysical modeling and faster computers have allowed for significant improvements in the data analysis. The additional 14 years of data now allow us to select a set of stable sources distributed more uniformly on the sky to more precisely define the axes. The additional data also allows us to filter out the most unstable sources for special handling, avoiding possible distortion of the frame that might occur otherwise. Additionally, there is now also a large amount of imaging data (e.g., the USNO Radio Reference Frame Image Database[1] and the Bordeaux VLBI Image Database[2]), mostly from analysis of the RDV sessions. Sources with extensive structure can thus be identified and eliminated from use in defining a reference frame. The ICRF1 used ∼1.6 million group delay measurements. At the current time, there are ∼6.5 million VLBI S/X-band group delay measurements available for use. The number of sources has also increased substantially. The ICRF1 contained 608 sources and was later expanded to 717. There are currently over 1200 sources whose positions can be obtained from the regular geodetic / astrometric sessions, and the number of far-southern sources has increased greatly. When we include the purely astrometric VCS sessions, nearly 2200 additional sources can be added, for a total of over 3400 sources. As previously mentioned, the sensitivity and quality

[1] http://rorf.usno.navy.mil/RRFID/
[2] http://www.obs.u-bordeaux1.fr/BVID/

of the data has also improved, and a conservative estimate is that the current noise floor has been reduced by a factor of 5 or more over ICRF1. Thus, there are many reasons for a new realization of the ICRF.

Greater accuracy and stability of the ICRF has benefits in at least two areas. It allows improvements in spacecraft navigation using differential VLBI relative to a nearby ICRF source. Also benefiting would be the VLBI monitoring of Earth orientation parameters, particularly of precession/nutation and UT1, which are the unique domain of VLBI. Enhanced stability and accuracy are needed for studies of the small, variable effects of deep structures of the Earth. Also, the upcoming Gaia mission will require much more precise positions of bright quasars in order to get the best optical-radio registration.

Since the adoption of ICRF1 by the IAU in 1997, the work of maintaining the ICRS was given to the IERS with the International VLBI Service for Geodesy and Astrometry (IVS) having operational responsibility for the VLBI realization. An IERS/IVS Working Group was established specifically for the second realization of the ICRF. This Working Group is truly an international team, with members from the USA, France, Germany, Italy, Russia, Ukraine, Australia, and China. This report describes the work of that team towards the generation of the second realization of the ICRF, hereafter referred to as ICRF2. The report is organized as follows: Sec. 2 describes the data used to construct the ICRF2, Sec. 3 describes the various software packages used in the analysis, Sec. 4 presents the selection and treatment of special handling sources, Sec. 5 discusses the characterization of source structure, Sec. 6 gives various model and data comparisons, Sec. 7 documents the configuration of the catalog solution, Sec. 8 describes and compares multiple preliminary catalog solutions, Sec. 9 evaluates the realistic uncertainties, Sec. 10 provides several tests of external validation for the ICRF2, Sec. 11 documents the selection of the final axes-defining sources, Sec. 12 describes how the ICRF2 was aligned onto the ICRS, Sec. 13 presents the ICRF2 catalog, Sec. 14 provides statistics of the ICRF2, and Sec. 15 gives conclusions and prospects for the future.

The Working Group studied the VLBI data using several independent software analysis packages, including Calc/Solve, OCCAM, SteelBreeze, and Quasar, all of which will be described briefly later in this report. Preliminary work with all the software packages included the generation and study of source position time series to identify stable and unstable sources, the generation and inter-comparison of preliminary catalogs, and the creation and study of a combination catalog. In the end, it was decided to use a single catalog rather than a combination for several reasons. The solutions going into the combination catalog all had some small differences in geophysical modeling, in editing criteria, and/or in data used. Also a combination catalog loses certain information, such as the full covariance matrix, and the links to the EOP and the Terrestrial Reference Frame (TRF) solutions. Although the final ICRF2 catalog is based on a single solution done at the NASA Goddard Space Flight Center (GSFC), the generation of ICRF2 has truly been an international group effort. The ICRF2 could not have been realized as accurately and with as much understanding of the limiting errors and noise levels without the participation of all the analysis centers and software packages involved.

2 The Data (DG)

The celestial reference frame results presented in this Technical Note come from nearly 30 years of accumulated geodetic/astrometric VLBI sessions organized and scheduled by many groups in many regional and worldwide campaigns. The major organizers have included NASA's Goddard Space Flight Center (GSFC) and Jet Propulsion Laboratory (JPL), the National Geodetic Survey (NGS), the U.S. Naval Observatory (USNO), the Naval Research Lab (NRL), the Geodetic Institute University of Bonn, Bundesamt für Kartographie und Geodäsie (BKG), and the Geographic Survey Institute (GSI) of Japan. The International VLBI Service (IVS) was formed in 1999, and took over coordination of the geodetic/astrometric campaigns, but the scheduling and analysis of individual sessions is still done by the individual member groups.

The earliest data used in this report is from 1979 August 3 and the latest is from 2009 March 16. All sessions used were dual frequency S/X-band (2.3/8.4 GHz) VLBI sessions taken either with the Mark III, Mark IV, VLBA, K4, K5, or combinations of these VLBI hardware/software systems. The participating antennas were all either dedicated geodetic stations or radio astronomical telescopes which spend most of their time doing astronomical research. The fixed antennas used here are located on all continents – with antennas in Antarctica, Australia, Brazil, Canada, Chile, China, Germany, Italy, Japan, Norway, Russia, Spain, South Africa, Sweden, Ukraine, and the USA. Most of the VLBI data used here was taken primarily for geodetic purposes, but is also well suited for astrometric analysis. A typical VLBI geodetic/astrometric experiment uses several antennas during a typical 24-hr data taking session.

The S/X-band systems record simultaneously several narrow channels (2–8 MHz) spanning broader bandwidths ($\sim$ 100–700 MHz). The combination of both bands allows for a first order correction for the dispersive effects of the Earth's ionosphere. In most of the VLBI sessions used, there were eight individual channels at X-band and six at S-band. Exceptions are the VLBA sessions, which use only four channels each at of S- and X-bands.

There were a total of 4540 sessions used for the final ICRF2 catalog, with approximately 6.5 million S/X-band ionosphere-corrected group delay measurements. The VLBI sessions used for ICRF2 include:

- Most fixed station sessions that are 18 hours or longer.
- Most of the Western U.S. and Alaska Crustal Dynamics Project (CDP) Mobile sessions, plus other sessions with mobile antennas – provided at least two large fixed antennas also participated. The three mobile systems were small transportable antennas of 3, 5, and 9 meter aperture. The two smaller systems occupied several dozen sites in the U.S., Canada, the Caribbean, and Europe during the 1980's and early 1990's.
- Most VLBA-correlated and AIPS-fringed S/X-band VLBA and VLBA +Mark IV sessions, a total of 168 such sessions. This includes 72 RDV sessions (January 1997 to December 2008) and 24 VCS sessions (August 1994 to January 2007).
- Most one-baseline southern hemisphere Celestial Reference Frame sessions, coordinated by USNO.
- 74 one-baseline NASA Deep Space Network sessions from 1988 August 20 – 1994 September 04 that were used in ICRF1 for consistency with ICRF1, even though some are of shorter duration than 18 hrs.

Sessions that were not used include various small and regional sessions (JADE, Canadian regional, most European mobiles), various "ties" sessions, several short one-baseline sessions, and other special sessions not

suitable for astrometric analysis. Also, no single band data (S-band only, X-band only, K-band, Ka-band, Q-band, etc.) was used.

It is important to note that the data used in this work is a very heterogeneous data set. The networks involved ranged from as little as 2 stations (1 baseline) to as large as 20 stations (190 baselines). Antenna sizes ranged from 3 meters up to 100 meters. The distribution of the fixed antennas was also very uneven. Out of some 53 antennas used over the past 30 years, only 10 have been in the southern hemisphere. Currently, there are some 34 fixed antennas that regularly or occasionally participate in geodetic/astrometric sessions, but only seven of those are in the southern hemisphere. This distribution directly affects the data available for the ICRF2. The amount of data begins to drop off quickly for sources south of around $-30°$ declination. In recent years, the USNO has made great efforts to observe new sources in the far south using the HARTRAO and HOBART antennas and this has added several dozen such sources. However, with the mechanical failure of HARTRAO in 2008, further progress in this area has been severely curtailed.

Worth mentioning is the contribution of the VLBA in improving the precision of the ICRF2. The VLBA[3] is an astronomical VLBI array of ten 25-meter antennas, all on U.S. territory. The VLBA antennas are some of the most sensitive and phase stable systems available. Details of their geodetic/astrometric use are given by Petrov et al. [2009]. Use of the Pietown VLBA antenna began in 1988 followed by the Los Alamos (LA-VLBA) antenna in 1991. Use of all 10 VLBA antennas, and correlation on the VLBA correlator began in 1994. In a 2004 study, Gordon [2004] found that the regular VLBA (non-VCS) observations accounted for some 30% of the available geodetic/astrometric VLBI data and its usage improved the TRF at non-VLBA sites by typically 10-40% and reduced the average source position formal errors by $\sim$62% in R.A. and $\sim$54% in declination for sources north of $-30°$ declination. This means the formal errors are roughly cut in half by a combination of more data and higher data quality due to VLBA usage. Currently, VLBA data comprises $\sim$28% of all the data used in this report.

The VCS were a series of six multi-session S/X-band astrometry campaigns designed to map and find precise positions of as many new compact radio sources as possible for use as phase referencing calibrators by the radio astronomical community. The first of these, VCS-1, was observed 1994–1997, and its 10 sessions are described and analyzed by Beasley et al. [2002]. An eleventh VCS-1 session, initially considered a failure, was later found and analyzed successfully. Five follow up VCS campaigns were made between 2002 and 2007 by Fomalont et al. [2003], Petrov et al. [2005], Petrov et al. [2006], Kovalev et al. [2007], and Petrov et al. [2008]. These added another 13 VCS sessions for a total of 24. The observing mode was much different from regular geodetic/astrometric sessions. The VCS sessions concentrated on making short observations of many new sources. They were not optimized for full sky coverage or atmospheric calibration, although the later ones were better calibrated than the first. The VCS sessions add nearly 2200 additional sources to the catalog with most of those observed in only one VCS session. In spite of that, many of the VCS source positions are as precise as many non-VCS sources.

[3]The VLBA is operated by the National Radio Astronomy Observatory, which is a facility of the National Science Foundation, and operated under cooperative agreement by Associated Universities, Inc.

3 VLBI Analysis Software (DG)

Several software packages have been developed over the years for VLBI processing and/or analysis. All have been developed independently by different groups. Four such software packages were used in studying the data included in ICRF2 and in generating preliminary and final solutions. In the following sections, we briefly describe each one.

3.1 Calc/Solve (DG)

The Calc/Solve analysis package has been under development and in use for over 30 years with most of the development work being done by the VLBI group at the GSFC. It is the oldest and most complete of the VLBI geodetic/astrometric analysis packages. It is composed of over one hundred different programs used for the creation and calibration of database session files, the analysis of individual sessions or mass analysis of multiple sessions, and many other assorted tasks. Calc/Solve was built around the original Mark III database handler which dates back to the late 1970's. Calc/Solve is the only analysis package which allows for single session editing and updating of individual VLBI sessions. As such, Calc/Solve provides the analyzed database versions which the other analysis packages depend on for their analysis.

Program Calc contains most of the geophysical models and computes a theoretical VLBI delay and delay rate for each observation in a session consistent with the IERS Conventions (2003) [McCarthy & Petit, 2004]. Calc also computes many of the partial derivatives of the delay and delay rates with respect to various parameters (such as nutation, polar motion, UT1, site positions, source coordinates, etc.) which are used in the analysis to solve for adjustments of those parameters. Calc also has an active role in the VLBI correlation process, as it is used at most of the world's VLBI geodetic and astronomical correlators (the three Mark IV correlators, the VLBA correlator, the JIVE correlator, the ATNF correlator, and the DiFX software correlator) to compute the correlator model delays for offsetting the bit streams from the different antennas.

Solve is made up of a large family of programs for both single session analysis and multiple session analysis. It performs a least-squares fit and parameter adjustments using the Calc theoretical delays and partial derivatives, the observed delays, and additional models and partials. Solve has two modes: an interactive single session analysis mode and a non-interactive global analysis mode. In the single session analysis mode, the analyst reads in the Calc'ed and calibrated X-band and S-band databases. They then perform ambiguity resolution (either automatically or manually); perform the ionosphere calibration; set the clock, atmosphere, and other parametrization; edit the data on each baseline (either automatically or manually); and update the X-band database. The analyzed, updated session version can then be used in the global analysis mode. In the non-interactive, global analysis mode, Solve is used to analyze large groups of sessions. It uses the arc-parameter elimination method described in Ma et al. [1990]. It can solve for various arc parameters (adjusted for each session) and global parameters (adjusted once for the entire data set). The use of Solve for generation of the ICRF2 solution is described in §7.

Calc/Solve was originally written in Fortran 77 and ran on a variety of HP machines for many years. Several years ago, it was converted to Fortran 90 and Linux. It is now most commonly used on Linux PC's under a variety of Linux operating systems.

3.2 SteelBreeze (SLB)

Software SteelBreeze was developed from scratch as a tool for geodetic VLBI data analysis at the Main Astronomical Observatory of the National Academy of Sciences of Ukraine. It performs a least-squares estimation of various geodynamical parameters using the Square Root Information Filter (SRIF) algorithm [Biermann, 1977]. SRIF allows the introduction of stochastic models for parameter estimation.

The software imports geodetic VLBI observations in known formats (NGS cards and Mark III databases). It stores observations as well as catalogs of radio sources, stations, EOP, ephemerides, and some other data sets in its own inner binary formats.

SteelBreeze analyzes VLBI data (group delays) of single and multiple sets of sessions. The time delay is modeled according to the IERS Conventions (2003) [McCarthy & Petit, 2004], and other additional models (tectonic plate motions, nutation models, wet and hydrostatic zenith delay, mapping function, etc.). The software makes estimations of the following parameters: Earth orientation parameters, coordinates and velocities of selected sets of stations, coordinates of selected sets of radio sources, clock functions and wet zenith delays and gradients, axis offsets, Love numbers, etc.

The SRIF algorithm allows estimations of unbiased parameters as well as stochastic ones. In SteelBreeze, each estimated parameter can be one of the following types:

- Global parameter: unbiased estimation for an entire set of selected sessions (typically applied for source and station coordinates estimation, etc.).
- Local parameter: unbiased estimation at each session. The estimates on different sessions are considered to be independent (e.g., EOP).
- Local parameter with time propagation: unbiased estimation at each session, the estimates on adjacent sessions are dependent according to a given rule.
- Stochastic parameter: the behavior of the estimated parameter is assumed to be varying with time with a given rule (implemented: white noise, 2^{nd} order Markov process, random walk). This type is useful for estimation of clock parameters and wet zenith delays.
- Stochastic parameter with time propagation: the same as above, but adjacent estimations for different sessions are tied with the same rule.

SteelBreeze is written in C++, uses the Qt user interface library and runs on Linux/GNU system.

3.3 OCCAM (OAT)

The OCCAM software package [Titov et al., 2004a] analyzes VLBI data by the least-squares collocation method (LSCM) [Titov et al., 2004b]. The LSCM minimizes a function similar to the conventional least-squares method and, additionally, it takes into account intra-day correlations between observations. These correlations are calculated from external data, in the case of VLBI, from the data about stochastic behavior of hydrogen maser clocks and wet components of troposphere delays and gradients. All estimated parameters are split into three groups based on their properties: stochastic, estimated for every epoch (clock functions and wet troposphere delays); daily or 'arc' parameters to be approximately constant within a 24-hour session; and so-called 'global' parameters, which are constant over the total period of observations.

3.4 QUASAR (SK)

QUASAR [Gubanov et al., 2004; Kurdubov, 2007] is the VLBI analysis software package developed by the Institute of Applied Astronomy of the Russian Academy of Sciences. It uses the least-squares collocation technique. Most of the reduction calculations are implemented according to the IERS Conventions (2003) [McCarthy & Petit, 2004]. QUASAR software supports both single and multi-session adjustment. There is a wide list of parameters which have partials and can be estimated. Every parameter can be estimated as a global, arc, or stochastic parameter. Every parameter can be represented as a polynomial function over the span of one session or the entire observation period. The Vienna Mapping Function (VMF1) [Böhm, Werl, & Schuh, 2006] is used for the tropospheric delay. QUASAR has two options for atmospheric loading: a one-dimensional regression model and a three dimensional numerical model. Antenna and axis offset thermal deformation are also accounted for. Celestial Intermediate Pole (CIP) formalism is used for Celestial pole coordinates and derivations. For nutation adjustments, QUASAR estimates the new CIP-X and CIP-Y instead of $d\psi$, $d\epsilon$.

For the iaa008c catalogue, VLBI observations from 1980 to 2009 March 30 (mostly from the GSFC list) were used. There were a total of 6353387 group delays. The celestial reference frame was defined by No-Net-Rotation (NNR) constraints on the coordinates of 203 sources from the ICRF1 "defining" list. The VTRF2008 catalog was used for *a priori* station positions. No-net-translation and no-net-rotation constraints were applied for the coordinates and velocities of 11 stations: MATERA, KOKEE, WETTZELL, FORTLEZA, WESTFORD, ALGOPARK, NYALES20, NOTO, ONSALA60, LA-VLBA, MK-VLBA. Coordinates of all radio sources, and positions and velocities of all stations were estimated as global parameters. EOP's were estimated as local parameters. Clock functions were estimated as the sum of a quadratic polynomial and a stochastic function. Tropospheric wet zenith delays were estimated as the sums of linear and stochastic parts. Total tropospheric gradients were estimated as local parameters with no constraints and no *a priori* model applied. For coordinates of sources that were observed fewer than 5 times, a soft 10 cm constraint was applied. For velocities of stations participating in fewer than 5 session or time spans less than one year, a soft 10 cm constraint was applied. Atmospheric pressure loading was applied using the Petrov & Boy [2004] 3-D model and the Vienna Mapping Function (VMF1) [Böhm, Werl, & Schuh, 2006] was used.

4 Selection and Treatment of Special Handling Sources (DG, DSM)

The radio sources observed were, in most cases, distant compact quasars or other active galactic nuclei. The positions of most of the sources were treated as global parameters in the least-squares solutions. This means that all the observations of each source in all the sessions were combined to estimate a single average position. For these global sources, the amount of data varied from as little as 3 observations in one session, to as many as ∼337300 observations in 4068 sessions (source 0552+398, which was observed in 89.6% of the sessions).

Studies of source positional stability were carried out by running solutions which generated time series of the source positions, i.e., a separate position for each observing session. Various statistics of the Right Ascension (RA) and declination of the sources were examined, such as weighted root-mean-square (wrms) variations about the mean, χ^2 per-degree-of-freedom, smoothed 2-year slopes, and other statistics. Some of these statistics were later used to identify the most stable sources—discussed later in this report. Smoothed and un-smoothed time series plots were also studied. One goal was to identify sources so unstable as to require special handling. Special handling sources were to be treated as arc parameters, with their positions estimated once for each session. A further goal was to keep this list as small as possible. Some 39 sources were selected for special handling. Most of these are sources that were observed in many sessions and which show significant positional instability in either RA and/or Declination. Some of these are strong sources that have been observed sparingly in recent years because of known adverse source structure effects on geodetic solutions (such as 3C84, 3C273B, 3C279, 3C345, and 3C454.3). A few are sources that have not been observed heavily, but still show convincing systematic position variations. Estimating the positions of these problem sources globally would yield grossly underestimated position uncertainties and could possibly distort the overall reference frame. Therefore they were treated as arc parameters. The positions given for them in the catalogs are the weighted means of their time series positions and the uncertainties are the wrms positions about the weighted means. Seven of these special handling sources were original ICRF1 defining sources (0014+813, 0235+164, 0637−752, 0738+313, 1308+326, 1448+762, and 2145+067). The 39 special handling sources are:
0014+813, 0106+013, 0202+149, 0208−512, 0212+735, 0235+164, 0238−084 (NGC1052), 0316+413 (3C84), 0430+052 (3C120), 0438−436, 0451−282, 0528+134, 0607−157, 0637−752, 0711+356, 0738+313, 0919−260, 0923+392 (4C39.25), 0953+254 (OK290), 1021−006, 1044+719, 1226+023 (3C273B), 1253−055 (3C279), 1308+326, 1404+286 (OQ208), 1448+762, 1458+718 (3C309.1), 1611+343, 1610−771, 1641+399 (3C345), 1739+522, 2121+053, 2128−123, 2134+004, 2145+067, 2201+315, 2234+282, 2243−123, and 2251+158 (3C454.3).
Time series plots of these 39 special handling sources are shown in Figure 1 to Figure 10. The plotted points are 45-day averages.

It should not be assumed that there are only 39 unstable sources among the ∼3400 available sources. The vast majority of the sources have not been observed with the frequency necessary to detect the type of small systematic position variations seen, for example, in sources like 0014+813, 0235+164, 0528+134, or 1044+719. Many other sources showed smaller position variations, but at a level that did not cause concern.

There were also many sources that were excluded from the solutions for various reasons. Included in this category were three known gravita-

tional lenses and six known radio stars. The gravitational lenses present analysis problems in assigning a single position and the radio stars were too weak to be used. Also excluded from the solution were 795 sources which had either zero or only one or two good group delay observations. A reliable position cannot be determined from only one or two observations. Most of these were sources either too weak or too spatially extended to be detected in the VCS sessions.

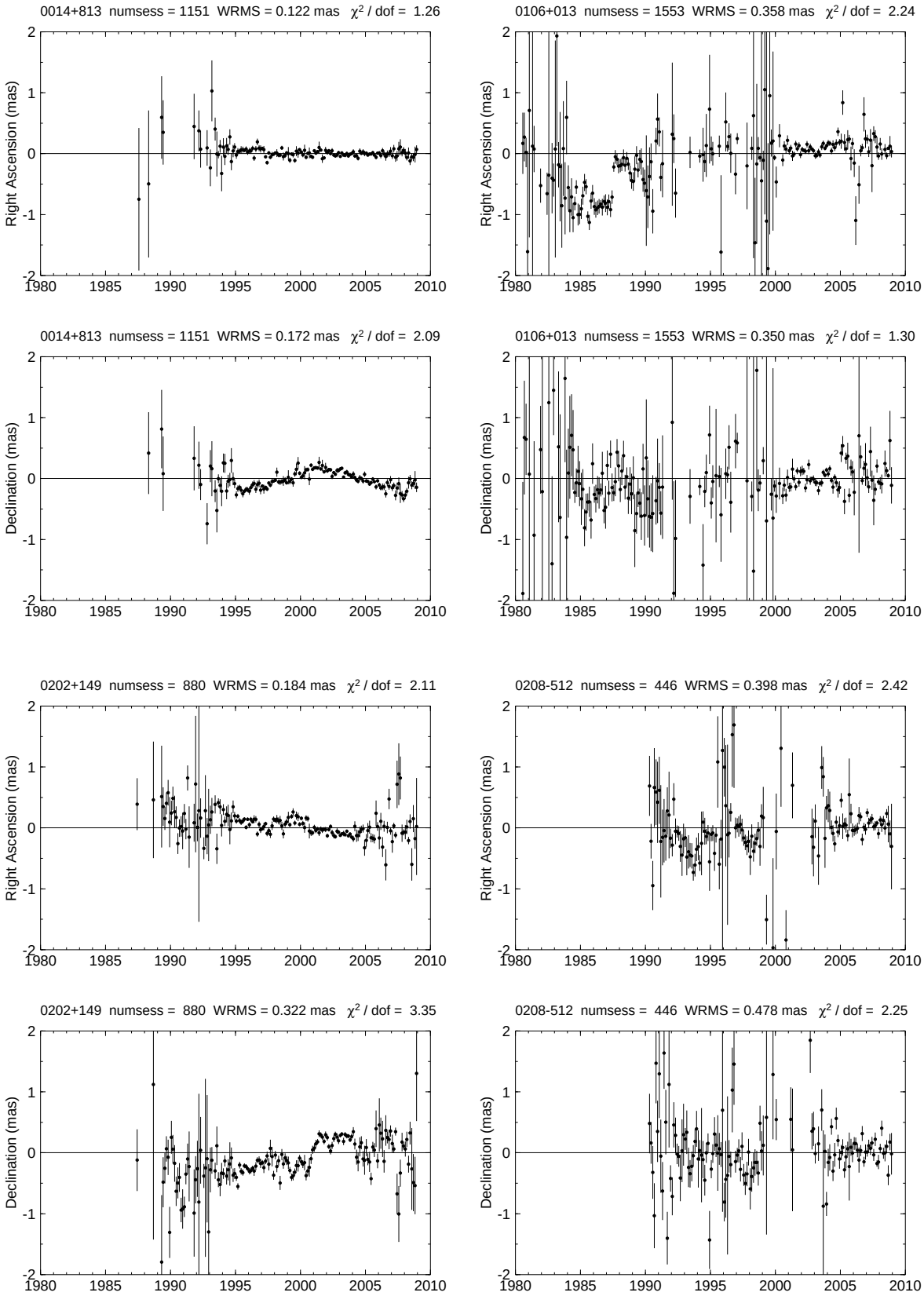

Figure 1: Time series plots of the 39 special handling sources.

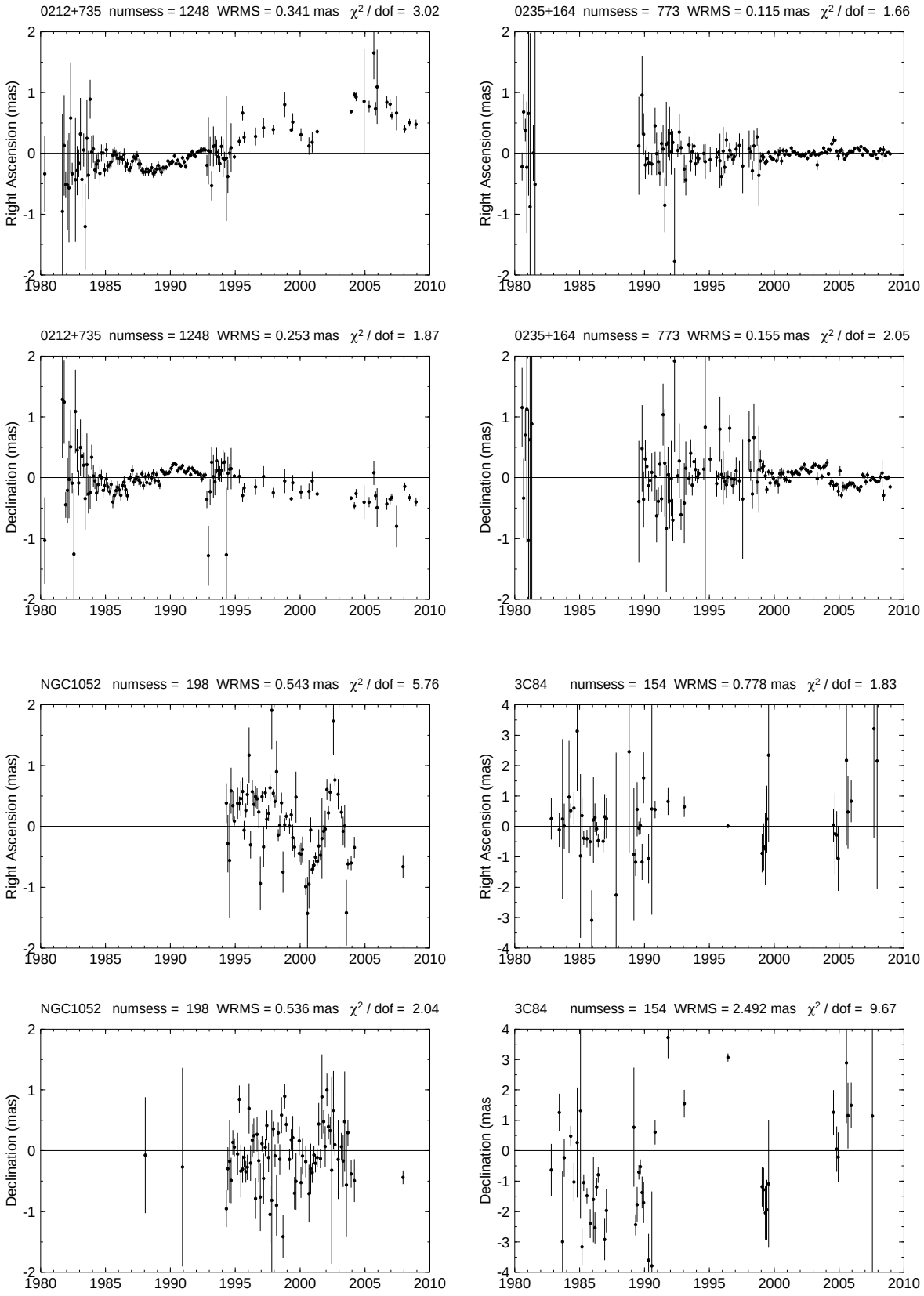

Figure 2: Time series plots of the 39 special handling sources – continued.

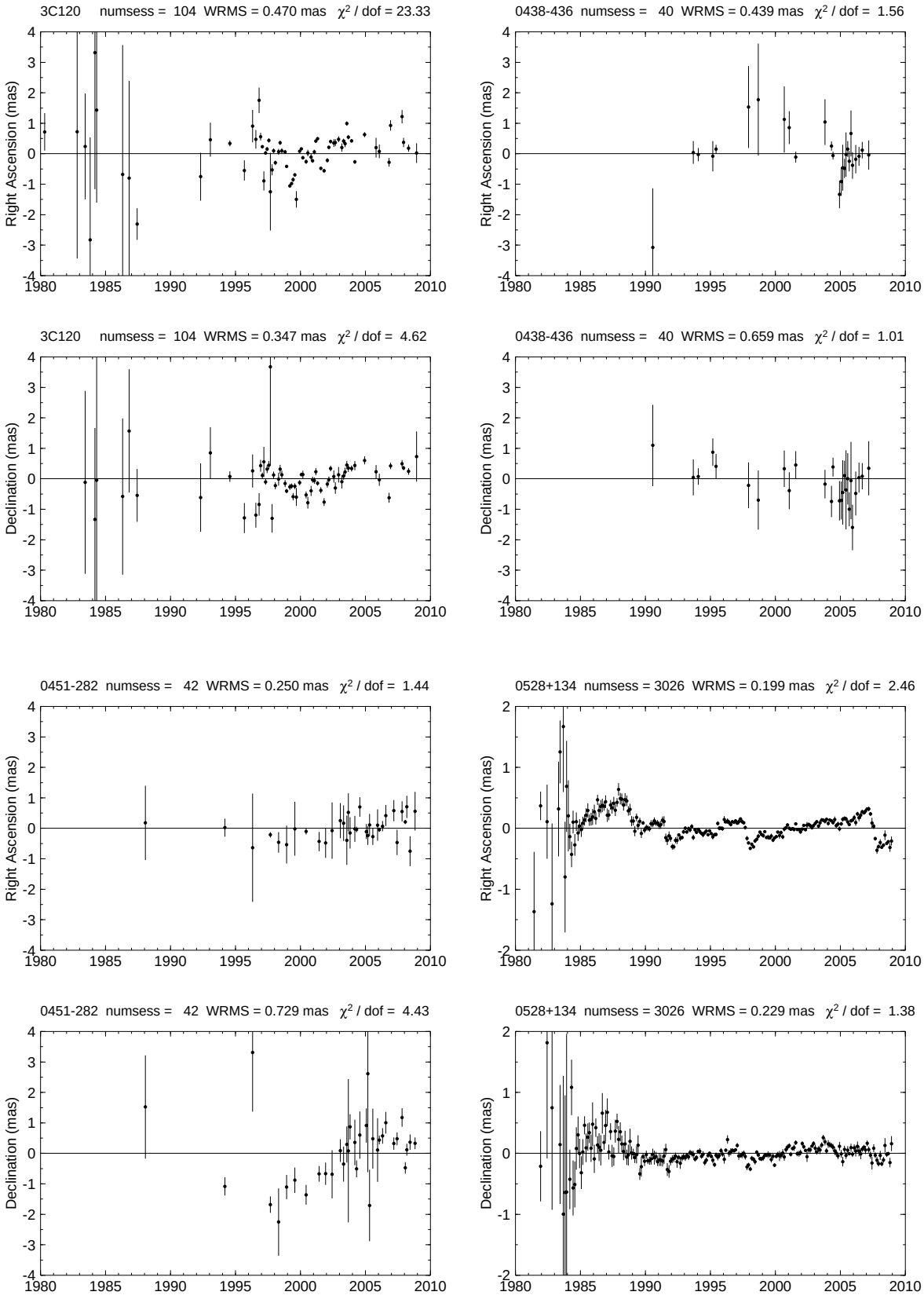

Figure 3: Time series plots of the 39 special handling sources – continued.

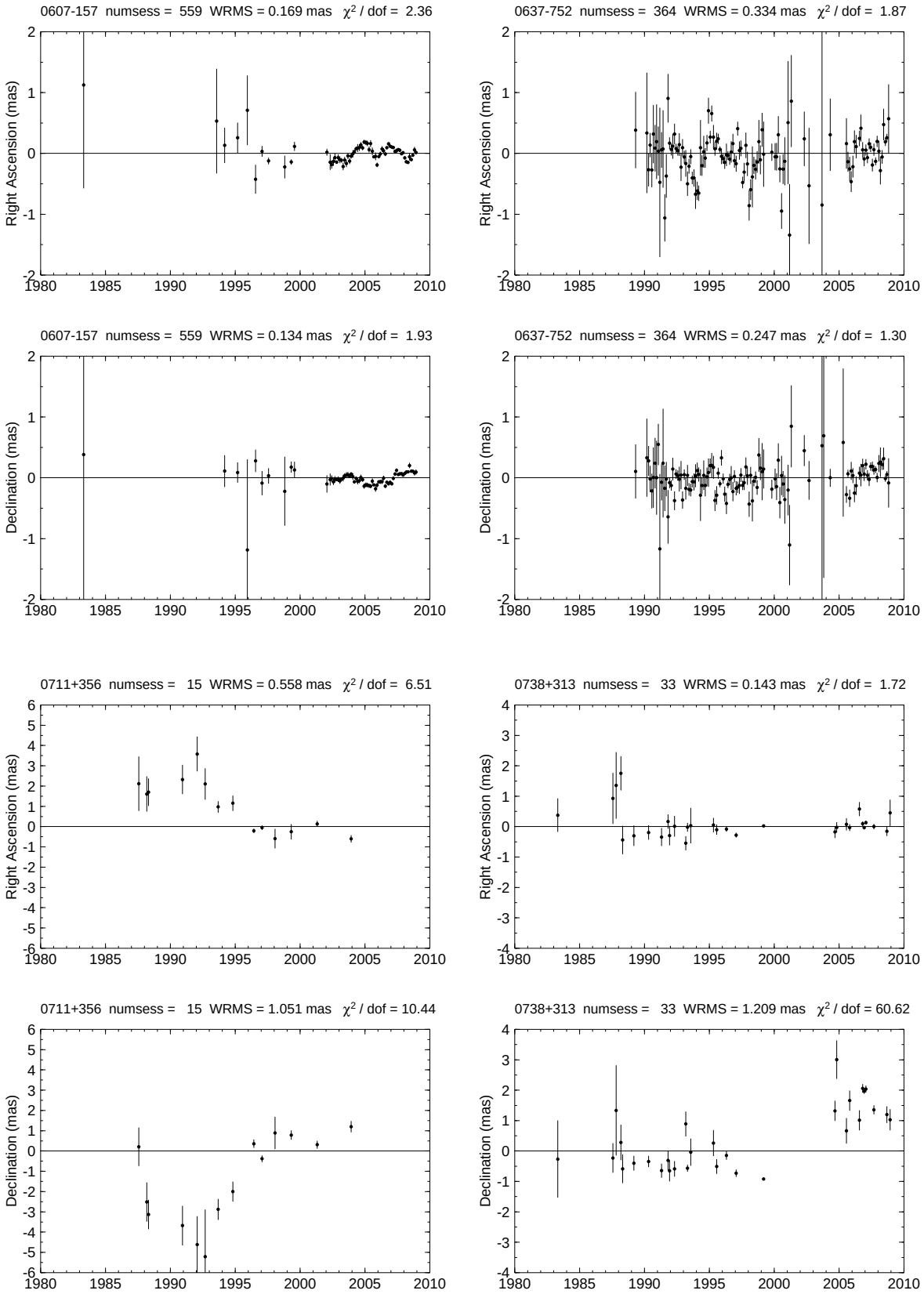

Figure 4: Time series plots of the 39 special handling sources – continued.

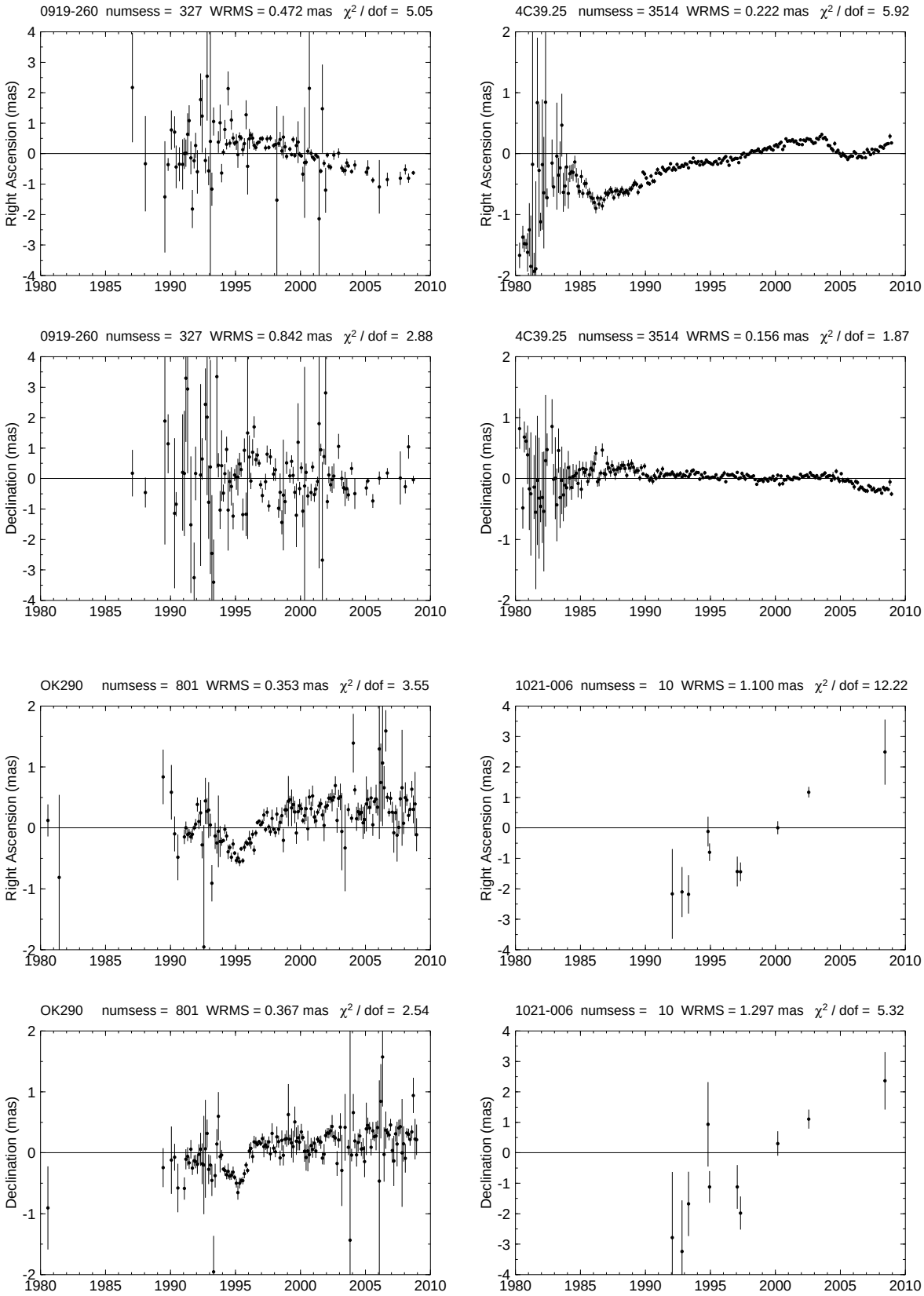

Figure 5: Time series plots of the 39 special handling sources – continued.

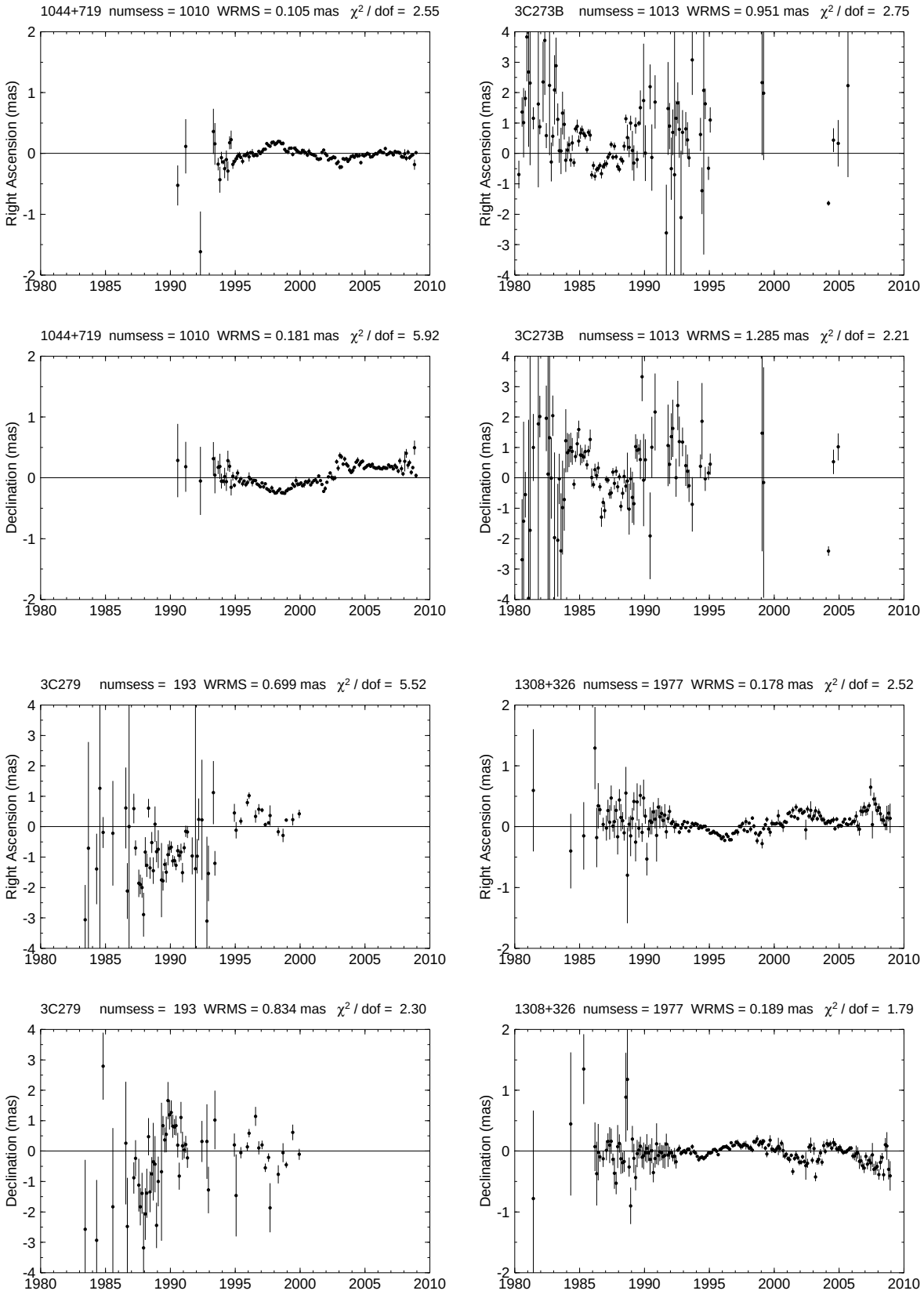

Figure 6: Time series plots of the 39 special handling sources – continued.

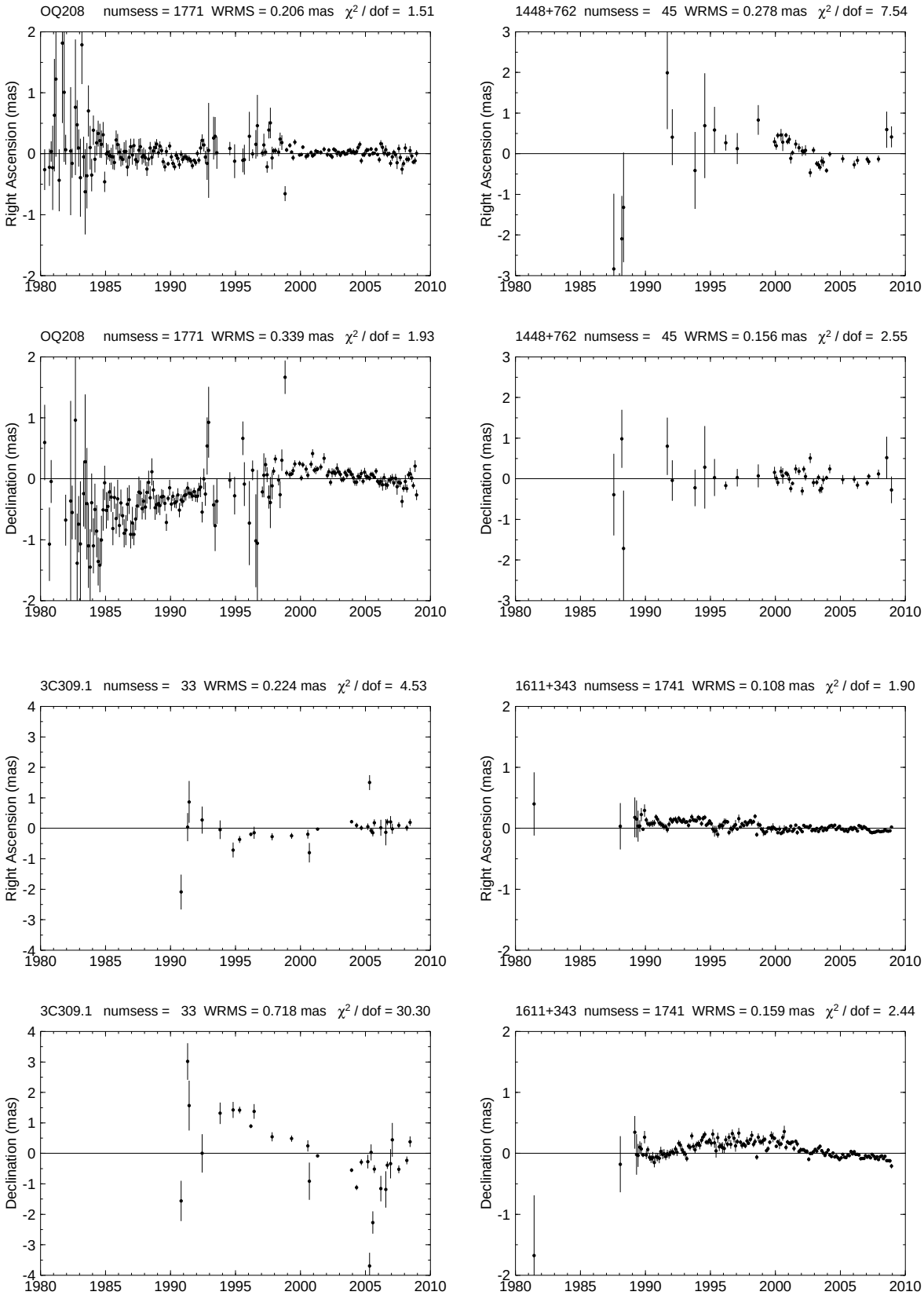

Figure 7: Time series plots of the 39 special handling sources – continued.

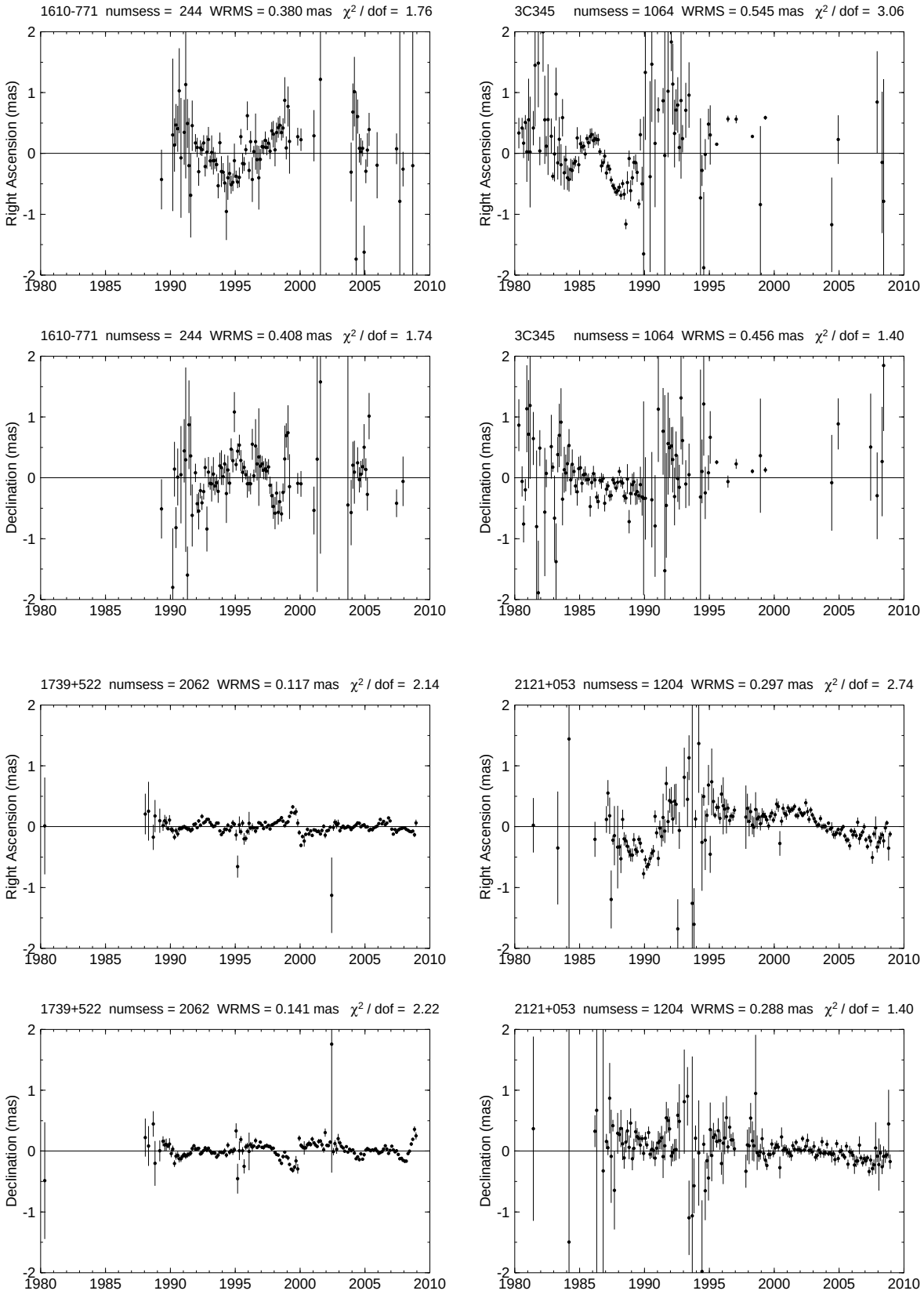

Figure 8: Time series plots of the 39 special handling sources – continued.

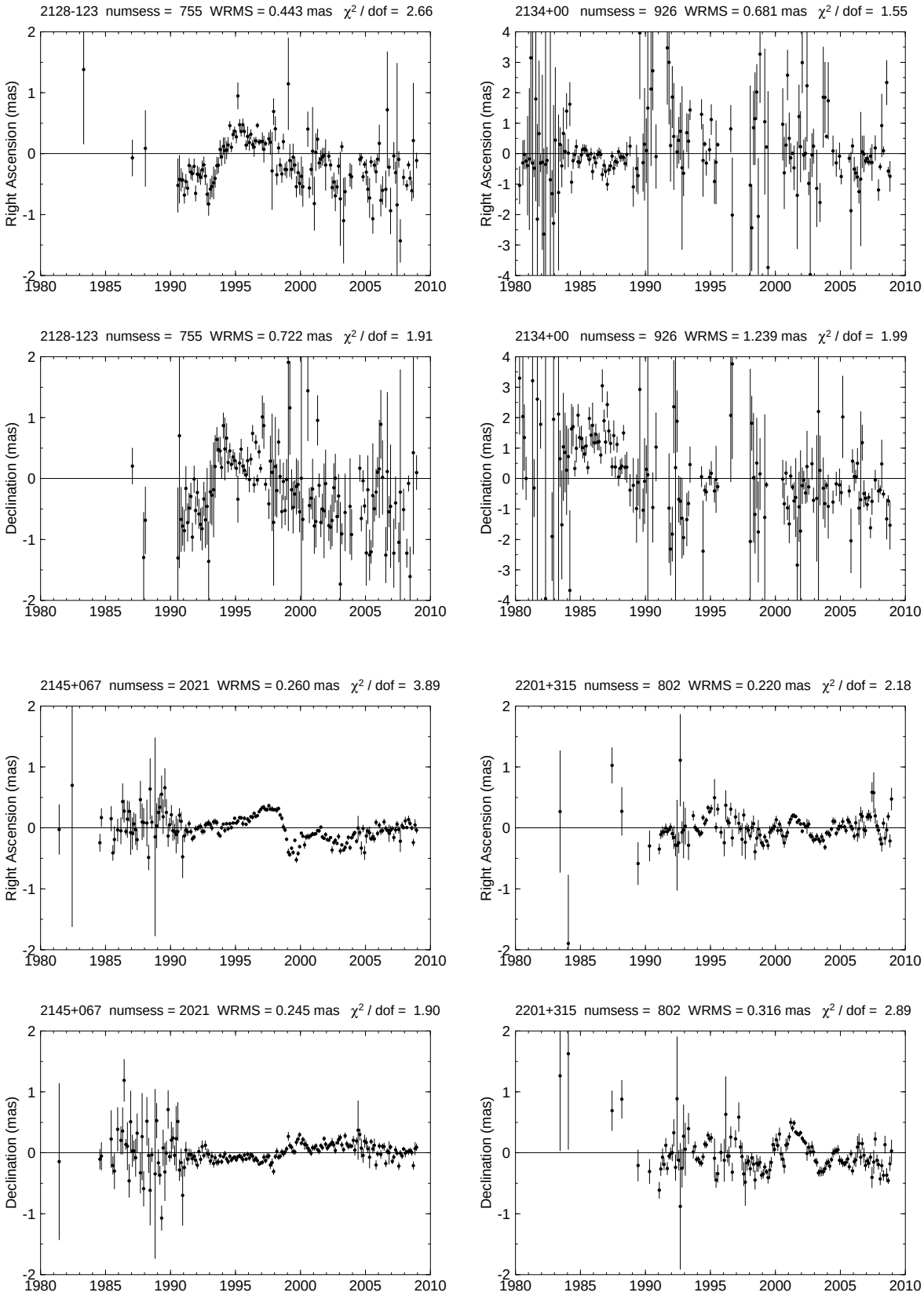

Figure 9: Time series plots of the 39 special handling sources – continued.

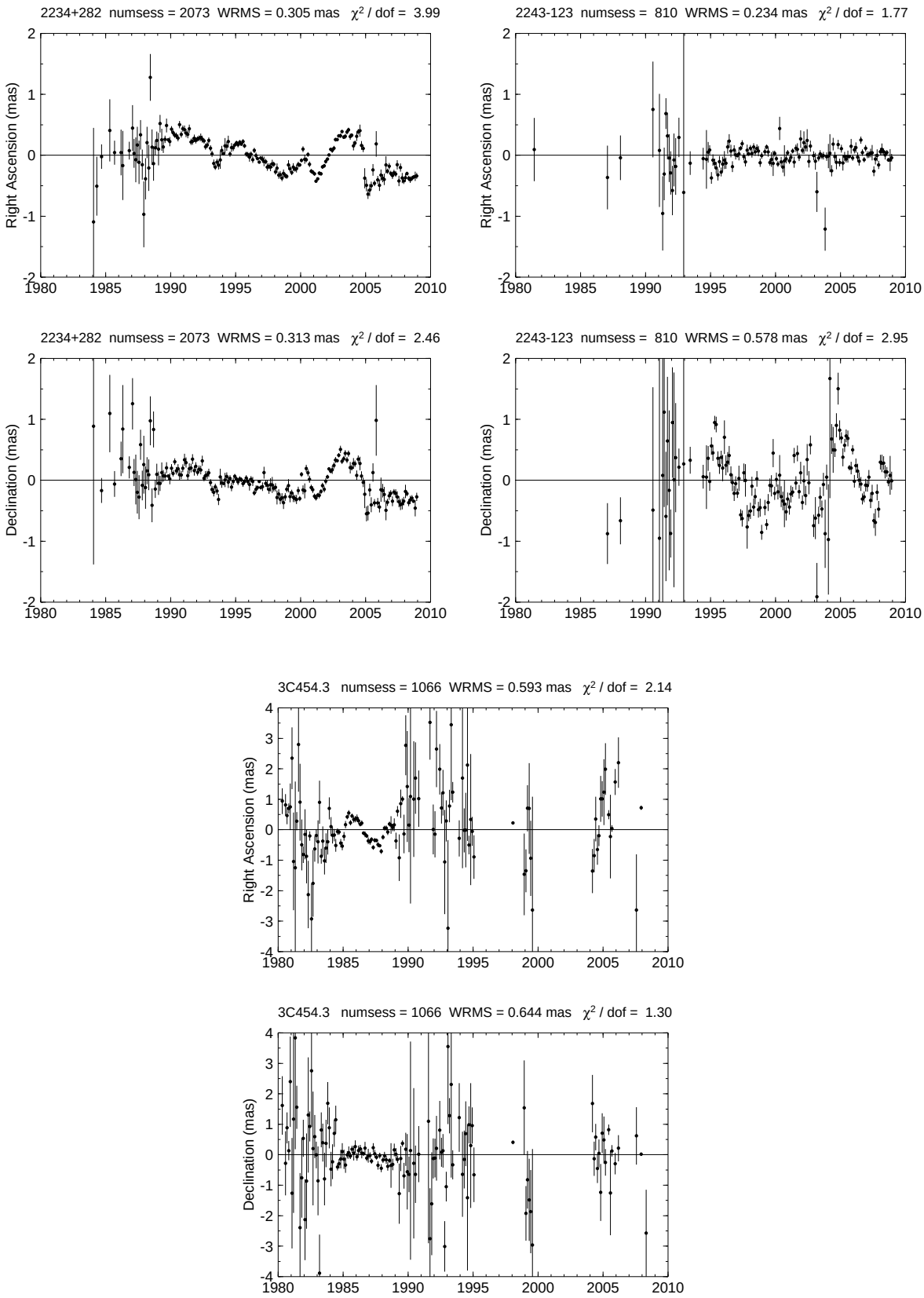

Figure 10: Time series plots of the 39 special handling sources – continued.

5 Characterization of Source Structure (PC, AC, ALF, RO, DAB)

As noted above, there is now a large amount of imaging data which can be used to both filter out the most extended sources and identify the most compact sources for defining the ICRF2 frame. In order to assess the astrometric quality of the sources, we used the so-called "structure index" (SI) defined by Fey & Charlot [1997], modified as to obtain a continuous structure index scale as described below. The structure index indicates the expected magnitude of the effects of intrinsic source structure on VLBI delay observations according to the median value of the structure delay corrections, $\tau_{\rm median}$, calculated for all projected VLBI baselines that could be observed with Earth–bound VLBI, using the algorithm devised by Charlot [1990]. While Fey & Charlot [1997] separated the sources into four categories, with values of the structure index ranging from 1 to 4, we adopted a continuous scale for the present work and defined the structure index SI as follows:

$$\mathrm{SI} = 1 + 2\log\left(\tau_{\rm median}\right) \tag{1}$$

where $\tau_{\rm median}$ is expressed in picoseconds (ps). Additionally, we constrained SI values to remain always positive by setting SI = 0 when $\log\left(\tau_{\rm median}\right) < -0.5$ (i.e., $\tau_{\rm median} <\sim 0.3$ ps). As shown in Figure 11, there is close correspondence at the (discrete) SI boundaries between the continuous SI values defined here and the values defined in Fey & Charlot [1997] (SI = 1.95 vs 2 for $\tau_{\rm median}$ = 3 ps, SI = 3.00 vs 3 for $\tau_{\rm median}$ = 10 ps, SI = 3.95 vs 4 for $\tau_{\rm median}$ = 30 ps). Therefore, the recommendation of Fey & Charlot [1997] that sources with SI values of 3 or 4 should preferably not be used for high-precision VLBI astrometry remains largely valid with this new definition of the structure index.

Based on the above definition, structure indices were derived for 701 different sources by using a total of 3046 X-band VLBI images from the USNO Radio Reference Frame Image Database and the Bordeaux VLBI Image Database for epochs between 1994 and 2008. The vast majority of the images for the sources north of about −40° declination were obtained from RDV sessions or from earlier VLBA sessions [Fey et al., 1996; Fey & Charlot, 1997, 2000]. For the sources in the far south, the images are from dedicated southern-hemisphere VLBI sessions [Ojha et al., 2004, 2005]. Nearly half of the sources (331 sources) have been imaged at only a single epoch whereas the most-intensively observed source (0727−115) has 32 images available. For the sources imaged at more than one epoch, an additional step was taken and the mean SI over all epochs was calculated. The time series of structure indices were also scrutinized to check for outliers, possibly caused by images with low dynamic range or poor resolution, which may affect the mean SI values, and for SI variability over time, which is indicative of astrophysical instabilities.

All source structure indices derived in this way, including the number of images on which the mean SI values are based, are reported in Table 1. Sources with good structure index (SI < 3.0) but which show significant SI variations over time or have bad structure at S band are also marked in the table. The distribution of the mean SI values is plotted in Figure 12. These values peak at about 2.75, corresponding to a value of 7.5 ps for the delay structure correction. Also marked in Figure 12, are the special handling sources discussed in the previous section, all of which except 0438−436 have a structure index available. Based on our calculation, it is found that 26 sources of these have a SI value larger than 3.0, which is an indication of extended emission. In addition, 6 of the remaining 12 sources that have a mean SI smaller than 3.0 (0528+134, 0919−260, 0923+392, 1044+719, 2145+067, 2234+282) are marked as variable in Table 1, which indicates that they are likely to show positional

instabilities. Overall, more than 80% of the special handling sources are thus found to be unsuitable for the highest astrometric accuracy when considering solely their structure, in agreement with the findings in the previous section.

Finally, it is to be noted that the structure index values listed in Table 1 represent a snapshot of the imaging data available at the time this work was carried out and that these values may evolve with time. While sources with already many images are likely to show only small variations of structure index in the future, those with only a single image may in some cases show larger variations due to temporal changes in their structure.

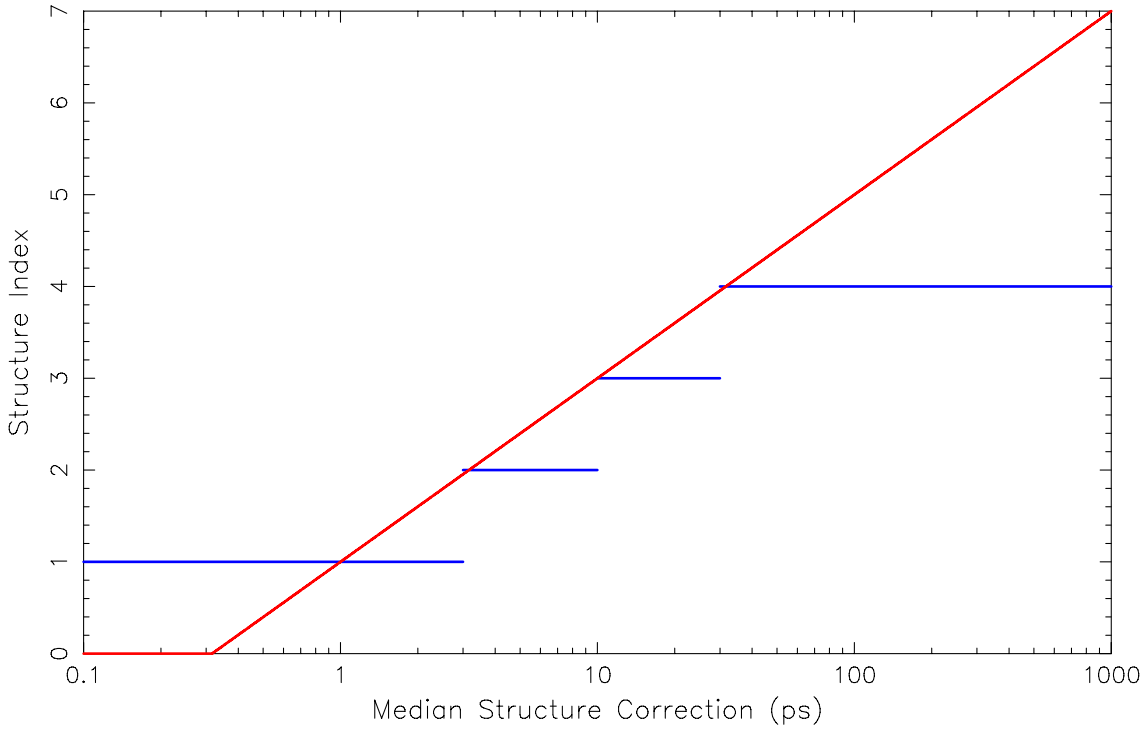

Figure 11: Correspondence between the discrete structure index defined by Fey & Charlot [1997], plotted in blue, and the continuous structure index from Equation 1, plotted in red.

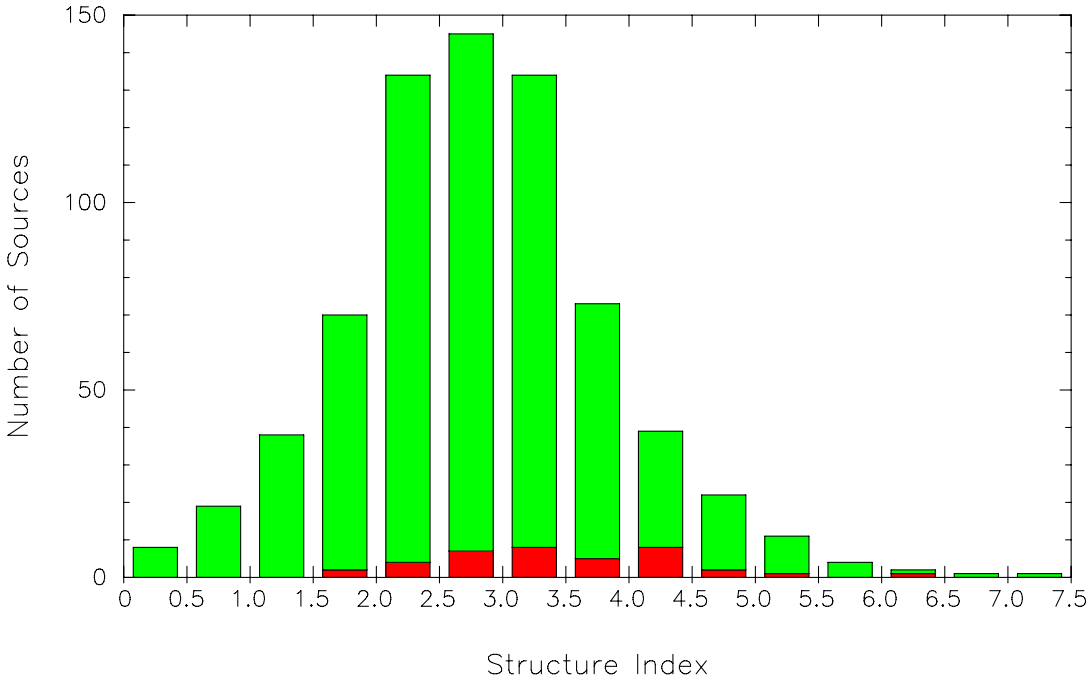

Figure 12: Distribution of the mean structure index for 701 sources with VLBI images available from the USNO Radio Reference Frame Image Database or the Bordeaux VLBI Image Database. The special handling sources discussed in §4 are color-coded in red.

Table 1: Mean source structure index values at X-band (8.4 GHz) for 701 sources with VLBI images available from the USNO Radio Reference Frame Image Database (RRFID) or the Bordeaux VLBI Image Database (BVID).

Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index
0003−066	25	3.1	0138−097	5	2.6	0312+100	1	2.5
0003+380	3	3.4	0144+209	1	4.6	0316+413	1	4.4
0007+106	3	0.9	0146+056	4	3.3	0316−444	1	2.5
0007+171	3	3.7	0148+274	1	3.8	0317+188	2	3.0
0008−264	1	1.6	0149+218	5	2.9‡	0319+121	2	4.0
0009+081	1	0.6	0150−334	1	4.5	0322+222	1	1.8
0010+405	2	2.6	0151+474	2	2.2	0325+395	1	0.9
0013−005	2	2.2	0153+744	2	5.0	0326+277	1	4.3
0014+813	22	2.5	0159−117	1	3.4	0332−403	1	2.3
0016+731	2	2.1†	0159+723	3	1.9	0333+321	2	3.7
0017+200	1	2.2	0201+113	21	3.1	0335−364	1	3.6
0019+058	3	1.4	0202+149	21	3.1	0336−019	28	3.0†
0025+197	1	1.6	0202−172	1	3.2	0338−214	1	3.4
0026+346	1	5.0	0202+319	4	1.8	0340+362	1	2.5
0035−252	1	1.8	0202−765	1	3.4	0341+158	1	2.5
0035+413	1	2.8	0208−512	1	2.3	0342+147	2	2.9
0039+230	3	4.2	0209+168	1	3.2	0345+460	1	3.1
0046+316	5	3.1	0211+171	1	0.8	0346−279	1	2.3
0047−579	1	3.8	0212+735	6	3.1	0347−211	1	2.4
0048−097	28	1.1	0215+015	1	1.4	0350+465	1	2.4
0048−427	1	1.8	0219+428	4	3.1	0355+508	2	2.0
0054+161	1	1.2	0220−349	2	3.2	0358+040	1	1.4
0055+300	1	3.6	0221+067	4	2.4	0358+210	1	0.8
0056−001	1	4.3	0224+671	4	3.3	0400+258	4	3.0
0056−572	1	5.0	0229+131	20	2.4	0400−319	1	3.0
0059+581	29	1.6	0234+285	18	2.6	0402−362	19	2.4
0103+127	1	3.6	0235+164	13	1.8	0403−132	1	0.6
0104−408	25	1.3	0237−027	2	2.0	0405−123	4	3.1
0106+013	6	3.2	0237+040	1	2.4	0405+304	1	1.8
0108+388	1	5.1	0237−233	2	5.6	0405−385	9	2.3
0109+224	2	2.0	0238−084	16	4.4	0406+121	3	2.9
0111+021	11	3.4	0239+108	3	3.0	0406−127	2	3.1
0111+131	1	2.4	0239+175	1	3.0	0409+229	2	3.4
0112−017	1	4.2	0241+622	2	2.9†	0410+110	1	2.5
0113−118	2	3.4	0244−452	1	3.6	0414−189	3	1.8
0115−214	1	2.5	0248+430	4	4.3	0415+398	1	1.6
0118−272	1	5.0	0252−712	1	6.6	0420−014	3	2.5†
0119+041	20	2.9†	0256−005	1	2.5	0420+417	4	3.3
0119+115	25	2.3	0256+075	2	3.1	0422+004	4	2.0
0123+257	4	3.0	0259+121	2	3.9	0422−380	1	4.1
0130−171	1	4.0	0300+470	5	2.5	0423+051	1	3.4
0131−522	1	2.4	0302+625	2	2.7	0423+237	1	2.7
0133+476	26	2.0	0305+039	2	3.1	0425+048	1	3.2
0134+311	1	2.7	0306+102	2	2.8	0426+273	4	2.6
0135−247	2	3.2	0307+380	1	0.0	0426−380	1	4.1
0137+012	1	1.5	0308−611	1	1.4	0430+052	16	4.3
0137+467	1	1.2	0309+411	2	2.1	0434−188	5	3.3

(continued on next page)

(Table 1: continued)

Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index
0437−454	2	2.2	0609+607	3	3.3	0747+185	1	0.7
0440−003	2	2.9	0611+131	2	2.2	0748+126	6	2.1
0440+345	1	2.8	0615+820	2	3.5	0749+540	9	2.7†
0442+389	1	2.4	0620+389	1	2.5	0754+100	4	3.1
0444+634	1	2.0	0625−354	1	3.1	0759+183	1	2.4
0446+112	4	2.4	0627−199	1	2.5	0804+499	20	1.8
0451−282	1	3.3	0629+160	1	4.6	0805−077	2	3.3
0454−234	27	1.9	0632−183	1	1.3	0805+410	11	2.1
0454−463	1	1.2	0636+680	1	1.7	0808+019	4	1.6
0454−810	1	2.5	0637−337	1	2.8	0809−493	1	3.9
0454+844	11	2.9	0637−752	1	4.3	0812+020	1	1.9
0457+024	2	4.2	0639−032	1	2.7	0812+367	1	2.8
0458−020	30	2.6	0641+392	1	2.6	0814+425	2	2.3
0458+138	2	2.9	0642+214	1	3.8	0818−128	1	3.5
0459+060	1	3.5	0642+449	24	1.5	0820+560	3	3.2
0459+252	1	3.0	0645+209	1	3.1	0821+248	1	1.7
0500+019	1	4.3	0646−306	3	2.7	0821+394	4	2.4‡
0502+049	1	3.4	0648−165	5	1.8	0823+033	27	2.7
0506+056	1	2.3	0648−287	1	0.8	0823−223	1	1.8
0506+101	2	1.3	0650+371	1	3.2	0823−500	1	6.0
0506−612	1	2.7	0654+244	1	3.5	0826−373	1	4.2
0507+179	3	2.9	0656+082	9	2.9	0827+243	3	2.4
0511−220	1	2.8	0657+172	4	2.2	0828−222	1	2.1
0518+165	1	4.1	0707+476	2	2.5	0828+493	1	2.3
0519+142	1	3.3	0710+439	4	5.7	0829+046	3	3.0
0521−365	1	3.6	0711+356	2	4.6	0831+557	3	5.1
0522−611	2	2.8	0716+714	2	1.9	0833+585	2	3.3
0524+034	1	1.1	0718+793	8	2.5	0834−201	2	2.3
0528+134	29	2.6†	0721−071	1	2.4	0834+250	1	2.8
0528−250	1	2.9	0722+145	2	2.7	0836+710	3	3.6
0529+075	1	4.0	0723−008	1	3.3	0838+133	1	3.2
0530−727	1	3.9	0723+219	1	0.6	0839+187	3	4.3
0536+145	3	1.4	0725+219	1	2.1	0850+581	3	3.2
0537−158	1	3.4	0727−115	32	2.0	0851+202	32	2.6†
0537−286	1	0.8	0727−365	1	3.7	0859−140	3	3.8
0537−441	22	2.7	0728+249	1	2.3	0859+470	2	3.1
0538+498	5	4.4	0729+259	1	3.4	0906+015	1	3.1
0539−057	2	2.8	0733−174	2	4.9	0906−048	1	2.2‡
0544+273	5	2.1	0735+178	2	3.4	0912+029	2	2.3
0547+234	1	2.0	0736+017	3	2.3	0912+297	3	2.5
0548+378	1	1.8	0736−332	1	4.3	0917+449	3	3.1
0552+398	31	2.5	0738+313	2	4.1	0917+624	3	3.1
0554+242	2	2.9†	0738+491	5	1.4	0918−297	1	3.6
0556+238	14	1.3	0738−674	2	3.1	0919−260	18	2.7†
0558−396	1	2.3	0742+103	10	3.9	0920+390	1	1.1
0600+177	2	2.8	0743−006	2	1.9	0920−397	16	2.5
0601+245	1	3.1	0743+259	9	2.1	0923+392	23	2.8†
0602+673	10	3.5	0743+277	1	1.5	0925−203	2	2.2
0605−085	3	3.4	0743−673	1	4.2	0927+469	1	3.4
0606−223	1	2.9	0745+241	3	2.5	0942+358	1	3.3
0607−157	15	2.2	0746+483	1	2.7	0945+408	3	3.6

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(Table 1: continued)

Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index
0949+354	2	2.6	1124−186	27	1.5	1257+145	1	2.1
0951+268	1	1.8	1125+366	1	1.0	1300+580	17	1.3
0951+693	3	2.7	1127−145	2	4.3	1302−102	2	3.3
0952+179	3	3.0	1128−047	1	3.3	1306+360	1	1.6
0953+254	16	3.2	1128+385	22	2.0	1307+121	1	3.6
0954+658	4	2.6	1130+009	1	2.4	1308+326	23	3.3
0955+326	4	2.8	1142+052	1	3.0	1308+328	3	2.7
0955+476	24	1.2	1143−245	3	3.5	1308+554	1	2.1
0958+346	1	2.1	1143−332	1	2.8	1313−333	18	2.7
1003+351	1	3.4	1144−379	26	2.2	1315+346	3	3.5
1004+141	10	3.5	1144+402	3	1.5	1323+321	1	4.6
1004−500	1	2.6	1145−071	17	2.8	1324+224	2	0.3
1011+250	2	3.2	1145+268	1	3.3	1328+307	1	5.7
1012+232	4	2.8	1146+596	1	4.1	1330+022	1	2.9
1013+127	1	1.1	1147−192	1	3.0	1330+476	1	0.8
1013+208	1	3.7	1147+245	2	2.6	1333−152	2	2.3
1020+400	1	3.1	1148−001	1	4.6	1333−337	1	2.5
1021−006	2	4.6	1150+497	2	3.2	1334−127	27	2.3
1022+194	5	2.6	1150+812	3	3.2	1338+381	3	3.8
1030+415	1	0.6	1155+251	3	4.7	1342+662	2	1.9
1032−199	2	3.2	1156−094	1	3.6	1342+663	3	2.8
1034−293	31	2.4	1156+295	26	2.5†	1345+125	1	5.4
1038+064	4	3.5	1212+171	1	2.2	1347+539	4	3.0‡
1038+528	1	2.8	1213−172	2	2.2	1348+308	1	2.1
1039+811	1	2.3	1213+350	2	3.3	1349−439	1	2.2
1040+123	1	3.9	1215+303	2	2.5	1351−018	17	2.3
1040+244	1	1.6	1216+487	3	3.1	1352−104	2	2.6†
1042+071	1	2.5	1218+339	1	2.0	1354−152	3	1.7
1044+719	23	2.2†	1219+044	15	1.9	1354+195	1	3.7
1045−188	4	3.0	1219+285	1	3.8	1357+769	22	0.7
1046−409	1	1.6	1221+809	3	2.6	1402+044	2	3.0
1047+147	1	2.4	1221−829	1	2.7	1404+286	24	3.6
1048−313	1	4.3	1222+037	1	4.5	1406−076	3	2.3
1049+215	2	3.0	1222+131	1	2.2	1409+218	2	2.5
1053+704	3	1.8	1223−188	2	2.6	1412+461	1	3.3
1053+815	13	2.3†	1226+023	1	5.5	1413+135	3	1.9‡
1054+004	1	2.9	1226+373	2	1.5	1416+067	3	3.1
1055+018	5	2.8	1228+126	21	3.6	1417+273	4	2.6
1056+212	1	1.9	1236+077	3	2.8	1417+385	10	1.9
1057−797	2	3.4	1237−101	1	4.3	1418−192	1	0.8
1059+282	1	1.4	1240+381	3	2.8	1418+546	20	3.0
1100+122	1	2.1	1241+166	1	2.0	1420+326	1	1.0
1101−325	1	3.0	1243−072	1	2.1	1424+240	1	2.1
1101+384	22	2.3	1244−255	1	0.2	1424+366	1	2.6
1104+728	1	2.1	1246+489	1	2.3	1424−418	18	2.5
1105−680	1	4.9	1251−197	1	2.5	1428+422	1	1.6
1107+485	1	1.5‡	1251−713	1	2.8	1430−178	1	3.9
1111+149	3	2.5	1252+119	3	2.9	1432+200	3	2.3
1116+128	3	3.3	1253−055	3	4.1	1433+304	1	2.4
1119+183	1	3.8	1255−316	15	3.2	1435−218	1	4.5
1123+264	2	2.4	1256−220	1	1.9	1435+638	1	4.2

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(Table 1: continued)

Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index
1441+252	1	1.6	1637+826	7	3.7	1758−651	1	1.7
1442+101	2	3.6	1638+398	22	1.6	1759−396	1	2.4
1443−162	1	2.8	1639−062	1	2.3	1800+440	4	2.2
1445−161	2	3.5	1639−200	1	1.8	1803+784	22	2.5†
1448+762	6	2.7	1639+230	2	1.3	1806+456	1	0.0
1451−375	16	3.0	1640−231	1	3.7	1807+698	4	3.2
1458+718	3	4.0	1641+399	2	4.1	1814−637	1	5.5
1459+480	3	2.6	1642+690	5	3.0	1817−254	1	3.5
1502+036	3	1.7	1645+271	1	2.9	1821+107	3	3.2
1502+106	4	2.9	1645−329	1	3.7	1822+033	1	2.1‡
1504−166	3	3.5	1647−296	1	2.3	1823+568	3	2.5†
1504+377	1	2.0	1648+084	1	0.0	1826+796	1	4.4
1505+428	1	3.4	1651+391	1	1.0	1829−207	1	4.8
1508−055	1	3.0‡	1652+398	4	3.4	1830+285	2	3.6
1510−089	3	2.9	1655+077	3	3.2	1842+681	3	1.9
1511−100	2	2.6	1656+053	2	3.2	1845−273	1	0.0
1514+004	1	3.1	1656+348	3	3.1	1845+797	2	3.9
1514+197	2	2.0	1656+477	1	4.0	1846+322	1	1.0
1514−241	16	3.5	1657−261	6	2.1	1849+670	3	1.5
1519−273	12	1.8	1705+018	2	2.6	1856+736	2	3.6
1520+319	1	1.8	1705+456	3	3.3	1901+319	2	3.9
1531−352	1	1.2	1706−174	4	2.4	1903−802	1	4.6
1532+016	2	4.1	1710−323	1	3.7	1908−201	25	2.5
1538+149	2	2.4	1717+178	3	2.8	1908+484	1	0.7
1540−828	1	7.2	1718−259	1	2.2	1909+161	1	2.7
1541+050	1	3.4	1718−649	1	5.4	1910+052	1	2.6
1546+027	4	2.7	1722+330	1	2.0	1920−211	2	2.5
1547+507	3	3.3	1725+044	3	3.2	1921−293	24	2.8
1548+056	2	2.9	1725+123	1	2.5	1922+155	1	2.3
1549−790	1	4.8	1726+455	15	2.2	1923+210	11	3.3
1555+001	2	1.8	1729−373	1	5.2	1925−206	2	2.1
1555−140	1	4.0	1730−130	3	2.5	1926+087	1	3.2
1557+032	1	2.1	1732+389	3	1.7	1928+738	4	3.9
1600−294	2	2.8	1736+324	1	1.5	1929+226	2	2.5
1600+335	2	4.0	1738+476	2	2.7	1932+204	3	2.1
1604−333	1	2.8	1738+499	3	2.3	1934−638	2	6.4
1606+106	30	2.5	1739+522	21	1.5	1936−155	4	2.1
1607+268	1	4.4	1741−038	28	1.9	1937−101	2	3.6
1608+243	1	1.5	1742−078	1	3.3	1943+228	1	1.3
1610−771	1	6.4	1743+173	1	2.6	1947+079	1	5.1
1611+343	24	3.2	1744+557	1	3.5	1951+355	1	2.7
1614+051	1	3.0	1745+624	22	1.7	1954−388	22	2.6
1616+063	2	2.8	1745+670	1	3.5	1954+513	2	2.6
1617+229	1	2.2	1746+470	4	1.1	1955+335	1	1.4
1622−253	25	2.0	1748−253	1	3.9	1958−179	10	1.5
1622−297	2	3.8	1749+096	31	1.3	2000+148	1	0.7
1624+416	1	3.7	1749+701	2	3.0	2000−330	2	4.1
1627+476	1	2.0	1751+288	2	2.3	2000+472	1	2.1
1633+382	1	3.4	1751+441	2	3.2	2005+403	1	3.6
1636+473	1	2.5	1754+155	1	2.1	2005−489	1	4.1
1637+574	3	2.5	1758+388	2	2.2	2007+777	2	3.4

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(Table 1: continued)

Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index	Source name	Number of maps	Structure Index
2008−068	3	4.1	2145+067	26	2.8†	2252−089	3	3.3
2008−159	4	1.6	2145+082	1	2.8	2253+417	2	3.6
2013+163	1	1.4	2147+077	1	4.9	2254+024	3	1.0
2017+743	4	2.2	2149+056	3	2.6	2254+074	2	2.2
2018+282	1	0.0	2149−306	2	3.6	2255−282	22	1.9
2021+317	4	3.3	2150+173	3	2.8	2259−375	1	4.9
2021+614	1	4.8	2152−699	1	4.5	2300−307	1	3.8
2023+336	2	3.4	2155−152	2	3.7	2300−683	1	2.1
2029+024	1	0.4	2155−304	1	2.1	2309+454	1	2.8
2029+121	2	2.7	2155+312	1	1.3	2312−319	1	3.1
2030+547	1	4.1	2200+420	18	3.5	2314−409	1	2.8
2037−253	1	3.3	2201+315	5	3.2	2318+049	12	2.6
2037+511	14	3.3	2205+166	1	2.5	2319+272	4	3.1
2048+312	4	3.0	2205+743	1	3.1	2319+317	1	1.7
2052−474	12	2.4	2209+236	9	1.9	2320−035	2	3.2
2054−377	1	3.1	2210−257	1	3.1	2320+506	3	3.6
2056−369	1	3.1	2211−388	1	4.5	2325+093	1	1.9
2059+034	1	2.1	2214+350	1	1.9	2325−150	1	2.5
2059−786	1	4.1	2216−038	2	3.3	2328+107	1	3.9
2106+143	1	2.6	2216+178	1	0.9	2329−162	3	3.7
2109−811	1	3.6	2223−052	13	2.3	2329−415	1	2.7
2113+293	11	2.8	2227−088	2	1.6	2331−240	1	3.5
2120+099	1	4.7	2227−399	1	3.8	2335−027	2	3.0
2121+053	4	3.0	2229−172	1	3.4	2337+264	2	4.8
2126−158	10	2.4	2229+695	1	2.6	2344+092	2	3.4
2127−096	1	2.9	2230+114	6	4.2	2345−167	1	3.8
2128−123	6	4.2	2233−148	2	3.3	2351−154	2	2.5
2131−021	2	2.8	2234+282	20	2.4†	2351+456	3	3.4
2134+004	6	3.5	2235+731	2	3.2	2353−686	1	2.9
2135−184	1	2.0	2239+096	1	2.9	2353+816	1	2.7
2136+141	19	2.8	2243−123	24	3.8	2355−106	1	0.7
2142+110	2	2.7	2245−328	1	2.8	2356+385	11	1.9
2143−156	3	3.1	2250+194	5	2.3	2358+189	1	1.9
2144+092	2	3.4	2251+158	4	3.7			

‡ Source has very extended S band structure
(information provided only for sources with SI $\leq$ 3.0).
† Time series of structure indices or maps indicate variability
(information provided only for sources with SI $\leq$ 3.0).

6 Data and Modeling Comparisons (DG, DSM)

One of the requirements for ICRF2 is that it should be consistent with the current realization of the International Terrestrial Reference Frame (ITRF) and EOP products. In practice, this means that it should be consistent with the VLBI contribution to ITRF2008, which is called VTRF2008 [Böckmann, Nothnagel, & Artz, 2009]. Thus, it was necessary for the ICRF2 solution to also solve for site positions, site velocities, and EOP. The level of agreement with VTRF2008 and EOP comparisons are discussed later in §10. The generation of ICRF2 is also required to use the best current state-of-the-art astronomical and geophysical models. Thus, the solution should use atmosphere gradients, the VMF1 troposphere mapping function model [Böhm, Werl, & Schuh, 2006], antenna thermal deformation, and the other standard VLBI models. Specifically, it should also use corrections for atmosphere pressure loading, even though they were not used for VTRF2008, since pressure loading is one of the state-of-the-art geophysical models that has become a standard VLBI analysis tool.

Some of the newer models have only recently become available in the analysis, such as the VMF1 model and the thermal deformation model. There was a desire to understand the effects of using different models, and to validate the newer models. Therefore, a number of model comparisons and tests were made. Tests were also made comparing subsets of the data, on the types of data, and on the data span. It was hoped that these tests and comparisons would help in determining the best data subset, the best analysis strategy, to identify and understand any systematic errors, and to help determine the noise floor. Some of these tests (decimation) are discussed later in §9. These tests were done at GSFC using the Calc/Solve analysis package. Most were made using preliminary catalog solutions, before the session and source lists were finalized. All the comparison tests except the VCS vs. non-VCS comparison used solutions without the 24 VCS sessions. In the discussions below of solution differences, the RA differences are always scaled by the cosine of the declination to give true arc lengths. A good summary of additional and complimentary comparisons using the OCCAM software can also be found in Tesmer [2007]. Their results generally agree with the results presented here.

6.1 Data Start Time Tests

The chronologically earlier VLBI data is known to be considerably noisier than later data. This has been due to many improvements over the past 30 years, such as: increased individual channel bandwidths, increased spanned bandwidths, improved electronics, new and more sensitive stations, larger networks, improved scheduling methods, and other factors. A question posed was whether to use data going back to the beginning of the Mark III era (August 1979), or to throw away the first few years of data. Alternate start times suggested were 1990 and 1993. One thought was, that although the earlier data is noisier, the formal errors are also larger and with proper weighting the earlier data should not degrade the reference frame. Three tests were made to study this issue, using data start times of Aug. 1979, Jan. 1990, and Jan. 1993.

When the start time is delayed from 1979 to 1990, there are some small differences in RA and declination for some sources, with some as large as $\sim$0.5 milli-arc-seconds (mas), but most much smaller. The formal uncertainties also increase slightly. The wrms differences between the ensemble of source positions estimated with and without the earlier data are 11 and 8 micro-arc-seconds (μas) in RA and declination, respectively. When the start time is delayed from 1979 to 1993, the differences are more dramatic. Large differences are seen for some sources, with a dozen

or so between 1 and 10 mas. The formal uncertainties for some sources also increase, some by ∼0.1 mas. Presumably, this is due to a greater emphasis on some sources in the earlier years. The wrms differences are 18 and 14 μas in RA and declination, respectively. From these comparisons, it was concluded that the earlier data, though noisier, will not degrade the reference frame, so it was used for ICRF2.

6.2 Data Type Comparisons

Another question was which types of sessions should be used. The earlier VLBI sessions were more concerned with plate tectonic and regional tectonic motion and less on Earth orientation and astrometry than the later sessions. Also, from 1982 until 1991 the Crustal Dynamics Project sponsored the Western U.S. and Alaska mobile VLBI campaigns. These used three small mobile VLBI systems (of 3, 5, and 9 meter diameter aperture), and the two smaller systems made repeated measurements at several dozen sites in California, Nevada, Arizona, Colorado, Alaska, and Canada to measure regional plate tectonics (see Clark et al. [1987] and Ma et al. [1990]). Data from the small mobile systems would not be expected to contribute to the celestial reference frame. However, most of these mobile sessions also used several large fixed antennas, such as OVRO130 (40 meter), Hatcreek (26 meter), Mojave12 (12 meter), Gilcreek (26 meter), and Westford (18.3 meter). These larger antennas would be expected to contribute to the celestial reference frame. A comparison was made of two solutions, one using only fixed station sessions (no mobile sessions) and one with mobile sessions added. When mobile sessions were added, very little difference in source positions were seen. The wrms differences are only 2 μas and the average differences are only 1 μas in both RA and declination. Only one difference was larger than 0.1 mas for a source observed in only a few sessions. There were no significant changes in formal errors and no significant rotation of the frame.

There was another class of sessions whose use was questionable. These were the small, regional sessions, like the JADE sessions, the Canadian regional sessions, most of the European mobile sessions, various "ties" sessions, and an assortment of special sessions not considered suitable for most VLBI analysis. Although these sessions were useful for their own purposes, they are made up of small or geometrically weak networks usually with only one large antenna and one or more small antennas. As such, they would not be expected to contribute much to the celestial reference frame. We made a comparison solution in which these sessions were added. When they were added in, the average position differences were not large, but some individual position differences were large, up to ∼1.6 mas, with 41 differences larger than 0.1 mas.

From these two comparison tests, it was decided to use most of the regular mobile sessions (with at least two well-separated fixed antennas) since they would add a considerable amount of data and could contribute to the reference frame, but not to use the smaller regional sessions, the ties sessions, or other special sessions.

6.3 Type of Solution: TRF vs. Baseline

There are two basic ways of treating the antenna positions in a solution. In a terrestrial reference frame (TRF) solution they are solved globally and the result is a set of antenna site positions and velocities at a specified epoch based on the entire observing history. In a baseline solution, site positions are treated as local (arc) parameters and separate positions are obtained for each session. In a TRF solution, one can apply no-net-rotation and no-net-translation constraints on the positions and

velocities of a set of core sites to align the TRF with an *a priori* reference frame. EOP are estimated for each session, except usually for 1-baseline sessions. Some sites show discontinuities due to earthquakes or mechanical movement of the antenna which must be modeled into the solution. In a baseline solution, no-net-translation constraints can be applied for the estimation of site coordinates for each experiment session. EOP is normally fixed to an *a priori* EOP series for a baseline solution.

For ICRF1 and its extensions, baseline solutions were made. However, for consistency with ITRF2008, ICRF2 must be generated as a TRF solution. Tests were made to see what effect this might have on the reference frame. Matching TRF and baseline solutions were made and compared. For both, the *a priori* TRF was VTRF2008 [Böckmann, Nothnagel, & Artz, 2009]. Comparison of these two solutions allows us to assess how much unmodeled site position noise in the TRF solution propagates to other parameter estimates, specifically the source position estimates. The two solutions show mostly only noise-like differences with wrms of 10-12 μas, and with no differences greater than around 0.6 mas. There are no declination-dependent systematic variations in the differences. Plots of the RA and Declination differences vs. Declination are shown in Figure 13. This comparison gives us confidence that the TRF requirement will not have any adverse effect on ICRF2.

6.4 Gradient Tests

The troposphere above VLBI sites is known to be azimuthally asymmetric, i.e. there are atmosphere gradients. In general, all stations have an average North-South gradient which increases towards the equator due to the pole-to-equator temperature gradient. East-West gradients also exist, but vary considerably over periods of days or less due to weather patterns. East-West gradients are expected to average out to near zero for most sites. If the refractive effects of atmospheric gradients are not accounted for, the radio source positions will be biased. This bias would be mainly seen in declination. For northern hemisphere stations, the N-S gradient will make lower declination sources appear higher in the sky, thus increasing their apparent declination. For southern hemisphere stations, the apparent declinations of higher declination sources will decrease. The northern hemisphere networks dominate though so that the maximum effect on declinations occurs south of the celestial equator. The end result is that, if gradients are not accounted for, the apparent declinations would increase by a maximum of $\sim$0.5 mas at $\sim -10^\circ$ declination.

The standard method of estimating gradients in program Solve has been to apply an *a priori* gradient model and solve for residual gradients. The *a priori* model of MacMillan & Ma [1997] was derived from a numerical weather model, and essentially gives a fixed N-S gradient for each site. The residuals can be solved for either by applying constraints or not. For a base solution, constraints of 0.5 mm and 2.0 mm/day on offsets and rates were imposed. Comparison tests were made in which: a) no *a priori* gradients were applied and no residual gradients were estimated; b) the *a priori* gradient model was applied, but no residuals were estimated; and c) no *a priori* model was applied, but total gradients were estimated.

As expected, a no gradients solution, compared to the standard gradients solution, shows a strong declination dependence—as was seen for the ICRF1 [Ma et al., 1997]. Without gradients, apparent declinations increase from the poles to a maximum of $\sim$0.5 mas at around -10° declination. If only mean *a priori* gradients are used, apparent declinations decrease by $\sim$0.05 mas for declinations south of around +10°. The *a priori* models thus appear to be statistically accurate at about the 10% level.

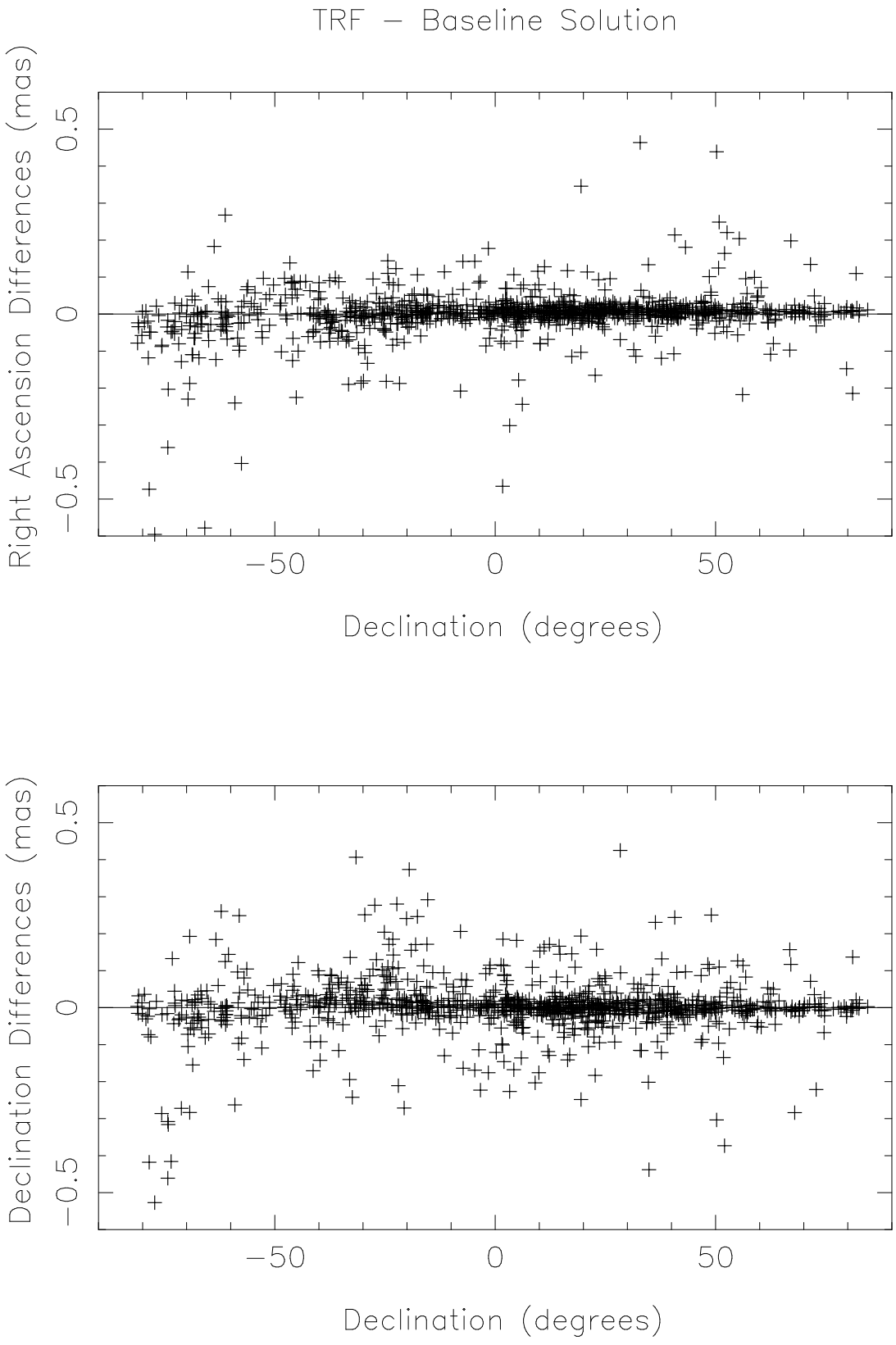

Figure 13: Differences between a TRF and a baseline solution. Sources with formal errors greater than 0.6 mas are not plotted.

A second method for estimating gradients is to estimate total gradients without the use of an *a priori* file. This is the method that was used for ICRF1 and its extensions, so a comparison of these two methods is very important. When a comparison was initially done, it was found that the constraints were too restrictive when used to estimate total gradients. Further tests were done in which the constraints were weakened four-fold and ten-fold. With these solutions, the agreement is very good, and all differences are less than ≈2.1 times their formal errors. Figure 14 shows the comparison plots for this case.

6.5 Pressure Loading Tests

Atmospheric pressure loading has become a standard VLBI analysis model over the past few years. Pressure loading corrections have been shown to improve VLBI baseline repeatability [Petrov & Boy, 2004], therefore it is desirable to use pressure loading for the ICRF2 solution. Pressure loading was *not* used for ITRF2008, at the request of the IERS, mainly because the other geodetic techniques were not using it. However, its use would not be expected to cause any adverse effects on the celestial or terrestrial reference frames or the EOP solution. Further, pressure loading is considered a current "state-of-the-art" geophysical model which thus should be used in the generation of ICRF2. Comparison solutions were made with pressure loading applied and not applied. Only small differences are seen in source positions, mostly less than 0.2 mas, and nothing systematic. Formal errors are unchanged. This test indicates that pressure loading corrections will have no adverse effect on the celestial reference frame.

6.6 Vienna Mapping Function vs. Niell Mapping Function

The VLBI contribution to ITRF2008 used the VMF1 mapping function [Böhm, Werl, & Schuh, 2006] for tropospheric delays, and it is considered the best current "state-of-the-art" model. Therefore, it should also be used for ICRF2. The previous standard was the Niell Mapping Function (NMF) [Niell, 1996]. We made comparison solutions using VMF1 and NMF. Catalog position differences are mostly small, but some as large as 0.8 mas are seen. There are only small, insignificant increases in uncertainties. VMF1 is derived from the ECMWF numerical weather model. Figure 15 shows the differences between using the two troposphere mapping functions, in units of formal errors. There are no differences greater than $0.9\,\sigma$.

6.7 VCS Test

The VLBA Calibrator Survey (VCS) sessions were VLBA only observing campaigns begun by Beasley et al. [2002] to obtain precise positions and snapshot maps of several thousand compact radio sources to increase the number of calibrator sources available for VLBI phase referencing. Five additional VCS campaigns were later carried out: Fomalont et al. [2003], Petrov et al. [2005], Petrov et al. [2006], Kovalev et al. [2007], and Petrov et al. [2008]. There were 24 successful VCS sessions. Use of these 24 sessions adds nearly 2200 additional sources to the catalog. Most of the VCS sources were scheduled for two scans (90 baseline observations) in only one session. A few sources were observed in two sessions. For many of the sources there are only a few good observations and their uncertainties are large. But also for many of them, there are many good observations, and their uncertainties are small. Therefore, it is desirable to include them in ICRF2, as long as doing so will not distort the frame. Comparisons were made with and without the 24 VCS sessions. Mostly

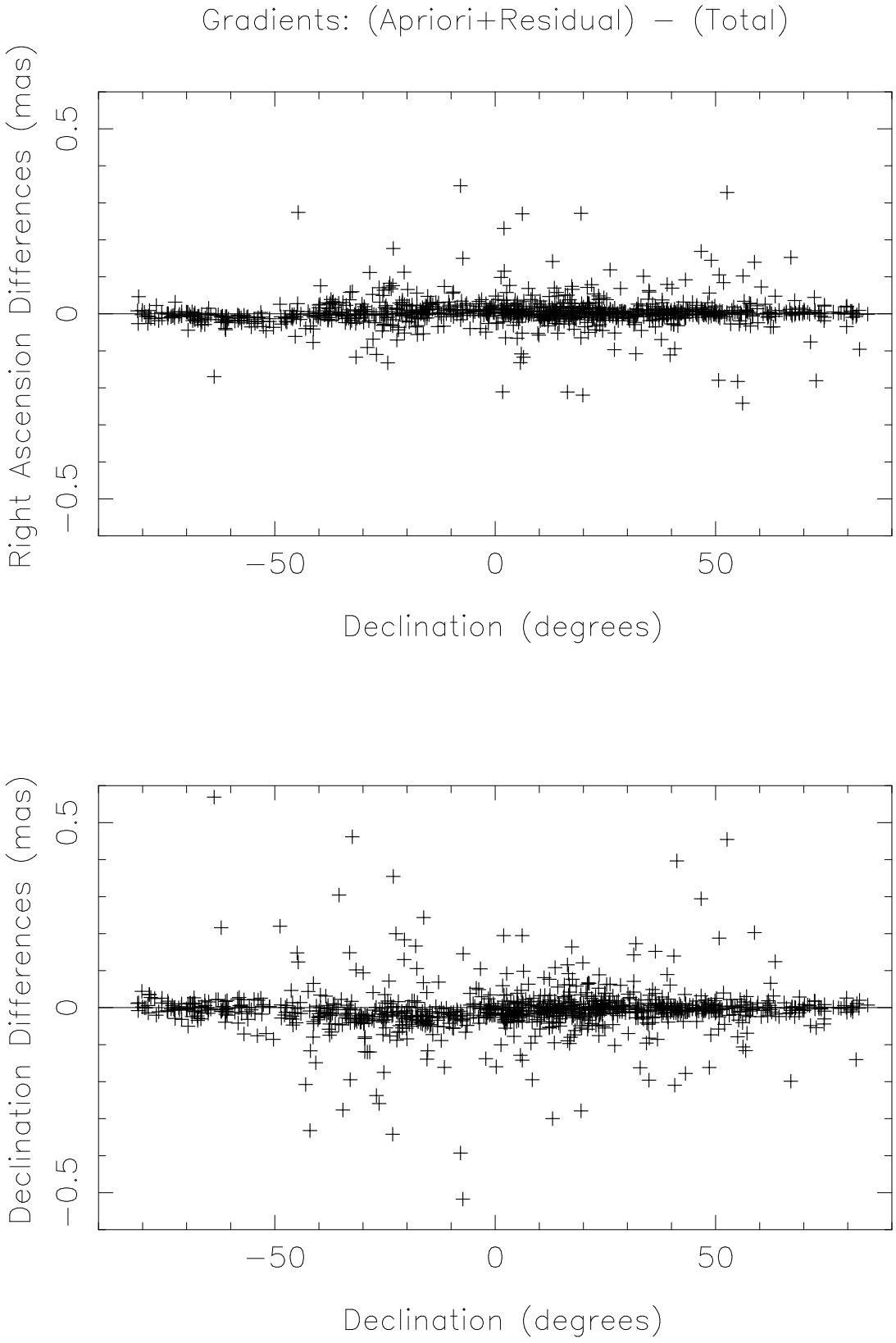

Figure 14: Differences between solving for gradients with an *a priori* mean gradient applied versus no mean gradient applied and using weak gradient constraints. Sources with formal errors greater than 0.6 mas are not plotted.

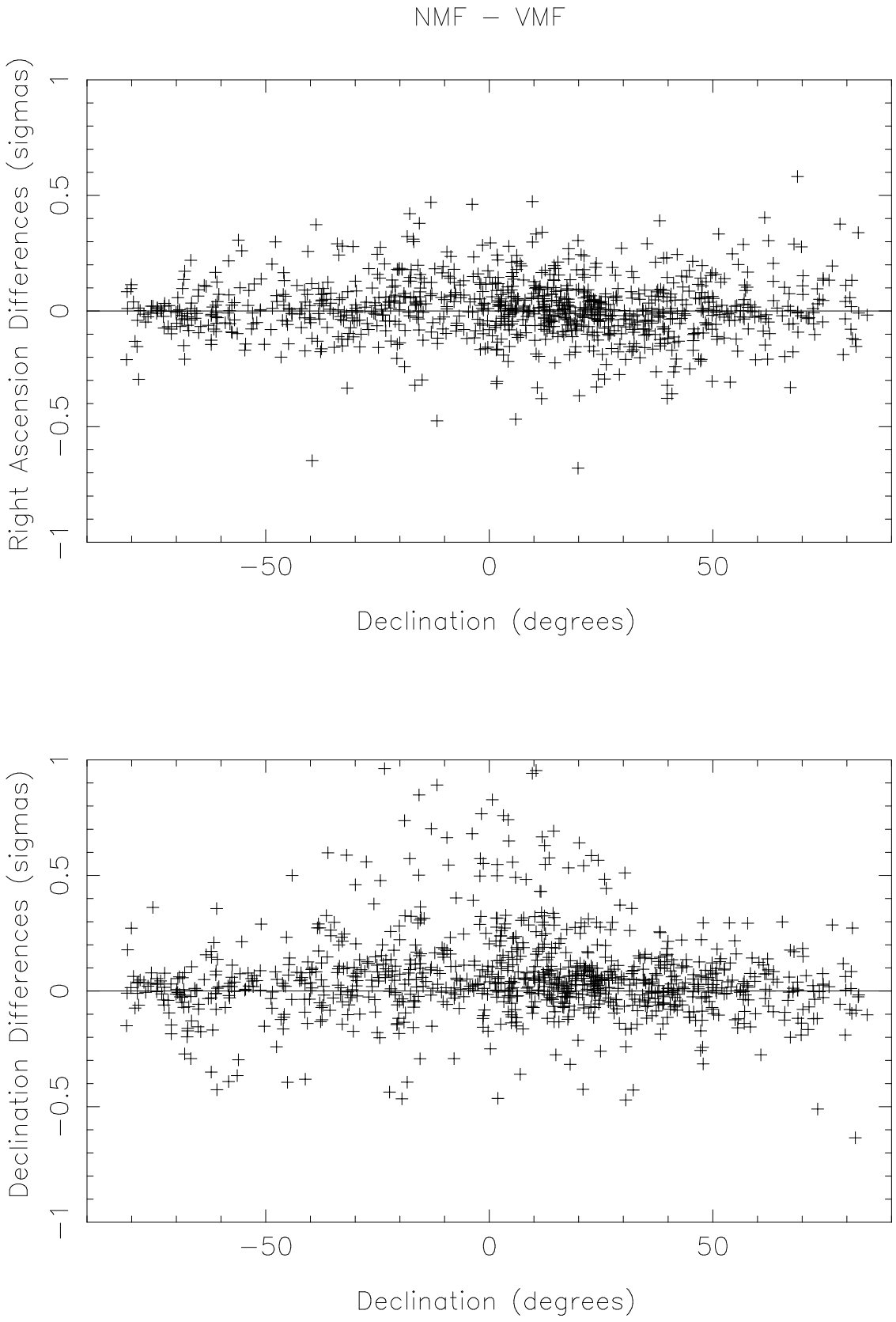

Figure 15: Differences between using the Niell Mapping Function (NMF) versus the Vienna Mapping Function (VMF1), in formal error units.

just small differences are seen. However, a few sparsely observed sources show large position changes (up to ∼200 mas) when the VCS sessions are added, due to a large increase in the number of observations, and presumably a better position. No systematic effects are seen. Figure 16 shows the position differences for cases where the number of observations (without VCS) is greater than four and the formal errors (non VCS) are less than 1 mas.

6.8 Thermal Deformation Test

The use of an antenna thermal deformation model was used for ITRF2008. Therefore it should also be used for ICRF2. The thermal deformation model described in Nothnagel [2008] accounts for the change in the position of the reference point of an antenna as a function of temperature relative to a specified reference temperature for each site. Specific information for each antenna (structural dimensions, expansion coefficients, reference temperature) are provided in Nothnagel [2008]. A comparison of source catalogs was made using thermal deformation and not using thermal deformation. Mostly small random differences are seen, up to ∼0.1 mas. Formal uncertainties are virtually unchanged. Figure 17 shows the differences, in formal error units.

6.9 Summary of Data and Model Comparisons

Table 2 summarizes the results of the various data and model comparisons. We present the weighted means of the differences and their wrms in Right Ascension and declination, as well as the overall rotation angles between the pairs of solutions. It will be seen that any uncertainties due to the data or model options are all smaller than the estimates that will be presented later for the ICRF2 noise floor and axes stability.

Table 2: Summary of Data and Model Comparisons

Data/Model Comparison	$\Delta\alpha\cos\delta$		$\Delta\delta$		Rotation Angles		
	mean (μas)	wrms (μas)	mean (μas)	wrms (μas)	X (μas)	Y (μas)	Z (μas)
Start Time: 1979 vs. 1990	1	8	1	11	0	2	1
Start Time: 1979 vs. 1993	0	14	0	18	-1	5	4
Session Type: Fixed vs. Fixed+Mobile	-1	2	-1	2	0	0	-1
Session Type: Fixed vs. Fixed+Mobile+Regionals	0	5	-2	5	2	-1	-3
TRF vs. Baseline	-1	10	0	12	2	2	2
Gradients: *a priori* vs. No *a priori*	0	7	6	12	8	5	3
Pressure Loading: On vs. Off	0	2	0	3	2	1	0
VMF1 vs. NMF	-1	3	-3	5	-1	2	-1
VCS vs. No VCS	2	17	1	18	-7	1	1
Thermal Deformation: On vs. Off	0	0	0	1	0	0	0

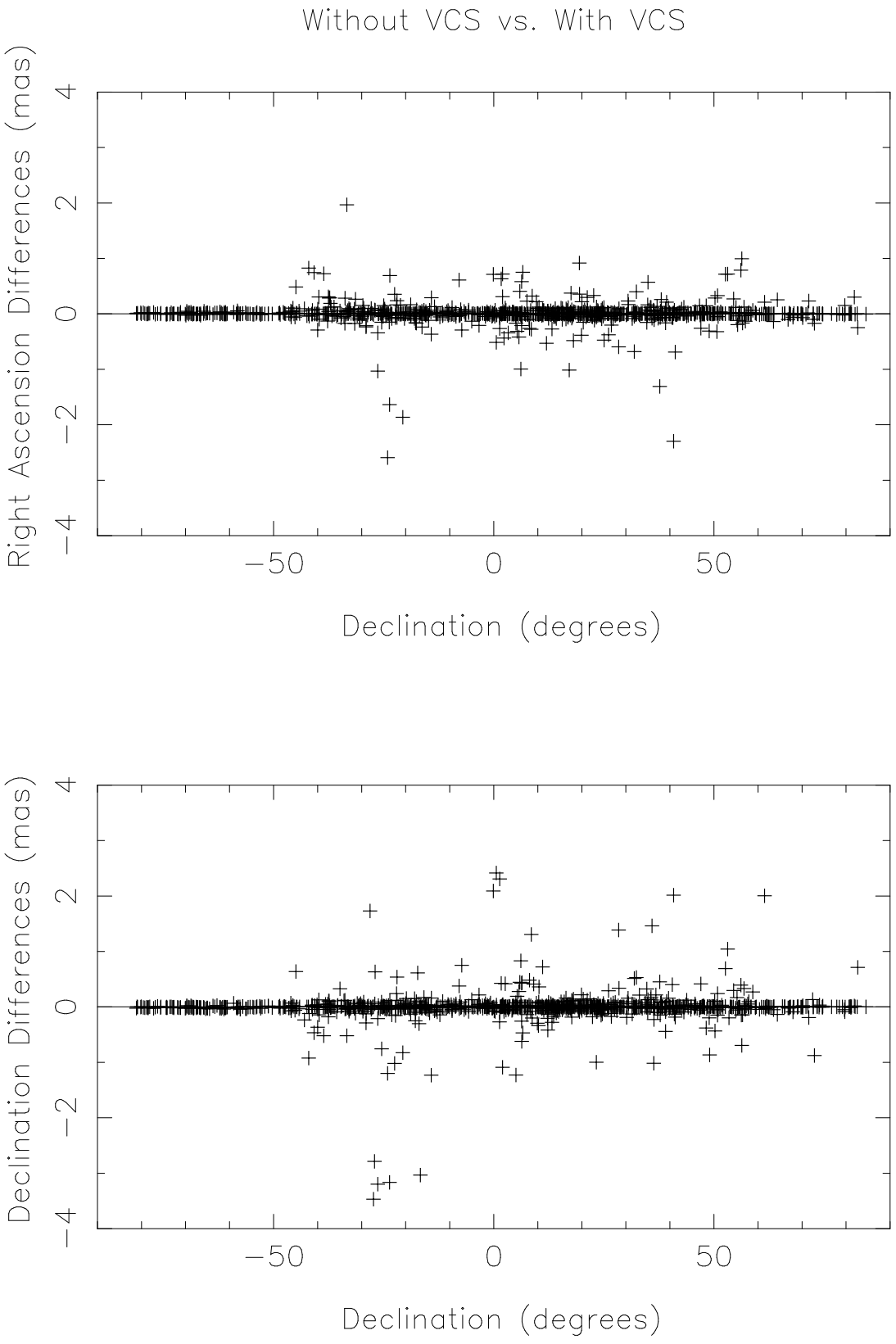

Figure 16: Solutions with and without the VCS sessions. Sources with fewer than four observations or formal errors greater than 4 mas are not plotted.

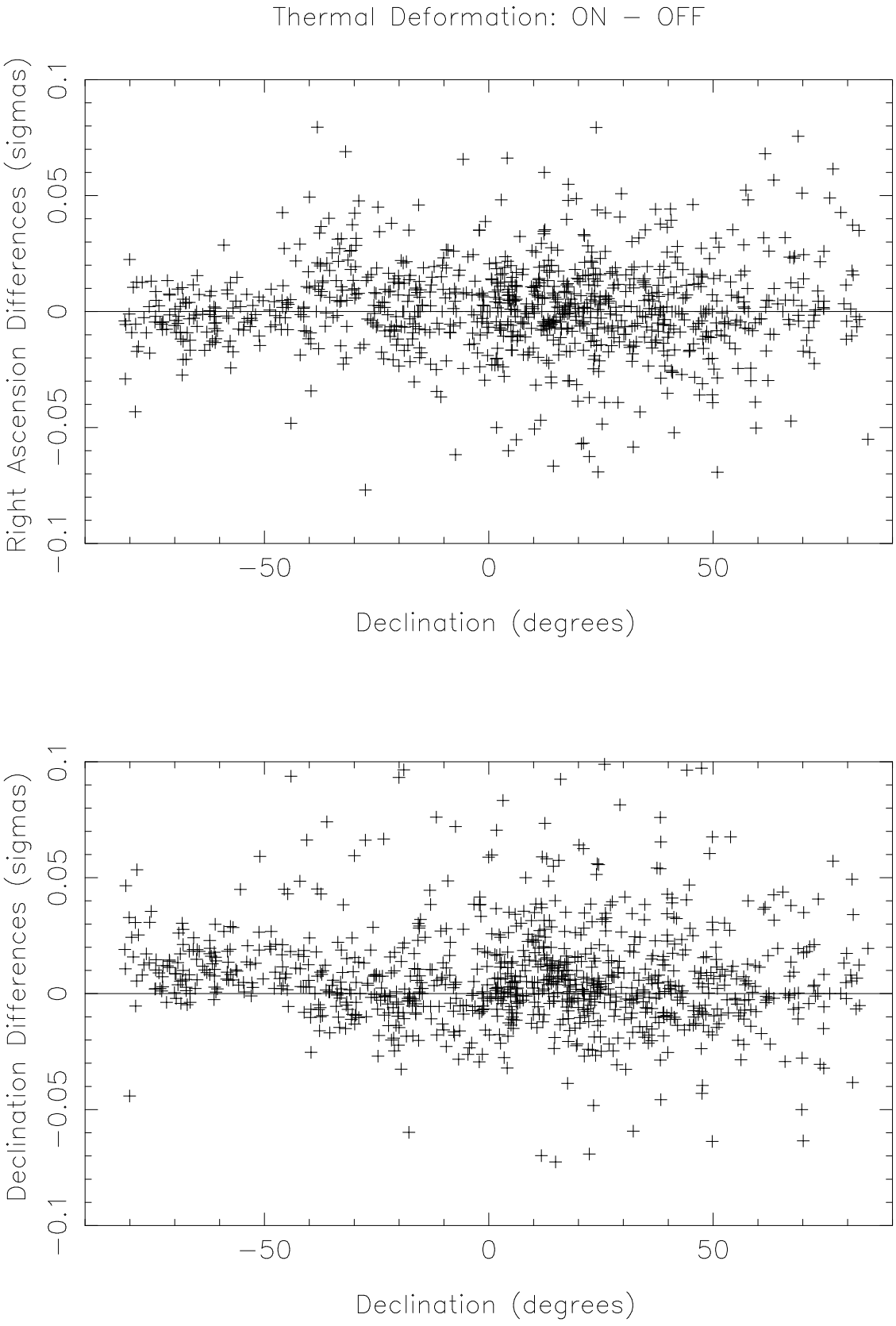

Figure 17: Differences between applying antenna thermal deformation and not applying antenna thermal deformation, in formal error units.

7 The ICRF2 Solution (DG, DSM)

7.1 Configuration

The solution used for generating ICRF2 is the "gsf008a" solution. It was run by the VLBI group at GSFC using the Calc/Solve analysis package, in its global solution mode. The solution used a total of 4540 VLBI sessions observed between 1979 August 3 and 2009 March 16. The solution used group delays only (no phase delay rates). Parameters were estimated using the arc-parameter elimination method described in Ma et al. [1990], where arc-parameter refers to those parameters that are estimated for each experiment session (arc) in a solution. Global parameter adjustments are based on data from the entire set of VLBI data in the solution. The specific parameters falling into these two general classes are as follows:

1) Arc parameters adjusted for each observing session:

- Station clocks were estimated as quadratic clock polynomials for the slowly varying clock behavior. Short-term behavior was estimated as piecewise linear continuous functions at 60 minute intervals.
- Station wet troposphere zenith delays were estimated as piecewise linear continuous functions at 20 minute intervals.
- Atmosphere gradient residuals in the N-S and E-W directions were estimated at 6 hour intervals. These residuals were adjustments from an *a priori* gradient model [MacMillan & Ma, 1997].
- UT1 and polar motion offsets and rates were estimated at the midpoint of each session.
- Nutation offsets were estimated at the midpoint of each session.
- Source positions were estimated for a set of 39 "special handling" sources whose time series exhibited clear systematic variations (see §4).

2) Global parameters adjusted based on the entire data set:

- Station positions and velocities were estimated, for reference epoch 2000 Jan 01. No-net-rotation and no-net-translation constraints were imposed on a set of 27 stations to align the estimated TRF with VTRF2008 [Nothnagel, 2008].
- Station position harmonic variations were estimated for 41 stations at diurnal, semi-diurnal, annual, and semi-annual frequencies.
- Spline parameter estimation of nonlinear variation was made for sites Gilcreek, Pietown, and HRAS085.
- A discontinuous offset parameter was estimated for 12 stations at epochs corresponding to an identifiable effect, e.g., an earthquake or an antenna repair. These sites were:
  YAKATAGA, SOURDOGH, WHTHORSE, FORTORDS,
  PRESIDIO, MOJAVE12, DSS15, MEDICINA, EFLSBERG,
  DSS65, GGAO7108, and SINTOTU3.
- Source positions were estimated for all sources with three or more good S/X-band observations, except for three gravitational lenses and six radio stars. Positions were estimated globally (for the entire data span) for all but 39 special handling sources. Some 795 sources were excluded from the solution because there were fewer than three good S/X-band observations in at least one session. Most of these were from the VCS sessions. A no-net-rotation constraint was imposed on 205 of the 212 ICRF1 defining sources (seven are special handling sources) to align their positions with the original ICRF1 defining sources.

- Adjustments to the antenna axis offsets were estimated at all fixed sites.

The *a priori* models for geophysical effects and precession/nutation generally followed the IERS Conventions (2003) [McCarthy & Petit, 2004]. Specifically, corrections for solid Earth tides, the pole tide, ocean loading, and high frequency EOP variations were made using the IERS Conventions (2003) [McCarthy & Petit, 2004]. A 5° elevation cutoff was imposed. Other important effects were modeled using:

- Atmosphere pressure loading corrections according to Petrov & Boy [2004].
- The Vienna Mapping Function (VMF1) troposphere model of Böhm, Werl, & Schuh [2006].
- The antenna thermal deformation model of Nothnagel [2008], in which the antenna heights were adjusted in each session using the average temperatures during that session.

The weighting of data in the solution followed the usual procedure for GSFC solutions. For each experiment session, re-weighting noise is calculated for each baseline so that the reduced χ^2 is close to one when the re-weighted noise is added quadratically to the measurement uncertainty determined from the correlation, fringe-fitting, and ionosphere calibration process. Ionosphere corrections were made using the difference of the X-band and S-band group delay observables.

7.2 Statistics

The Solve/Global solution used a total of 4540 VLBI sessions and 6.495553 million observations. The sessions extended from 1979 August 3 to 2009 March 16. The overall wrms post-fit delay residual was 21.856 ps and the χ^2 per degree of freedom was 0.890. "Global" positions were obtained for 3375 sources, and "arc" positions (time series) positions were obtained for the 39 special handling sources. Weighted mean positions of these 39 sources were computed and added to the global catalog. For their formal errors, we assigned the wrms of their RA and Declination positions with respect to the weighted means. Catalog gsf008a thus has positions and formal errors for 3414 sources.

8 Combination and Comparison of Contributed Catalogs (SOL, SLB, DG)

The following section describes the preliminary catalogs submitted by seven different analysis centers using four independent software analysis packages, the construction of a combination catalog from seven contributed catalogs generated at seven different VLBI analysis centers, and comparisons of individual catalogs amongst themselves and the combined catalog. The main purpose of this analysis is to investigate systematic effects in individual solutions and estimate a precision of the combined and the individual realizations of the celestial reference frame.

8.1 Contributed Catalogs

The analysis centers involved in ICRF2 were asked to generate and submit two catalogs, one without the VCS sessions and one with the VCS sessions. The data and models used were to be as similar as possible. The VCS catalogs were to be used to construct a combination catalog at Main Astronomical Observatory. Lists of database sessions, sources to solve as arc parameters, and sources to exclude were distributed by GSFC. The solutions were to use group delays only, use only sources with three or more "good" observations, be a TRF solution using VTRF2008, and apply a no-net-rotation constraint using the 205 ICRF1 defining sources that were not classified as special handling sources. The solutions also were to solve for atmosphere gradients, apply pressure loading, use the VMF1 model, and apply thermal deformation. Seven analysis centers generated catalogs using four independent software analysis packages and submitted them in time for use in constructing a combination catalog. Table 3 lists the particulars of the contributed solutions. It can be seen that no two analysis centers used the same data span, the same sessions, or obtained the same number of estimated sources. One of the catalogs also had an editing problem and used some observations normally considered bad. Also, most analysis centers used different analysis models. Some did not use the thermal deformation model, or the VMF1 model, or pressure loading, or solved for baselines instead of the TRF. The model comparisons section showed that these analysis differences should not produce any significant systematic differences, but may increase the noise level of the differences between solutions. Seven contributed catalogs were used to produce the combined catalog, listed with an "*" in Table 3. Because of larger differences seen in the aus007a solution, the Geoscience Australia group produced two additional solutions, aus008a and aus009a, which are included in the comparisons later in this section. Later, in §10, we will present comparisons of the corresponding TRF and EOP solutions.

8.2 Creation of a Combined Catalog

The seven catalogs used to generate a combination catalog are given in Table 4. The first line is the combination catalog itself, designated maoC08a. There are two columns for the number of sources. The first gives the number of sources in the catalog and the second gives the number of sources included in the combination catalog and used in the comparisons.

In the combination procedure, only sources which were observed three or more times (number of group delays) were used. The procedure was performed recursively, eliminating outlier radio sources (5σ) from individual catalogs. The outliers are sources with small ($3 - 15$) numbers of observations in one or two sessions with poor network configuration

Table 3: Contributed Catalogs

Solution ID	# Sessions	# Sources	Time Range	Software	Analysis Center
aus007a*	3712	1564	1979.7-2008.7	OCCAM6.2	GA
aus008a	3774	2869	1979.7-2008.7	OCCAM6.2	GA
aus009a	3774	537	1979.7-2008.7	OCCAM6.2	GA
bkg001a*	3823	3039	1984.0-2009.2	CALC 10, SOLVE rev. 2007.10.31	BKG
gsf007a	4516	1219	1979.7-2009.2	CALC 10, SOLVE rev. 2008.12.05	GSFC
gsf007b*	4540	3414	1979.7-2009.2	CALC 10, SOLVE rev. 2008.12.05	GSFC
iaa008a	...	3009	1980.0-2009.2	QUASAR	IAA
iaa008b	...	3009	1980.0-2009.2	QUASAR	IAA
iaa008c*	...	3009	1980.0-2009.2	QUASAR	IAA
mao008a*	4541	3555	1979.7-2009.3	SteelBreeze	MAO
opa008b*	4528	3244	1979.7-2009.2	CALC 10, SOLVE rev. 2008.12.05	OP
opa008c	4434	1188	1979.7-2009.2	CALC 10, SOLVE rev. 2008.12.05	OP
usn010b*	4465	3414	1979.7-2009.2	CALC 10, SOLVE rev. 2007.11.08	USNO

Table 4: General characteristics of the combination catalog and the seven contributed solutions used to construct it.

Solution ID	$N_{sources}$ total	$N_{sources}$ in comb.	Software	Analysis Center
maoC08a	3572	3572	Combination	MAO
aus007a	1564	1516	OCCAM6.2	GA
bkg001a	3019	2978	CALC/SOLVE	BKG
gsf007b	3414	3378	CALC/SOLVE	GSFC
iaa008c	2961	2918	QUASAR	IAA
mao008a	3555	3512	SteelBreeze	MAO
opa008b	3244	3214	CALC/SOLVE	OP
usn010b	3414	3380	CALC/SOLVE	USNO

(usually, one-baseline sessions). The combined catalog, maoC08a, consists of the coordinates of 3572 radio sources. The combined solution, maoC08a, was created using the arc-length method. The method of arc-lengths was developed at the Main Astronomical Observatory of the National Academy of Sciences of Ukraine and is described in Kur′yanova & Yatskiv [1993]. The principles of the arc-length method are:

- calculation of the arc lengths (distances on the celestial sphere) of the common ICRF1 defining sources for all individual solutions;
- construction of an intermediate reference frame, with an orientation defined by the positions of two radio sources;
- building of a combined catalog in the intermediate reference frame;
- transition from the combined catalog frame of two sources to a frame given by the positions of the ICRF1 defining radio sources.

The list of ICRF1 defining sources used consisted of 204 objects. From the 212 ICRF1 defining sources we eliminated eight sources: seven are from the special handling sources list (0014+813, 0235+164, 0637−752, 0738+313, 1308+326, 1448+762 and 2145+067) plus the source 1903−802, which is missing in bkg001a solution.

8.3 Comparison of Individual Solutions

A comparison of catalogs was performed in the following way. First, the parameters of a transformation model between two catalogs were esti-

mated with the least-squares method. Then, the model was applied to coordinates of one of the catalogs and wrms residuals for right ascension and declination were calculated. And lastly, from the comparison of three catalogs at a time (combined and the two individual ones), the so-called "external" dispersions have been evaluated.

8.3.1 Systematic Effects

For evaluation of systematic effects a transformation model was applied. The model assumes the following systematic effects: rotation of one catalog relative to another, slopes in Right Ascension and declination, a bias in declination, and harmonic terms in both coordinates (see Bolotin & Lytvyn [2008]). The differences in Right Ascension, $\Delta\alpha$, and declination, $\Delta\delta$, are presented as:

$$\Delta\alpha = A_1 \tan\delta \cos\alpha + A_2 \tan\delta \sin\alpha - A_3 + D_\alpha(\delta - \delta_0) + C_\alpha \sin(\alpha + \varphi_\alpha) \quad (2)$$

$$\Delta\delta = -A_1 \sin\alpha + A_2 \cos\alpha + D_\delta(\delta - \delta_0) + B_\delta + C_\delta \sin(\alpha + \varphi_\delta), \quad (3)$$

where A_1, A_2 and A_3 are the rotation angles about the three axes; D_α and D_δ are the slopes in right ascension and declination as functions of the declination; B_δ is a bias in declination; C_α, φ_α and C_δ, φ_δ are amplitudes and phases of harmonic oscillations in right ascension and declination.

Table 5: Number of common sources in the catalogs (all and defining).

ID	aus008a		aus009a		bkg001a		gsf007b		iaa008c		mao008a		opa008b		usn010b	
maoC08a	2847	203	536	177	2977	204	3375	204	2918	204	3505	204	3214	204	3377	204
aus008a			537	177	2736	203	2836	203	2583	203	2829	203	2804	203	2839	203
aus009a					536	177	536	177	536	171	536	177	536	177	536	177
bkg001a							2945	204	2747	204	2933	204	2883	204	2945	204
gsf007b									2897	204	3340	204	3202	204	3367	204
iaa008c											2899	204	2848	204	2898	204
mao008a													3193	204	3345	204
opa008b															3209	204

To calculate the parameters of the model the coordinates of the common (for both catalogs) ICRF1 defining sources were used. Then, after the model was applied, the wrms was evaluated for the entire set of common radio sources. The numbers of common defining sources and all sources for each pair of catalogs are presented in Table 5.

Table 6: Weighted post-fit residuals ($\Delta\alpha\cos\delta$, $\Delta\delta$), μas.

ID	aus008a		aus009a		bkg001a		gsf007b		iaa008c		mao008a		opa008b		usn010b	
maoC08a	103	127	57	59	39	37	27	30	45	42	43	54	27	39	27	41
aus008a			26	19	129	128	104	109	108	115	98	102	106	108	115	110
aus009a					66	68	58	58	60	69	53	56	58	58	64	62
bkg001a							40	39	47	46	59	61	42	42	42	69
gsf007b									49	64	41	46	15	15	24	29
iaa008c											59	52	46	40	49	49
mao008a													41	46	46	55
opa008b															24	28

The results of least square estimation of model parameters are presented in Table 7 and Table 8. Table 7 shows comparison of the combined catalog, maoC08a, with the individual solutions. Mutual comparisons between individual solutions are presented in Table 8. In the tables the first lines for each pair of catalogs present the estimated values, and the second lines present the standard deviations. Parameters A_1, A_2, A_3,

Table 7: Comparison of catalogs: maoC08a vs. individual solutions. The first row for each pair presents the estimated parameters of the transformation model. The second rows present the corresponding standard deviations.

A_1	A_2	A_3	D_α	D_δ	B_δ	C_α	φ_α	C_δ	φ_δ
maoC08a – aus008a									
290.5	111.4	−164.5	−37.8	37.8	−23.3	13.0	301.7	32.3	18.5
20.1	16.6	11.6	21.3	13.1	10.6	15.2	65.1	22.1	37.4
maoC08a – aus009a									
29.0	8.1	−11.6	−26.1	−8.0	18.4	12.8	261.5	35.7	353.8
10.9	9.8	7.5	12.6	7.8	6.9	9.3	40.0	12.5	18.6
maoC08a – bkg001a									
−34.2	13.9	−14.4	−5.2	13.0	−30.0	9.2	146.3	13.2	128.3
6.8	6.0	4.1	7.2	4.8	4.3	5.0	34.9	7.7	30.6
maoC08a – gsf007b									
−1.2	−3.4	0.3	−0.9	11.2	−2.2	8.9	185.8	1.8	79.5
5.2	4.6	3.3	5.6	3.5	3.1	4.2	27.1	5.3	181.4
maoC08a – iaa008c									
−7.1	11.9	5.0	21.3	−16.7	2.5	7.5	225.8	9.4	305.8
7.8	6.9	5.1	8.6	5.4	4.8	6.8	46.3	8.8	49.2
maoC08a – mao008a									
8.8	−25.3	−6.6	1.1	−24.5	24.5	19.2	148.7	7.2	53.3
8.8	7.9	6.0	9.7	5.9	5.3	7.1	23.9	9.1	81.6
maoC08a – opa008b									
9.6	−11.8	2.3	−0.8	18.6	−12.1	5.4	191.5	6.3	73.3
6.3	5.6	4.1	6.8	4.2	3.7	5.2	54.6	6.5	65.4
maoC08a – usn010b									
−6.3	26.4	7.4	2.7	3.6	−1.6	33.7	350.5	18.2	259.5
6.5	5.7	4.2	7.0	4.5	4.0	5.2	9.2	6.7	23.3

B_δ, C_α and C_δ are in units of μas; units for D_α and D_δ are $\mu as/rad$; and phases φ_α and φ_δ are in degrees.

In Table 6 weighted post-fit residuals for each comparison pair are shown. The residuals have been evaluated for each pair of catalogs after removing the estimated systematic effects.

As one can see from the tables, there are significant systematic effects in catalog aus008a. The angles of rotation are about 150–300 μas between aus008a and other individual solutions, while for other individual catalogs (including aus009a) the mutual rotation is about 50 μas or less. Also, standard deviations of estimated parameters for catalog aus008a are greater than the corresponding deviations of parameters for other solutions by about 2–3 times.

On the other hand, catalog aus009a shows relatively good agreement with the other individual catalogs. Catalogs aus008a and aus009a differ only in the minimum number of observations per source (> 3 for aus008a and > 100 for aus009a, which eliminated many VCS sources). This could indicate the influence of *a priori* information on results in solutions obtained by Geoscience Australia caused either by design of the least squares collocation method or its implementation. In any case, if catalog aus008a is omitted, then the remaining mutual systematic effects between seven individual catalog solutions obtained with four independent software packages do not exceed the 50 μas level.

Also we note considerably large (up to 40 μas) angles of rotation between the bkg001a catalog and other individual solutions. The reason of this change in orientation is the absence of one ICRF1 defining source, 1903−802, in the BKG solution. All the other analysis centers included observations of this source and its *a priori* coordinates were used in the

Table 8: Comparison of catalogs: comparisons between individual solutions. The first rows of each comparison present the estimated parameters of the transformation model. The second rows present the corresponding standard deviations.

A_1	A_2	A_3	D_α	D_δ	B_δ	C_α	φ_α	C_δ	φ_δ
				aus008a – aus009a					
−266.4	−109.7	146.7	11.0	−18.3	22.5	12.3	138.8	4.0	234.8
4.1	3.5	2.5	4.5	2.8	2.3	3.1	14.9	4.1	67.8
				aus008a – bkg001a					
−332.9	−106.2	155.3	39.1	−21.0	−9.9	27.2	118.7	43.4	167.2
21.9	18.4	12.7	23.4	14.6	11.8	16.6	34.1	25.5	28.9
				aus008a – gsf007b					
−289.4	−114.7	162.3	33.9	−22.5	19.8	16.0	154.5	28.4	190.6
18.1	15.1	10.5	19.3	11.9	9.7	13.3	49.8	20.4	37.9
				aus008a – iaa008c					
−287.9	−97.9	165.4	60.0	−63.5	32.1	18.2	146.7	24.7	236.5
19.0	15.9	11.1	20.3	12.6	10.3	14.1	45.9	19.2	50.7
				aus008a – mao008a					
−277.4	−138.2	158.3	41.5	−71.8	59.6	25.9	134.2	23.2	153.0
16.9	14.1	10.0	18.1	11.1	9.1	12.8	28.5	19.6	41.9
				aus008a – opa008b					
−277.8	−120.3	162.9	33.7	−13.8	7.9	14.4	154.3	25.0	190.3
18.2	15.1	10.6	19.3	11.9	9.7	13.3	55.3	20.5	43.1
				aus008a – usn010b					
−292.9	−85.4	167.9	36.6	−21.1	11.3	26.1	1.0	46.3	226.7
19.1	15.9	11.1	20.3	12.6	10.2	13.8	32.3	19.6	26.7
				aus009a – bkg001a					
−59.4	10.3	−0.4	25.8	20.5	−48.4	18.0	120.6	41.1	166.7
12.4	11.3	8.6	14.6	9.3	8.2	9.7	35.3	14.5	18.5
				aus009a – gsf007b					
−31.1	−13.4	10.2	23.1	16.3	−17.8	14.6	109.1	38.1	167.7
10.7	9.7	7.4	12.6	8.0	7.1	8.5	37.1	12.5	17.2
				aus009a – iaa008c					
−34.7	4.6	18.6	50.4	−10.1	−15.7	7.6	124.3	28.9	192.3
12.0	10.9	8.4	14.1	8.9	8.0	9.4	82.2	13.3	27.0
				aus009a – mao008a					
−23.4	−39.0	2.3	23.7	−17.1	6.6	26.6	111.8	38.7	156.3
10.0	9.2	7.1	11.9	7.5	6.7	8.1	19.6	12.0	15.7
				aus009a – opa008b					
−19.6	−24.4	12.7	23.8	21.9	−26.2	12.9	86.1	38.8	157.6
10.7	9.8	7.5	12.6	8.0	7.1	9.1	40.2	12.7	16.7
				aus009a – usn010b					
−39.4	18.9	18.4	27.9	6.9	−15.7	36.8	17.8	46.6	198.1
11.6	10.5	8.0	13.6	8.7	7.7	10.2	14.5	12.6	16.4
				bkg001a – gsf007b					
29.9	−19.3	14.9	4.0	−3.5	30.0	2.6	257.7	8.4	308.9
6.6	6.1	4.3	7.6	5.3	4.7	5.5	115.2	7.9	49.2
				bkg001a – iaa008c					
25.1	−4.2	19.7	24.5	−31.2	34.4	10.8	287.3	19.5	306.8
7.8	7.1	5.2	9.0	6.1	5.4	6.3	35.5	9.2	24.8
				bkg001a – mao008a					
36.0	−44.0	5.7	2.0	−37.7	54.8	12.1	120.8	4.6	358.1
10.1	9.3	6.9	11.6	7.8	6.9	7.9	42.9	11.6	140.8

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(Table 8: continued)

A_1	A_2	A_3	D_α	D_δ	B_δ	C_α	φ_α	C_δ	φ_δ
				bkg001a – opa008b					
41.4	−29.0	17.8	5.4	2.5	21.2	5.2	323.4	6.9	351.8
6.9	6.4	4.6	7.9	5.5	4.8	5.4	65.5	8.1	63.8
				bkg001a – usn010b					
22.9	11.0	22.0	7.2	−11.7	30.6	41.7	351.6	26.7	269.9
7.5	6.8	4.9	8.5	6.0	5.3	6.0	8.4	8.4	18.5
				gsf007b – iaa008c					
−5.2	15.2	5.6	22.6	−26.6	3.5	7.7	297.1	11.1	302.6
7.1	6.4	4.9	8.2	5.5	4.9	5.6	46.7	8.3	39.3
				gsf007b – mao008a					
7.9	−23.1	−7.1	1.7	−36.2	27.0	13.7	122.5	4.7	71.8
7.3	6.7	5.1	8.4	5.6	5.0	5.8	28.2	8.0	103.7
				gsf007b – opa008b					
10.9	−9.5	2.6	0.6	6.0	−8.6	4.5	359.0	5.6	74.7
2.5	2.3	1.7	2.9	1.9	1.7	2.1	26.4	2.7	29.9
				gsf007b – usn010b					
−7.1	30.5	7.6	3.9	−7.8	0.9	41.3	355.1	20.9	255.1
4.5	4.1	3.0	5.2	3.6	3.1	3.7	5.2	4.9	14.4
				iaa008c – mao008a					
12.4	−38.7	−14.1	−23.8	−7.1	21.7	21.8	119.3	16.3	113.9
9.3	8.5	6.6	10.8	7.1	6.3	7.5	22.4	10.9	35.9
				iaa008c – opa008b					
16.6	−25.1	−3.2	−22.1	33.2	−12.7	6.7	79.5	15.3	106.3
7.2	6.6	5.0	8.4	5.5	4.9	6.3	51.3	8.3	30.0
				iaa008c – usn010b					
−2.6	15.9	1.9	−18.9	18.0	−2.0	37.4	5.4	16.5	224.5
8.4	7.6	5.8	9.7	6.5	5.8	7.2	10.7	8.9	34.3
				mao008a – opa008b					
2.2	13.4	9.2	−2.1	43.8	−37.0	16.4	316.9	1.1	124.7
7.2	6.7	5.1	8.4	5.5	4.9	5.8	23.7	8.6	399.4
				mao008a – usn010b					
−14.7	53.6	15.6	3.6	29.7	−27.0	50.6	342.0	25.3	255.0
8.5	7.8	6.0	9.9	6.6	5.9	7.1	8.6	9.4	22.7
				opa008b – usn010b					
−17.5	39.9	5.1	3.5	−13.6	9.3	37.0	354.1	26.2	255.9
4.4	4.1	3.0	5.1	3.5	3.1	3.7	5.8	4.9	11.4

no-net-rotation constraints to fix the orientation of the obtained celestial reference frame.

Significant differences in the harmonic oscillation parameters are obtained for the usn010b catalog. Comparing with gsf007b, they are $41 \pm 4\,\mu$as and $21 \pm 5\,\mu$as for Right Ascension and declination respectively. Such deformations could be caused either by the absence of diurnal and semi-diurnal tidal EOP variations or by using an obsolete model of nutation (see Bolotin [2007]).

8.3.2 External Uncertainties

The so-called "external" uncertainties can be evaluated in the following way. For a pair of catalogs we can write (with some assumptions):

$$\overline{d_{12}{}^2} = \sigma_1{}^2 - 2\rho_{12}\sigma_1\sigma_2 + \sigma_2{}^2 \tag{4}$$

where $\overline{d_{12}{}^2}$ is the weighted mean of the squared differences between a pair of catalogs; σ_1 and σ_2 are the "external" uncertainties of the catalogs; and ρ_{12} is the corresponding correlation coefficient. By writing such equations for three catalogs, it is possible to construct a system of equations and to solve it with respect to σ_1, σ_2 and σ_3. The results of such calculations of external uncertainties are presented in Table 9. In these comparisons the combined solution has been used as third catalog. The calculations were done for all common radio sources in the three catalogs.

"External" uncertainties for almost all catalogs except bkg001a, aus008a, and aus009a are at the level of 50 μas. For bkg001a they are about twice as great, and for aus009a catalog they are about 1.5 times greater. So, in addition to the systematic effects, these catalogs are also noisier.

Table 9: Comparison of catalogs: external uncertainties

Coordinate	index		σ_1	σ_2	σ_3
	1	2	μas	μas	μas
α	aus008a	aus009a	58	61	6
δ	aus008a	aus009a	73	76	3
α	aus008a	bkg001a	188	89	14
δ	aus008a	bkg001a	220	73	7
α	aus008a	gsf007b	189	22	10
δ	aus008a	gsf007b	223	29	6
α	aus008a	iaa008c	192	64	14
δ	aus008a	iaa008c	219	70	6
α	aus008a	mao008a	199	57	17
δ	aus008a	mao008a	227	62	10
α	aus008a	opa008b	190	20	10
δ	aus008a	opa008b	224	30	6
α	aus008a	usn010b	190	23	11
δ	aus008a	usn010b	223	40	8
α	aus009a	bkg001a	58	24	9
δ	aus009a	bkg001a	77	27	5
α	aus009a	gsf007b	57	15	7
δ	aus009a	gsf007b	75	18	3
α	aus009a	iaa008c	57	33	11
δ	aus009a	iaa008c	76	36	4
α	aus009a	mao008a	56	38	11
δ	aus009a	mao008a	73	42	7
α	aus009a	opa008b	57	15	6
δ	aus009a	opa008b	75	16	3

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(Table 9: continued)

Coordinate	index		σ_1	σ_2	σ_3
	1	2	μas	μas	μas
α	aus009a	usn010b	57	17	7
δ	aus009a	usn010b	75	30	6
α	bkg001a	gsf007b	88	23	10
δ	bkg001a	gsf007b	115	30	7
α	bkg001a	iaa008c	85	65	14
δ	bkg001a	iaa008c	110	74	8
α	bkg001a	mao008a	94	56	13
δ	bkg001a	mao008a	119	64	9
α	bkg001a	opa008b	92	20	10
δ	bkg001a	opa008b	120	33	7
α	bkg001a	usn010b	89	23	11
δ	bkg001a	usn010b	117	42	8
α	gsf007b	iaa008c	25	64	10
δ	gsf007b	iaa008c	30	73	7
α	gsf007b	mao008a	26	55	12
δ	gsf007b	mao008a	33	62	10
α	gsf007b	opa008b	23	21	10
δ	gsf007b	opa008b	28	32	8
α	gsf007b	usn010b	24	25	11
δ	gsf007b	usn010b	29	41	9
α	iaa008c	mao008a	59	47	15
δ	iaa008c	mao008a	68	53	10
α	iaa008c	opa008b	64	23	10
δ	iaa008c	opa008b	71	32	8
α	iaa008c	usn010b	64	26	10
δ	iaa008c	usn010b	74	43	8
α	mao008a	opa008b	52	23	12
δ	mao008a	opa008b	59	32	10
α	mao008a	usn010b	56	27	12
δ	mao008a	usn010b	64	45	10
α	opa008b	usn010b	21	24	10
δ	opa008b	usn010b	33	40	9

8.4 Conclusions

Comparison of individual contributed catalog solutions have showed that the individual catalogs are very close to each other. The systematic effects in general are at the level of 50 μas. The weighted post-fit residuals, evaluated after removing systematic effects for all common sources of pairs of catalogs are at the same level. That indicates good agreement between the different solutions. Considering that the individual catalogs were obtained with four independent software packages, and used slightly different data sets and analysis models, one could conclude that systematic effects and additional random errors in the newly generated celestial reference frame ICRF2 will not exceed $50 - 100\,\mu$as.

9 Determination of Realistic Errors (DSM)

The formal uncertainties of source position estimates based on observation noise tend to improve by a factor of $1/\sqrt{N}$ where N is the number of observations. For sources that have a very large number of observations, the formal uncertainties are generally too small. To obtain a more realistic measure of the uncertainty, we have considered three effects: 1) modeling errors, 2) analysis noise, and 3) statistical consistency (validity) of the formal uncertainties. The sensitivities of source position estimates to different modeling choices was discussed in §6 and summarized in Table 2. These sensitivities are less than 20 μas. They should not be interpreted necessarily as errors in analysis but rather as the level of variation associated with improvements of the state-of-the-art analysis. Unmodeled or mis-modeled errors should be at this level. Analysis noise refers to the cumulative effects of data editing and modeling errors. This is quantified by comparing catalogs generated by different analysis centers and was discussed in detail in §8. Differences will result from different analysis software as well as different analysis strategies. Each analysis center may edit data differently or choose different sets of experiment sessions to include in a solution. However, the raw observation data available to all analysis centers are identical. This means that the source position estimates from the different centers will be correlated. Therefore, differences between position estimates from different solutions will not reflect the true noise in either solution. In the following, we consider how to inflate the formal source position estimates to obtain realistic uncertainties.

9.1 Decimation Test

To determine a realistic level of source position errors, we ran a decimation test in which all experiments were ordered chronologically and divided into two sets selected by even or odd session. This was done for each well-defined session type, where a session type refers to a series of experiments with the same core network of observing stations. This should help ensure that the two full sets of sessions were equivalent in terms of networks and sources observed. The remaining group of sessions not in an obvious category were similarly divided. The source position estimates from the two solutions are independent and the solution position differences provide estimates of the noise of each solution as well as how much the formal uncertainties should be scaled up. In a similar way, Ryan et al. [1993] investigated geodetic solutions to determine the uncertainty of site velocity estimates. Analysis of the differences between site velocities estimated in two terrestrial reference frame solutions that used independent session lists yielded the result that the site velocity component formal errors should be multiplied by a factor of 1.3–1.8.

The differences in source position estimates from the two decimation solutions were scaled by their formal errors and then the standard deviation of the scaled differences was computed. The histograms of the scaled differences are shown in Figure 18. The resulting scaling factors (standard deviations) were 1.6 and 1.5 for declination and Right Ascension, respectively.

The wrms difference between source position estimates, s_i, from the two solutions after removing biases is

$$\sigma^2 = \left\langle (s_1 - s_2)^2 \right\rangle = \sigma_1^2 + \sigma_2^2 \tag{5}$$

where σ_i^2 are the solution noise variances and the estimates from the two solutions are assumed to be uncorrelated,

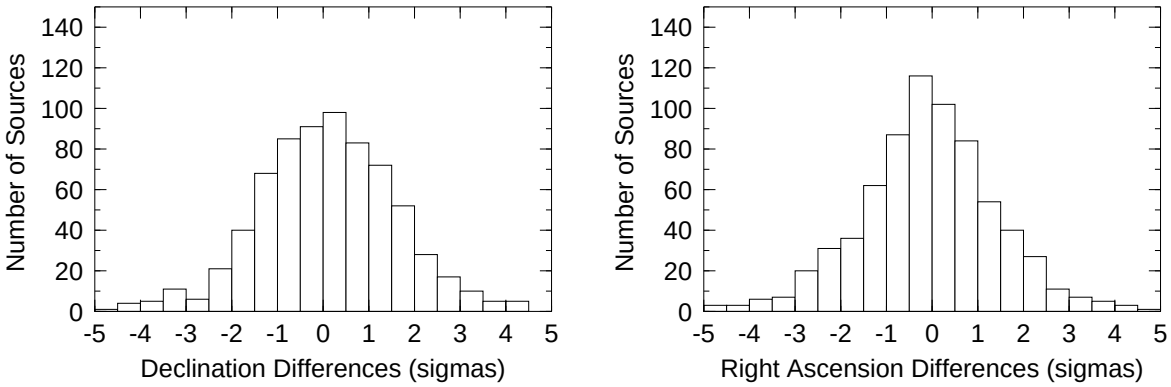

Figure 18: Histograms of declination and Right Ascension differences (scaled by sigmas) between estimates from the two decimation solutions.

Table 10: Solution Difference Statistics

Solution difference	Right Ascension		Declination		Number of Sources
	wrms (μas)	scale factor	wrms (μas)	scale factor	
Decimation	67	1.6	52	1.54	730
gsf08b -usn10b	39	0.91	32	1.17	1136
gsf08b - iaa008c	55	1.14	38	1.06	1051
gsf08b - mao008a	66	1.37	48	1.31	1031

wrms differences were scaled by $1/\sqrt{2}$.

$$\langle s_i s_j \rangle = \sigma_i^2 \delta_{ij} \tag{6}$$

If we assume the two solutions have the same noise then we can get an estimate of the noise of each solution

$$\sigma_i \sim \sigma/\sqrt{2} \tag{7}$$

For comparison, we have computed the wrms differences (scaled by a factor of $1/\sqrt{2}$ between the GSFC solution (gsf008b) and several of the other analysis center solutions (usn010b, iaa008c, and mao008a). VCS sources from these solutions were not included in the comparisons. The average wrms differences (scaled by $1/\sqrt{2}$) for the different analysis center solutions are compared with the differences from the decimation test in Table 1.

9.2 Declination Band Noise

In Figure 19, the noise, σ_i, is shown as a function of declination band. One can see that the right ascension wrms differences for the bands north of $-45°$ declination are about 50 μas. For declination, σ_i are about 50 μas north of 30° declination, but are 60–80 μas between $-45°$ and $-30°$ declination. If the scaling factor is computed for different declination bands, one finds that it has a declination dependence, which is shown in Figure 20. The factor tends to increase with declination because higher declination sources have been observed more frequently.

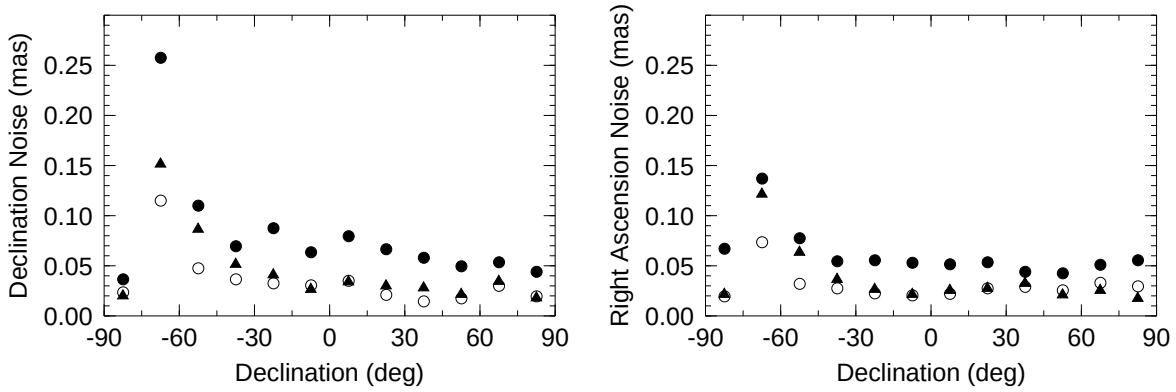

Figure 19: Declination and Right Ascension noise for each 15 degree declination band in each solution derived from differences between positions in the two decimation solutions (solid circles). The average noise for the solution differences gsf08b - usn10b (open circles) and for gsf08b - iaa008c (solid triangles) are shown for comparison.

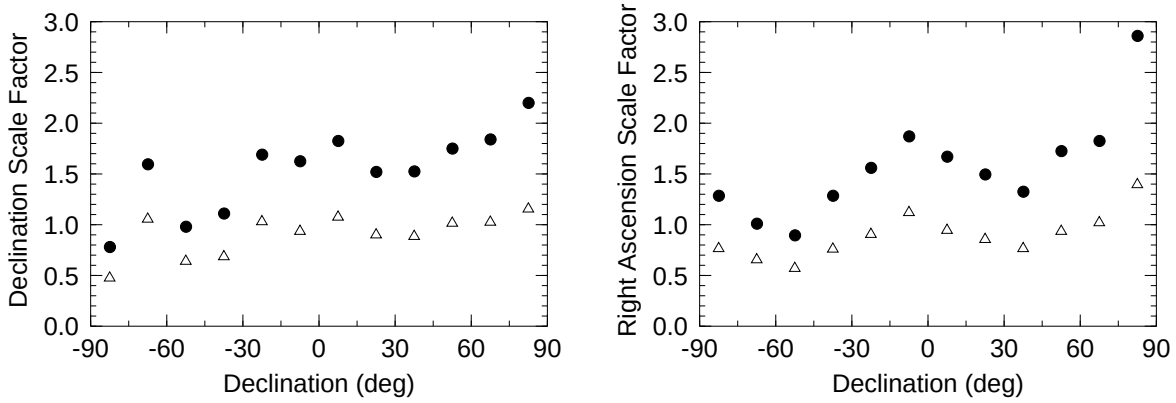

Figure 20: Formal error scaling factor for declination and Right Ascension (solid circles). Also shown is the residual scaling factor after applying a uniform average scaling factor of 1.5 to the formal uncertainties followed by a root-sum-square addition of 40 μas (open triangles).

The differences between the GSFC solution and the other analysis center solutions are shown in Figure 19 and follow the same general trend in declination as for the decimation test difference. The magnitudes of the differences are smaller because each of the analysis center solutions used approximately the same set of data so that the estimates from the two solutions are correlated. The analysis center wrms differences give a measure of analysis noise. The GSFC/USNO differences are generally the smallest since both solutions used the SOLVE analysis software. The MAO and IAA differences tend to be larger probably because these solutions used different analysis software – SteelBreeze for MAO and QUASAR for IAA.

9.3 Dependence of Source Noise on Number of Observing Sessions

The average formal precision of position generally is better as declination increases since observing has been dominated by sites in the Northern hemisphere. However, there is a large range of variation of formal precision in all declination bands. One of the motivations for inflating the position uncertainties and establishing a noise floor is to account for error sources that cannot be averaged down by more frequent observing. If all errors were Gaussian then the uncertainty of position estimates

should fall off as $1/\sqrt{N}$ where N is the number of observations. Instead of looking at the dependence of the wrms differences between decimation solutions as a function of declination, we next consider the dependence on the number of sessions that a source was observed. The sources were ordered by the average number of experiment sessions in which a source was observed in the two decimation solutions. The differences in position were analyzed for a running window of 50 sources in this ordered sequence of sources. We computed the wrms difference of positions from the two solutions for each 50 source subset of all the sources common to both decimation solutions. Figure 21 shows the dependence of the wrms difference (scaled by $1/\sqrt{2}$) as a function of the minimum number of sessions in each subset. This is compared to the median formal uncertainty in the subset. The wrms differences are larger than the median formal errors and both fall off approximately as $1/\sqrt{N}$. The observed minimum error of 25 μas for declination and 15 μas for right ascension is reached for sources that have been observed in more than 200 sessions. If one applies an overall scaling factor of 1.5 based on all source position differences, one still needs to add additional noise to account for residual scaling errors that are as large as 1.5 for sources observed in less than 75 sessions. An additional 40 μas of noise in a root-sum-square sense reduces the residual scaling error to what is shown in Figure 22 at the expense of conservative uncertainties for the most observed sources.

9.4 Summary

For ICRF1, a scaling factor of 1.5 was first applied to the formal uncertainties followed by a root-sum-square increase of 250 μas. From the current decimation test, we get a similar scaling factor when averaging over all sources, but we can see that the scaling factor increases with declination since the formal uncertainties of positions tend to increase with declination. To account for this, we need to then add additional noise. Based on the noise shown in Figure 21, a value of 40 μas is a reasonable upper limit on the noise floor. The residual scale factor after applying first a scale factor of 1.5 to the original formal uncertainties and then adding 40 μas in a root-sum-square sense shown in Figure 20 is flatter and closer to unity as a function of declination. As a function of the number of sessions in which a source is observed, the residual scale factor shown in Figure 22 is generally less than unity. After applying these corrections to the formal errors, the average residual scaling factors are 0.95 for declination and 0.88 for Right Ascension.

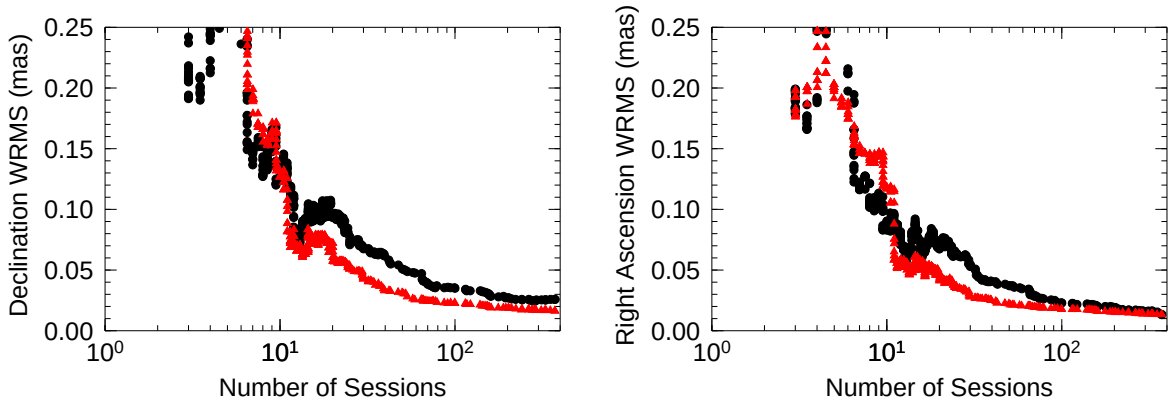

Figure 21: Wrms noise (solid circles) for subsets of 50 sources in each solution as a function of the minimum number of sessions a source was observed. The median formal uncertainty (red triangles) in each subset is shown for comparison. These were derived from differences between positions in the two decimation solutions.

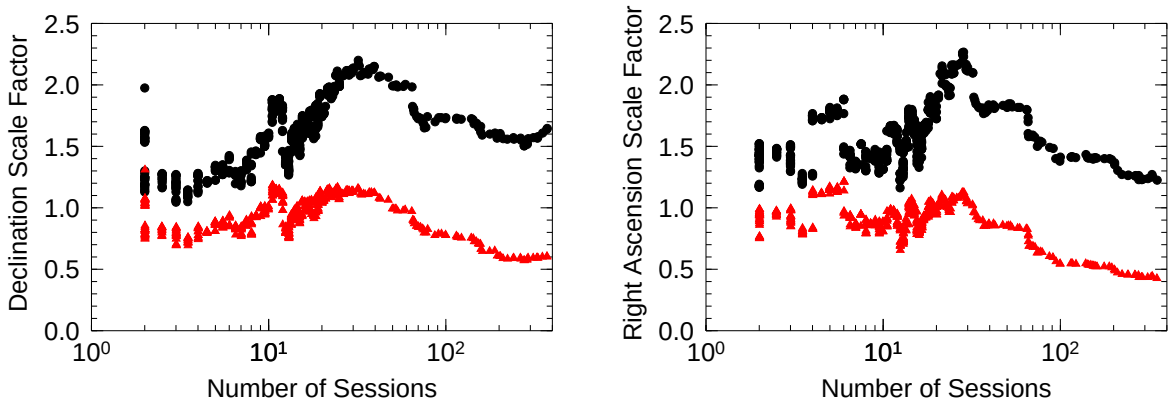

Figure 22: Error scaling factor (solid black circles) for each subset of 50 sources in each solution as a function of the minimum number of sessions a source was observed. The residual scaling factor (red triangles) after application of a scale factor of 1.5 to the formal uncertainties followed by a root-sum-square increase of 40 μas.

10 External validation (AN, SB)

In the absence of any superior-quality source position catalogue, a state-of-the-art CRF does not find a data set to which it can be compared to assess its own quality. However, the results of the estimation process of radio source positions always depend on a simultaneous estimate of the whole suite of unknown parameters in the VLBI model. For this reason, the results of site coordinates and velocities as well as of the Earth orientation parameters belong to a certain CRF determination in a consistent way when estimated together. An external validation of a complete VLBI adjustment and of the CRF results can, thus, be carried out through an indirect quality assessment applied to the TRF and the EOP results alone.

10.1 Earth Orientation Parameters

For a comparison of the full set of EOP results, i.e., polar motion and UT1−UTC and their time derivatives as well as the offsets in the two nutation angles, it has to be noted that only for the polar motion components an external evaluation is possible through GPS providing a suitable data set with the same or even better quality. The official EOP series (igs00p03.erp) of the International GNSS Service (IGS) was used for the following comparisons. After subtracting a bias and a rate the six solutions considered initially for ICRF2 exhibit a level of agreement of roughly 120 μas in both components (Table 11). Figure 23 and Figure 24 depict the behavior of the pole components in the form of medians calculated every seven days for plus/minus 35 days. Noticeable systematic variations seem to be more prominent in the y component which have been identified to belong to changes in the IVS network constellations [Artz et al., 2008]. In general, the scatter of the VLBI results and the systematic network effects are at the same level indicating that the wrms values are representative for the overall agreement.

The other three components of the standard Earth orientation representation, UT1−UTC and nutation in dX and dY, can only be determined by VLBI observations with sufficient accuracy. For these components no suitable external (i.e. non-VLBI) comparison is available. An evaluation can, thus, only be carried out by inter-comparing the results of the six solutions. This is a valid approach here since the six time series have been generated by three different software packages. In order to subtract a common signal for a better interpretation, the IERS 05C04 EOP series has been used as a reference. It should be mentioned that the wrms differences (Table 12) and the graphs do not show any quality in an absolute sense since the 05C04 series for UT1−UTC and nutation is mainly driven by VLBI results, however computed with different inputs and for a different purpose. For this reason, the quality of these EOP components should only be derived by contemplating the level of relative agreement.

Taking these considerations into account, a first criterion of the quality should be any systematic behavior visible in the plots (Figure 25 and Figure 26). It is easily discernible that the four Calc/Solve solutions and the SteelBreeze solution by MAO do not exhibit strong systematic variations in the 70-day-median representation. However, a very obvious effect with an irregular period is visible in the IAA time series. This effect has been caused by errors in the submitted IAA EOP file. Since the MAO and the IAA time series do not show strong correlations but the MAO rather follows the four Calc/Solve solutions with some excess noise, it can be concluded that the numerical results provide a reliable relative indication of the quality of each input series.

In Table 12, the MAO solution agrees with the IERS 05C04 series with

Table 11: wrms differences of the different VLBI solutions w.r.t. IGS

Analysis Center	X Pole			Y Pole		
	Offset [μas]	Rate [μas/day]	wrms [μas]	Offset [μas]	Rate [μas/day]	wrms [μas]
BKG	-87.0 ± 4.3	12.4 ± 1.7	131.0	-125.1 ± 4.1	-13.2 ± 1.6	125.2
GSF	-86.6 ± 3.7	11.4 ± 1.5	111.4	-132.3 ± 3.5	-15.2 ± 1.4	106.7
MAO	-21.3 ± 4.3	6.3 ± 1.7	124.8	-93.9 ± 4.1	-10.1 ± 1.5	120.1
IAA	-140.5 ± 4.1	13.5 ± 1.6	123.5	-137.3 ± 3.9	-17.2 ± 1.5	119.6
OPA	-80.4 ± 3.7	7.6 ± 1.5	115.2	-119.1 ± 3.5	-13.8 ± 1.4	109.1
USN	-79.1 ± 4.0	9.0 ± 1.6	121.3	-141.2 ± 3.8	-12.9 ± 1.5	115.7

Table 12: wrms differences of the different VLBI solutions w.r.t. IERS 05C04 for nutation

Analysis Center	Nutation dX			Nutation dY		
	Offset [μas]	Rate [μas/day]	wrms [μas]	Offset [μas]	Rate [μas/day]	wrms [μas]
BKG	19.0 ± 1.9	-2.0 ± 0.4	76.6	-8.1 ± 2.2	3.4 ± 0.5	93.3
GSF	34.7 ± 1.6	-1.8 ± 0.3	61.9	19.7 ± 1.8	3.9 ± 0.4	75.9
MAO	-14.2 ± 2.6	-1.2 ± 0.6	100.5	-31.1 ± 2.7	2.1 ± 0.7	107.2
IAA	-6.1 ± 3.5	-11.2 ± 0.8	143.8	95.7 ± 3.5	13.5 ± 0.9	147.8
OPA	37.1 ± 1.8	-1.2 ± 0.4	69.8	24.0 ± 1.8	-2.1 ± 0.5	76.3
USN	35.8 ± 1.9	-2.5 ± 0.4	76.7	32.6 ± 2.2	3.3 ± 0.6	92.9

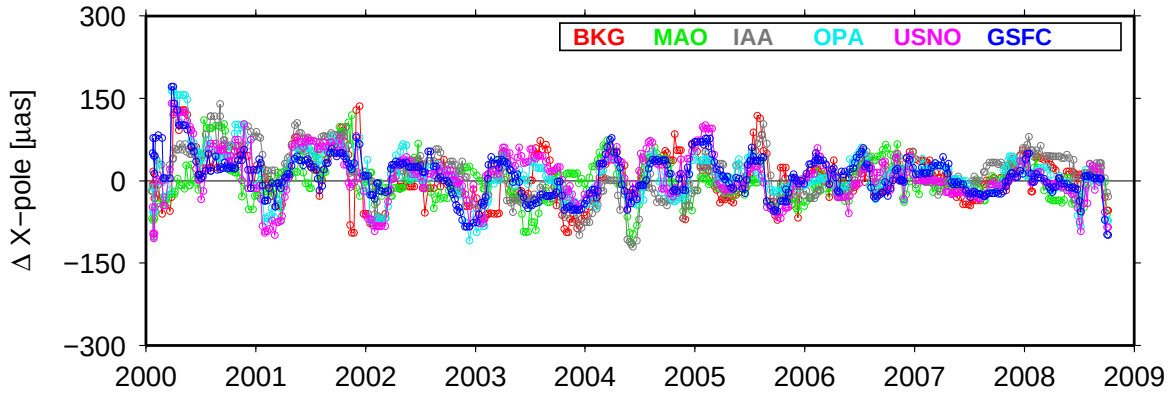

Figure 23: 70-day-median smoothed X pole difference w.r.t. IGS (igs00p03.erp)

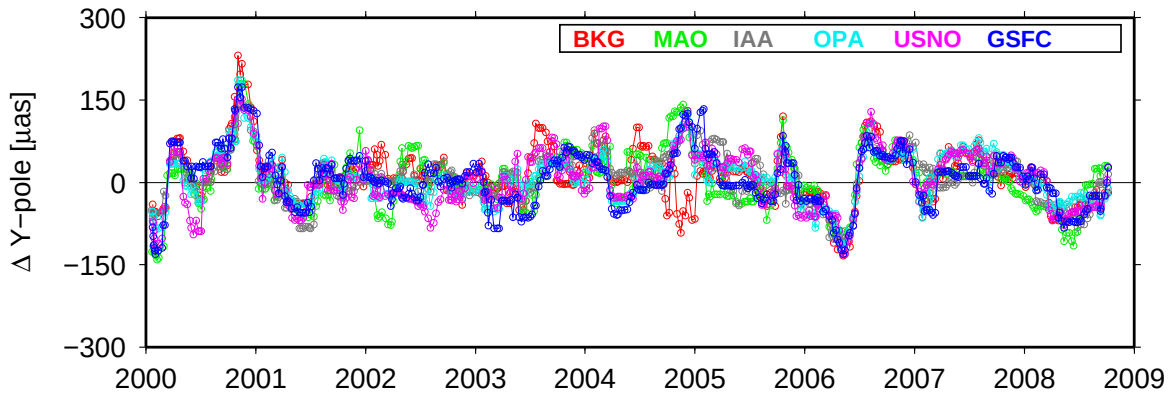

Figure 24: 70-day-median smoothed Y pole difference w.r.t. IGS (igs00p03.erp)

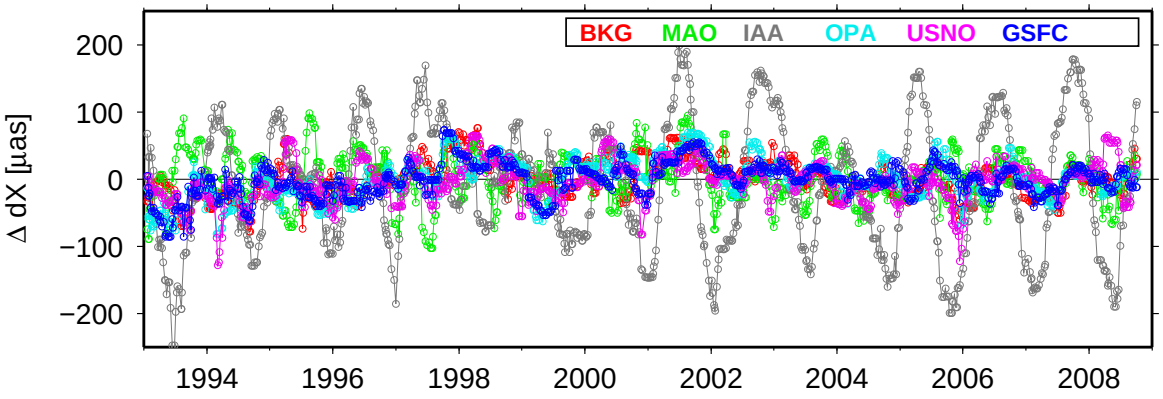

Figure 25: 70-day-median smoothed dX nutation differences w.r.t. IERS 05C04

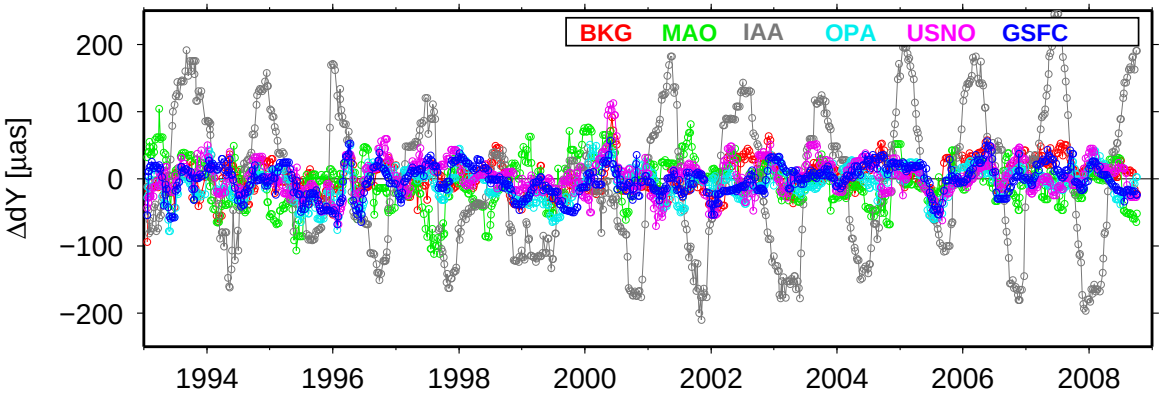

Figure 26: 70-day-median smoothed dY nutation differences w.r.t. IERS 05C04

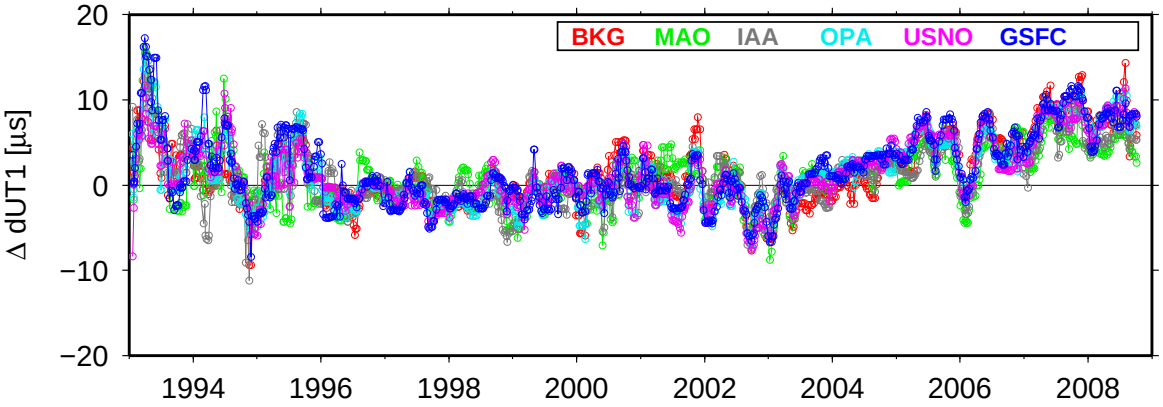

Figure 27: 70-day-median smoothed UT1−UTC differences w.r.t. IERS 05C04

Analysis Center	UT1−UTC Offset [μs]	Rate [μs/day]	wrms [μs]
BKG	−4.47 ± 0.23	−0.40± 0.06	9.08
GSF	−3.88 ± 0.21	−0.38± 0.06	8.60
MAO	−0.07 ± 0.24	−0.43± 0.07	9.21
IAA	−0.95 ± 0.21	−0.17± 0.06	8.56
OPA	−4.10 ± 0.21	−0.21± 0.06	8.63
USN	−4.91 ± 0.22	−0.15± 0.06	8.77

Table 13: wrms differences of the different VLBI solutions w.r.t. IERS 05C04 for UT1−UTC

100 and 107 μas in a wrms sense and the Calc/Solve solutions at the level of 60 to 95 μas. Since these time series all agree with the reference series at a similar level, the absolute accuracy of the nutation estimates should not be worse than by a factor of $\sqrt{2}$. This indicates that the nutation accuracy is at the same level as that of polar motion.

A comparison of the six time series for UT1−UTC shows a slightly different problem (Figure 27). The reference series IERS 05C04 exhibits a long term drift after 2002.5. Nevertheless, the VLBI solutions agree with each other at the few μs level. Table 13 provides the wrms differences w.r.t. the reference series at the level of about 9 μs which corresponds to 135 μas. Obviously, this number is driven by the systematic effect in the differences and does not characterize the agreement of the six series as such. This agreement is rather at the level of 4–5 μs. The level of the agreement of the UT1−UTC results, thus, matches that of the polar motion results and the 100 μas can, therefore, be considered as the upper limit also of this component of Earth rotation.

Biases of the polar motion components of the individual solutions w.r.t. to IERS 05C04 are below 85 μs. The orientations of the terrestrial axes are, thus, effected at the same level.

From the comparisons of the EOP results, it can be concluded that the solutions initially considered for the computation of ICRF2 agree with each other at the level of better than 100 μas excluding obvious systematic deficiencies. The polar motion results of the solution selected for ICRF2, gsf008a, agree with the IGS GPS results by 111 and 107 μas for the x and y component, respectively. Considering that the other EOP components do not exhibit any obvious systematic effects, it can be concluded that their accuracy is at the same level. An upper bound of 110 μas or 3.3 mm at the Earth's surface can thus be inferred for the overall accuracy of each observing session contributing to the determination of ICRF2.

10.2 Terrestrial Reference Frame

A second option for external validations is to investigate what quality the terrestrial reference frame (TRF) has which was estimated in the same process as the CRF was. Since the decision has been made to use the gsf008a solution for ICRF2, the respective TRF has been compared to other TRFs. A comparison of different TRF is most practically being carried out by estimating the parameters of a 14 parameter Helmert transformation and a study of the respective residuals. Ideally, a comparison should be made to the latest realization of the International Terrestrial Reference System, the ITRF2008. Unfortunately, ITRF2008 has not been released at this time. Therefore, VTRF2008 which is the TRF determined from the VLBI input to ITRF2008 is the best independent TRF currently available for this purpose [Böckmann, Nothnagel, & Artz, 2009].

VTRF2008 is a TRF combination product from input of several IVS Analysis Centers and should provide a very reliable reference due to the stabilizing effect of the combination. Seven of nine contributions had been accepted after a detailed quality check excluding two solutions which did not match the high quality criteria. Six of the seven ACs accepted had used the program package Calc/Solve and only one other solution by DGFI was generated with an independent software package, OCCAM. Although it would be better to have more solutions from different software packages, the agreement of all the accepted solutions in general and between the software packages of Calc/Solve and OCCAM in particular should exclude any serious deficiencies in the combined TRF.

The second reference TRF to compare the gsf008a TRF to, is ITRF2005 [Altamimi et al., 2007]. However, ITRF2005 has a known deficiency

due to a flaw in the pole tide modeling of the VLBI input. Due to the pole tide error and the unbalanced distribution of observing sites, any comparisons to ITRF2005 will show a noticeable difference in the scale factor [Altamimi et al., 2007; Böckmann et al., 2007].

The Helmert parameters of the gsf008a solution w.r.t. VTRF2008 and ITRF2005 are listed in Table 14. In the context of ICRF2, the rotations and their time evolution are of particular importance. The gsf008a solution is rotated w.r.t. VTRF2008 by not more than 41 μas and w.r.t. ITRF2005 by not more than 3 μas. The rotation rates are at the level of a few μas/yr with formal errors at the same level. The scale difference and its rate w.r.t. VTRF2008 is so small that it is hardly significant. The well known scale effect of ITRF2005 of 0.4 ppb appears as expected.

Table 14: Helmert parameters of TRF(gsf008a) w.r.t. VTRF2008 and ITRF2005

Helmert	VTRF2008		ITRF2005		
Parameter	value	σ	value	σ	unit
T_x	−0.69	±0.36	−0.26	±0.94	mm
T_y	−0.22	±0.35	0.00	±0.87	mm
T_z	−0.21	±0.34	0.11	±0.87	mm
R_x	−31.8	±13.9	0.5	±30.0	μas
R_y	−41.2	±13.2	−0.7	±35.3	μas
R_z	15.2	±9.2	2.9	±32.2	μas
ΔS	−0.006	±0.050	−0.406	±0.138	ppb
T_x/dt	−0.06	±0.09	−0.24	±0.14	mm/y
T_y/dt	0.09	±0.09	0.13	±0.15	mm/y
T_z/dt	0.22	±0.09	0.11	±0.14	mm/y
R_x/dt	−4.61	±3.7	−5.50	±5.96	μas/y
R_y/dt	−2.35	±3.5	−7.57	±5.19	μas/y
R_z/dt	−2.52	±3.2	−1.63	±4.83	μas/y
ΔS/dt	−0.009	±0.014	−0.015	±0.022	ppb/y

The quality of the coordinates and velocities of individual observatories can best be discussed by looking at the post fit residuals of the epoch positions and of the velocities. Observing sites active at the reference epoch of the station positions (2000.0) generally show differences w.r.t. VTRF2008 below 5 mm in the horizontal topocentric positions (Figure 28) with velocities at the 1 mm/y level and below (Figure 29). Notable exceptions are SYOWA and OHIGGINS in Antarctica, TIGO-CONC in Chile and NYALES20 on Spitsbergen with horizontal residuals being slightly larger. However, the vertical differences (Figure 30) of these sites fit to VTRF2008 very well. The other stations with larger residuals are older radio telescopes which have been decommissioned already some time ago.

The comparison with ITRF2005 shows a similar picture (Figure 31 and Figure 32). However, a number of sites did have only a short observing history at that time and differences are, thus, larger. In addition, the error in the 2005 VLBI pole tide model appears as a zonal effect in the differences today. For this reason, ITRF2005 turns out not to be a suitable reference for an external validation of the solution for ICRF2 on an individual site basis.

On the basis of the Helmert parameters of the gsf008a TRF estimates w.r.t. the two reference TRFs (VTRF2008 and ITRF2005) it can be stated that the solution fulfills the requirements in terms of the orientation of the axes. The residuals of horizontal and vertical coordinate

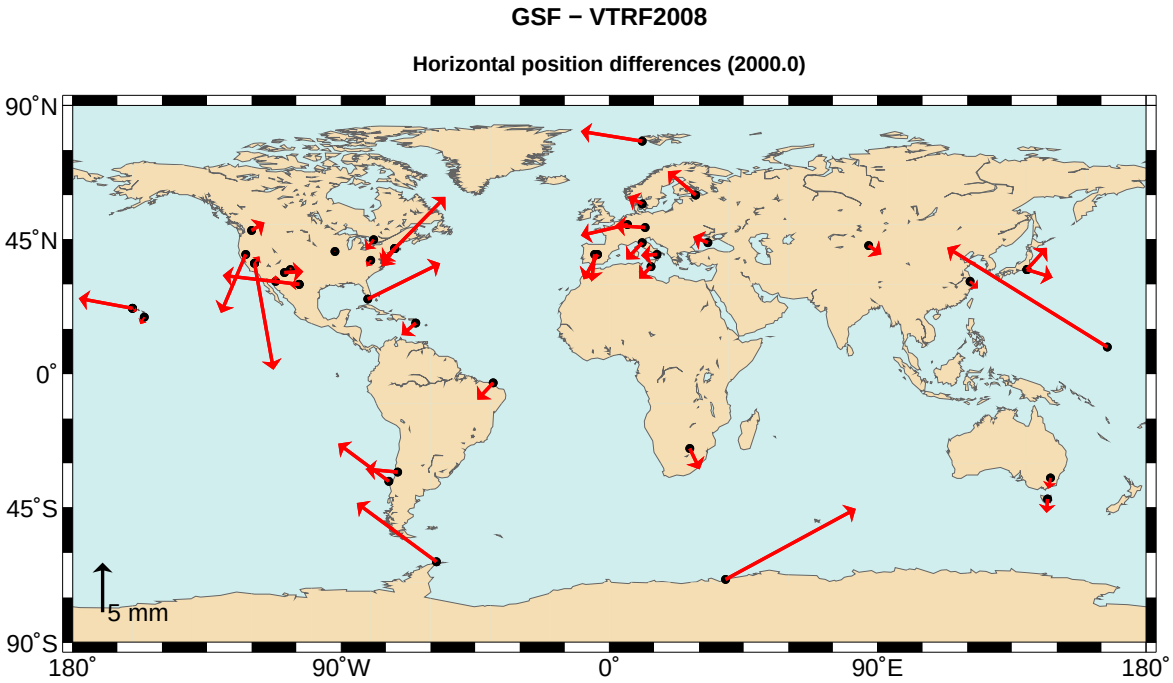

Figure 28: Position differences gsf008a−VTRF2008 at epoch 2000.0

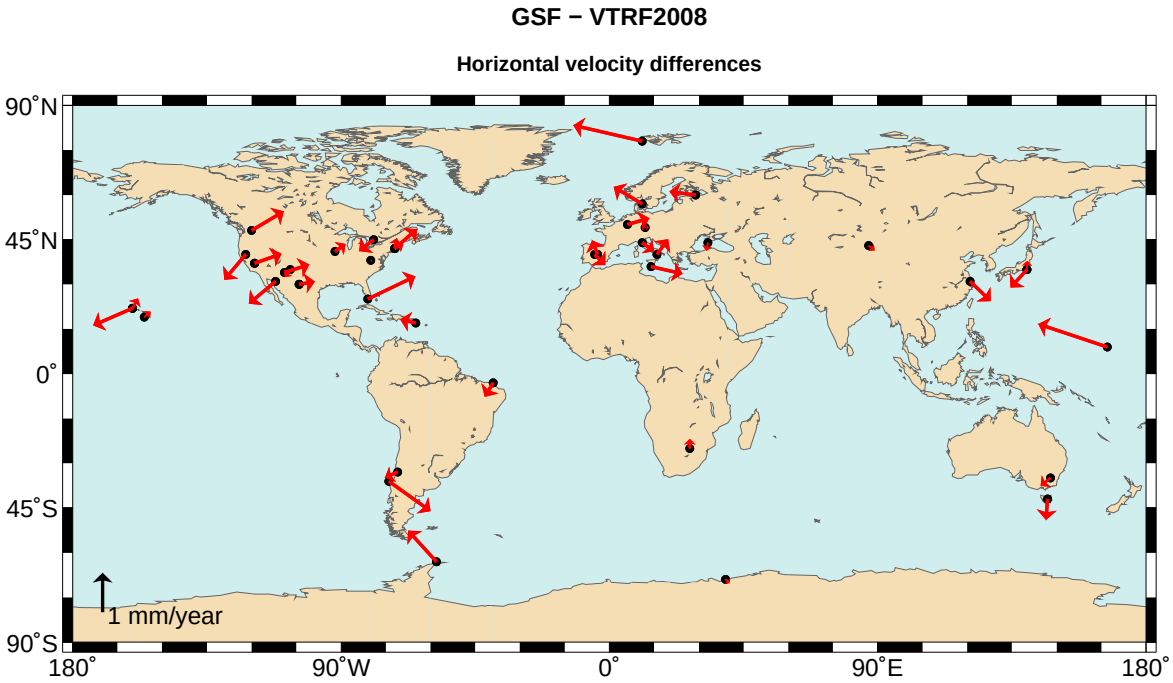

Figure 29: Velocity differences gsf008a−VTRF2008

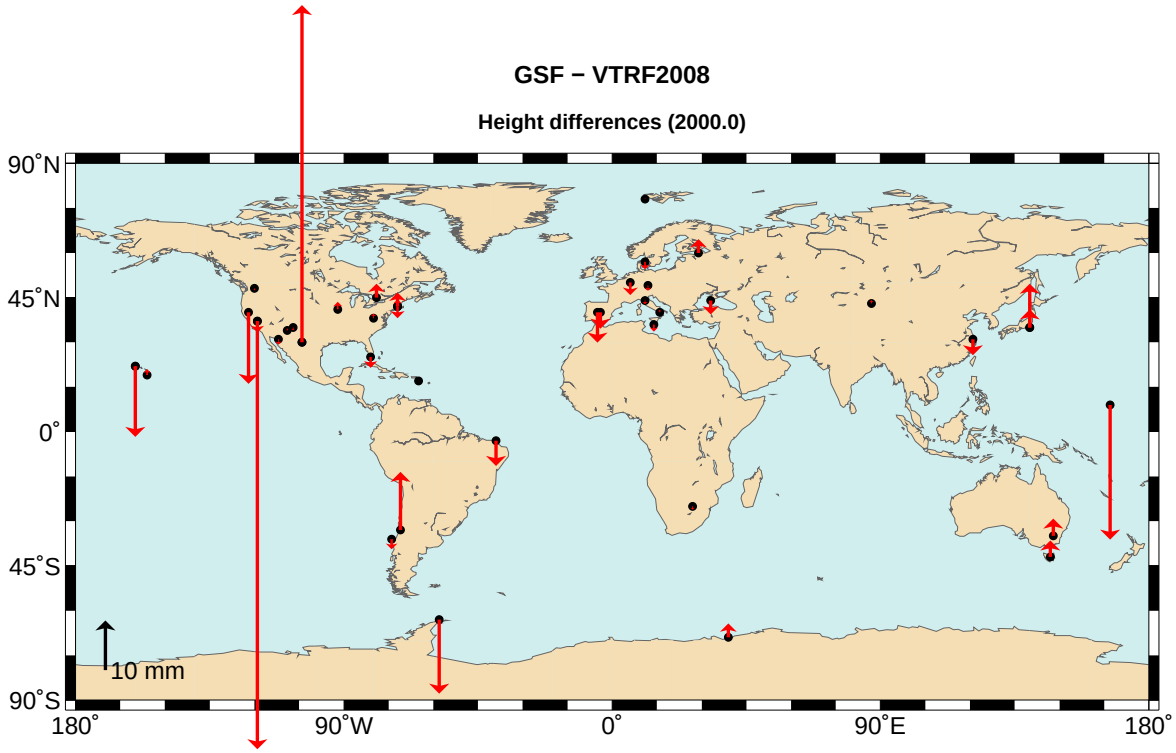

Figure 30: Height differences gsf008a−VTRF2008 at epoch 2000.0

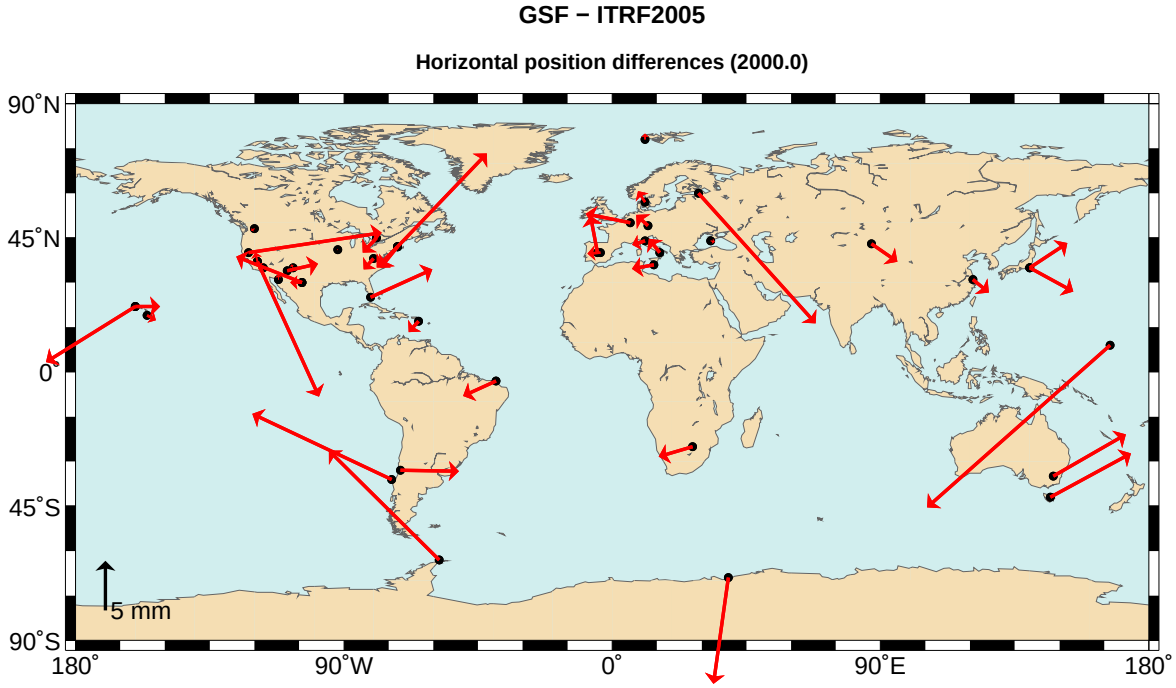

Figure 31: Position differences gsf008a−ITRF2005 at epoch 2000.0

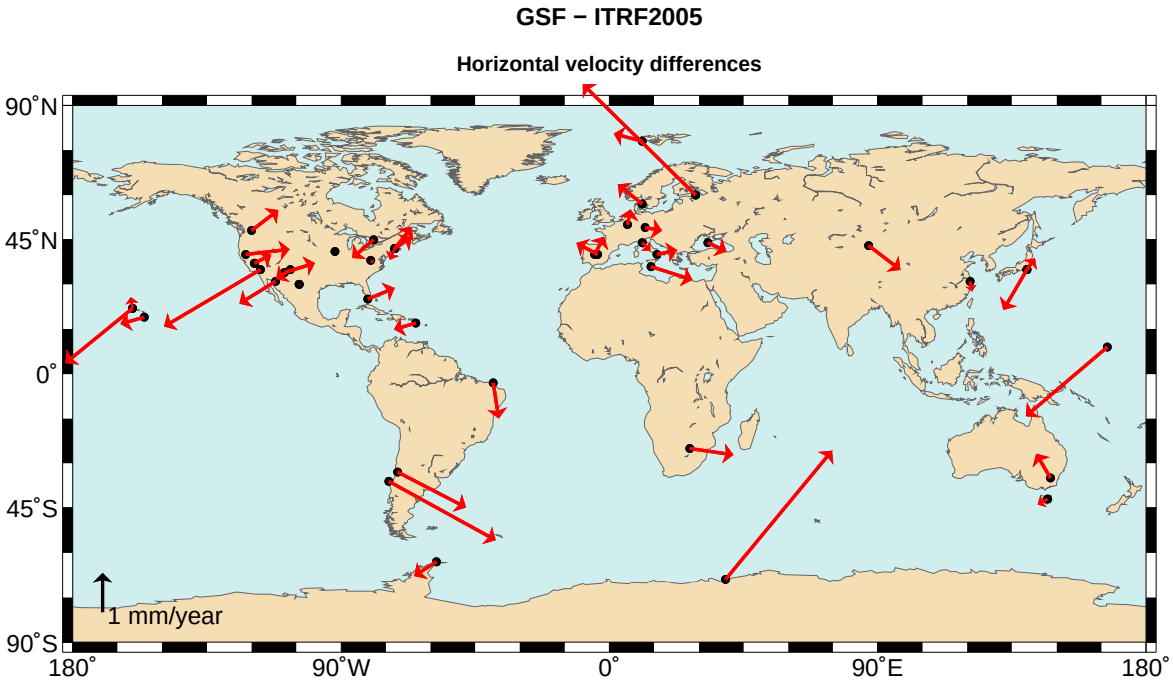

Figure 32: Velocity differences gsf008a−ITRF2005

components as well as of the velocities confirm the overall accuracy of the gsf008a solution at the level of 3.5 mm.

10.3 Celestial Reference Frame at 24, 32, and 43 GHz (CSJ)

A third method of external validation of the ICRF2 is comparing it to celestial frames at other frequencies.

The original ICRF [Ma et al., 1998], its extensions [Fey et al., 2004] and now the ICRF2 are based on VLBI measurements over the last several decades at radio frequencies of 2.3/8.4 GHz. The deep atmospheric window at these radio frequencies combined with the Gigahertz-peaked spectrum nature of many extra-galactic objects facilitates the use of these frequencies for VLBI reference frame work. Historically, the use of these frequencies for radio astronomy at existing antennas contributed to their adoption for use in radio astrometry.

In 1997, as part of the IAU adoption of the original ICRF, resolution B2-d [IAU General Assembly XXIII, 1997] was issued encouraging the extension of the ICRF to other frequencies. In response, VLBI global astrometric measurements have now been made at 24, 32, and 43 GHz and thus can provide the independent checks on the ICRF2 source positions that we desire.

10.3.1 High Frequency Data

With that in mind, we now take a closer look at the high frequency data sets.

- At 24 GHz (K-band), 82 000 observations [Lanyi et al., 2008] have produced a frame of 275 sources covering down to about −40° declination.
- At 8.4/32 GHz (X/Ka-band), 9 400 observations (e.g., Jacobs & Sovers [2008]) have produced a frame of 339 sources covering down to −45°.

- At 43 GHz (Q-band), 19 000 observations [Lanyi et al., 2008] have produced a frame of 132 sources covering down to roughly −30°.

All three of these data sets are much, much smaller than the ICRF2's S/X-band data set. Also all three of these data sets cover only part of the southern hemisphere.

10.3.2 Statistical Agreement

We now examine the agreement of the source positions produced at 24, 32, and 43 GHz with our 2.3/8.4 GHz based ICRF2. Table 15 presents the statistics of the comparison with the three high frequency frames and the ICRF2. N_{src} is the number of overlapping sources considered. After removing a three dimensional rotation, the wrms and mean offset were calculated. The results are tabulated in units of μas.

Table 15: Agreement between ICRF2 and frames at 24, 32, and 43 GHz

Frame	N_{src}	$\alpha\cos(\delta)$ wrms	offset	δ wrms	offset
24 GHz	257	115	−2	216	109
32 GHz	320	186	16	261	−8
43 GHz	125	356	20	451	105

For all three frequencies the R.A. agreement is better than the declination agreement. For 24 and 43 GHz, this is because of the limited north-south coverage, i.e., the lack of southern stations in the VLBA network, which creates both a geometrical weakness and which leads to sources in the south being systematically observed at lower elevations and thus more susceptible to atmospheric modeling errors. In particular, there were no dual-frequency plasma calibrations for either the 24- or 43-GHz data sets. The ionosphere was only partially corrected using nearby lines of sight observed to GPS satellites. Tropospheric mis-modeling also contributes to the errors.

For 32 GHz, the declination coordinate was weaker because the observations collected using the two-baseline Deep Space Network had far fewer observations on the north-south California-Australia baseline than on the east-west California-Spain baseline.

Both 32 and 43 GHz observations were limited by low SNR. In addition, the 32 GHz sessions lacked instrumental phase calibrations. These factors will limit the level of agreement with the ICRF2. Yet, despite these limitations, the agreement is good. Recall that the ICRF1 imposed a 250 μas noise floor on its positions. Both the 8 vs. 24 GHz and 8 vs. 32 GHz position agreements are close to or better than this floor. Moreover, our experience suggests that once the VLBA's 43 GHz system sensitivity is improved by increasing from 128 to 512 Mbps sample rates, this band should also agree to ≤ 250 μas.

The most interesting result of this comparison is the 8 vs. 24 GHz wrms agreement in R.A. ($\alpha\cos\delta$) of 115 μas. Given that there is no reason to expect that source structure is systematically different in the declination coordinate and given that a good portion of the scatter is due to thermal and atmospheric errors, this result sets a tight statistical constraint on the core shift and source structure effects between 8 and 24 GHz of ≤ 100 μas for the overlapping sources. Because sources which are observable at both 8 and 24 GHz are expected to be more compact than the average S/X-band ICRF2 source, the 100 μas figure given above may be optimistically biased due to the selection effect of requiring the sources be detectable at high frequencies. Thus users are encouraged to

consider detectability at high frequency as one attribute of the highest quality sources.

In summary, since the publication of the ICRF1 in 1998, radio frame work has been extended to three new frequencies: 24, 32, and 43 GHz. Comparing the S/X-band ICRF2 to these independent high frequency data sets shows agreement at the $100-500$ μas level thus lending further validation to the accuracy of the ICRF2.

11 Selection of ICRF2 Defining Sources (SBL, PC, AMG)

This section reports on the establishment of a preliminary ordered list of sources based on their positional stability, and of the cross-correlation between this preliminary ranking and the list of source structure indices. A list of defining sources for ICRF2 is proposed.

11.1 Positional Stability of Sources

11.1.1 Ranking method

The ranking is based on the data files gsf005a.stats (time series statistics) and gsf008a.cat (non-aligned final ICRF2 catalog), from which the sources considered for special handling were removed. We keep 593 sources observed in at least ten sessions. All these sources are estimated globally and have an observational history longer than 2 years.

From the former file, one can compute the positional stability as

$$r = \sqrt{\mathrm{wrms}^2_{\alpha\cos\delta}\chi^2_\alpha + \mathrm{wrms}^2_\delta\chi^2_\delta}. \tag{8}$$

From the latter, an overall formal error on the position estimate can be computed as

$$d = \sqrt{\sigma^2_{\alpha\cos\delta} + \sigma^2_\delta + \sigma_{\alpha\cos\delta}\sigma_\delta C(\alpha,\delta)}, \tag{9}$$

where $C(\alpha, \delta)$ is the correlation between estimates of α and δ. Figure 33 displays the values of r and d as functions of the declination.

One could define an overall positional stability as $p = r + d$. However, d appears to be lower than r by a factor of 10, so that p would be dominated by information from time series. Moreover, a ranking based on the above-defined quantities only will obviously reject the southern hemisphere sources.

In the following, we implement a method inspired by Section 3 of Fey et al. [2001].

1. First of all, data are binned by intervals of declination. We chose 4 nodes ($-31°$, $0°$, $18°$, and $40°$) so that the number of sources in each interval is approximately the same (around 110 sources).
2. In each interval of declination, sources are given a mark between 0 and 10 on the basis of r. Again, the binning is such that the number of sources in each category is approximately the same.
3. Point (2) is repeated for d.
4. The scaled r and d are summed and normalized to 100: this constitutes the final "quality" index p. The distribution of p is displayed in Figure 34.

It is interesting to note that if one leaves the special handling sources into the input catalog and time series statistics file before doing the ranking, the special handling sources arrive between the 334th place and the 632nd place. Five of them (0235+164, 0607-157, 1611+343, 0637-752, 0528+134) arrive before the 400th place. This indicates that the ranking method can fail to exclude sources known to be of poor quality and that sources ranked after the 300th row must be considered cautiously.

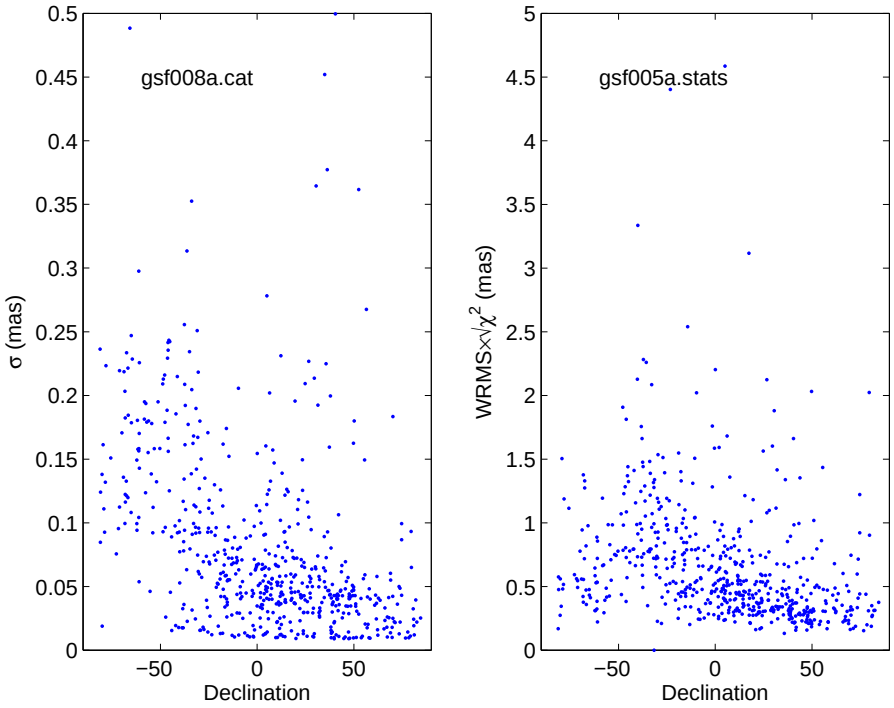

Figure 33: Quantities r and d vs. the declination.

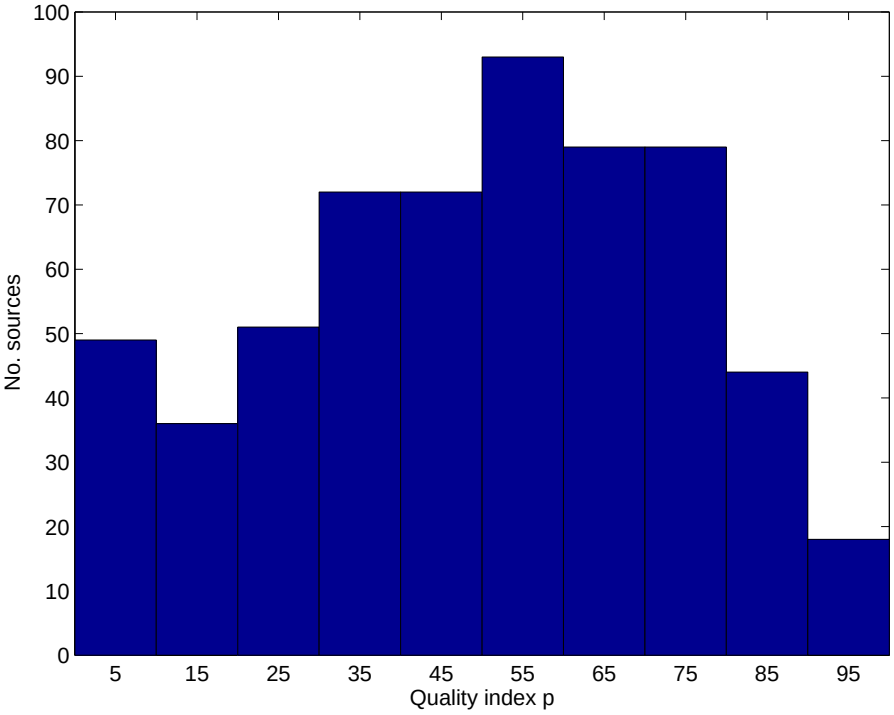

Figure 34: Distribution of the final quality index p.

11.1.2 Tests of stability

Method 1: tests on annual catalogs A first test of stability is done using annual reference frames computed from coordinate time series (method explained in Lambert & Gontier [2009]). Results are reported in Figure 35 by the solid, thick line (left scale). The thin line represents a degree-2 polynomial fit. By this method, the stability of the 212 ICRF defining sources is close to 25 μas. The red, dashed line (right scale), shows the average declination of the considered set. Figure 35 indicates that the minimum value of N should be around 200. Taking the first $N > 200$ sources of the ranking would provide a frame definitely more stable than the current 212 ICRF1 defining sources by a factor of two, and would moreover present a much better coverage of both hemispheres. There seems to be an optimal value at N close to 380, after which the stability is degraded.

Method 2: tests on randomly-selected subsets We ran another series of tests of stability similarly to what was proposed in Ma et al. [1998], Section 11. To assess the stability of the axes defined by a set of N sources, we estimate the relative orientation between this set and a reference catalog (e.g., ICRF-Ext.2) on the basis of different subsets of size $N/2$. The scatter of the rotation parameters obtained from the various subsets gives the stability of the axes. The different subsets are randomly selected and are as large as a half of the tested set. The stability of the 212 ICRF1 defining sources checked by this method is $\sim$18 μas, in agreement with the conservative value of $\sim$20 μas mentioned in Ma et al. [1998].

The solid line in Figure 36 (left scale) represents the stability of the frame as a function of the number of defining sources. The stability is computed as the maximum of the respective scatters of the four usual transformation parameters A_1, A_2, A_3, and dz. The horizontal, green line indicates the stability of the 212 ICRF1 defining sources. For example, take a number of defining sources of 200: they are the first 200 lines of the ranking list, i.e, the most stable 200 sources. Among these 200 sources, 100 are selected randomly, and the orientation of these 100 sources is evaluated. The scheme is repeated a thousand times. The obtained stability is close to 10 μas, and the average declination is approximately 5°. (The average declination of the 212 ICRF1 defining sources is around 14°.)

From this method, it seems that taking 200, 400, or more sources is equivalent in terms of stability and sky coverage. However, one must keep in mind that the tests are not done on N sources, but on subsets of $N/2$ sources. For example, the stability for $N = 500$ is computed from subsets of 250 sources. Although containing also 'bad' sources, the axes of such a frame are strongly maintained by the good ones that were selected in the random process.

11.2 Structure Information and Selection of Defining Sources

The final list of defining sources results from the cross-correlation between the ranked list of sources described above, based on positional stability, and the ranked list of sources based on structure indices described in §5. Overall, the two criteria (positional stability and source structure index) show good consistency, with positional stability increasing as the structure index decreases (see Figure 37).

The effect of the cross-correlation was to filter out an initial list of defining sources derived from positional stability only. This initial list comprises a total of 423 sources, corresponding to sources with stability index larger than or equal to 40. Setting the threshold for structure index to

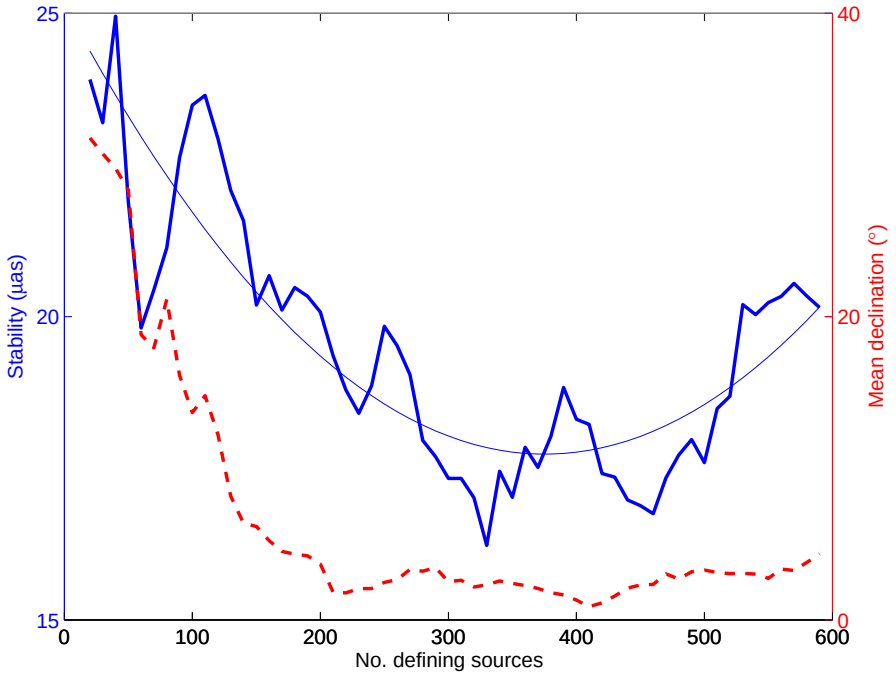

Figure 35: Axes stability and average declination of various subsets of sources of increasing size tested on annual catalogs.

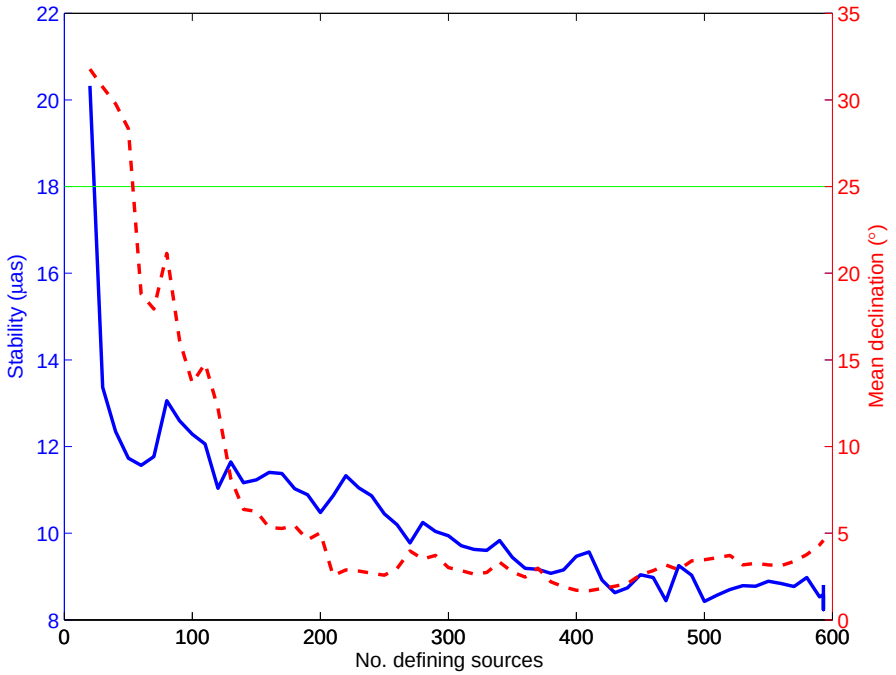

Figure 36: Axes stability and average declination of various subsets of sources of increasing size checked on randomly-selected subsets.

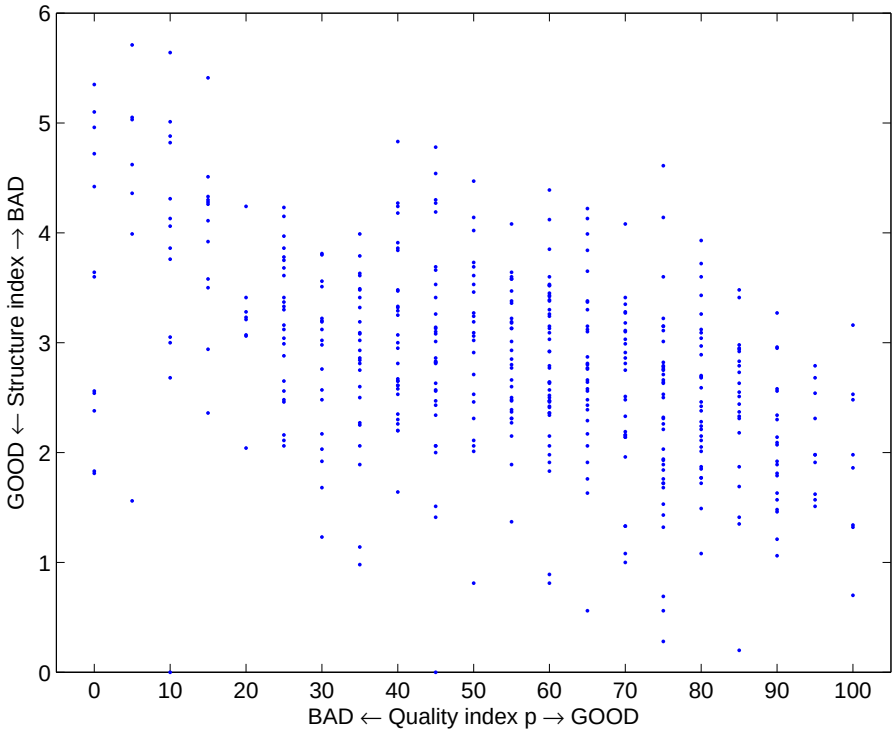

Figure 37: Source structure index vs. stability index p.

3.0, all sources with structure index values larger than or equal to this threshold were removed from the list, leaving 297 sources. About a quarter of these, mostly in the southern hemisphere, were found to have no structure index. When available, VLBI images from these sources were examined, which led to excluding two additional sources. The other sources (with no structure information available) were kept on the basis of their good positional stability only. Thus, the proposed set of defining sources comprise 295 sources.

The stability of the frame based on these 295 sources is 20 μas using the first method above and 10 μas using the second method, which is satisfactory (the corresponding stability's for the 212 ICRF1 defining sources are 26 μas and 18 μas). The mean declination of the sample is 0.7°. The distributions in declination, in p, and in structure index are shown in Figure 38, with the sky distribution plotted in Figure 39.

Preliminary checks against the ICRF1 revealed that rotation parameters towards the ICRF1 are at the level of $\sim$30 μas. The tilt parameter is negligible as well as the deformation parameters.

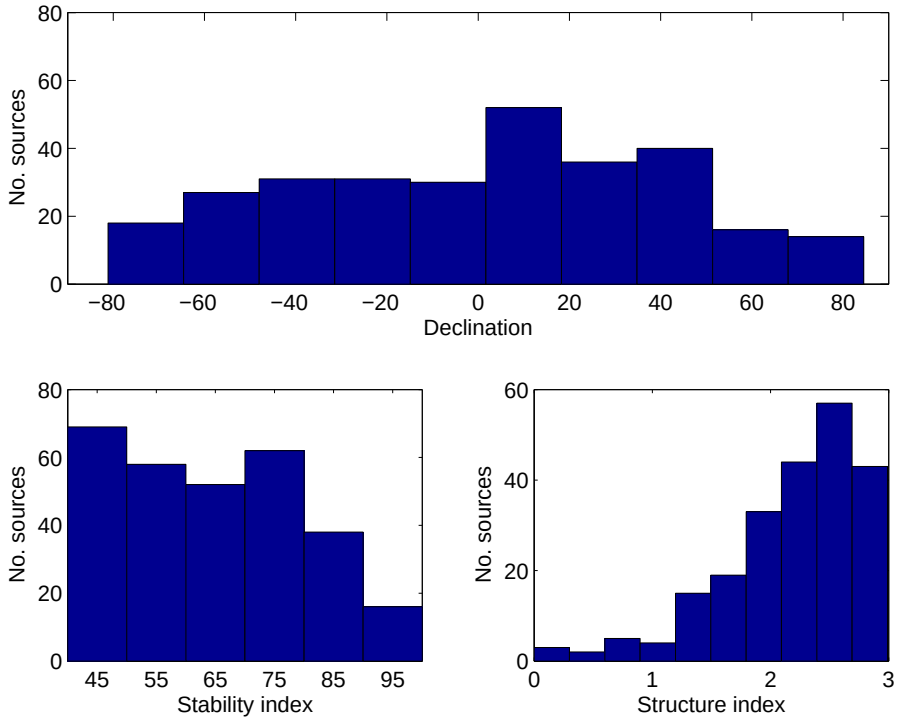

Figure 38: Defining sources' distribution in declination (top), in stability index (bottom-left), and in structure index when available (bottom-right).

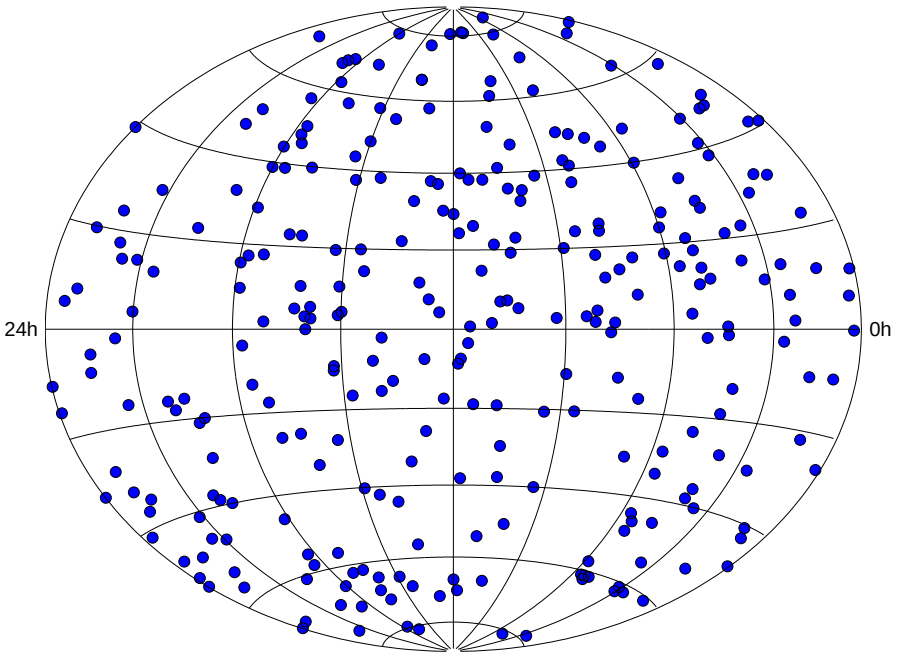

Figure 39: Distribution of the defining sources.

12 Alignment of ICRF2 onto ICRS and Axis Stability (AMG, EFA, SBL)

12.1 Linking sources

Among the 295 selected defining sources of the ICRF2, only 97 are also defining sources of the ICRF1. Most of them are in the northern hemisphere, making the sample badly distributed for a reliable estimation of rotation angles. To remedy, 41 ICRF2 defining sources (but not defining sources of the ICRF1) preferably taken in the southern hemisphere were added, resulting in 138 common objects for comparison which have been used for the link between the gsf008a catalogue and ICRF1-Ext2. The defining sources, the linking sources and the common to both ICRF1 and ICRF2 are displayed in Figure 40. The status in ICRF1-Ext.2 of the 41 additional sources is: 24 candidate sources, 16 other, and 1 new. Figure 41 displays the distribution of formal errors of the various subsets of sources before inflation, after inflation (see next paragraph), and of the corresponding errors in the ICRF1-Ext.2.

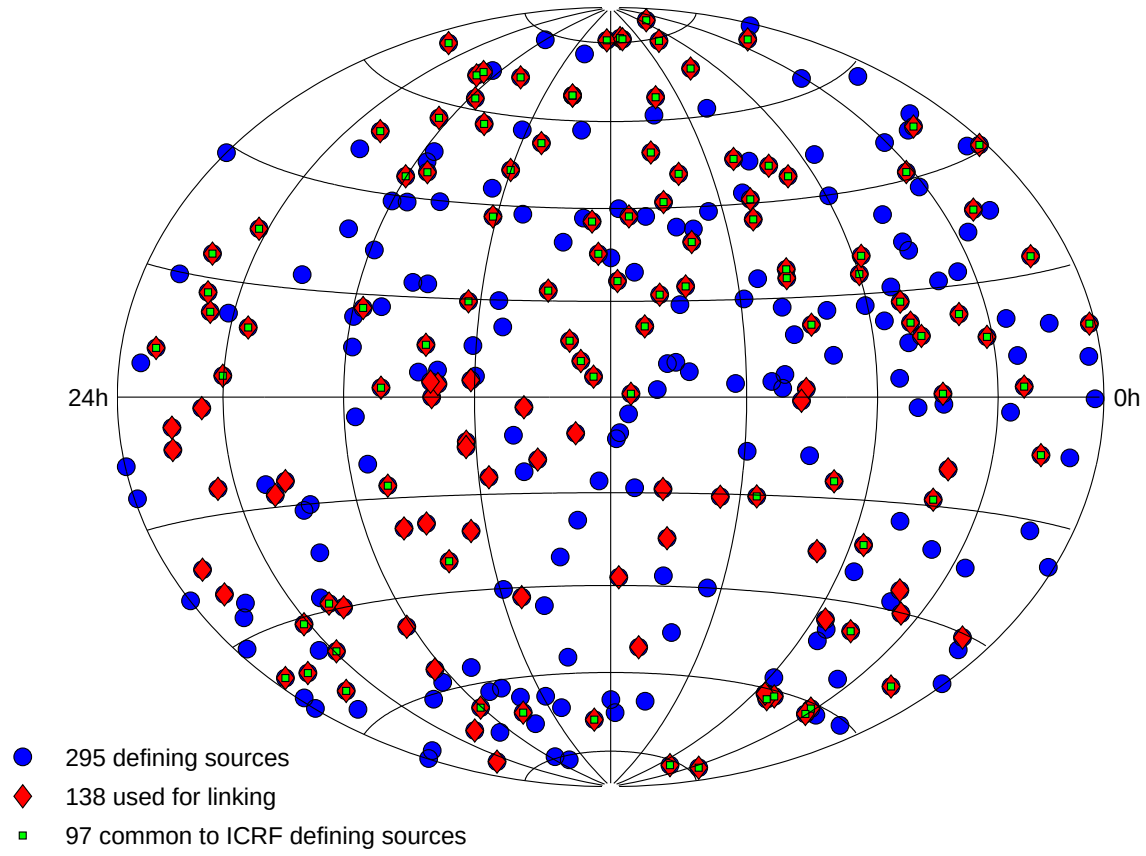

Figure 40: Distribution of the 295 defining sources (blue circles), of the 138 used for linking ICRF2 to ICRF1-Ext.2 (red diamonds). The 97 ICRF2 defining sources that are also defining sources of the ICRF1 are marked with green squares.

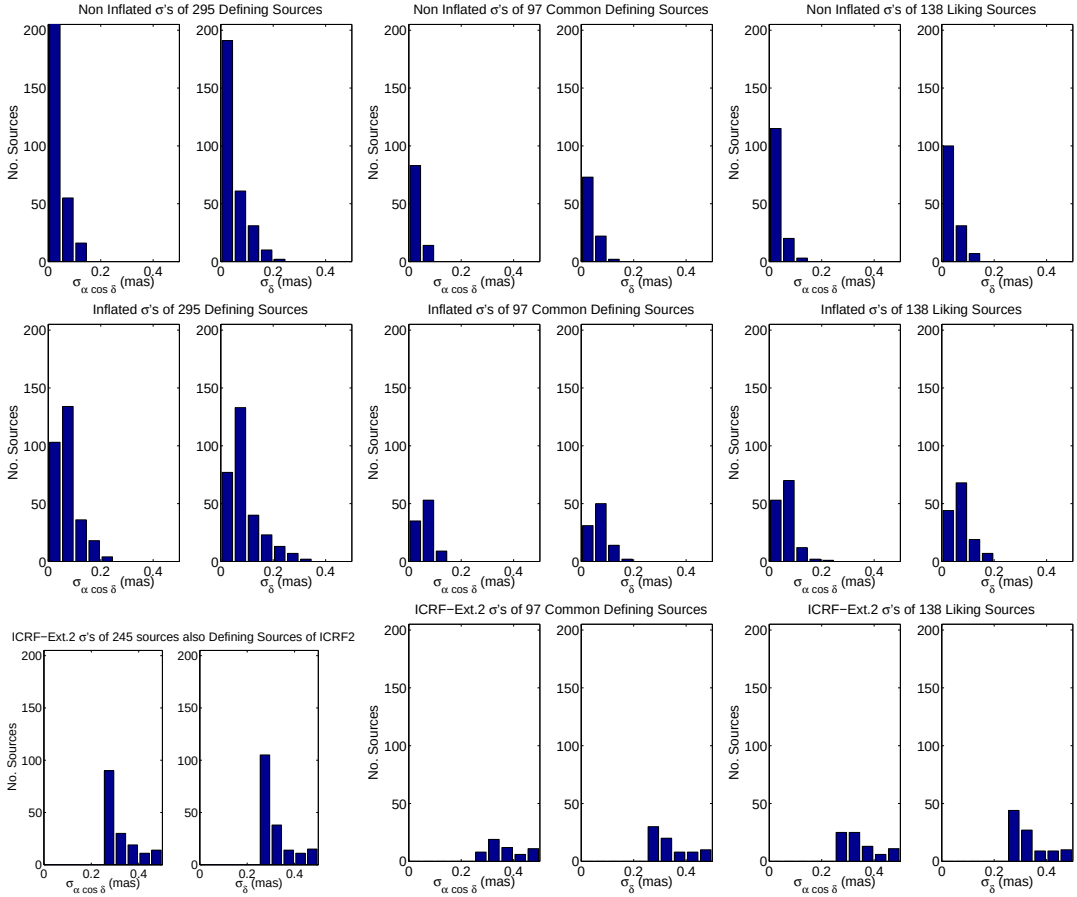

Figure 41: Distribution of formal errors of the defining, common and linking sources before inflation, after inflation, and of the corresponding errors in the ICRF1-Ext.2.

12.2 Rotation

The gsf008a catalogue, wherein the formal errors were inflated following the formula

$$\sigma^2_{\alpha\cos\delta} = (1.5\,\sigma_{\alpha\cos\delta,0})^2 + (0.04\ \mathrm{mas})^2 \quad (10)$$

$$\sigma^2_{\delta} = (1.5\,\sigma_{\delta,0})^2 + (0.04\ \mathrm{mas})^2 \quad (11)$$

was compared to the ICRF1-Ext.2 using a 4-parameter transformation in which the coordinate difference is modeled by three rotations of angles A_1, A_2 and A_3, around the X, Y and Z axes of the celestial frame, respectively, and a parameter dz accounting for a global translation of the source coordinates in declination (see, e.g., IERS [1996] or Feissel-Vernier et al. [2006]):

$$\Delta\alpha = A_1 \tan\delta\cos\alpha + A_2 \tan\delta\sin\alpha - A_3 \quad (12)$$

$$\Delta\delta = -A_1 \sin\alpha + A_2 \cos\alpha + dz \quad (13)$$

The additional two deformation parameters used in the transformation formula for the alignment of the first realization of the ICRF1 [Ma et al., 1998] were found negligible and are not estimated here. Values of parameters are reported in Table 16.

Improvements in the models and procedures applied in the gsf008a catalogue solution resulted in a frame less corrupted by deformations than

Table 16: Relative orientation and deformation parameter to transform ICRF2 into ICRF1-Ext.2. A_1, A_2, A_3 are the small rotation angles between axes of the frames; dz (formerly B_δ) is the bias in declination. All these parameters have been adjusted on the basis of the 138 defining sources in ICRF2 used for the link to ICRF1-Ext.2. r_α and r_δ are the wrms residuals in $\alpha\cos\delta$ and δ, respectively. Unit is μas.

A_1	A_2	A_3	dz	r_α	r_δ
23.3	−33.5	7.8	11.2	9.2	12.4
±19.2	±19.5	±18.4	±16.6		

ICRF1-Ext.2, but with a slight mis-orientation. In the procedure applied to rotate the gsf008a catalogue positions into the ICRS, care was taken not to transfer the deformations of ICRF1-Ext.2 to ICRF2. Consequently the radio source coordinates of the gsf008a catalogue were rotated onto the ICRS using only the three rotation angles A_1, A_2, and A_3. The rotated gsf008a catalogue constitutes the ICRF2.

12.3 Axis stability

The stability of the system axes was tested by estimating the relative orientation between ICRF2 and ICRF1-Ext.2 on the basis of various subsets of sources (see Table 17). The scatter of the rotation parameters obtained in the different comparisons indicate that the axes are stable to within 10 μas.

Table 17: Axis stability tests: transformation parameters between ICRF2 and ICRF1-Ext.2 for various subsets of defining sources. Unit is μas.

	No. sources	A_1	±	A_2	±	A_3	±	dz	±	r_α	r_δ
ICRF2 sources common to ICRF1-Ext.2											
All	710	18.2	9.1	−5.6	8.5	8.2	8.3	15.2	8.1	4.52	5.87
North	435	26.7	9.0	−6.2	8.5	5.9	8.8	21.1	8.8	5.18	5.03
South	275	−11.5	23.4	−2.9	21.0	10.9	17.7	1.2	18.2	8.91	13.18
Used for NNR	207	1.0	20.0	4.5	19.7	−14.1	21.0	−2.7	17.5	9.71	13.44
ICRF2 defining sources											
Common to ICRF-Ext.2	245	5.2	11.0	−5.1	10.5	14.0	10.4	22.0	10.0	5.32	7.43
Used for linking	138	−0.0	19.2	0.0	19.5	0.0	18.4	11.1	16.6	9.20	12.44
North	148	17.0	10.7	−1.2	10.4	12.7	10.7	26.1	10.2	6.07	7.51
South	97	−35.4	28.0	−18.6	24.8	11.2	22.3	19.9	22.3	10.46	16.51
Decimation rate = 2	128	−1.9	14.9	15.3	15.7	17.9	14.5	20.1	13.9	7.07	10.66
Decimation rate = 3	166	4.5	11.3	−19.3	10.5	20.2	11.1	13.6	10.5	5.62	7.62
Overall wrms		12.4		7.9		6.8		7.0			

13 The ICRF2 Catalogue

13.1 The ICRF2 Catalogue Positions (AMG, ALF)

The ICRF2 catalogue positions are obtained from the gsf008a solution after inflating the formal errors and aligning it onto the ICRS as discussed in §12.2. It consists of positions of 3414 sources. Of the total number of sources, 2197 sources are observed only in VCS sessions. Among the remaining 1217 sources, 295 have been designated as "defining" sources, i.e., the positions of these 295 sources define the axes of the ICRF2 frame (see §11).

The coordinates of the 295 ICRF2 defining sources are listed in Table 18. It should be noted that these positions *are not* epoch-dependent and hence no epoch is explicitly stated. However, the listed positions *are* consistent with J2000.0. Coordinates of the remaining 922 (out of 1217) non-defining sources are listed in Table 19. The coordinates of all 1217 sources (including the 295 defining sources) are also available at:

- `http://hpiers.obspm.fr/icrs-pc/icrf2/icrf2-non-vcs.dat`.

Note that the correlation coefficient $C_{\alpha-\delta}$ cannot be provided for the 39 special handling sources, due to the method by which the positions and their formal uncertainties were estimated (see §4).

The coordinates of the 2197 VCS-only sources of the ICRF2, are listed in Table 20 and are also available at:

- `http://hpiers.obspm.fr/icrs-pc/icrf2/icrf2-vcs-only.dat`.

Note that seven sources from the ICRF1-Ext.2 catalogue are not in ICRF2 [0647 − 475, 1020 − 103, 1039 − 474, 1217+295 (NGC 4278), 1329 − 665, 1601+173 (NGC 6034), and 1829 − 106]. The total number of group delay observations for each of these seven sources was less than three, insufficient to derive a reliable position.

13.2 Physical characteristics of ICRF2 defining sources (AMG, ZMM, OAT, CB)

This subsection introduces Table 21 on the physical characteristics of the defining sources. This table includes, where known, the object type, 8.4 GHz and 2.3 GHz flux, spectral index, visual magnitude, a classification of spectrum and comments for each ICRF2 defining sources.

The material in Table 21 is entirely compiled information, obtained from the following primary sources:

- The Large Quasar Astrometric Catalog (LQAC) [Souchay et al., 2009] is a compilation of 12 largest quasar catalogues (4 from radio interferometry programs, 8 from optical surveys). It contains 113666 quasars, providing information when available on: u, b, v, g, r, i, z, J, K photometry as well as redshift, radio fluxes at 1.4GHz, 2.3GHz, 5.0GHz, 8.4GHz, 24GHz and redshift references. This catalogue is available from the Centre de Donnees astronomiques de Strasbourg (CDS) (http://cdsweb.u-strasbg.fr/), as catalogue J/A+A/494/799.
- The "Optical Characteristics of Astrometric Radio Sources" [Malkin & Titov, 2008] includes 4261 radio sources with J2000.0 coordinates, redshift, V magnitude, object type and comments. This catalog is available at:
  http://www.gao.spb.ru/english/as/ac_vlbi/sou_car.dat

- The "Quasar and Active Galactic Nuclei (12th Ed.)", [Veron-Cetty & Veron, 2006] —hereafter VCV06—includes 85221 quasars, 1122 BL Lac objects and 21737 active galaxies together with known lensed quasars and double quasars. This catalogue is available from the CDS as catalogue VII/248.
- The "All-sky survey of Flat-spectrum Radio Sources" [Healey et al., 2007] —hereafter HR07—catalog provides precise positions, subarcsecond structures, and spectral indices for some 11000 sources. This catalog is available from the CDS as catalogue J/ApJS/171/61.
- The "Optical spectroscopy of 1Jy, S4 and S5 radio source identifications" [Stickel et al., 1989-94] —hereafter SK94. Position, magnitude, type of the optical identification, flux at 5GHz and two-point spectral index between 2.7 GHz and 5 GHz are provided. This catalog is available from the CDS as catalogue III/175.

Table 21 is arranged in J2000 Right Ascension order. The data in the table was derived by sequentially searching the above five references.

In practice, the LQAC was used to provide information on flux at 8.4 GHz and 2.3 GHz and initial information for the redshift and the magnitude.

Secondly, a comparison was made with the MT08 catalogue. Matches were done here by name. In this comparison, information on object type and comments was brought in. The redshift and the magnitude were checked and such data were provided for some sources. Most of the discrepancies found are explained by the comments.

Thirdly, the VCV06 data were merged in a similar fashion. At this stage, the object type was refined and the classification of spectrum was added.

As a fourth step, spectral index data between low frequency and 8.4 GHz were taken from the HR07 catalogue and completed for 7 sources by the SK94 catalogue.

At each of these steps, comparison printouts were generated to show the differences between the database as it existed to that point and the new data being read. As just noted, this provided for checks that the right objects were being matched and that the data were reasonable.

Acknowledgement: This research has made use of the NASA/IPAC Extragalactic Database (NED) which is operated by the Jet Propulsion Laboratory, Caltech, under contract with the National Aeronautics and Space Administration. This research has also made use of the Virtual Observatory tools.

14 Statistics of the ICRF2 Catalogue (CSJ)

This section will describe the ICRF2 catalogue. The catalogue is taken from a solution named gsf008a which produced angular positions for 3414 sources—more than five times the number of sources in the original ICRF1. However, 1966 sources were observed in only one session with the goal of densifying the catalogue. Hereafter in this section, we will refer to these sources as "survey" sources even though not all of them were observed in specially designed calibrator surveys such as the VLBA Calibrator Survey. The remaining sources which were observed in more than one session will be identified as "multi-session" sources.

14.1 Primary Distribution

Figure 42 shows the distribution over the sky of the 1448 sources which have been observed in at least two sessions. The color coding given in the figure's legend signifies the un-inflated 1-σ formal declination uncertainties.

14.2 Survey Distribution

Figure 43 shows the distribution over the sky of the 1966 single-session survey sources. The survey sources median un-inflated formal uncertainties are 406 and 571 μas, in $\alpha\cos(\delta)$ and δ respectively. The survey's median number of group delay observations is 41 and the median epoch of observation is 2004.4.

The rest of this section will focus on the remaining 1448 sources which were observed in at least two sessions. For these sources, we will look at the distribution of sources over the sky, the formal position errors, the number of observing sessions and group delays per source, and the distributions of mean, first and last epochs of observations as well as the total time span of observations per source. In all these ways we will characterize the ICRF2 observations.

14.3 Un-inflated formal uncertainties

Figure 44 shows the distribution of the un-inflated 1-σ formal uncertainties in Right Ascension arc-length for which the median is $\sigma_{\alpha\cos(\delta)} = 100$ μas. Figure 45 shows the distribution of the un-inflated 1-σ formal uncertainty in declination for which the median is $\sigma_\delta = 175$ μas. Both figures show $\log_{10}(\sigma)$ vs. $\log_{10}(N_{obs})$. A slope of -0.5 corresponds to the un-inflated formal uncertainties scaling as $1/\sqrt{N_{obs}}$ as one would expect from averaging white noise limited measurements. However, for small numbers of observations the observed slopes are steeper than -0.5 and become shallower as the numbers of observations increase. For sources with the largest numbers of observations the slope is nearly flat with a $\sigma \approx 10$ μas.

14.4 Number of observations

Figure 46 shows the distribution of the number of observing sessions per source for sources with a minimum of two sessions. The median number of sessions for these sources is 7. Note that over 400 sources have been observed in only a few sessions.

Figure 47 shows the distribution of the number of group delay measurements per source plotted on a log scale. The median number of delay observations per multi-session source is 156. Note the strong peak near 100 observations.

Some sources that have long been used for geodetic and earth orientation sessions have more than 10,000 observations and a few even have more than 100,000 observations. The unevenness in the distributions of both sessions and delay observations results from the ICRF2 database being built in large part from programs whose primary goals were not building a celestial frame, but rather measuring plate tectonics or earth orientation. Programs to densify the ICRF1 have been very successful as was seen in Figs. 42 and 43, but the densification programs typically are resource limited to observe each source in only a few sessions.

14.5 Observing Epochs

Figure 48 shows the distribution of the mean epoch of observation for the 1448 multi-session sources. The median mean epoch is 2001 with the vast majority of the source mean epochs being between 1994 and 2007. Figure 49 shows the distribution of the first epoch of observation for the 1448 multi-session sources. The median first epoch is 1995.5. Figure 50 shows the distribution of the last epoch of observation for the 1448 multi-session sources. The median last epoch is 2008. About half of the 1448 sources have been observed within the last few years and the vast majority of the sources have been observed since 1995—the data cutoff date for the original ICRF1.

Finally, Figure 51 shows the distribution of observing span in years for the 1448 multi-session sources. As just explained, the distribution of observations is very uneven. From this figure we note that about 250 sources have spans of about a year or less. At the other extreme, there are a few sources that were used in early geodetic and earth orientation programs that have 23–30 year spans. After the mid-1980s the Mark III observing system increased sensitivity resulting in more sources being observed. We see this reflected the increase in the distribution height for sources with spans less than 23 years.

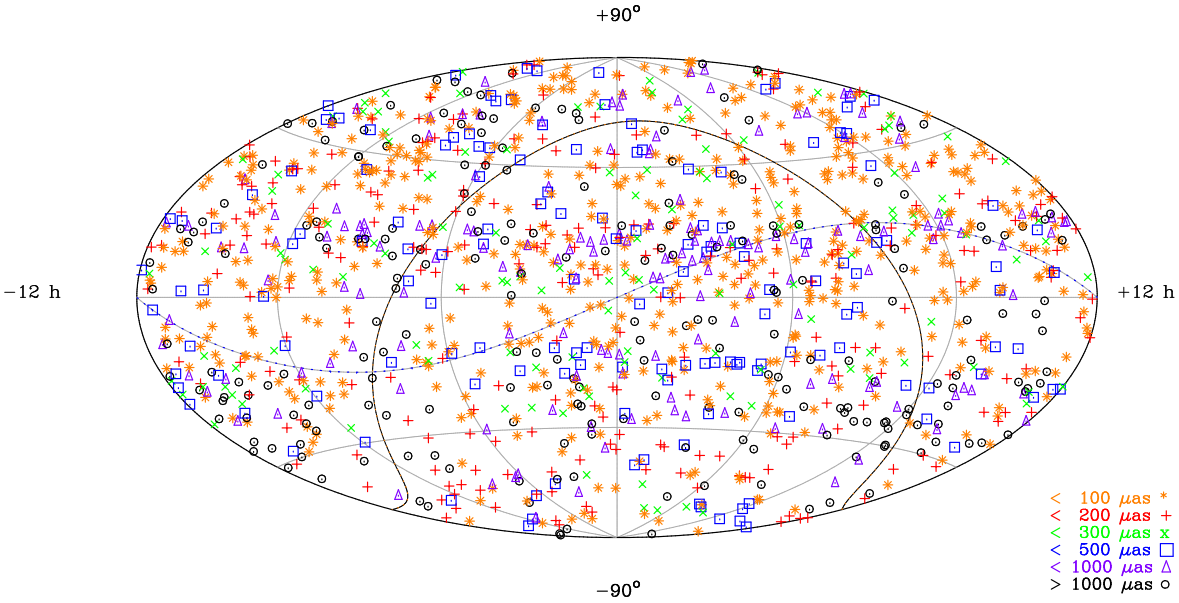

Figure 42: gsf008a distribution of 1448 multi-session sources (at least 2 observing sessions). The un-inflated 1-σ formal declination errors are color coded according to the legend in the figure. The median $\sigma_\delta = 175$ μas. The center is $(\alpha, \delta) = (0, 0)$. The Galactic plane is the roughly Ω-shaped line surrounding the center. The ecliptic plane is the dashed line. The single-session survey sources used to densify are shown in the next figure, Figure 43.

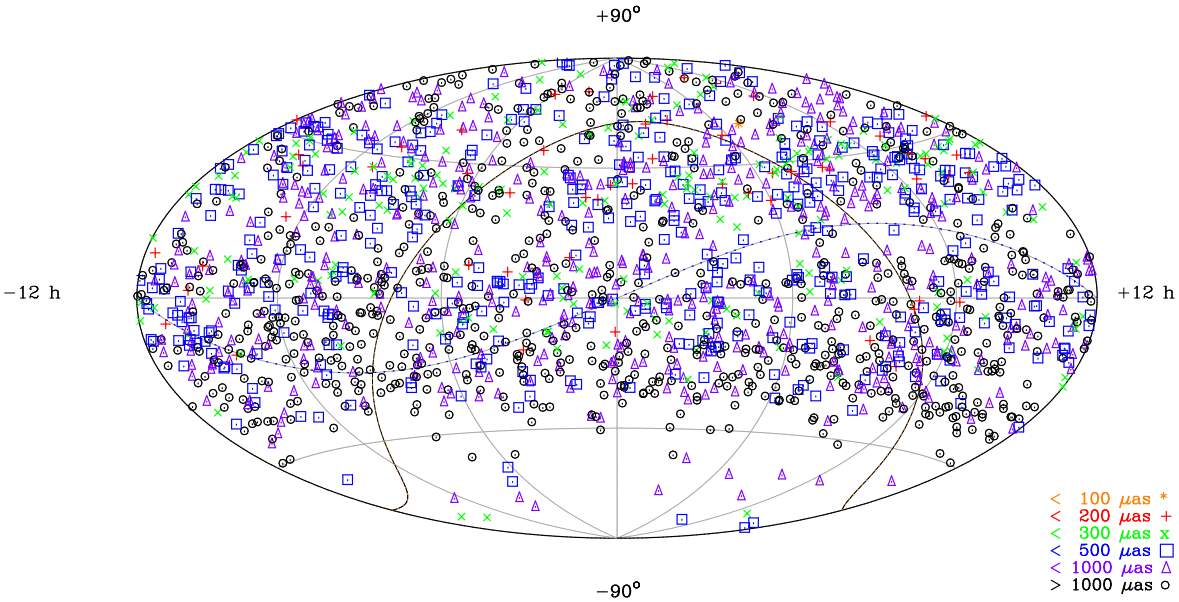

Figure 43: gsf008a survey distribution of 1966 single-session sources. The un-inflated 1-σ formal declination errors are color coded according to the legend in the figure. The median $\sigma_\delta = 751$ μas. The center is $(\alpha,\delta)=(0,0)$. The Galactic plane is the roughly Ω-shaped line surrounding the center. The ecliptic plane is the dashed line.

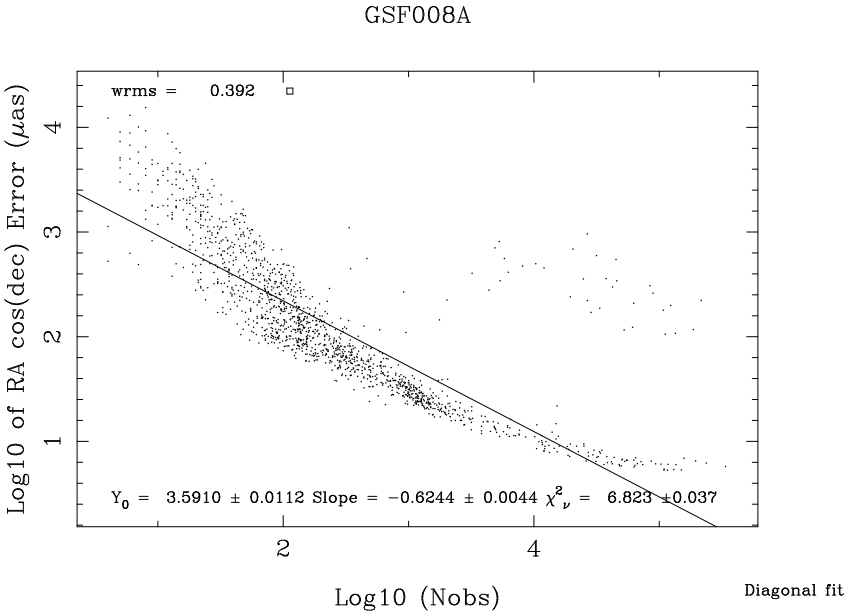

Figure 44: gsf008a catalogue's dependence of un-inflated $\sigma_{\alpha\cos(\delta)}$ on the number of observations for sources observed in at least two sessions. A slope of -0.5 would correspond to $1/\sqrt{N_{obs}}$ averaging of white noise. Calibrator survey's ≈ 2000 single-session densifying sources are not shown.

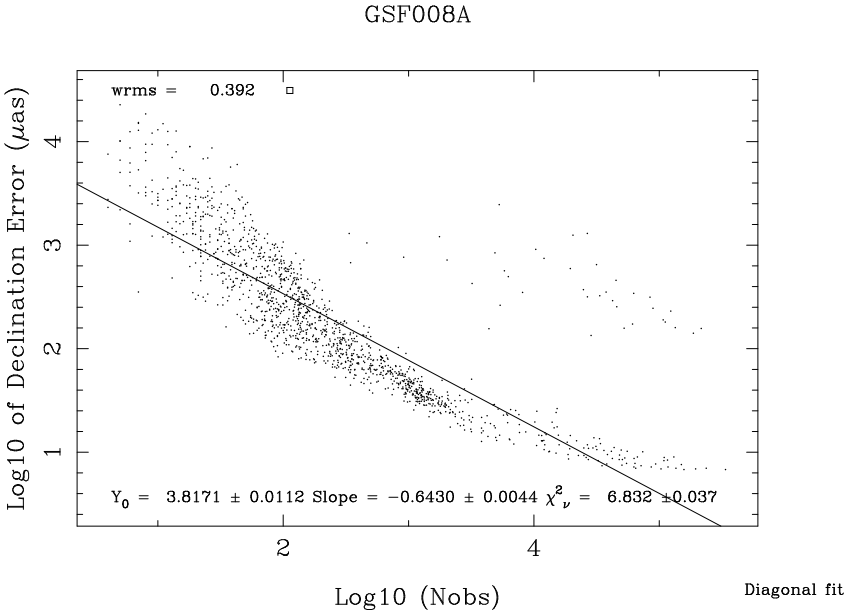

Figure 45: gsf008a catalogue's dependence of un-inflated σ_{δ} on the number of observations for sources observed in at least two sessions. A slope of -0.5 would correspond to $1/\sqrt{N_{obs}}$ averaging of white noise. Calibrator survey's ≈ 2000 single-session densifying sources are not shown.

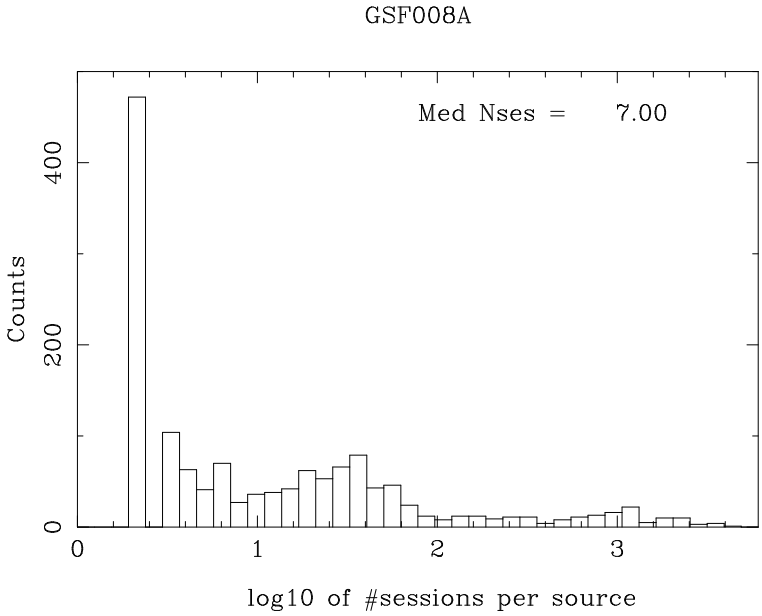

Figure 46: gsf008a catalogue's distribution of the number of observing sessions per source for sources with at least two sessions. The median number of sessions per source is 7 excluding the set of ≈ 2000 single-session densifying sources (not shown) from calibrator surveys.

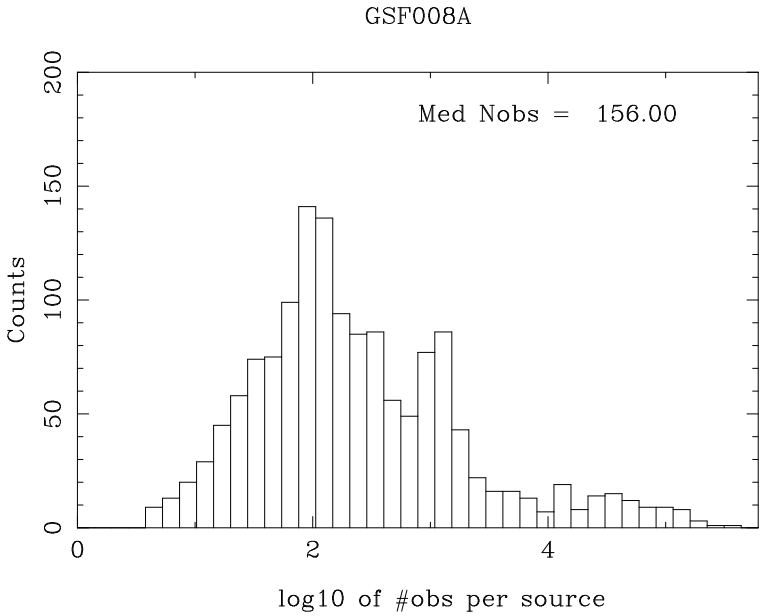

Figure 47: gsf008a catalogue's distribution of the number of group delay measurements plotted on a log scale for sources observed in at least two sessions. Note the strong peak near 100 observations. Calibrator survey's ≈ 2000 single-session densifying sources are not shown.

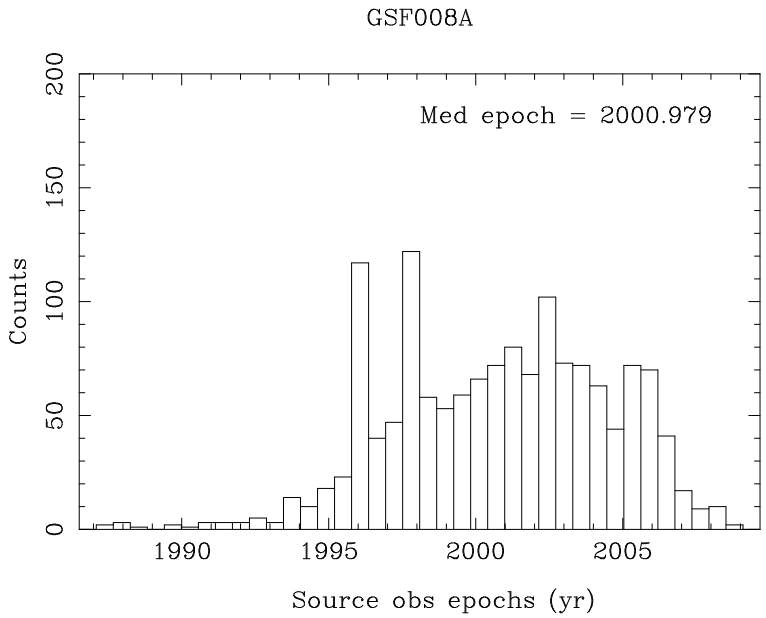

Figure 48: gsf008a catalogue's distribution of mean observing epoch for sources observed in at least two sessions. Calibrator survey's ≈ 2000 single-session densifying sources are not shown.

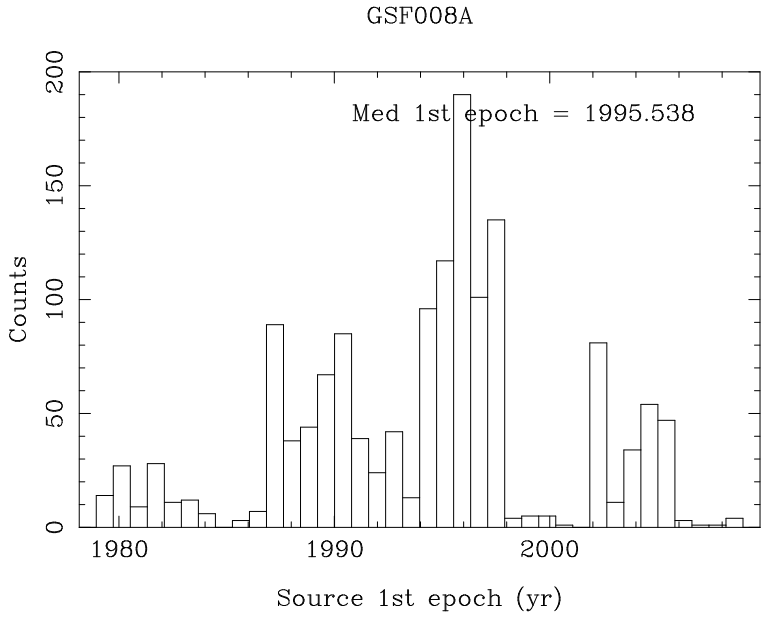

Figure 49: gsf008a catalogue's distribution of first observing epoch for sources observed in at least two sessions. Calibrator survey's ≈ 2000 single-session densifying sources are not shown.

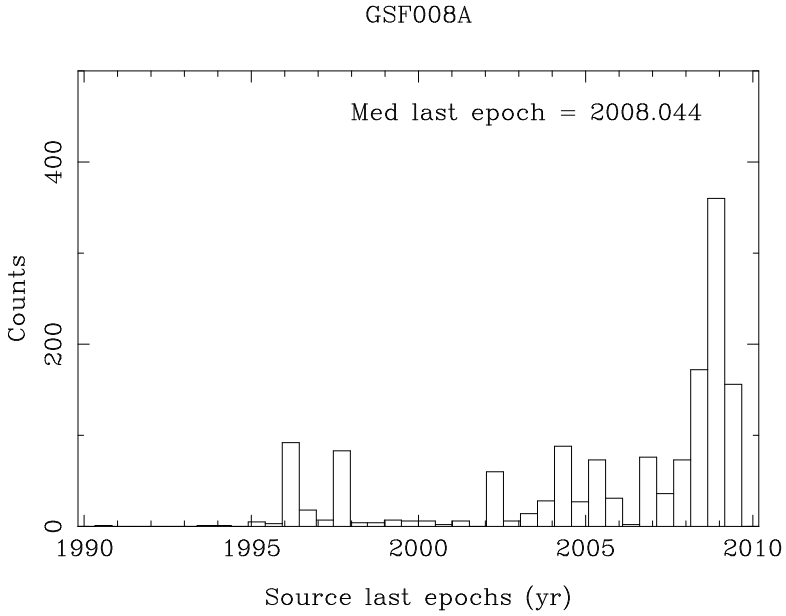

Figure 50: gsf008a catalogue's distribution of last observing epoch for sources observed in at least two sessions. Calibrator survey's ≈ 2000 single-session densifying sources are not shown.

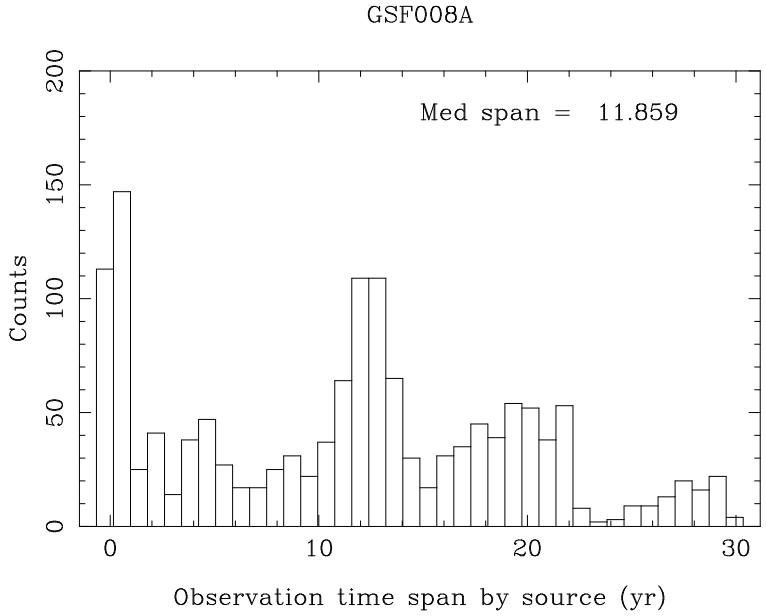

Figure 51: gsf008a catalogue's distribution of observing span for each source which was observed in at least two sessions. The observation spans are very unevenly distributed from zero to 30 years with a median of about 12 years Calibrator survey's ≈ 2000 single-session densifying sources are not shown.

15 Conclusions and Future Work (DG)

Through an international effort, we have produced a celestial reference frame of 3414 compact radio sources using nearly 30 years of VLBI observations. This new catalog has become the second realization of the International Celestial Reference Frame (ICRF2). Compared to the first ICRF, the second ICRF has more than 5 times as many sources, is roughly 5–6 times more accurate, and is nearly twice as stable.

In preparation for ICRF2, we generated and studied catalog solutions from 7 different VLBI analysis centers made with 4 different analysis software packages. A combined catalog was also constructed. Intercomparisons amongst the individual catalogs and with the combined catalog indicate agreement at the $\sim$50 μas level. Internal and external tests and comparisons were made to determine a formal error scaling factor of $\sim$1.5 and a conservative estimate of the noise floor of $\sim$40 μas.

The final ICRF2 catalog is based on a single solution, made after some final tweaking of the sessions and the solution configuration. This final solution was aligned with the first ICRF by using 138 stable sources common with ICRF1-Ext2. Some 295 sources were selected to be the ICRF2 "defining" sources, based on their positional stability and a lack of any known extensive source structure. Their stability and the fact that they are very evenly distributed over the northern and southern hemispheres eliminates the two largest weaknesses of the first ICRF. The 295 ICRF2 defining sources will be used to define the ICRF2 frame for all future maintenance or extensions of the ICRF2.

The ICRF2 catalog is extremely diverse, with over half the sources being observed in only one session. As such, it is split into two parts. The 'multi-session' sources (1448 sources) are those sources in two or more sessions; and the 'survey' sources (1966 sources) are those in only one session, mostly VLBA Calibrator Survey sources.

It is not certain whether any future extensions will be made to ICRF2, but the VLBI geodetic/astrometric programs will continue. Reference frame work will continue in several areas. The southern hemisphere CRF sessions should continue, and perhaps new antennas can be used and/or new collaborations in the southern hemisphere can be developed. Attempts should be made to re-observe many of the noisiest sources to improve their positions, particularly after an expected doubling of the recorded bit rates for some sessions are accomplished. Attempts to observe the optically brightest quasars, even though they may be weak in the radio region, should be begun, for future alignment with Gaia optical positions.

The research described in this paper was performed in part at:
Geoscience Australia, Canberra, ACT, Australia (AUS); Laboratoire d′Astrophysique de Bordeaux, University of Bordeaux, CNRS, Floirac, France; Bundesamt für Kartographie und Geodäsie, Frankfurt am Main, Germany (BKG); Goddard Space Flight Center, Greenbelt, MD, USA (GSF); Institute of Astronomy and Astrophysics of the Russian Academy of Sciences, St. Petersburg, Russia (IAA); Jet Propulsion Laboratory of the California Institute of Technology, Pasadena, CA, USA, under a contract with the National Aeronautics and Space Administration; Main Astronomical Observatory of the National Academy of Sciences of Ukraine, Kiev, Ukraine (MAO); Pulkovo Observatory, St. Petersburg, Russia; l′Observatoire de Paris, CNRS, Paris, France (OPA); and the U.S. Naval Observatory, Washington, DC, USA (USN).

A IERS/IVS Working Group

Charter:

The purpose of the working group is to generate the second realization of the ICRF from VLBI observations of extragalactic radio sources, consistent with the current realization of the ITRF and EOP data products. The working group will apply state-of-the-art astronomical and geophysical models in the analysis of the entire relevant S/X astrometric and geodetic VLBI data set. The working group will carefully consider the selection of defining sources and the mitigation of source position variations to improve the stability of the ICRF. The goal is to present the second ICRF to relevant authoritative bodies, e.g. IERS and IVS, and submit the revised ICRF to the IAU Division I working group on the second realization of the ICRF for adoption at the 2009 IAU general assembly.

Goal:

Produce ICRF2 for IERS/IVS consideration and for submission to the IAU Working Group.

Active:

2006 – 2009

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- E. F. Arias, France
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B IAU Working Group – Division I

Charter:

The purpose of the working group is to oversee the generation of the second realization of the ICRF from VLBI observations of extragalactic radio sources. The reference frame will apply state-of-the-art astronomical and geophysical models in the analysis of the entire relevant S/X astrometric and geodetic VLBI data set. The working group will ensure the selection of defining sources and the mitigation of source position variations and the consistency with the ITRF and the IERS EOP to improve the stability of the ICRF. The goal is to present the second ICRF at the 2009 IAU general assembly.

Goal:

Oversee generation, validation and utility of ICRF2; engage in formulation of resolutions of adoption by IAU.

Active:

2006 – 2009

Membership:

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Table 18: Coordinates of 295 ICRF2 Defining Sources at S/X-band

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J000435.6 − 473619	0002 − 478	00 04 35.65550384	−47 36 19.6037899	0.00001359	0.0002139	0.383	52501.0	49330.5	54670.7	28	129
ICRF J001031.0 + 105829	0007 + 106	00 10 31.00590186	10 58 29.5043827	0.00000491	0.0000930	−0.187	53063.9	47288.7	54803.7	29	559
ICRF J001101.2 − 261233	0008 − 264	00 11 01.24673846	−26 12 33.3770171	0.00000660	0.0000936	−0.183	52407.5	47686.1	54768.6	45	592
ICRF J001331.1 + 405137	0010 + 405	00 13 31.13020334	40 51 37.1441040	0.00000482	0.0000683	−0.139	51619.2	48434.7	54713.7	22	1083
ICRF J001611.0 − 001512	0013 − 005	00 16 11.08855479	−00 15 12.4453413	0.00000435	0.0001005	−0.235	50403.0	47394.1	51492.8	67	716
ICRF J001945.7 + 732730	0016 + 731	00 19 45.78641940	73 27 30.0174396	0.00000989	0.0000424	−0.050	49249.8	44343.6	54865.7	458	25038
ICRF J002232.4 + 060804	0019 + 058	00 22 32.44120914	06 08 04.2690807	0.00000439	0.0000956	−0.237	52705.8	47394.1	54880.7	42	800
ICRF J003824.8 + 413706	0035 + 413	00 38 24.84359231	41 37 06.0003032	0.00000499	0.0000613	−0.035	52262.4	49422.9	54887.7	18	1024
ICRF J005041.3 − 092905	0048 − 097	00 50 41.31738756	−09 29 05.2102688	0.00000278	0.0000428	−0.030	51323.1	44773.8	54816.7	1802	41482
ICRF J005109.5 − 422633	0048 − 427	00 51 09.50182012	−42 26 33.2932480	0.00000932	0.0001177	0.013	53857.8	52306.7	54907.7	31	315
ICRF J010245.7 + 582411	0059 + 581	01 02 45.76238248	58 24 11.1366009	0.00000523	0.0000414	0.009	52030.9	48720.9	54880.7	1864	236989
ICRF J010645.1 − 403419	0104 − 408	01 06 45.10796851	−40 34 19.9602291	0.00000376	0.0000455	0.016	52201.3	47640.2	54903.8	1175	11531
ICRF J010915.4 − 604948	0107 − 610	01 09 15.47520598	−60 49 48.4599686	0.00001744	0.0001750	0.108	53933.9	52780.7	54726.7	24	102
ICRF J011205.8 + 224438	0109 + 224	01 12 05.82471754	22 44 38.7863909	0.00000379	0.0000653	−0.007	51836.0	48434.7	54872.7	37	1851
ICRF J011327.0 + 494824	0110 + 495	01 13 27.00680344	49 48 24.0431742	0.00000597	0.0000727	−0.135	52989.4	49422.9	54781.7	20	759
ICRF J011857.2 − 214130	0116 − 219	01 18 57.26216666	−21 41 30.1399986	0.00000683	0.0001138	−0.058	52128.2	50632.3	54768.6	19	289
ICRF J012141.5 + 114950	0119 + 115	01 21 41.59504339	11 49 50.4131012	0.00000279	0.0000429	−0.018	52622.1	47394.1	54901.7	1151	36167
ICRF J013305.7 − 520003	0131 − 522	01 33 05.76255607	−52 00 03.9457209	0.00001218	0.0001605	0.251	52621.9	48162.4	54901.7	28	126
ICRF J013658.5 + 475129	0133 + 476	01 36 58.59480585	47 51 29.1000445	0.00000407	0.0000414	0.014	52890.7	44343.6	54907.7	1307	117353
ICRF J013708.7 + 312235	0134 + 311	01 37 08.73362970	31 22 35.8553611	0.00000553	0.0001012	0.044	53105.6	50219.8	54901.7	13	550
ICRF J014125.8 − 092843	0138 − 097	01 41 25.83215547	−09 28 43.6741894	0.00000455	0.0000878	−0.020	52777.3	46875.8	54768.6	34	1008
ICRF J015456.2 + 474326	0151 + 474	01 54 56.28988783	47 43 26.5395732	0.00000530	0.0000654	−0.014	53123.2	49750.8	54657.8	21	1395
ICRF J020333.3 + 723253	0159 + 723	02 03 33.38496841	72 32 53.6672938	0.00001231	0.0000546	0.052	52872.5	47011.4	54907.7	35	1482
ICRF J020504.9 + 321230	0202 + 319	02 05 04.92536007	32 12 30.0954538	0.00000367	0.0000520	−0.038	52311.3	45466.3	54852.7	62	2357
ICRF J021748.9 + 014449	0215 + 015	02 17 48.95475182	01 44 49.6990704	0.00000348	0.0000673	−0.120	51978.4	48919.9	54837.7	37	1200
ICRF J022428.4 + 065923	0221 + 067	02 24 28.42819659	06 59 23.3415393	0.00000382	0.0000683	−0.214	52153.5	47394.1	54662.7	68	1173
ICRF J022934.9 − 784745	0230 − 790	02 29 34.94659358	−78 47 45.6017972	0.00003546	0.0001073	0.032	52873.3	47626.5	54726.7	49	247
ICRF J023145.8 + 132254	0229 + 131	02 31 45.89405431	13 22 54.7162668	0.00000281	0.0000422	−0.006	49841.4	44773.8	54844.7	2537	66911
ICRF J023631.1 − 295355	0234 − 301	02 36 31.16942057	−29 53 55.5402759	0.00000978	0.0001544	−0.032	53761.6	53126.1	54741.8	16	135
ICRF J023653.2 − 613615	0235 − 618	02 36 53.24574589	−61 36 15.1834250	0.00002197	0.0001688	0.249	53734.9	52861.2	54670.7	17	106
ICRF J023752.4 + 284808	0234 + 285	02 37 52.40567732	28 48 08.9900231	0.00000313	0.0000421	−0.023	49361.6	44447.0	54664.7	1199	53070
ICRF J023945.4 − 023440	0237 − 027	02 39 45.47226775	−02 34 40.9144020	0.00000359	0.0000672	−0.090	52760.9	49253.8	54901.7	36	1437
ICRF J030335.2 + 471616	0300 + 470	03 03 35.24222254	47 16 16.2754406	0.00000417	0.0000433	−0.048	48470.0	44343.6	54844.7	757	25008
ICRF J030350.6 − 621125	0302 − 623	03 03 50.63134799	−62 11 25.5498711	0.00001499	0.0001135	0.150	51436.6	48162.4	54726.7	44	248
ICRF J030642.6 + 624302	0302 + 625	03 06 42.65954796	62 43 02.0241642	0.00000833	0.0000613	−0.047	52280.3	48614.0	54662.7	37	1334

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(Table 18: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J030903.6 + 102916	0306 + 102	03 09 03.62350016	10 29 16.3409599	0.00000415	0.0000770	−0.209	52036.1	47394.1	54768.6	76	952
ICRF J030956.0 − 605839	0308 − 611	03 09 56.09915397	−60 58 39.0561502	0.00000861	0.0000726	0.169	50431.8	47626.5	54907.7	121	1152
ICRF J031049.8 + 381453	0307 + 380	03 10 49.87992951	38 14 53.8378720	0.00000642	0.0001107	−0.044	53283.0	49939.8	54901.7	11	347
ICRF J031301.9 + 412001	0309 + 411	03 13 01.96212305	41 20 01.1835585	0.00000480	0.0000642	−0.147	52400.3	47165.8	54818.7	47	1138
ICRF J032536.8 + 222400	0322 + 222	03 25 36.81435154	22 24 00.3655873	0.00000389	0.0000695	−0.141	51716.8	50085.5	54907.7	32	1171
ICRF J033413.6 − 400825	0332 − 403	03 34 13.65451358	−40 08 25.3978415	0.00001125	0.0001211	−0.345	51855.9	47640.2	54893.7	25	212
ICRF J033553.9 − 543025	0334 − 546	03 35 53.92484162	−54 30 25.1146727	0.00001704	0.0002055	0.355	52901.7	48388.4	54706.7	31	113
ICRF J034506.4 + 145349	0342 + 147	03 45 06.41654424	14 53 49.5582021	0.00000446	0.0000837	−0.094	51563.2	47394.1	54676.7	47	894
ICRF J034838.1 − 274913	0346 − 279	03 48 38.14457723	−27 49 13.5655526	0.00000599	0.0000929	−0.157	53999.3	50688.3	54901.7	11	372
ICRF J040145.1 + 211028	0358 + 210	04 01 45.16607260	21 10 28.5870359	0.00000639	0.0001325	−0.026	52184.0	50085.5	54887.7	15	396
ICRF J040353.7 − 360501	0402 − 362	04 03 53.74989835	−36 05 01.9131085	0.00000359	0.0000487	0.161	52084.5	47415.7	54887.7	857	7648
ICRF J040534.0 − 130813	0403 − 132	04 05 34.00338957	−13 08 13.6907083	0.00000397	0.0001030	−0.146	51867.0	47176.5	54112.8	20	745
ICRF J040659.0 − 382628	0405 − 385	04 06 59.03533560	−38 26 28.0423567	0.00000423	0.0000575	−0.147	53096.5	48162.4	54882.8	286	2087
ICRF J041636.5 − 185108	0414 − 189	04 16 36.54445140	−18 51 08.3400284	0.00000471	0.0000851	−0.100	52136.7	46840.8	54803.7	39	930
ICRF J042315.8 − 012033	0420 − 014	04 23 15.80072776	−01 20 33.0654034	0.00000279	0.0000450	−0.037	48415.7	44773.8	54893.7	1290	30117
ICRF J042446.8 + 003606	0422 + 004	04 24 46.84206092	00 36 06.3293676	0.00000385	0.0000768	−0.082	52464.8	46976.8	54887.7	31	1013
ICRF J042952.9 + 272437	0426 + 273	04 29 52.96076804	27 24 37.8762939	0.00000428	0.0000790	0.059	52851.0	50219.8	54802.7	35	984
ICRF J043337.8 + 290555	0430 + 289	04 33 37.82985993	29 05 55.4770346	0.00000372	0.0000576	−0.044	51901.2	50043.8	54901.7	52	1948
ICRF J043900.8 − 452222	0437 − 454	04 39 00.85466883	−45 22 22.5628657	0.00001180	0.0001577	−0.108	52776.1	48766.9	54670.7	35	269
ICRF J044331.6 + 344106	0440 + 345	04 43 31.63520255	34 41 06.6640222	0.00000445	0.0000642	−0.049	50605.8	47718.4	51967.7	37	1454
ICRF J044907.6 + 112128	0446 + 112	04 49 07.67110088	11 21 28.5964577	0.00000341	0.0000603	−0.082	53331.6	47394.1	54845.7	41	1722
ICRF J045005.4 − 810102	0454 − 810	04 50 05.44020132	−81 01 02.2313228	0.00004163	0.0000967	0.064	51639.5	47626.5	54726.7	49	342
ICRF J045703.1 − 232452	0454 − 234	04 57 03.17922863	−23 24 52.0201418	0.00000299	0.0000428	−0.026	51444.2	46440.9	54903.8	2533	55475
ICRF J050112.8 − 015914	0458 − 020	05 01 12.80988366	−01 59 14.2562534	0.00000273	0.0000424	−0.068	51137.5	44773.8	54907.7	2150	48225
ICRF J050145.2 + 135607	0458 + 138	05 01 45.27082031	13 56 07.2204176	0.00000539	0.0001288	−0.026	52136.0	47394.1	54201.7	28	619
ICRF J050643.9 − 610940	0506 − 612	05 06 43.98872791	−61 09 40.9937940	0.00001524	0.0001190	0.113	52511.7	48110.9	54880.7	41	182
ICRF J050842.3 + 843204	0454 + 844	05 08 42.36345199	84 32 04.5440155	0.00003335	0.0000494	−0.108	52914.6	44343.6	54889.8	165	4081
ICRF J050927.4 + 101144	0506 + 101	05 09 27.45706864	10 11 44.6000396	0.00000378	0.0000826	−0.113	52566.7	47394.1	54872.7	42	1174
ICRF J051002.3 + 180041	0507 + 179	05 10 02.36912982	18 00 41.5816534	0.00000404	0.0000610	−0.075	51714.9	47605.1	54713.7	62	1182
ICRF J051644.9 − 620705	0516 − 621	05 16 44.92616793	−62 07 05.3892036	0.00001331	0.0001157	0.112	51882.1	48749.6	54726.7	37	218
ICRF J051803.8 + 205452	0515 + 208	05 18 03.82450329	20 54 52.4974899	0.00000620	0.0001535	−0.037	52114.2	50085.5	54907.7	11	428
ICRF J052234.4 − 610757	0522 − 611	05 22 34.42547880	−61 07 57.1335242	0.00002109	0.0001653	0.322	52851.2	47626.5	54706.7	20	90
ICRF J052531.4 − 455754	0524 − 460	05 25 31.40015013	−45 57 54.6848636	0.00001684	0.0001861	0.000	52412.0	49750.8	54726.7	28	161
ICRF J052616.6 − 483036	0524 − 485	05 26 16.67131064	−48 30 36.7915470	0.00001592	0.0002543	0.400	53913.6	53223.4	54726.7	11	68
ICRF J052732.7 + 033131	0524 + 034	05 27 32.70544796	03 31 31.5166429	0.00000484	0.0000871	−0.074	53092.2	49914.7	54893.7	12	441

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(Table 18: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J053315.8 + 482252	0529 + 483	05 33 15.86578266	48 22 52.8076620	0.00000506	0.0000584	−0.035	54311.3	50306.3	54852.7	13	1348
ICRF J053435.7 − 610607	0534 − 611	05 34 35.77248961	−61 06 07.0730607	0.00002193	0.0001790	0.082	53715.3	50182.6	54670.7	19	81
ICRF J053628.4 − 340111	0534 − 340	05 36 28.43237520	−34 01 11.4684150	0.00001027	0.0001610	0.218	53790.6	52306.7	54907.7	34	341
ICRF J053850.3 − 440508	0537 − 441	05 38 50.36155219	−44 05 08.9389165	0.00000392	0.0000442	0.010	52847.7	47305.8	54903.8	1085	18435
ICRF J053942.3 + 143345	0536 + 145	05 39 42.36599103	14 33 45.5616993	0.00000370	0.0000640	−0.147	51944.2	47394.1	54901.7	73	1202
ICRF J053954.2 − 283955	0537 − 286	05 39 54.28147645	−28 39 55.9478122	0.00000515	0.0000782	−0.036	52718.2	48573.8	54872.7	58	995
ICRF J054734.1 + 272156	0544 + 273	05 47 34.14892109	27 21 56.8425667	0.00000412	0.0000700	−0.101	51906.5	47394.1	54858.7	65	1421
ICRF J055009.5 − 573224	0549 − 575	05 50 09.58018296	−57 32 24.3965304	0.00001696	0.0002398	0.372	53796.1	53223.4	54670.7	10	64
ICRF J055530.8 + 394849	0552 + 398	05 55 30.80561150	39 48 49.1649664	0.00000355	0.0000413	0.001	51012.9	44090.5	54901.7	4068	337322
ICRF J055932.0 + 235353	0556 + 238	05 59 32.03313165	23 53 53.9267683	0.00000305	0.0000445	−0.020	52323.5	47394.1	54887.7	590	11999
ICRF J060309.1 + 174216	0600 + 177	06 03 09.13026176	17 42 16.8105604	0.00000479	0.0000799	−0.379	52205.7	47394.1	54664.7	46	829
ICRF J064632.0 + 445116	0642 + 449	06 46 32.02599463	44 51 16.5901237	0.00000386	0.0000413	−0.014	53168.5	45466.3	54903.8	1211	103287
ICRF J064814.0 − 304419	0646 − 306	06 48 14.09647071	−30 44 19.6596827	0.00000692	0.0000939	−0.154	52092.0	47640.2	54887.7	40	601
ICRF J065024.5 − 163739	0648 − 165	06 50 24.58185521	−16 37 39.7251917	0.00000350	0.0000578	−0.066	53236.8	46875.8	54907.7	60	1791
ICRF J065917.9 + 081330	0656 + 082	06 59 17.99603428	08 13 30.9533022	0.00000302	0.0000590	−0.377	53670.1	49914.7	54903.8	401	4840
ICRF J070001.5 + 170921	0657 + 172	07 00 01.52553646	17 09 21.7014901	0.00000308	0.0000490	−0.113	51827.5	47655.8	54907.7	183	4503
ICRF J071046.1 + 473211	0707 + 476	07 10 46.10487679	47 32 11.1427167	0.00000527	0.0000642	−0.057	51517.3	44343.6	54837.7	25	1162
ICRF J072153.4 + 712036	0716 + 714	07 21 53.44846336	71 20 36.3634253	0.00000948	0.0000470	−0.032	52163.3	44343.6	54893.7	136	2799
ICRF J072516.8 + 142513	0722 + 145	07 25 16.80776128	14 25 13.7466902	0.00000366	0.0000615	−0.102	52580.8	47394.1	54522.7	45	1266
ICRF J072611.7 + 791131	0718 + 792	07 26 11.73524096	79 11 31.0162085	0.00001488	0.0000415	0.002	52440.4	48223.7	54887.7	1251	34947
ICRF J073019.1 − 114112	0727 − 115	07 30 19.11247420	−11 41 12.6005110	0.00000278	0.0000422	−0.022	51578.1	45259.2	54903.8	3261	109457
ICRF J073918.0 + 013704	0736 + 017	07 39 18.03389693	01 37 04.6178588	0.00000337	0.0000580	−0.122	52409.0	44773.8	54845.7	63	1624
ICRF J074202.7 + 490015	0738 + 491	07 42 02.74894651	49 00 15.6089340	0.00000593	0.0000688	−0.037	53155.0	49750.8	54823.7	18	1156
ICRF J074554.0 − 004417	0743 − 006	07 45 54.08232111	−00 44 17.5398546	0.00000384	0.0000971	−0.089	51189.3	46527.7	53068.7	30	731
ICRF J074625.8 + 254902	0743 + 259	07 46 25.87417871	25 49 02.1347553	0.00000305	0.0000422	−0.054	53817.2	47407.6	54903.8	671	26091
ICRF J074836.1 + 240024	0745 + 241	07 48 36.10927469	24 00 24.1100315	0.00000349	0.0000542	−0.072	51144.2	47620.8	54810.7	159	2550
ICRF J075052.0 + 123104	0748 + 126	07 50 52.04573519	12 31 04.8281766	0.00000299	0.0000475	−0.125	52767.7	44773.8	54816.7	145	3819
ICRF J080248.0 + 180949	0759 + 183	08 02 48.03196182	18 09 49.2493958	0.00000519	0.0001104	−0.110	52214.7	50085.5	54872.7	12	494
ICRF J080518.1 + 614423	0800 + 618	08 05 18.17956846	61 44 23.7002968	0.00000740	0.0000609	−0.147	54532.8	52409.7	54887.7	10	981
ICRF J080757.5 + 043234	0805 + 046	08 07 57.53857015	04 32 34.5310021	0.00001020	0.0002069	−0.168	51371.7	49914.7	54664.7	14	174
ICRF J080839.6 + 495036	0804 + 499	08 08 39.66628353	49 50 36.5304035	0.00000426	0.0000414	−0.047	51488.4	44343.6	54893.7	1406	86324
ICRF J080856.6 + 405244	0805 + 410	08 08 56.65203923	40 52 44.8888616	0.00000366	0.0000425	−0.014	51735.0	48720.9	54901.7	575	18706
ICRF J081126.7 + 014652	0808 + 019	08 11 26.70731189	01 46 52.2202616	0.00000289	0.0000456	−0.024	52826.7	46977.9	54818.7	221	5330
ICRF J081525.9 + 363515	0812 + 367	08 15 25.94485739	36 35 15.1488917	0.00000449	0.0000725	−0.028	52354.7	45775.8	54657.8	21	973
ICRF J081815.9 + 422245	0814 + 425	08 18 15.99960470	42 22 45.4149140	0.00000486	0.0000575	−0.080	49202.0	44343.6	53051.1	149	2383

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(Table 18: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J082550.3 + 030924	0823 + 033	08 25 50.33835429	03 09 24.5200730	0.00000273	0.0000430	−0.029	51407.8	45466.3	54907.7	1365	49660
ICRF J083052.0 + 241059	0827 + 243	08 30 52.08619070	24 10 59.8204032	0.00000354	0.0000544	−0.131	51630.9	47023.7	54655.7	82	1980
ICRF J083639.2 − 201659	0834 − 201	08 36 39.21525294	−20 16 59.5040953	0.00000559	0.0001054	−0.121	52587.9	46840.8	54741.8	33	626
ICRF J085448.8 + 200630	0851 + 202	08 54 48.87492702	20 06 30.6408861	0.00000290	0.0000416	−0.039	50426.4	44342.2	54907.7	3449	149927
ICRF J085641.8 − 110514	0854 − 108	08 56 41.80414812	−11 05 14.4301901	0.00000512	0.0000778	−0.109	54477.1	53552.8	54858.7	15	344
ICRF J091437.9 + 024559	0912 + 029	09 14 37.91343166	02 45 59.2469393	0.00000329	0.0000601	−0.001	53574.1	47407.6	54865.7	30	1838
ICRF J092246.4 − 395935	0920 − 397	09 22 46.41826064	−39 59 35.0683561	0.00000431	0.0000859	−0.167	51602.8	47686.1	54907.7	227	3181
ICRF J092314.4 + 384939	0920 + 390	09 23 14.45293105	38 49 39.9101375	0.00000432	0.0000594	−0.003	52287.9	49736.9	54845.7	64	1567
ICRF J092751.8 − 203451	0925 − 203	09 27 51.82431596	−20 34 51.2324031	0.00000467	0.0000749	−0.146	52818.4	47777.3	54887.7	71	1010
ICRF J095232.0 + 351252	0949 + 354	09 52 32.02616656	35 12 52.4030592	0.00000524	0.0000893	−0.044	52576.8	50242.8	54887.7	16	483
ICRF J095819.6 + 472507	0955 + 476	09 58 19.67163931	47 25 07.8424347	0.00000404	0.0000414	−0.054	52388.7	48720.9	54907.7	2006	135716
ICRF J095820.9 + 322402	0955 + 326	09 58 20.94963113	32 24 02.2095353	0.00000390	0.0000580	−0.101	52606.9	47761.7	54657.8	29	1915
ICRF J095847.2 + 653354	0954 + 658	09 58 47.24510127	65 33 54.8180587	0.00000701	0.0000444	−0.117	49883.0	44343.6	54901.7	284	11507
ICRF J100614.0 − 501813	1004 − 500	10 06 14.00931618	−50 18 13.4706757	0.00001340	0.0001922	0.270	53837.6	49535.0	54795.7	22	105
ICRF J101447.0 + 230116	1012 + 232	10 14 47.06545658	23 01 16.5708649	0.00000413	0.0000634	−0.086	52012.0	47407.6	54712.7	34	1656
ICRF J101603.1 + 051302	1013 + 054	10 16 03.13646769	05 13 02.3414482	0.00000383	0.0000735	−0.020	54066.5	49914.7	54893.7	13	903
ICRF J101725.8 + 611627	1014 + 615	10 17 25.88757718	61 16 27.4966664	0.00000843	0.0000596	0.069	50914.9	49422.9	53153.2	22	1224
ICRF J101810.9 + 354239	1015 + 359	10 18 10.98809086	35 42 39.4408279	0.00000525	0.0001043	0.024	53327.1	50242.8	54880.7	10	493
ICRF J102343.5 − 664648	1022 − 665	10 23 43.53319996	−66 46 48.7177526	0.00002040	0.0001359	0.165	53658.5	52780.7	54670.7	27	153
ICRF J102444.8 + 191220	1022 + 194	10 24 44.80959508	19 12 20.4156249	0.00000354	0.0000619	−0.036	51418.7	47783.2	54803.7	41	2343
ICRF J103303.7 + 411606	1030 + 415	10 33 03.70786817	41 16 06.2329177	0.00000481	0.0000627	0.024	52634.8	47019.9	54818.7	29	1178
ICRF J103334.0 + 071126	1030 + 074	10 33 34.02429130	07 11 26.1477035	0.00000426	0.0000745	−0.080	52507.6	50855.8	54627.7	154	1220
ICRF J103653.4 − 374415	1034 − 374	10 36 53.43960199	−37 44 15.0656721	0.00001205	0.0001597	−0.102	53991.0	53223.4	54741.8	13	138
ICRF J103716.0 − 293402	1034 − 293	10 37 16.07973476	−29 34 02.8133345	0.00000324	0.0000444	−0.047	51514.0	46440.9	54903.8	1887	21896
ICRF J104146.7 + 523328	1038 + 528	10 41 46.78163764	52 33 28.2313168	0.00000517	0.0000524	0.029	51279.1	48524.8	54852.7	199	3040
ICRF J104423.0 + 805439	1039 + 811	10 44 23.06254789	80 54 39.4430277	0.00002013	0.0000478	−0.051	51808.6	47288.7	54788.7	53	2150
ICRF J104455.9 + 065538	1042 + 071	10 44 55.91124593	06 55 38.2626553	0.00000708	0.0001883	−0.211	51442.2	47777.3	52711.7	13	289
ICRF J104806.6 − 190935	1045 − 188	10 48 06.62060701	−19 09 35.7266240	0.00000394	0.0000869	−0.154	52670.5	47176.5	54858.7	33	1130
ICRF J105148.7 + 211952	1049 + 215	10 51 48.78907490	21 19 52.3138145	0.00000422	0.0000685	−0.088	51671.0	47931.6	54746.7	28	1229
ICRF J105811.5 + 811432	1053 + 815	10 58 11.53537962	81 14 32.6751819	0.00001836	0.0000420	0.003	52489.6	47453.0	54880.7	675	18890
ICRF J105829.6 + 013358	1055 + 018	10 58 29.60520747	01 33 58.8237691	0.00000300	0.0000526	−0.221	49266.2	44773.8	54601.7	307	6161
ICRF J110352.2 − 535700	1101 − 536	11 03 52.22167171	−53 57 00.6966293	0.00000939	0.0001166	0.232	50525.9	47626.5	54706.7	54	398
ICRF J110427.3 + 381231	1101 + 384	11 04 27.31394136	38 12 31.7990644	0.00000359	0.0000444	−0.101	51979.0	49519.8	54763.8	528	11654
ICRF J111358.6 + 144226	1111 + 149	11 13 58.69508359	14 42 26.9525965	0.00000484	0.0000982	−0.073	51713.1	47005.8	54789.7	42	779
ICRF J112553.7 + 261019	1123 + 264	11 25 53.71192285	26 10 19.9786840	0.00000360	0.0000544	−0.138	50804.2	46977.9	54907.7	165	2248

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(Table 18: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J112704.3 − 185717	1124 − 186	11 27 04.39244958	−18 57 17.4416582	0.00000292	0.0000432	0.009	52704.6	46875.8	54903.8	1087	27242
ICRF J113053.2 + 381518	1128 + 385	11 30 53.28261193	38 15 18.5469933	0.00000348	0.0000417	−0.044	51787.2	45775.8	54903.8	1227	63954
ICRF J113320.0 + 004052	1130 + 009	11 33 20.05579171	00 40 52.8372903	0.00000472	0.0000956	−0.129	51426.8	47019.9	54852.7	50	850
ICRF J113624.5 − 033029	1133 − 032	11 36 24.57693290	−03 30 29.4964694	0.00000509	0.0001256	−0.038	53907.2	50576.2	54845.7	10	474
ICRF J114553.6 − 695401	1143 − 696	11 45 53.62417065	−69 54 01.7977922	0.00002802	0.0001945	0.377	53671.0	52872.9	54706.7	14	72
ICRF J114658.2 + 395834	1144 + 402	11 46 58.29791629	39 58 34.3045026	0.00000392	0.0000483	−0.067	50262.3	45138.8	54872.7	177	4823
ICRF J114701.3 − 381211	1144 − 379	11 47 01.37070177	−38 12 11.0234199	0.00000362	0.0000456	−0.014	52592.2	47654.0	54907.7	928	10954
ICRF J114751.5 − 072441	1145 − 071	11 47 51.55402876	−07 24 41.1410887	0.00000294	0.0000529	−0.170	51567.1	47176.5	54713.7	161	7586
ICRF J115019.2 + 241753	1147 + 245	11 50 19.21217405	24 17 53.8353207	0.00000401	0.0000671	−0.100	52721.4	48720.9	54893.7	20	1262
ICRF J115217.2 − 084103	1149 − 084	11 52 17.20951537	−08 41 03.3138824	0.00000432	0.0000688	−0.021	54046.7	50576.2	54893.7	15	517
ICRF J115918.3 − 663539	1156 − 663	11 59 18.30544873	−66 35 39.4272186	0.00002870	0.0002008	0.313	53993.0	52872.9	54726.7	14	90
ICRF J115931.8 + 291443	1156 + 295	11 59 31.83390975	29 14 43.8268741	0.00000313	0.0000420	−0.038	52031.0	46977.9	54880.7	1312	47905
ICRF J121546.7 − 173145	1213 − 172	12 15 46.75176110	−17 31 45.4029502	0.00000377	0.0000745	−0.055	52572.7	46840.8	54907.7	54	1267
ICRF J121752.0 + 300700	1215 + 303	12 17 52.08196139	30 07 00.6359190	0.00000533	0.0000920	−0.089	51708.3	48434.7	54683.7	20	890
ICRF J122222.5 + 041315	1219 + 044	12 22 22.54962080	04 13 15.7761797	0.00000275	0.0000435	−0.070	51119.4	48378.8	54907.7	1241	31223
ICRF J122340.4 + 804004	1221 + 809	12 23 40.49373854	80 40 04.3404390	0.00002117	0.0000540	−0.006	51486.2	48022.7	54803.7	35	2145
ICRF J122847.4 + 370612	1226 + 373	12 28 47.42367744	37 06 12.0958631	0.00000471	0.0000705	0.003	51946.9	48378.8	54830.7	31	1147
ICRF J123924.5 + 073017	1236 + 077	12 39 24.58832517	07 30 17.1892686	0.00000389	0.0000729	−0.063	52779.9	48378.8	54601.7	28	960
ICRF J124251.3 + 375100	1240 + 381	12 42 51.36907635	37 51 00.0252447	0.00000504	0.0000664	−0.188	52701.2	49429.9	54818.7	18	1258
ICRF J124604.2 − 073046	1243 − 072	12 46 04.23210358	−07 30 46.5745473	0.00000407	0.0000811	−0.168	51744.3	47176.5	54684.7	69	1034
ICRF J124646.8 − 254749	1244 − 255	12 46 46.80203492	−25 47 49.2887900	0.00000375	0.0000587	−0.209	51956.8	46875.8	54880.7	131	1989
ICRF J125438.2 + 114105	1252 + 119	12 54 38.25561161	11 41 05.8951798	0.00000445	0.0000826	−0.094	52027.5	46977.9	54830.7	54	914
ICRF J125459.9 − 713818	1251 − 713	12 54 59.92144870	−71 38 18.4366697	0.00002216	0.0001076	0.122	50743.2	47626.5	54726.7	38	258
ICRF J130252.4 + 574837	1300 + 580	13 02 52.46527568	57 48 37.6093180	0.00000515	0.0000415	−0.005	52953.0	49422.9	54844.7	942	71553
ICRF J131059.4 + 323334	1308 + 328	13 10 59.40272936	32 33 34.4496333	0.00000376	0.0000557	−0.016	52791.2	49706.7	54865.7	55	2153
ICRF J131607.9 − 333859	1313 − 333	13 16 07.98593995	−33 38 59.1725057	0.00000370	0.0000587	−0.134	51699.5	47415.7	54657.8	334	4738
ICRF J132700.8 + 221050	1324 + 224	13 27 00.86131377	22 10 50.1629729	0.00000320	0.0000496	−0.073	53314.8	48429.0	54901.7	74	3162
ICRF J132901.1 − 560802	1325 − 558	13 29 01.14492878	−56 08 02.6657428	0.00001797	0.0002042	0.409	53671.8	52676.7	54670.7	27	126
ICRF J133739.7 − 125724	1334 − 127	13 37 39.78277768	−12 57 24.6932620	0.00000280	0.0000428	−0.018	51396.0	46840.8	54903.8	2674	73758
ICRF J134345.9 + 660225	1342 + 662	13 43 45.95957134	66 02 25.7451011	0.00000768	0.0000472	0.002	53694.5	47783.2	54887.7	31	3135
ICRF J134408.6 + 660611	1342 + 663	13 44 08.67966687	66 06 11.6438846	0.00000872	0.0000537	−0.015	51630.0	44343.6	54803.7	57	2123
ICRF J135256.5 − 441240	1349 − 439	13 52 56.53494294	−44 12 40.3875227	0.00001113	0.0001047	−0.392	52338.6	48110.9	54706.7	45	301
ICRF J135406.8 − 020603	1351 − 018	13 54 06.89532213	−02 06 03.1904447	0.00000278	0.0000479	−0.007	52358.7	48573.8	54901.7	882	15317
ICRF J135711.2 − 152728	1354 − 152	13 57 11.24497976	−15 27 28.7867232	0.00000356	0.0000600	−0.140	52510.7	46875.8	54818.7	136	1964
ICRF J135755.3 + 764321	1357 + 769	13 57 55.37153147	76 43 21.0510512	0.00001195	0.0000413	0.015	52397.9	47011.4	54903.8	1786	194975

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(Table 18: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J140856.4 − 075226	1406 − 076	14 08 56.48120036	−07 52 26.6664200	0.00000357	0.0000682	−0.147	52583.4	47176.5	54657.8	59	1385
ICRF J141946.5 + 542314	1418 + 546	14 19 46.59740212	54 23 14.7871875	0.00000474	0.0000419	−0.022	52721.5	45138.8	54907.7	697	32547
ICRF J141946.6 + 382148	1417 + 385	14 19 46.61376070	38 21 48.4750925	0.00000355	0.0000430	−0.009	53418.9	49750.8	54713.7	271	12066
ICRF J142455.5 − 680758	1420 − 679	14 24 55.55739563	−68 07 58.0945205	0.00002421	0.0002266	0.289	53830.0	52872.9	54723.8	15	76
ICRF J142549.0 + 142456	1423 + 146	14 25 49.01801632	14 24 56.9019040	0.00000659	0.0001657	−0.007	51188.2	50085.5	53690.7	15	334
ICRF J142756.2 − 420619	1424 − 418	14 27 56.29756536	−42 06 19.4375991	0.00000389	0.0000464	0.032	52594.1	47305.8	54907.7	886	8609
ICRF J143439.7 + 195200	1432 + 200	14 34 39.79335525	19 52 00.7358213	0.00000452	0.0000813	0.103	52140.7	48863.2	54907.7	29	1099
ICRF J144553.3 − 162901	1443 − 162	14 45 53.37628643	−16 29 01.6189137	0.00000690	0.0000981	−0.433	52430.8	47941.3	54741.8	35	499
ICRF J145239.6 − 650203	1448 − 648	14 52 39.67924989	−65 02 03.4333591	0.00003553	0.0002790	0.196	53586.2	52887.6	54726.7	13	53
ICRF J145432.9 − 401232	1451 − 400	14 54 32.91235921	−40 12 32.5142375	0.00000696	0.0001251	0.067	51860.3	47640.2	54732.7	54	684
ICRF J145859.3 + 041613	1456 + 044	14 58 59.35621201	04 16 13.8206019	0.00000546	0.0001029	−0.025	53225.9	49914.7	54893.7	15	426
ICRF J150048.6 + 475115	1459 + 480	15 00 48.65422191	47 51 15.5381838	0.00000554	0.0000616	0.003	51760.8	47459.8	54844.7	25	1739
ICRF J150424.9 + 102939	1502 + 106	15 04 24.97978142	10 29 39.1986151	0.00000298	0.0000496	−0.111	48555.5	44447.0	54664.7	623	13963
ICRF J150506.4 + 032630	1502 + 036	15 05 06.47715917	03 26 30.8126616	0.00000351	0.0000636	−0.099	53031.1	48853.8	54872.7	29	1503
ICRF J150609.5 + 373051	1504 + 377	15 06 09.52996778	37 30 51.1325044	0.00000466	0.0000660	−0.001	51732.7	46977.9	54614.7	32	1267
ICRF J151002.9 + 570243	1508 + 572	15 10 02.92236464	57 02 43.3759071	0.00000681	0.0000621	0.099	50741.0	49541.8	53153.2	53	1572
ICRF J151250.5 − 090559	1510 − 089	15 12 50.53292491	−09 05 59.8295878	0.00000310	0.0000560	−0.160	49643.6	44773.8	54713.7	354	5184
ICRF J151344.8 − 101200	1511 − 100	15 13 44.89341390	−10 12 00.2644930	0.00000437	0.0001068	−0.251	51598.7	46875.8	53153.2	34	718
ICRF J151656.7 + 193212	1514 + 197	15 16 56.79616342	19 32 12.9920178	0.00000391	0.0000712	−0.111	52149.3	48434.7	54858.7	33	1269
ICRF J152149.6 + 433639	1520 + 437	15 21 49.61387985	43 36 39.2681562	0.00000567	0.0000873	0.088	53679.3	50242.8	54901.7	11	367
ICRF J152237.6 − 273010	1519 − 273	15 22 37.67598872	−27 30 10.7854174	0.00000320	0.0000444	0.010	53348.7	46875.8	54887.7	659	11666
ICRF J154929.4 + 023701	1546 + 027	15 49 29.43684301	02 37 01.1634197	0.00000310	0.0000599	−0.135	53012.2	47005.8	54907.7	64	2191
ICRF J155035.2 + 052710	1548 + 056	15 50 35.26924162	05 27 10.4484262	0.00000314	0.0000557	−0.050	48158.6	44773.8	53609.2	254	6518
ICRF J155751.4 − 000150	1555 + 001	15 57 51.43397128	−00 01 50.4137075	0.00000324	0.0000624	−0.267	51279.0	44773.8	54901.7	235	2087
ICRF J155850.2 − 643229	1554 − 643	15 58 50.28436339	−64 32 29.6374071	0.00002934	0.0002738	0.200	53611.1	52861.2	54670.7	15	58
ICRF J155930.9 + 030448	1557 + 032	15 59 30.97261545	03 04 48.2568829	0.00000418	0.0000783	−0.066	51808.0	49541.8	54732.7	42	835
ICRF J160734.7 − 333108	1604 − 333	16 07 34.76234480	−33 31 08.9133114	0.00000993	0.0001104	−0.483	52916.8	48393.7	54741.8	49	506
ICRF J160846.2 + 102907	1606 + 106	16 08 46.20318554	10 29 07.7758300	0.00000277	0.0000419	0.014	51950.0	45138.8	54903.8	2259	116280
ICRF J161630.6 − 710831	1611 − 710	16 16 30.64155980	−71 08 31.4545422	0.00004268	0.0002293	0.353	53791.6	52887.6	54670.7	13	62
ICRF J161637.5 + 045932	1614 + 051	16 16 37.55681502	04 59 32.7367495	0.00000353	0.0000670	−0.181	51528.0	47605.1	54657.8	158	1619
ICRF J161914.8 + 224747	1617 + 229	16 19 14.82461057	22 47 47.8510784	0.00000540	0.0001014	−0.217	52327.2	50085.5	54901.7	11	542
ICRF J162418.4 − 680912	1619 − 680	16 24 18.43700573	−68 09 12.4965314	0.00002085	0.0001461	0.128	51926.5	47626.5	54706.7	30	167
ICRF J162546.8 − 252738	1622 − 253	16 25 46.89164010	−25 27 38.3267989	0.00000307	0.0000439	−0.017	51255.1	46840.8	54903.8	2182	33914
ICRF J162854.6 − 615236	1624 − 617	16 28 54.68982354	−61 52 36.3978862	0.00002301	0.0002064	0.231	53863.5	52861.2	54726.7	15	73
ICRF J163813.4 + 572023	1637 + 574	16 38 13.45629705	57 20 23.9790727	0.00000548	0.0000463	0.045	49616.1	44343.6	54907.7	324	7675

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(Table 18: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J164029.6 + 394646	1638 + 398	16 40 29.63277180	39 46 46.0285033	0.00000356	0.0000416	0.024	51119.1	44343.6	54852.7	1177	93554
ICRF J164125.2 + 225704	1639 + 230	16 41 25.22756501	22 57 04.0327611	0.00000376	0.0000698	−0.133	53216.0	50085.5	54907.7	31	1283
ICRF J164207.8 + 685639	1642 + 690	16 42 07.84850549	68 56 39.7564973	0.00000785	0.0000428	0.017	51281.4	44090.5	54614.7	194	13165
ICRF J164257.3 − 810835	1633 − 810	16 42 57.34565318	−81 08 35.0701687	0.00009167	0.0002633	0.274	53711.6	52861.2	54670.7	15	50
ICRF J170053.1 − 261051	1657 − 261	17 00 53.15406129	−26 10 51.7253457	0.00000377	0.0000665	−0.205	52210.7	46875.8	54887.7	99	2558
ICRF J170144.8 − 562155	1657 − 562	17 01 44.85811384	−56 21 55.9019532	0.00001398	0.0001933	0.313	53753.0	52676.7	54723.8	29	142
ICRF J170336.5 − 621240	1659 − 621	17 03 36.54124564	−62 12 40.0081704	0.00001844	0.0001686	0.408	53741.4	52780.7	54726.7	22	111
ICRF J170734.4 + 014845	1705 + 018	17 07 34.41527100	01 48 45.6992837	0.00000342	0.0000736	−0.138	51738.7	48194.7	54858.7	65	1498
ICRF J170934.3 − 172853	1706 − 174	17 09 34.34539327	−17 28 53.3649724	0.00000453	0.0000943	−0.337	52211.4	48093.0	54741.8	149	900
ICRF J171913.0 + 174506	1717 + 178	17 19 13.04848160	17 45 06.4373011	0.00000372	0.0000702	0.009	52556.6	47011.4	54830.7	29	1476
ICRF J172727.6 + 453039	1726 + 455	17 27 27.65080470	45 30 39.7313444	0.00000392	0.0000417	0.034	51622.9	48720.9	54798.5	1342	54791
ICRF J173302.7 − 130449	1730 − 130	17 33 02.70578476	−13 04 49.5481484	0.00000313	0.0000540	−0.112	47785.2	45259.2	53609.2	635	15034
ICRF J173340.7 − 793555	1725 − 795	17 33 40.70027819	−79 35 55.7166934	0.00005617	0.0001818	0.213	53897.2	52887.6	54723.8	14	80
ICRF J173420.5 + 385751	1732 + 389	17 34 20.57853662	38 57 51.4430746	0.00000447	0.0000596	−0.049	51811.4	46977.9	54858.7	62	1455
ICRF J173927.3 + 495503	1738 + 499	17 39 27.39049252	49 55 03.3684410	0.00000608	0.0000725	0.013	52608.9	49422.9	54901.7	18	986
ICRF J173957.1 + 473758	1738 + 476	17 39 57.12907360	47 37 58.3615566	0.00000538	0.0000643	0.071	51602.7	47288.7	54713.7	29	1261
ICRF J174358.8 − 035004	1741 − 038	17 43 58.85613396	−03 50 04.6166450	0.00000273	0.0000422	0.021	51323.2	44773.8	54903.8	3318	130762
ICRF J174535.2 + 172001	1743 + 173	17 45 35.20817083	17 20 01.4236878	0.00000393	0.0000762	−0.162	51587.7	46977.9	54657.8	52	1059
ICRF J174614.0 + 622654	1745 + 624	17 46 14.03413721	62 26 54.7383903	0.00000601	0.0000420	0.066	51974.3	48916.8	54893.7	925	27177
ICRF J175132.8 + 093900	1749 + 096	17 51 32.81857318	09 39 00.7284829	0.00000276	0.0000419	0.031	51989.2	44447.0	54907.7	2635	108967
ICRF J175342.4 + 284804	1751 + 288	17 53 42.47364429	28 48 04.9388841	0.00000361	0.0000544	−0.091	52901.8	47005.8	54901.7	44	1608
ICRF J175653.1 + 153520	1754 + 155	17 56 53.10213624	15 35 20.8265328	0.00000522	0.0001064	0.132	53639.4	52306.7	54893.7	11	491
ICRF J180024.7 + 384830	1758 + 388	18 00 24.76536125	38 48 30.6975330	0.00000414	0.0000540	−0.037	52081.0	49429.9	54907.7	42	1570
ICRF J180045.6 + 782804	1803 + 784	18 00 45.68391641	78 28 04.0184502	0.00001378	0.0000413	0.023	50587.1	44343.6	54907.7	2295	157326
ICRF J180132.3 + 440421	1800 + 440	18 01 32.31482108	44 04 21.9003219	0.00000421	0.0000505	0.050	53394.6	48194.7	54845.7	39	2759
ICRF J180323.4 − 650736	1758 − 651	18 03 23.49666700	−65 07 36.7612094	0.00001681	0.0001262	0.198	52673.9	48043.8	54706.7	30	175
ICRF J180957.8 − 455241	1806 − 458	18 09 57.87175020	−45 52 41.0139197	0.00001886	0.0001793	−0.382	53146.2	49629.6	54726.7	37	182
ICRF J181945.3 − 552120	1815 − 553	18 19 45.39951849	−55 21 20.7453785	0.00000818	0.0000552	0.025	51665.2	47626.5	54903.8	334	1726
ICRF J182332.8 + 685752	1823 + 689	18 23 32.85390304	68 57 52.6125919	0.00001275	0.0000816	0.009	53891.4	49827.5	54901.7	10	419
ICRF J182407.0 + 565101	1823 + 568	18 24 07.06837771	56 51 01.4908371	0.00000529	0.0000448	0.034	51440.8	44343.6	54887.7	205	6364
ICRF J182912.4 − 581355	1824 − 582	18 29 12.40237320	−58 13 55.1616899	0.00002140	0.0002150	0.403	54023.5	53223.4	54726.7	10	58
ICRF J183728.7 − 710843	1831 − 711	18 37 28.71493799	−71 08 43.5545891	0.00002405	0.0001336	0.012	49334.4	47626.5	52971.6	23	229
ICRF J184233.6 + 680925	1842 + 681	18 42 33.64168915	68 09 25.2277840	0.00000865	0.0000490	−0.099	51888.8	44343.6	54830.7	26	2463
ICRF J184822.0 + 321902	1846 + 322	18 48 22.08858135	32 19 02.6037429	0.00000451	0.0000830	−0.018	53653.9	50219.8	54865.7	10	573
ICRF J184916.0 + 670541	1849 + 670	18 49 16.07228978	67 05 41.6802978	0.00000753	0.0000445	0.029	52094.0	48649.8	54713.7	148	5045

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(Table 18: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J191109.6 − 200655	1908 − 201	19 11 09.65289198	−20 06 55.1089891	0.00000298	0.0000476	−0.081	52233.4	46840.8	54865.7	852	14482
ICRF J192332.1 − 210433	1920 − 211	19 23 32.18981466	−21 04 33.3330547	0.00000424	0.0000794	−0.384	51790.5	47407.6	54858.7	93	999
ICRF J192451.0 − 291430	1921 − 293	19 24 51.05595514	−29 14 30.1210524	0.00000319	0.0000448	0.006	50176.4	45259.2	54903.8	1744	33365
ICRF J193006.1 − 605609	1925 − 610	19 30 06.16009446	−60 56 09.1841517	0.00002042	0.0002039	0.159	52356.8	47626.5	54706.7	26	120
ICRF J193124.9 + 224331	1929 + 226	19 31 24.91678444	22 43 31.2586209	0.00000381	0.0000665	−0.040	52878.8	48614.0	54907.7	36	2062
ICRF J193716.2 − 395801	1933 − 400	19 37 16.21735166	−39 58 01.5529907	0.00000832	0.0001018	−0.356	51868.7	47640.2	54810.7	53	371
ICRF J193926.6 − 152543	1936 − 155	19 39 26.65774750	−15 25 43.0584183	0.00000343	0.0000646	−0.171	52436.9	47176.5	54901.7	86	1763
ICRF J194025.5 − 690756	1935 − 692	19 40 25.52820104	−69 07 56.9714945	0.00002282	0.0001647	0.148	52017.0	47626.5	54726.7	31	128
ICRF J195542.7 + 513148	1954 + 513	19 55 42.73826837	51 31 48.5461210	0.00000538	0.0000539	−0.117	51522.9	45775.8	54818.7	58	2260
ICRF J195759.8 − 384506	1954 − 388	19 57 59.81927470	−38 45 06.3557585	0.00000365	0.0000457	−0.074	52549.4	48766.9	54907.7	849	12512
ICRF J200057.0 − 174857	1958 − 179	20 00 57.09044485	−17 48 57.6725440	0.00000291	0.0000433	0.011	51879.7	46875.8	54903.8	1320	29536
ICRF J200210.4 + 472528	2000 + 472	20 02 10.41825568	47 25 28.7737223	0.00000479	0.0000519	0.006	54513.2	50306.3	54880.7	16	1457
ICRF J200555.0 − 372341	2002 − 375	20 05 55.07090025	−37 23 41.4778536	0.00001226	0.0002700	0.185	53301.1	52306.7	54684.7	14	107
ICRF J201115.7 − 154640	2008 − 159	20 11 15.71093257	−15 46 40.2536652	0.00000349	0.0000676	−0.146	51615.5	46840.8	54907.7	116	1447
ICRF J203154.9 + 121941	2029 + 121	20 31 54.99427114	12 19 41.3403129	0.00000349	0.0000596	0.016	52328.2	47019.9	54788.7	46	1719
ICRF J205616.3 − 471447	2052 − 474	20 56 16.35981874	−47 14 47.6276461	0.00000463	0.0000516	−0.204	53381.0	48162.4	54903.8	285	3243
ICRF J210138.8 + 034131	2059 + 034	21 01 38.83416420	03 41 31.3209577	0.00000357	0.0000696	−0.036	52596.7	48434.7	54907.7	57	1569
ICRF J210841.0 + 143027	2106 + 143	21 08 41.03215158	14 30 27.0123177	0.00000467	0.0001236	−0.076	51110.8	50085.5	53355.7	12	605
ICRF J210933.1 − 411020	2106 − 413	21 09 33.18859195	−41 10 20.6053191	0.00000750	0.0001219	0.027	52594.7	47626.5	54880.7	55	520
ICRF J211529.4 + 293338	2113 + 293	21 15 29.41345556	29 33 38.3669657	0.00000317	0.0000432	0.011	53066.6	46977.9	54907.7	527	19303
ICRF J212630.7 − 460547	2123 − 463	21 26 30.70426484	−46 05 47.8920231	0.00001556	0.0003044	0.328	53732.0	53223.4	54706.7	13	46
ICRF J212912.1 − 153841	2126 − 158	21 29 12.17589777	−15 38 41.0413097	0.00000302	0.0000532	−0.015	53235.2	47176.5	54903.8	720	6058
ICRF J213410.3 − 015317	2131 − 021	21 34 10.30959643	−01 53 17.2387909	0.00000366	0.0000719	−0.230	51782.1	47176.5	54768.6	92	1317
ICRF J213901.3 + 142335	2136 + 141	21 39 01.30926937	14 23 35.9922096	0.00000282	0.0000421	−0.010	53139.2	45466.3	54837.7	947	42224
ICRF J214712.7 − 753613	2142 − 758	21 47 12.73062415	−75 36 13.2248179	0.00004159	0.0001621	0.175	52936.3	47626.5	54670.7	19	84
ICRF J215224.8 + 173437	2150 + 173	21 52 24.81939953	17 34 37.7950583	0.00000368	0.0000638	−0.098	52151.9	47005.8	54648.7	45	1763
ICRF J220743.7 − 534633	2204 − 540	22 07 43.73330411	−53 46 33.8197226	0.00001054	0.0001418	0.231	52590.7	48110.9	54726.7	43	235
ICRF J221205.9 + 235540	2209 + 236	22 12 05.96631138	23 55 40.5438272	0.00000304	0.0000428	0.011	53642.5	48194.7	54788.7	227	13321
ICRF J222305.9 − 345547	2220 − 351	22 23 05.93057815	−34 55 47.1774281	0.00001175	0.0003101	0.226	53774.6	53223.4	54741.8	20	128
ICRF J222547.2 − 045701	2223 − 052	22 25 47.25929302	−04 57 01.3907581	0.00000275	0.0000425	−0.009	53301.4	44773.8	54844.7	947	38566
ICRF J222940.0 − 083254	2227 − 088	22 29 40.08434003	−08 32 54.4353948	0.00000359	0.0000661	−0.181	51961.7	45466.3	54852.7	86	1127
ICRF J223036.4 + 694628	2229 + 695	22 30 36.46970494	69 46 28.0768954	0.00000853	0.0000443	0.010	54249.0	47459.8	54907.7	48	3820
ICRF J223513.2 − 483558	2232 − 488	22 35 13.23657712	−48 35 58.7945006	0.00000978	0.0001159	−0.018	52833.6	48162.4	54670.7	51	389
ICRF J223912.0 − 570100	2236 − 572	22 39 12.07592367	−57 01 00.8393966	0.00001773	0.0002127	0.312	53973.7	53223.4	54670.7	10	54
ICRF J224703.9 − 365746	2244 − 372	22 47 03.91732284	−36 57 46.3039624	0.00001209	0.0001214	−0.324	53586.9	52676.7	54741.8	24	254

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(Table 18: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J224838.6 − 323552	2245 − 328	22 48 38.68573771	−32 35 52.1879540	0.00001173	0.0001555	−0.641	50937.3	47394.1	53126.1	36	286
ICRF J225307.3 + 194234	2250 + 190	22 53 07.36917339	19 42 34.6287472	0.00000348	0.0000624	−0.079	52833.3	50085.5	54845.7	42	2828
ICRF J225717.3 + 074312	2254 + 074	22 57 17.30312249	07 43 12.3024770	0.00000391	0.0000828	−0.001	52174.3	47011.4	54601.7	52	1007
ICRF J225805.9 − 275821	2255 − 282	22 58 05.96288481	−27 58 21.2567425	0.00000320	0.0000455	0.175	50766.7	46875.8	54907.7	1559	19519
ICRF J230343.5 − 680737	2300 − 683	23 03 43.56462053	−68 07 37.4429706	0.00002212	0.0001313	0.071	53693.5	49650.8	54706.7	19	91
ICRF J232044.8 + 051349	2318 + 049	23 20 44.85659790	05 13 49.9525567	0.00000281	0.0000437	−0.082	53208.0	47019.9	54889.8	807	12205
ICRF J232917.7 − 473019	2326 − 477	23 29 17.70435026	−47 30 19.1148404	0.00000929	0.0001188	0.117	51685.6	47305.8	54726.7	64	346
ICRF J233633.9 − 411521	2333 − 415	23 36 33.98509655	−41 15 21.9839279	0.00001435	0.0002856	−0.017	53888.7	53223.4	54726.7	15	61
ICRF J234719.8 − 511036	2344 − 514	23 47 19.86409462	−51 10 36.0654829	0.00001458	0.0002418	0.368	54063.7	53223.4	54723.8	14	85
ICRF J235430.1 − 151311	2351 − 154	23 54 30.19518762	−15 13 11.2130207	0.00000576	0.0001319	−0.484	50462.3	47394.1	51282.8	39	451
ICRF J235600.6 − 682003	2353 − 686	23 56 00.68140587	−68 20 03.4717084	0.00001928	0.0001166	0.044	52861.1	48162.4	54723.8	33	178
ICRF J235753.2 − 531113	2355 − 534	23 57 53.26608808	−53 11 13.6893562	0.00001476	0.0001888	0.270	51084.2	47626.5	54706.7	40	181
ICRF J235810.8 − 102008	2355 − 106	23 58 10.88240761	−10 20 08.6113211	0.00000326	0.0000545	−0.155	52378.0	47394.1	54893.7	196	2707
ICRF J235933.1 + 385042	2356 + 385	23 59 33.18079739	38 50 42.3182943	0.00000359	0.0000436	−0.048	53220.2	49519.8	54907.7	813	10501
ICRF J235935.4 − 313343	2357 − 318	23 59 35.49154293	−31 33 43.8242510	0.00000861	0.0002660	0.051	53392.9	52409.7	54872.7	9	257

[a] ICRF Designations, constructed from the source coordinates
with the format ICRF JHHMMSS.s+DDMMSS or ICRF JHHMMSS.s-DDMMSS;
they follow the recommendations of the IAU Task Group on Designations.
[b] IERS Designations, previously constructed from B1950
coordinates; the complete format, including acronym and epoch in addition
to the coordinates, is IERS BHHMM+DDd or IERS BHHMM-DDd.

Table 19: Coordinates of 922 ICRF2 Non-Defining Sources at S/X-band

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J000108.6 + 191433	2358 + 189	00 01 08.62156690	19 14 33.8017390	0.00000490	0.0000984	0.080	53306.0	50085.5	54907.7	21	716
ICRF J000211.9 − 215309	2359 − 221	00 02 11.98262436	−21 53 09.8359742	0.00115400	0.0386714	0.971	54818.7	54818.7	54818.7	1	3
ICRF J000435.7 + 201942	0002 + 200	00 04 35.75829931	20 19 42.3174919	0.00001434	0.0002426	0.079	52600.4	52409.7	52983.7	3	102
ICRF J000557.1 + 382015	0003 + 380	00 05 57.17539168	38 20 15.1489409	0.00000488	0.0000621	−0.083	52010.2	48720.9	54718.7	26	1518
ICRF J000613.8 − 062335	0003 − 066	00 06 13.89288849	−06 23 35.3353162	0.00000277	0.0000437	−0.035	52342.2	47176.5	54889.8	1254	26713
ICRF J000800.3 − 233918	0005 − 239	00 08 00.36965673	−23 39 18.1511374	0.00002400	0.0007055	−0.650	50918.1	50632.3	54643.7	3	95
ICRF J001033.9 + 172418	0007 + 171	00 10 33.99063132	17 24 18.7613217	0.00000486	0.0000824	−0.098	51780.9	47931.6	54844.7	40	1242
ICRF J001052.5 − 415310	0008 − 421	00 10 52.51790008	−41 53 10.7781702	0.00019412	0.0043581	−0.068	50998.2	48162.4	52409.7	5	22
ICRF J001135.2 + 082355	0009 + 081	00 11 35.26963063	08 23 55.5862723	0.00001305	0.0004120	−0.455	52574.8	49914.7	53609.2	2	100
ICRF J001708.4 + 813508	0014 + 813	00 17 08.47492105	81 35 08.1365288	0.00008598	0.0002624		50567.9	47023.3	54112.5	1185	61191
ICRF J001937.8 + 202145	0017 + 200	00 19 37.85450158	20 21 45.6446718	0.00000655	0.0001138	−0.040	51210.3	50085.5	53609.2	5	356
ICRF J002427.3 + 243926	0021 + 243	00 24 27.33054544	24 39 26.2295755	0.00001415	0.0002517	−0.039	52670.8	52409.7	53307.8	11	115
ICRF J002442.9 − 420203	0022 − 423	00 24 42.98977943	−42 02 03.9479276	0.00006971	0.0013214	−0.582	51518.2	48162.4	53131.8	8	37
ICRF J002715.3 + 224158	0024 + 224	00 27 15.37153913	22 41 58.0688698	0.00004355	0.0006729	−0.137	50621.1	50085.5	54664.7	3	120
ICRF J002829.8 + 200026	0025 + 197	00 28 29.81848608	20 00 26.7443060	0.00001399	0.0003630	−0.143	50454.5	50085.5	54837.7	5	209
ICRF J002914.2 + 345632	0026 + 346	00 29 14.24246572	34 56 32.2471186	0.00003535	0.0004340	0.457	49505.8	47011.4	51386.3	14	234
ICRF J002945.8 + 055440	0027 + 056	00 29 45.89631066	05 54 40.7124201	0.00001584	0.0003807	−0.175	50645.2	49914.7	54643.7	2	123
ICRF J003525.3 + 613030	0032 + 612	00 35 25.31063011	61 30 30.7613057	0.00006099	0.0004981	0.307	53460.9	52620.7	53552.8	2	71
ICRF J003758.2 + 240711	0035 + 238	00 37 58.29982404	24 07 11.8699687	0.00016333	0.0046830	−0.479	54292.7	54292.7	54292.7	1	12
ICRF J003814.7 − 245902	0035 − 252	00 38 14.73550693	−24 59 02.2351862	0.00000815	0.0001397	−0.095	52498.1	50632.3	54907.7	7	301
ICRF J003820.5 − 020740	0035 − 024	00 38 20.52934827	−02 07 40.5476126	0.00001584	0.0004962	−0.410	54125.8	54125.8	54125.8	1	82
ICRF J003939.6 + 141157	0037 + 139	00 39 39.61959335	14 11 57.5567419	0.00001465	0.0003107	−0.249	50925.2	50085.5	53193.7	6	195
ICRF J004007.8 − 590352	0037 − 593	00 40 07.84908888	−59 03 52.7640423	0.00006916	0.0007714	0.327	53594.7	52887.6	54457.4	5	30
ICRF J004204.5 + 232001	0039 + 230	00 42 04.54517179	23 20 01.0620234	0.00000425	0.0000798	−0.119	52211.0	48919.9	54795.7	21	1079
ICRF J004219.4 + 570836	0039 + 568	00 42 19.45169063	57 08 36.5860772	0.00002746	0.0002988	0.207	51249.7	49577.0	54664.7	2	146
ICRF J004847.1 + 315725	0046 + 316	00 48 47.14148006	31 57 25.0848725	0.00000468	0.0000875	−0.137	53102.3	50219.8	54739.7	23	813
ICRF J004943.2 + 023703	0047 + 023	00 49 43.23594851	02 37 03.7783255	0.00001326	0.0003898	−0.169	51750.4	49914.7	54872.7	5	185
ICRF J004959.4 − 573827	0047 − 579	00 49 59.47306878	−57 38 27.3399688	0.00001384	0.0001470	0.245	52043.3	47626.5	54706.7	39	189
ICRF J005655.2 + 162513	0054 + 161	00 56 55.29432846	16 25 13.3409281	0.00000984	0.0001923	0.212	53385.7	50156.3	54852.7	6	130
ICRF J005748.8 + 302108	0055 + 300	00 57 48.88334932	30 21 08.8119505	0.00000590	0.0000921	−0.356	51950.0	50219.8	53178.7	22	869
ICRF J005805.0 − 053952	0055 − 059	00 58 05.06630952	−05 39 52.2778596	0.00000507	0.0001022	−0.066	53919.4	50576.2	54852.7	7	346
ICRF J005846.5 − 565911	0056 − 572	00 58 46.58117584	−56 59 11.4706965	0.00003993	0.0005795	0.358	50239.8	47626.5	52941.7	8	36
ICRF J005905.5 + 000651	0056 − 001	00 59 05.51492827	00 06 51.6209985	0.00000812	0.0002161	−0.193	50627.4	47875.8	53068.7	15	363
ICRF J010009.3 − 333731	0057 − 338	01 00 09.39094184	−33 37 31.9360512	0.00008300	0.0036751	−0.236	54381.5	52306.7	54440.7	2	36
ICRF J010529.5 + 512546	0102 + 511	01 05 29.55851181	51 25 46.5809142	0.00027629	0.0015295	−0.515	52811.6	50306.3	54314.7	2	24

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J010626.0 − 271811	0104 − 275	01 06 26.08205896	−27 18 11.8248061	0.00001174	0.0004112	−0.087	50845.3	50688.3	54664.7	2	76
ICRF J010633.3 + 130002	0103 + 127	01 06 33.35654134	13 00 02.6038991	0.00002572	0.0008471	−0.633	54037.5	50156.3	54314.7	2	75
ICRF J010838.7 + 013500	0106 + 013	01 08 38.77110945	01 35 00.3173261	0.00003602	0.0005294		49677.4	44446.9	54907.9	1594	37672
ICRF J011137.3 + 390628	0108 + 388	01 11 37.31677543	39 06 28.1038332	0.00000705	0.0001018	0.064	50865.7	49099.7	53129.7	9	497
ICRF J011218.9 − 663445	0110 − 668	01 12 18.91294900	−66 34 45.1876545	0.00003397	0.0003235	0.438	54065.1	53223.4	54706.7	14	43
ICRF J011343.1 + 022217	0111 + 021	01 13 43.14494950	02 22 17.3163553	0.00000342	0.0000629	−0.332	51625.1	47023.7	54865.7	249	3195
ICRF J011354.5 + 132452	0111 + 131	01 13 54.51036043	13 24 52.4779374	0.00005124	0.0008155	−0.072	53936.7	50156.3	54314.7	2	33
ICRF J011457.3 − 241944	0112 − 245	01 14 57.32646442	−24 19 44.6782839	0.00004598	0.0014560	0.307	54818.7	54818.7	54818.7	1	36
ICRF J011517.0 − 012704	0112 − 017	01 15 17.09995842	−01 27 04.5771667	0.00000494	0.0001110	−0.491	50213.9	47278.8	52340.7	63	517
ICRF J011523.8 − 280455	0113 − 283	01 15 23.88362096	−28 04 55.2236573	0.00002148	0.0005635	−0.174	51274.3	50688.3	54643.7	2	81
ICRF J011612.5 − 113615	0113 − 118	01 16 12.52201569	−11 36 15.4343096	0.00000502	0.0001355	−0.364	50957.6	47176.5	53503.7	36	496
ICRF J011748.7 − 211106	0115 − 214	01 17 48.78012894	−21 11 06.6330095	0.00000644	0.0001296	−0.089	52829.6	50632.3	54901.7	12	397
ICRF J011935.0 + 321050	0116 + 319	01 19 35.00346907	32 10 50.0583319	0.00029808	0.0035012	−0.380	51365.0	48787.9	54440.7	6	25
ICRF J012031.6 − 270124	0118 − 272	01 20 31.66336979	−27 01 24.6525053	0.00000964	0.0001831	−0.268	52167.6	49650.8	54684.7	30	360
ICRF J012156.8 + 042224	0119 + 041	01 21 56.86169956	04 22 24.7343340	0.00000277	0.0000433	−0.037	49896.8	46977.9	54844.7	1706	43604
ICRF J012238.8 + 250231	0119 + 247	01 22 38.81598841	25 02 31.7928347	0.00001013	0.0002578	−0.050	50657.4	50219.8	53306.8	3	94
ICRF J012425.8 + 561851	0121 + 560	01 24 25.82700660	56 18 51.9175106	0.00008694	0.0010764	0.317	50277.8	49577.0	54482.7	2	49
ICRF J012457.3 − 511316	0122 − 514	01 24 57.39146872	−51 13 16.1674400	0.00001930	0.0002844	0.425	54103.7	53382.7	54726.7	9	48
ICRF J012528.8 − 000555	0122 − 003	01 25 28.84381760	−00 05 55.9317692	0.00000924	0.0002871	−0.257	50913.2	50576.2	53609.2	2	81
ICRF J012633.8 − 151834	0124 − 155	01 26 33.89073340	−15 18 34.1168187	0.00001846	0.0005962	0.004	54657.8	54657.8	54657.8	1	59
ICRF J012642.7 + 255901	0123 + 257	01 26 42.79264015	25 59 01.3001582	0.00000406	0.0000772	−0.076	52132.0	48378.8	54643.7	24	1264
ICRF J012830.5 + 630629	0125 + 628	01 28 30.56509504	63 06 29.8824504	0.00008614	0.0003934	−0.242	53978.7	53978.7	53978.7	1	81
ICRF J013027.6 + 084246	0127 + 084	01 30 27.63444929	08 42 46.1722245	0.00001807	0.0006003	−0.300	50203.2	49914.7	51927.8	5	97
ICRF J013243.4 − 165448	0130 − 171	01 32 43.48746261	−16 54 48.5218416	0.00000633	0.0000955	−0.039	52224.5	50632.3	54741.8	36	457
ICRF J013435.6 − 093102	0132 − 097	01 34 35.66662046	−09 31 02.8787711	0.00008811	0.0018082	0.725	53702.2	52409.7	54440.7	2	22
ICRF J013738.3 − 243053	0135 − 247	01 37 38.34645327	−24 30 53.8853577	0.00000556	0.0000873	0.027	52639.5	47640.2	54684.7	39	789
ICRF J013741.2 + 330935	0134 + 329	01 37 41.29949941	33 09 35.1337711	0.00005872	0.0008549	0.550	48893.9	48194.7	50460.3	11	79
ICRF J013941.9 + 175307	0136 + 176	01 39 41.97919686	17 53 07.5497043	0.00003109	0.0005886	−0.107	50930.6	50085.5	54664.7	3	136
ICRF J013957.3 + 013146	0137 + 012	01 39 57.30581788	01 31 46.1384878	0.00002700	0.0007689	−0.135	54314.7	54314.7	54314.7	1	42
ICRF J014043.0 + 465828	0137 + 467	01 40 43.07249471	46 58 28.4907159	0.00023789	0.0025340	−0.271	52561.1	50306.3	54314.7	2	16
ICRF J014658.7 + 211024	0144 + 209	01 46 58.78393123	21 10 24.3808888	0.00011021	0.0020953	−0.915	51883.5	50085.5	54440.7	3	54
ICRF J014922.3 + 055553	0146 + 056	01 49 22.37088693	05 55 53.5686380	0.00000401	0.0000829	−0.262	50429.1	47288.7	51660.8	57	990
ICRF J015002.6 − 072548	0147 − 076	01 50 02.69726779	−07 25 48.4877676	0.00006895	0.0034783	−0.292	50701.2	49535.0	53523.9	8	18
ICRF J015127.1 + 274441	0148 + 274	01 51 27.14618081	27 44 41.7936492	0.00000496	0.0000825	−0.220	52145.1	48720.9	54818.7	21	1053
ICRF J015218.0 + 220707	0149 + 218	01 52 18.05904586	22 07 07.6998109	0.00000347	0.0000585	−0.129	52043.9	46977.9	54907.7	73	2005

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J015232.0 − 141239	0150 − 144	01 52 32.01247878	−14 12 39.3940762	0.00004133	0.0011615	−0.523	51528.4	50632.3	54664.7	2	63
ICRF J015310.1 − 331025	0150 − 334	01 53 10.12174468	−33 10 25.8617364	0.00001723	0.0001612	−0.310	53241.8	48162.4	54741.8	24	183
ICRF J015537.0 − 404842	0153 − 410	01 55 37.05932763	−40 48 42.3558778	0.00011665	0.0013459	0.033	51102.6	48766.9	52409.7	5	24
ICRF J015649.7 − 543948	0155 − 549	01 56 49.71191560	−54 39 48.4969996	0.00101580	0.0088726	−0.944	54723.8	54723.8	54723.8	1	5
ICRF J015734.9 + 744243	0153 + 744	01 57 34.96492103	74 42 43.2298289	0.00002534	0.0000981	0.056	51012.0	47019.9	54641.7	23	686
ICRF J020157.1 − 113233	0159 − 117	02 01 57.17936397	−11 32 33.4367645	0.00001216	0.0003977	−0.483	54187.7	54187.7	54187.7	1	80
ICRF J020206.8 − 055900	0159 − 062	02 02 06.86471237	−05 59 00.1222338	0.00005041	0.0017775	−0.705	52620.7	52620.7	52620.7	1	42
ICRF J020213.6 − 762003	0202 − 765	02 02 13.69365065	−76 20 03.0630831	0.00011822	0.0004528	0.073	52186.5	48110.9	54457.4	3	20
ICRF J020307.8 + 810613	0157 + 808	02 03 07.87127925	81 06 13.2102719	0.00027449	0.0005482	−0.551	54440.7	54440.7	54440.7	1	34
ICRF J020346.6 + 113445	0201 + 113	02 03 46.65705872	11 34 45.4095674	0.00000287	0.0000462	−0.187	52079.3	47605.1	54872.7	809	12247
ICRF J020434.7 + 090349	0201 + 088	02 04 34.75930320	09 03 49.2628247	0.00006048	0.0009175	−0.156	50164.8	49914.7	51386.3	3	32
ICRF J020450.4 + 151411	0202 + 149	02 04 50.41389571	15 14 11.0436591	0.00001956	0.0004885		50264.7	46976.4	53552.9	928	33540
ICRF J020457.6 − 170119	0202 − 172	02 04 57.67434602	−17 01 19.8403980	0.00000473	0.0000939	−0.036	52292.4	47171.5	54844.7	28	941
ICRF J020750.9 − 683755	0206 − 689	02 07 50.93164800	−68 37 55.1623368	0.00007109	0.0009027	0.163	54723.8	54723.8	54723.8	1	10
ICRF J020834.9 − 173934	0206 − 178	02 08 34.94335368	−17 39 34.6808751	0.00002495	0.0009976	−0.095	54818.7	54818.7	54818.7	1	27
ICRF J020930.7 − 043826	0206 − 048	02 09 30.76671938	−04 38 26.1462824	0.00002655	0.0010254	−0.713	52480.8	52480.8	52480.8	1	78
ICRF J020935.9 + 135200	0206 + 136	02 09 35.99831933	13 52 00.7519781	0.00000887	0.0002086	0.062	51715.4	50085.5	54893.7	8	342
ICRF J021016.5 − 073720	0207 − 078	02 10 16.52891524	−07 37 20.6940433	0.00028525	0.0049584	0.312	53323.1	52480.8	53552.8	2	14
ICRF J021046.2 − 510101	0208 − 512	02 10 46.20042509	−51 01 01.8917929	0.00006579	0.0007452		51435.2	47966.3	54904.0	487	6244
ICRF J021148.7 + 170722	0209 + 168	02 11 48.77888204	17 07 22.7211079	0.00004723	0.0007091	−0.691	53972.7	50085.5	54314.7	3	61
ICRF J021222.6 − 174614	0210 − 180	02 12 22.64358846	−17 46 14.3426753	0.00001928	0.0006334	0.124	54657.8	54657.8	54657.8	1	59
ICRF J021316.6 − 071932	0210 − 075	02 13 16.67057233	−07 19 32.4733714	0.00003024	0.0011001	−0.350	52480.8	52480.8	52480.8	1	39
ICRF J021444.9 + 172249	0211 + 171	02 14 44.91285639	17 22 49.5108724	0.00004492	0.0009934	−0.369	54278.7	54278.7	54278.7	1	36
ICRF J021511.5 − 034307	0212 − 039	02 15 11.50649024	−03 43 07.8951607	0.00004619	0.0012743	0.318	52480.8	52480.8	52480.8	1	41
ICRF J021603.1 − 520012	0214 − 522	02 16 03.19777212	−52 00 12.4763135	0.00009827	0.0020510	−0.507	53438.5	52887.6	54457.4	4	23
ICRF J021605.6 − 011803	0213 − 015	02 16 05.66384766	−01 18 03.3971335	0.00002142	0.0007551	−0.532	52543.7	52543.7	52543.7	1	68
ICRF J021612.2 − 010518	0213 − 013	02 16 12.21194265	−01 05 18.8260068	0.00002443	0.0012426	−0.596	52543.7	52543.7	52543.7	1	55
ICRF J021730.8 + 734932	0212 + 735	02 17 30.81337130	73 49 32.6217403	0.00012312	0.0003832		47085.2	44343.3	49827.1	1264	45839
ICRF J021754.9 − 012150	0215 − 015	02 17 54.99937841	−01 21 50.7186715	0.00001541	0.0005650	−0.332	52543.7	52543.7	52543.7	1	130
ICRF J021907.0 + 012059	0216 + 011	02 19 07.02450872	01 20 59.8660375	0.00001212	0.0004132	−0.373	50116.2	49914.7	54482.7	2	136
ICRF J022239.6 + 430207	0219 + 428	02 22 39.61149612	43 02 07.7988160	0.00000530	0.0000694	−0.073	52776.8	48650.8	54858.7	20	942
ICRF J022256.4 − 344128	0220 − 349	02 22 56.40164259	−34 41 28.7301331	0.00000634	0.0001086	−0.073	53348.0	47640.2	54713.7	43	793
ICRF J022311.4 + 425931	0220 + 427	02 23 11.41126357	42 59 31.3846772	0.00003344	0.0004492	0.213	52709.0	51449.7	53068.7	2	45
ICRF J022313.0 − 020507	0220 − 023	02 23 13.04052698	−02 05 07.9340509	0.00002397	0.0009015	−0.614	52620.7	52620.7	52620.7	1	77
ICRF J022502.8 − 231248	0222 − 234	02 25 02.82145678	−23 12 48.4858646	0.00002547	0.0008721	−0.116	54657.8	54657.8	54657.8	1	49

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J022647.6 − 184339	0224 − 189	02 26 47.62838853	−18 43 39.2380923	0.00010283	0.0029125	−0.812	54657.8	54657.8	54657.8	1	19
ICRF J022821.5 − 554603	0226 − 559	02 28 21.59837319	−55 46 03.2803936	0.00005351	0.0008889	0.447	54723.8	54723.8	54723.8	1	9
ICRF J022850.0 + 672103	0224 + 671	02 28 50.05148948	67 21 03.0293039	0.00000813	0.0000505	−0.017	50705.5	44090.5	54893.7	64	3059
ICRF J022928.4 − 364356	0227 − 369	02 29 28.44906605	−36 43 56.8221968	0.00001209	0.0001286	−0.095	53696.4	52306.7	54907.7	10	139
ICRF J023045.7 + 403253	0227 + 403	02 30 45.71079962	40 32 53.0686036	0.00001592	0.0003704	−0.110	50681.4	50242.8	54482.7	2	87
ICRF J023220.7 + 231756	0229 + 230	02 32 20.75649631	23 17 56.8588109	0.00002644	0.0006545	−0.495	50409.4	50085.5	54482.7	3	171
ICRF J023838.9 + 163659	0235 + 164	02 38 38.93010666	16 36 59.2745843	0.00001242	0.0002401		49675.4	44446.9	54904.0	819	52429
ICRF J023951.2 + 041621	0237 + 040	02 39 51.26304399	04 16 21.4119085	0.00000588	0.0001331	−0.363	50722.1	47941.3	52809.7	31	599
ICRF J024008.1 − 230915	0237 − 233	02 40 08.17446359	−23 09 15.7295913	0.00000803	0.0001286	0.036	51281.3	48126.7	54741.8	50	619
ICRF J024104.7 − 081520	0238 − 084	02 41 04.79850256	−08 15 20.7517956	0.00005640	0.0008492		48876.2	47176.0	50576.4	253	5815
ICRF J024224.2 + 174258	0239 + 175	02 42 24.26827887	17 42 58.8489234	0.00001263	0.0003461	−0.336	52036.1	50085.5	54901.7	8	219
ICRF J024229.1 + 110100	0239 + 108	02 42 29.17085456	11 01 00.7279554	0.00000346	0.0000648	−0.229	51463.4	47626.5	54803.7	107	1411
ICRF J024457.6 + 622806	0241 + 622	02 44 57.69668137	62 28 06.5154803	0.00005477	0.0003312	0.143	51607.0	48223.7	53051.1	6	95
ICRF J024554.1 − 445939	0244 − 452	02 45 54.11075319	−44 59 39.6104520	0.00005747	0.0021778	−0.668	54489.7	54489.7	54489.7	1	21
ICRF J024918.0 + 061951	0246 + 061	02 49 18.01610629	06 19 51.9478626	0.00001074	0.0002750	−0.147	50637.6	49914.7	54643.7	2	157
ICRF J025134.5 + 431515	0248 + 430	02 51 34.53674204	43 15 15.8291997	0.00000534	0.0000711	−0.105	52327.4	47931.6	54872.7	26	1053
ICRF J025246.1 − 710435	0252 − 712	02 52 46.15468371	−71 04 35.2664607	0.00110102	0.0093299	−0.188	52359.0	48162.4	54457.4	2	6
ICRF J025329.1 − 544151	0252 − 549	02 53 29.18040448	−54 41 51.4358949	0.00001405	0.0001612	0.302	52697.1	47626.5	54706.7	31	134
ICRF J025334.8 + 180542	0250 + 178	02 53 34.88223856	18 05 42.5243511	0.00002861	0.0007331	0.323	53167.0	48977.5	53561.9	5	52
ICRF J025634.9 + 133435	0253 + 133	02 56 34.98467213	13 34 35.3449284	0.00002194	0.0006299	−0.460	50400.8	50085.5	52443.7	4	126
ICRF J025642.6 − 331521	0254 − 334	02 56 42.60272702	−33 15 21.2769138	0.00001494	0.0003861	0.188	52936.3	52306.7	54684.7	11	80
ICRF J025927.0 + 074739	0256 + 075	02 59 27.07662273	07 47 39.6429493	0.00000382	0.0000869	−0.145	51807.8	47011.4	54818.7	77	1196
ICRF J025928.5 − 001959	0256 − 005	02 59 28.51615516	−00 19 59.9752617	0.00000504	0.0001155	0.118	53588.9	50576.2	54907.7	8	293
ICRF J030123.6 + 011835	0258 + 011	03 01 23.60695282	01 18 35.9970506	0.00003517	0.0010696	−0.219	52406.5	49914.7	54664.7	2	61
ICRF J030230.5 + 121856	0259 + 121	03 02 30.54675745	12 18 56.7521483	0.00001229	0.0002790	−0.236	50194.4	47941.3	52480.8	20	261
ICRF J030326.5 − 240711	0301 − 243	03 03 26.50287454	−24 07 11.4272168	0.00002641	0.0008540	0.073	54657.8	54657.8	54657.8	1	53
ICRF J030826.2 + 040639	0305 + 039	03 08 26.22380280	04 06 39.3008111	0.00000422	0.0000832	−0.005	52816.8	50303.8	54614.7	33	1048
ICRF J031155.2 − 765150	0312 − 770	03 11 55.25018411	−76 51 50.8483062	0.00013283	0.0004376	0.606	50369.0	48110.9	53129.7	8	36
ICRF J031521.1 + 101243	0312 + 100	03 15 21.13979960	10 12 43.0834865	0.00002594	0.0007428	−0.505	54278.7	54278.7	54278.7	1	59
ICRF J031733.6 − 280318	0315 − 282	03 17 33.69963653	−28 03 18.6007140	0.00017539	0.0069667	0.194	54818.7	54818.7	54818.7	1	12
ICRF J031757.6 − 441417	0316 − 444	03 17 57.67935755	−44 14 17.1324973	0.00059962	0.0427226	0.632	54601.7	54601.7	54601.7	1	3
ICRF J031905.5 − 161347	0316 − 164	03 19 05.52800138	−16 13 47.0465517	0.00002237	0.0007830	0.024	54657.8	54657.8	54657.8	1	54
ICRF J031948.1 + 413042	0316 + 413	03 19 48.16009577	41 30 42.1037450	0.00010848	0.0036974		47166.4	44090.1	50242.7	172	5284
ICRF J031951.2 + 190131	0317 + 188	03 19 51.25672225	19 01 31.2911273	0.00000460	0.0000847	−0.203	51848.9	48942.5	54803.7	51	1103
ICRF J032019.1 − 170239	0318 − 172	03 20 19.10743317	−17 02 39.1336754	0.00006296	0.0015956	−0.410	54657.8	54657.8	54657.8	1	22

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J032153.1 + 122113	0319 + 121	03 21 53.10350836	12 21 13.9537265	0.00000355	0.0000734	−0.201	52678.6	47019.9	54713.7	41	1297
ICRF J032743.3 − 180342	0325 − 182	03 27 43.34162433	−18 03 42.0277724	0.00005109	0.0014594	−0.603	54657.8	54657.8	54657.8	1	25
ICRF J032754.1 + 023341	0325 + 023	03 27 54.19501256	02 33 41.9825439	0.00002551	0.0005895	0.528	52877.9	51492.8	53068.7	3	39
ICRF J032850.3 + 394044	0325 + 395	03 28 50.31328133	39 40 44.5322072	0.00059442	0.0193020	−0.766	52569.6	50242.8	54314.7	2	7
ICRF J032957.6 + 275615	0326 + 277	03 29 57.66941462	27 56 15.4992344	0.00000857	0.0001258	−0.424	50277.7	47165.8	54643.7	32	354
ICRF J033409.9 + 022609	0331 + 022	03 34 09.94771967	02 26 09.6483089	0.00017068	0.0028857	0.253	50731.8	50554.8	50800.8	3	14
ICRF J033453.3 + 080014	0332 + 078	03 34 53.31667568	08 00 14.4192305	0.00000861	0.0001733	−0.047	52490.8	49914.7	54858.7	6	288
ICRF J033630.1 + 321829	0333 + 321	03 36 30.10760600	32 18 29.3422210	0.00000367	0.0000513	−0.095	51855.0	44773.8	54893.7	109	2646
ICRF J033654.0 − 361606	0335 − 364	03 36 54.02351047	−36 16 06.2242474	0.00002259	0.0003815	0.039	51996.3	50919.8	53080.7	15	96
ICRF J033717.1 + 013722	0334 + 014	03 37 17.10809226	01 37 22.7494775	0.00035581	0.0057375	0.766	52340.9	49177.8	53503.7	5	16
ICRF J033755.4 − 120404	0335 − 122	03 37 55.45156436	−12 04 04.5440639	0.00018346	0.0042882	0.244	51425.5	50576.2	54482.7	2	23
ICRF J033900.9 − 013317	0336 − 017	03 39 00.98623295	−01 33 17.6068729	0.00005813	0.0012202	0.408	54187.7	54187.7	54187.7	1	17
ICRF J033930.9 − 014635	0336 − 019	03 39 30.93778751	−01 46 35.8041062	0.00000273	0.0000421	−0.010	52350.5	44773.8	54903.8	1767	62909
ICRF J034035.6 − 211931	0338 − 214	03 40 35.60786053	−21 19 31.1720263	0.00000486	0.0001015	−0.100	51887.9	46875.8	54880.7	40	871
ICRF J034328.9 + 362212	0340 + 362	03 43 28.95239734	36 22 12.4295041	0.00000870	0.0001791	0.168	52229.4	50242.8	54810.7	5	186
ICRF J034423.1 + 155943	0341 + 158	03 44 23.17216227	15 59 43.3693414	0.00000666	0.0001714	−0.042	50804.5	47394.1	53306.8	30	466
ICRF J034918.7 + 460959	0345 + 460	03 49 18.74156886	46 09 59.6579051	0.00000607	0.0000799	−0.179	53763.3	50306.3	54852.7	14	441
ICRF J034957.8 − 210247	0347 − 211	03 49 57.82667457	−21 02 47.7414283	0.00000592	0.0001397	−0.016	52744.6	50632.3	54907.7	8	353
ICRF J035430.0 + 464318	0350 + 465	03 54 30.01165255	46 43 18.7503476	0.00001490	0.0002304	−0.058	51664.5	50306.3	53609.2	2	107
ICRF J035547.8 − 664533	0355 − 669	03 55 47.88343240	−66 45 33.8171785	0.00003886	0.0001936	0.538	53802.8	52861.2	54726.7	22	85
ICRF J035721.6 + 231953	0354 + 231	03 57 21.60988566	23 19 53.8255336	0.00001715	0.0003430	−0.144	50583.7	50085.5	52989.7	4	156
ICRF J035721.9 − 481215	0355 − 483	03 57 21.91786833	−48 12 15.1607592	0.00007463	0.0020296	0.777	49394.5	48162.4	52884.6	5	14
ICRF J035746.1 + 054231	0355 + 055	03 57 46.12566530	05 42 31.2584546	0.00005540	0.0009312	0.047	51472.1	49914.7	54664.7	2	61
ICRF J035830.1 + 560644	0354 + 559	03 58 30.18819697	56 06 44.4602032	0.00002794	0.0002599	−0.108	52487.7	52409.7	53306.8	2	69
ICRF J035929.7 + 505750	0355 + 508	03 59 29.74726473	50 57 50.1615765	0.00000547	0.0000563	0.015	47004.5	44090.5	54643.7	515	15323
ICRF J035933.6 − 261531	0357 − 263	03 59 33.68176810	−26 15 31.3289008	0.00012095	0.0038728	−0.303	50966.7	50632.3	54643.7	3	52
ICRF J040119.9 + 041334	0358 + 040	04 01 19.91296419	04 13 34.4076427	0.00001652	0.0003446	−0.266	53608.0	53607.8	53609.2	2	72
ICRF J040221.2 − 314725	0400 − 319	04 02 21.26601027	−31 47 25.9453862	0.00000799	0.0001249	−0.166	52445.1	48766.9	54858.7	40	501
ICRF J040305.5 + 260001	0400 + 258	04 03 05.58606763	26 00 01.5028075	0.00000392	0.0000626	−0.144	52219.9	47005.8	54830.7	64	1433
ICRF J040612.2 − 174957	0403 − 179	04 06 12.24452896	−17 49 57.9270574	0.00002078	0.0006976	−0.119	51895.1	50632.3	54664.7	3	128
ICRF J040639.3 − 235503	0404 − 240	04 06 39.34005637	−23 55 03.7878438	0.00002306	0.0007953	−0.174	54657.8	54657.8	54657.8	1	51
ICRF J040748.4 − 121136	0405 − 123	04 07 48.43097979	−12 11 36.6593538	0.00000472	0.0000944	0.011	52751.1	48766.9	54768.6	30	718
ICRF J040820.3 + 303230	0405 + 304	04 08 20.37757204	30 32 30.4899512	0.00001871	0.0004409	0.472	50962.8	49033.6	52711.7	15	175
ICRF J040820.3 − 654509	0407 − 658	04 08 20.37827830	−65 45 09.0802788	0.00058504	0.0044385	−0.585	50905.8	48162.4	54457.4	4	20
ICRF J040905.7 − 123848	0406 − 127	04 09 05.76972193	−12 38 48.1438071	0.00000515	0.0001195	−0.321	52110.5	47777.3	54852.7	31	646

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J040922.0 + 121739	0406 + 121	04 09 22.00871268	12 17 39.8477204	0.00000404	0.0000779	−0.227	51952.2	46977.9	54810.7	56	1223
ICRF J041243.6 + 230505	0409 + 229	04 12 43.66686761	23 05 05.4526057	0.00000521	0.0000944	−0.215	51594.1	50085.5	54664.7	19	746
ICRF J041340.3 + 111214	0410 + 110	04 13 40.34101427	11 12 14.7860303	0.00001748	0.0004474	−0.203	54314.7	54314.7	54314.7	1	68
ICRF J041821.2 + 380135	0415 + 379	04 18 21.27722894	38 01 35.8001267	0.00000929	0.0001414	0.107	51847.8	51464.8	52409.7	6	151
ICRF J041922.5 + 395528	0415 + 398	04 19 22.54953540	39 55 28.9775927	0.00000621	0.0000855	−0.117	53814.6	50242.8	54907.7	9	470
ICRF J042244.3 + 532426	0418 + 532	04 22 44.39886992	53 24 26.2633216	0.00002666	0.0003752	0.211	51396.9	49577.0	54482.7	2	62
ICRF J042252.2 + 021926	0420 + 022	04 22 52.21465772	02 19 26.9310614	0.00000554	0.0001372	−0.083	52931.7	49914.7	54830.7	6	388
ICRF J042301.9 + 210802	0420 + 210	04 23 01.98838893	21 08 02.1273102	0.00002433	0.0004433	0.123	52480.8	52480.8	52480.8	1	75
ICRF J042356.0 + 415002	0420 + 417	04 23 56.00979059	41 50 02.7129192	0.00000447	0.0000534	0.015	52715.8	47568.6	54880.7	34	1810
ICRF J042423.4 + 144216	0421 + 145	04 24 23.49064749	14 42 16.6830492	0.00005981	0.0009406	−0.124	53005.7	50085.5	54440.7	3	51
ICRF J042442.2 − 375620	0422 − 380	04 24 42.24370765	−37 56 20.7841314	0.00000647	0.0001026	0.074	52854.1	48162.4	54837.7	35	559
ICRF J042636.6 + 051819	0423 + 051	04 26 36.60410631	05 18 19.8723567	0.00000620	0.0001682	0.003	51454.3	48194.7	54718.7	23	349
ICRF J042655.7 + 232739	0423 + 233	04 26 55.73479309	23 27 39.6336400	0.00001638	0.0004501	−0.340	50678.3	50085.5	53087.7	9	148
ICRF J042655.9 + 235026	0423 + 237	04 26 55.97038882	23 50 26.5821980	0.00017023	0.0028270	−0.896	53180.6	50156.3	54314.7	2	22
ICRF J042747.5 + 045708	0425 + 048	04 27 47.57053172	04 57 08.3256492	0.00000798	0.0001724	−0.599	51194.6	47394.1	52543.7	21	269
ICRF J042835.6 + 173223	0425 + 174	04 28 35.63368356	17 32 23.5879892	0.00002547	0.0005490	−0.317	50760.9	50085.5	54643.7	3	152
ICRF J042840.4 − 375619	0426 − 380	04 28 40.42427648	−37 56 19.5804718	0.00000908	0.0000977	−0.177	52754.0	47640.2	54684.7	26	341
ICRF J043221.1 − 510925	0431 − 512	04 32 21.17828086	−51 09 25.1859674	0.00011370	0.0017112	0.593	50342.3	48043.8	52941.7	6	13
ICRF J043311.0 + 052115	0430 + 052	04 33 11.09552741	05 21 15.6192233	0.00004752	0.0005255		49496.0	44090.1	54901.9	113	8116
ICRF J043334.1 − 603013	0432 − 606	04 33 34.10843747	−60 30 13.7696002	0.00004735	0.0008161	0.446	54723.8	54723.8	54723.8	1	8
ICRF J043701.4 − 184448	0434 − 188	04 37 01.48273818	−18 44 48.6134950	0.00000350	0.0000732	−0.355	52532.5	46875.8	54887.7	289	2789
ICRF J043835.0 − 125103	0436 − 129	04 38 35.02100809	−12 51 03.3591794	0.00000728	0.0002167	−0.101	53041.9	50576.2	54901.7	8	249
ICRF J044017.1 − 433308	0438 − 436	04 40 17.17996781	−43 33 08.6042469	0.00006168	0.0010163		51359.4	49565.8	53153.1	49	345
ICRF J044238.6 − 001743	0440 − 003	04 42 38.66073910	−00 17 43.4203921	0.00000391	0.0000982	−0.044	51097.3	47011.4	52900.7	23	836
ICRF J044611.4 + 390017	0442 + 389	04 46 11.49405608	39 00 17.1006086	0.00001046	0.0002074	0.314	53018.8	50242.8	54887.7	5	220
ICRF J044848.5 − 741731	0450 − 743	04 48 48.55799992	−74 17 31.2459379	0.00008385	0.0004333	0.077	53501.2	50182.6	54457.4	3	24
ICRF J044923.3 + 633209	0444 + 634	04 49 23.31057391	63 32 09.4339675	0.00000778	0.0000554	−0.092	50775.7	49422.9	51569.8	8	1100
ICRF J045118.7 + 593532	0446 + 595	04 51 18.72179366	59 35 32.1835582	0.00001611	0.0001411	−0.438	53768.8	53768.8	53768.8	1	168
ICRF J045314.6 − 280737	0451 − 282	04 53 14.64679549	−28 07 37.3265546	0.00003048	0.0011491		50155.2	47176.0	53134.3	51	914
ICRF J045550.7 − 461558	0454 − 463	04 55 50.77252761	−46 15 58.6797411	0.00001594	0.0002778	0.386	53337.3	49015.7	54670.7	16	80
ICRF J045608.9 − 215909	0454 − 220	04 56 08.92369931	−21 59 09.3972824	0.00008143	0.0022914	−0.221	54657.8	54657.8	54657.8	1	25
ICRF J045848.7 + 060803	0456 + 060	04 58 48.77157953	06 08 03.8593391	0.00001615	0.0007933	−0.393	54125.8	54125.8	54125.8	1	59
ICRF J045952.0 + 022931	0457 + 024	04 59 52.05066226	02 29 31.1765607	0.00000471	0.0000842	0.048	50909.2	47005.8	54865.7	80	1851
ICRF J050215.4 + 060907	0459 + 060	05 02 15.44593988	06 09 07.4940469	0.00000771	0.0001661	−0.117	50575.1	47394.1	52340.7	15	334
ICRF J050233.2 + 133810	0459 + 135	05 02 33.21951320	13 38 10.9589537	0.00000702	0.0001672	0.116	51088.0	50085.5	53543.7	9	320

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J050258.4 + 251625	0459 + 252	05 02 58.47478439	25 16 25.2761557	0.00001448	0.0003658	−0.214	54125.8	54125.8	54125.8	1	67
ICRF J050321.1 + 020304	0500 + 019	05 03 21.19717510	02 03 04.6763382	0.00000636	0.0001440	−0.352	50459.6	47394.1	52403.7	20	318
ICRF J050401.7 − 604952	0503 − 608	05 04 01.70113203	−60 49 52.5394101	0.00003104	0.0002201	0.369	52491.4	48110.9	54706.7	19	72
ICRF J050523.1 + 045942	0502 + 049	05 05 23.18472342	04 59 42.7245908	0.00000375	0.0000698	−0.009	51900.7	47394.1	54571.7	32	1023
ICRF J051138.3 + 135719	0508 + 138	05 11 38.31965584	13 57 19.1936032	0.00000809	0.0001479	0.078	50875.0	50085.5	53509.7	10	263
ICRF J051241.0 + 151723	0509 + 152	05 12 41.01297844	15 17 23.4809225	0.00001527	0.0002540	0.322	50788.4	50085.5	52457.7	4	136
ICRF J051349.1 − 215916	0511 − 220	05 13 49.11432090	−21 59 16.0920584	0.00000795	0.0001951	−0.466	50809.3	47176.5	53045.7	22	284
ICRF J051418.6 + 560211	0510 + 559	05 14 18.69961861	56 02 11.0541730	0.00017351	0.0011005	0.015	50085.8	49577.0	54664.7	2	30
ICRF J051615.9 − 160307	0514 − 161	05 16 15.92934671	−16 03 07.6346324	0.00002675	0.0007386	−0.088	50858.8	50632.3	54482.7	2	68
ICRF J051637.7 − 723707	0517 − 726	05 16 37.71907047	−72 37 07.4657369	0.00016536	0.0005234	0.615	50325.2	48757.4	53143.7	6	19
ICRF J052109.8 + 163822	0518 + 165	05 21 09.88592749	16 38 22.0517668	0.00000765	0.0001176	−0.146	51503.9	47931.6	54592.7	18	275
ICRF J052245.1 + 141529	0519 + 142	05 22 45.14668319	14 15 29.2831655	0.00012026	0.0013232	−0.163	54314.7	54314.7	54314.7	1	38
ICRF J052257.9 − 362730	0521 − 365	05 22 57.98464282	−36 27 30.8510772	0.00000577	0.0000832	0.101	52111.5	48110.9	54741.8	158	768
ICRF J052648.3 − 234255	0524 − 237	05 26 48.38545375	−23 42 55.8592183	0.00007492	0.0022858	0.517	54657.8	54657.8	54657.8	1	29
ICRF J052718.6 − 230736	0525 − 231	05 27 18.60815425	−23 07 36.9998310	0.00002520	0.0009345	0.003	54657.8	54657.8	54657.8	1	55
ICRF J052930.0 − 724528	0530 − 727	05 29 30.04217690	−72 45 28.5072742	0.00001992	0.0000922	−0.045	50696.7	47626.5	54723.8	85	380
ICRF J052957.0 − 251558	0527 − 253	05 29 57.06738006	−25 15 58.9321421	0.00001501	0.0003695	−0.234	54818.7	54818.7	54818.7	1	70
ICRF J053007.9 − 250329	0528 − 250	05 30 07.96279681	−25 03 29.8994010	0.00000611	0.0001648	−0.254	50919.4	47640.2	52991.8	21	485
ICRF J053056.4 + 133155	0528 + 134	05 30 56.41674659	13 31 55.1495251	0.00002069	0.0003484		49835.5	44774.0	54897.0	3087	123505
ICRF J053238.9 + 073243	0529 + 075	05 32 38.99848582	07 32 43.3456821	0.00004945	0.0006960	0.145	49354.7	44773.8	54643.7	13	100
ICRF J053932.0 − 155030	0537 − 158	05 39 32.01013430	−15 50 30.3209793	0.00000848	0.0002390	−0.028	50993.3	47777.3	54684.7	29	263
ICRF J054138.0 − 054149	0539 − 057	05 41 38.08336927	−05 41 49.4283315	0.00000498	0.0001281	−0.171	51700.1	47176.5	54741.8	32	679
ICRF J054150.7 − 733215	0543 − 735	05 41 50.77592742	−73 32 15.3474452	0.00008687	0.0005558	0.078	53624.2	52887.6	54457.4	4	39
ICRF J054212.7 − 265842	0540 − 270	05 42 12.71350421	−26 58 42.5403395	0.00005474	0.0023760	−0.718	54818.7	54818.7	54818.7	1	22
ICRF J054236.1 + 495107	0538 + 498	05 42 36.13789843	49 51 07.2337251	0.00000617	0.0000666	0.071	52398.3	48538.8	54601.7	18	1272
ICRF J055047.3 + 232648	0547 + 234	05 50 47.39089525	23 26 48.1769181	0.00001027	0.0001847	−0.026	53017.9	52306.7	53609.2	20	153
ICRF J055217.9 + 375425	0548 + 378	05 52 17.93691587	37 54 25.2823729	0.00000799	0.0001333	0.208	53246.3	50242.8	54907.7	8	280
ICRF J055225.8 + 191340	0549 + 192	05 52 25.88498477	19 13 40.2685538	0.00003613	0.0008451	−0.441	53154.1	52306.7	53609.2	3	74
ICRF J055704.7 + 241355	0554 + 242	05 57 04.71358097	24 13 55.2986398	0.00000487	0.0000920	0.217	52023.7	50065.8	53609.2	26	624
ICRF J060031.4 − 393702	0558 − 396	06 00 31.41755226	−39 37 02.1968374	0.00002922	0.0010068	0.154	54489.7	54489.7	54489.7	1	47
ICRF J060351.5 + 215937	0600 + 219	06 03 51.55701577	21 59 37.6986666	0.00001070	0.0003509	−0.045	53758.7	50168.7	54076.8	4	92
ICRF J060357.7 − 171628	0601 − 172	06 03 57.73244064	−17 16 28.2184809	0.00001078	0.0003573	−0.111	50937.5	50632.3	54643.7	2	92
ICRF J060455.1 + 242955	0601 + 245	06 04 55.12138298	24 29 55.0364929	0.00000512	0.0000890	−0.025	53016.9	52409.7	53609.2	27	259
ICRF J060550.8 + 403008	0602 + 405	06 05 50.85536574	40 30 08.1036615	0.00000747	0.0001114	−0.007	51123.3	50242.8	53150.7	6	271
ICRF J060752.6 + 672055	0602 + 673	06 07 52.67160861	67 20 55.4099805	0.00000717	0.0000416	−0.035	53507.3	49750.8	54907.7	507	38102

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J060759.6 − 083449	0605 − 085	06 07 59.69923743	−08 34 49.9781718	0.00000354	0.0000731	−0.175	51802.5	44773.8	54614.7	51	1150
ICRF J060859.6 − 222020	0606 − 223	06 08 59.68683826	−22 20 20.9566813	0.00000561	0.0001054	−0.083	53162.6	50632.3	54865.7	9	426
ICRF J060940.9 − 154240	0607 − 157	06 09 40.94953417	−15 42 40.6726003	0.00001795	0.0002052		50185.0	45466.0	54904.0	569	28581
ICRF J061048.8 + 724853	0604 + 728	06 10 48.87212758	72 48 53.1866539	0.00022199	0.0007863	0.044	51137.6	49827.5	54664.7	2	48
ICRF J061151.3 − 282759	0609 − 284	06 11 51.36536975	−28 27 59.8535636	0.00003091	0.0010544	0.349	54818.7	54818.7	54818.7	1	31
ICRF J061336.3 + 170824	0610 + 171	06 13 36.36007026	17 08 24.9454875	0.00002260	0.0007305	0.300	52468.6	52409.7	52758.7	3	65
ICRF J061350.1 + 260436	0610 + 260	06 13 50.13917401	26 04 36.7198424	0.00000898	0.0001477	−0.178	51801.1	50065.8	53306.8	16	275
ICRF J061357.6 + 130645	0611 + 131	06 13 57.69275496	13 06 45.4009267	0.00000429	0.0001080	−0.113	52270.9	47394.1	54657.8	33	1021
ICRF J061423.8 + 604621	0609 + 607	06 14 23.86617054	60 46 21.7559014	0.00000724	0.0000589	−0.185	52233.3	45466.3	54718.7	35	1745
ICRF J061635.9 − 345616	0614 − 349	06 16 35.98056063	−34 56 16.5584624	0.00055265	0.0105394	−0.361	52574.2	48766.9	53503.7	3	13
ICRF J061716.9 + 570116	0613 + 570	06 17 16.92255778	57 01 16.4234179	0.00001190	0.0001329	0.060	52662.6	49577.0	54865.7	5	238
ICRF J061732.3 − 363414	0615 − 365	06 17 32.32746590	−36 34 14.8322980	0.00162135	0.0186995	−0.850	50571.1	48766.9	52409.7	3	6
ICRF J061830.1 − 784302	0621 − 786	06 18 30.15868914	−78 43 02.1409006	0.00012187	0.0006326	0.228	54723.8	54723.8	54723.8	1	9
ICRF J062331.7 − 441302	0622 − 441	06 23 31.78599260	−44 13 02.5423812	0.00035826	0.0018948	−0.120	50894.2	48162.4	52409.7	4	16
ICRF J062419.0 + 385648	0620 + 389	06 24 19.02128916	38 56 48.7359920	0.00000534	0.0000748	−0.091	52532.1	49391.7	54803.7	21	827
ICRF J062603.0 + 820225	0615 + 820	06 26 03.00616906	82 02 25.5678202	0.00002752	0.0000585	−0.005	51626.5	47019.9	54732.7	47	1390
ICRF J062706.7 − 352915	0625 − 354	06 27 06.72938955	−35 29 15.3392815	0.00001838	0.0007460	−0.232	54489.7	54489.7	54489.7	1	57
ICRF J062839.6 − 671247	0628 − 671	06 28 39.60783728	−67 12 47.4054515	0.00008159	0.0008547	0.449	54723.8	54723.8	54723.8	1	6
ICRF J062857.4 − 624844	0628 − 627	06 28 57.48775014	−62 48 44.7443227	0.00067971	0.0019267	0.033	52963.3	52887.6	53138.8	3	17
ICRF J062923.7 − 195919	0627 − 199	06 29 23.76185955	−19 59 19.7235279	0.00000574	0.0001028	−0.056	52782.8	50632.3	54880.7	6	373
ICRF J063111.9 − 415426	0629 − 418	06 31 11.99803381	−41 54 26.9465039	0.00001145	0.0002415	0.207	52830.9	47626.5	54706.7	41	247
ICRF J063206.5 − 261414	0630 − 261	06 32 06.50174548	−26 14 14.0287463	0.00004877	0.0015632	−0.012	54272.8	53552.8	54440.7	2	37
ICRF J063243.1 + 155957	0629 + 160	06 32 43.13553829	15 59 57.6207697	0.00001077	0.0002865	0.144	51702.0	50085.5	54125.8	7	214
ICRF J063459.0 − 233511	0632 − 235	06 34 59.00099976	−23 35 11.9570699	0.00001537	0.0002566	0.109	53775.2	53503.7	54816.7	4	103
ICRF J063511.0 − 182126	0632 − 183	06 35 11.01302948	−18 21 26.2420081	0.00003705	0.0012115	−0.496	54601.7	54601.7	54601.7	1	32
ICRF J063519.4 − 262055	0633 − 26*B*	06 35 19.41623059	−26 20 55.7172875	0.00004030	0.0015466	−0.608	54559.7	54559.7	54559.7	1	38
ICRF J063520.9 − 262039	0633 − 263	06 35 20.90908181	−26 20 39.8664037	0.00002500	0.0009452	0.129	54408.0	53560.8	54559.7	3	45
ICRF J063540.8 − 582710	0634 − 584	06 35 40.82991826	−58 27 10.2764239	0.00005699	0.0009595	0.474	54723.8	54723.8	54723.8	1	7
ICRF J063546.5 − 751616	0637 − 752	06 35 46.50791481	−75 16 16.8153495	0.00013511	0.0003962		51265.3	47626.7	54904.0	399	5374
ICRF J063920.9 − 334600	0637 − 337	06 39 20.90463360	−33 46 00.1131870	0.00001445	0.0002421	0.149	52679.9	48865.8	54684.7	24	180
ICRF J064151.1 − 032048	0639 − 032	06 41 51.13294565	−03 20 48.5824642	0.00000889	0.0002770	−0.250	53043.2	52409.7	53609.2	2	142
ICRF J064204.2 + 675835	0636 + 680	06 42 04.25740247	67 58 35.6207886	0.00001074	0.0000616	−0.187	51745.6	48357.8	54614.7	55	1855
ICRF J064453.7 + 391447	0641 + 392	06 44 53.70958230	39 14 47.5336667	0.00000725	0.0001401	−0.059	53366.9	50242.8	54845.7	6	364
ICRF J064524.0 + 212151	0642 + 214	06 45 24.09951782	21 21 51.2014532	0.00000975	0.0001648	−0.531	50095.6	47718.4	50460.3	20	252
ICRF J064832.7 + 205308	0645 + 209	06 48 32.71389903	20 53 08.9216262	0.00002755	0.0007686	−0.282	54314.7	54314.7	54314.7	1	52

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J065032.9 − 284917	0648 − 287	06 50 32.92792014	−28 49 17.8569426	0.00008113	0.0027283	−0.797	54601.7	54601.7	54601.7	1	25
ICRF J065158.1 − 210111	0649 − 209	06 51 58.12004893	−21 01 11.9156663	0.00000914	0.0002575	−0.389	53719.8	53719.8	53719.8	1	81
ICRF J065358.2 + 370540	0650 + 371	06 53 58.28281491	37 05 40.6065393	0.00000715	0.0001238	−0.150	49967.3	48348.6	50849.8	40	363
ICRF J065510.0 + 410010	0651 + 410	06 55 10.02473432	41 00 10.1599629	0.00000915	0.0001711	−0.234	51083.3	50242.8	53158.7	7	230
ICRF J065705.6 + 242355	0654 + 244	06 57 05.67553957	24 23 55.3944439	0.00001722	0.0004536	−0.184	51455.9	50085.5	54482.7	4	133
ICRF J070134.5 − 463436	0700 − 465	07 01 34.54706032	−46 34 36.6221767	0.00046862	0.0039278	−0.349	48162.4	48162.4	48162.4	1	3
ICRF J070242.9 − 195122	0700 − 197	07 02 42.90066969	−19 51 22.0358457	0.00001118	0.0003753	−0.158	54350.3	53552.8	54901.7	6	215
ICRF J071338.1 + 434917	0710 + 439	07 13 38.16412910	43 49 17.2071530	0.00000592	0.0000952	−0.007	51766.5	48179.7	54907.7	37	891
ICRF J071424.8 + 353439	0711 + 356	07 14 24.81745662	35 34 39.7963920	0.00006866	0.0015764		48624.1	47005.4	50242.7	15	465
ICRF J071751.8 + 453803	0714 + 457	07 17 51.85241063	45 38 03.2610495	0.00000627	0.0000818	−0.019	54187.2	50306.3	54887.7	6	558
ICRF J072113.4 − 153041	0718 − 154	07 21 13.49142709	−15 30 41.0067937	0.00004220	0.0020767	−0.704	54657.8	54657.8	54657.8	1	25
ICRF J072417.2 − 071520	0721 − 071	07 24 17.29263439	−07 15 20.3529198	0.00001149	0.0004116	−0.334	52775.6	52306.7	53609.2	2	100
ICRF J072550.6 − 005456	0723 − 008	07 25 50.63996171	−00 54 56.5441985	0.00000449	0.0000929	−0.238	51035.6	44773.8	54768.6	46	839
ICRF J072614.2 + 215320	0723 + 219	07 26 14.26073766	21 53 20.1140804	0.00000775	0.0001653	−0.053	53973.5	53134.5	54845.7	5	207
ICRF J072820.6 + 215306	0725 + 219	07 28 20.60829964	21 53 06.3902713	0.00000741	0.0001508	−0.052	51177.8	50085.5	53609.2	5	369
ICRF J072905.4 − 363945	0727 − 365	07 29 05.41225580	−36 39 45.2446066	0.00016793	0.0059073	−0.193	54292.7	54292.7	54292.7	1	12
ICRF J073051.3 + 404950	0727 + 409	07 30 51.34655323	40 49 50.8273413	0.00003450	0.0004827	−0.445	51079.4	50242.8	54664.7	2	74
ICRF J073133.7 + 245158	0728 + 249	07 31 33.74545710	24 51 58.5987745	0.00001385	0.0003965	0.215	50262.7	50085.5	53020.8	5	214
ICRF J073256.2 + 254838	0729 + 259	07 32 56.27526338	25 48 38.7956511	0.00000621	0.0001225	0.103	53623.4	50219.8	54880.7	6	273
ICRF J073545.8 − 173548	0733 − 174	07 35 45.81248037	−17 35 48.5022692	0.00000884	0.0002035	0.196	51965.1	48919.9	54741.8	33	460
ICRF J073602.3 − 185309	0733 − 187	07 36 02.37749905	−18 53 09.9224788	0.00014652	0.0032260	0.296	54601.7	54601.7	54601.7	1	12
ICRF J073730.0 + 594103	0733 + 597	07 37 30.08697865	59 41 03.1943714	0.00004628	0.0010055	−0.317	53534.1	49577.0	54088.1	4	51
ICRF J073807.3 + 174218	0735 + 178	07 38 07.39374766	17 42 18.9982302	0.00000295	0.0000437	0.112	49462.9	44773.8	54718.7	578	15897
ICRF J073816.9 − 332212	0736 − 332	07 38 16.94895574	−33 22 12.7772415	0.00008508	0.0010927	−0.277	51529.4	48766.9	53126.1	5	25
ICRF J073856.4 − 673550	0738 − 674	07 38 56.49622760	−67 35 50.8260388	0.00002226	0.0001523	0.194	51884.3	47626.5	54726.7	25	155
ICRF J074110.7 + 311200	0738 + 313	07 41 10.70330959	31 12 00.2290339	0.00001720	0.0018132		47842.8	45466.0	50219.6	35	1765
ICRF J074331.6 − 672625	0743 − 673	07 43 31.61163970	−67 26 25.5464081	0.00002535	0.0001263	−0.060	53037.3	48110.9	54670.7	28	133
ICRF J074420.3 − 691907	0744 − 691	07 44 20.39366669	−69 19 07.1567791	0.00007607	0.0004690	0.187	53787.2	52887.6	54457.4	4	33
ICRF J074421.6 − 062935	0741 − 063	07 44 21.65635539	−06 29 35.9146409	0.00002364	0.0007292	−0.217	54187.7	54187.7	54187.7	1	52
ICRF J074447.2 + 212000	0741 + 214	07 44 47.27670801	21 20 00.4269550	0.00003247	0.0008444	−0.059	53596.3	53551.7	53600.7	2	22
ICRF J074533.0 + 101112	0742 + 103	07 45 33.05952141	10 11 12.6923363	0.00000293	0.0000496	−0.144	49177.2	44773.8	52900.7	315	10174
ICRF J074640.4 + 273459	0743 + 277	07 46 40.43230698	27 34 59.0473025	0.00000716	0.0001609	−0.106	53573.1	50219.8	54893.7	5	244
ICRF J075000.3 + 182311	0747 + 185	07 50 00.32994173	18 23 11.4071030	0.00000816	0.0001914	−0.275	52330.5	50085.5	54858.7	7	352
ICRF J075020.4 + 481453	0746 + 483	07 50 20.43631328	48 14 53.5564020	0.00002352	0.0002894	0.101	50743.5	50306.3	53609.2	2	68
ICRF J075301.3 + 535259	0749 + 540	07 53 01.38456785	53 52 59.6370745	0.00000466	0.0000414	−0.015	52216.3	45775.8	54903.8	823	62749

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J075706.6 + 095634	0754 + 100	07 57 06.64294682	09 56 34.8523471	0.00000326	0.0000627	−0.058	52622.1	46502.8	54893.7	33	1557
ICRF J075828.1 + 374711	0755 + 379	07 58 28.10815179	37 47 11.8073127	0.00003050	0.0004548	−0.427	52028.7	51246.6	52409.7	3	88
ICRF J080634.0 − 711215	0806 − 710	08 06 34.09421169	−71 12 15.7442432	0.00011774	0.0007247	0.330	54336.6	52887.6	54457.4	2	13
ICRF J080705.3 − 153125	0804 − 153	08 07 05.30898008	−15 31 25.3814107	0.00001248	0.0004318	−0.356	54559.7	54559.7	54559.7	1	81
ICRF J080815.5 − 075109	0805 − 077	08 08 15.53603615	−07 51 09.8862880	0.00000440	0.0001082	−0.282	51384.9	47176.5	54643.7	35	620
ICRF J080907.3 − 153246	0806 − 153	08 09 07.39183469	−15 32 46.8750413	0.00006047	0.0015367	0.064	54559.7	54559.7	54559.7	1	37
ICRF J081108.8 − 492943	0809 − 493	08 11 08.80324937	−49 29 43.5082590	0.00069484	0.0036424	0.324	50295.2	48043.8	52878.7	3	10
ICRF J081522.9 + 015459	0812 + 020	08 15 22.96083908	01 54 59.4805839	0.00001534	0.0005711	−0.500	54125.8	54125.8	54125.8	1	51
ICRF J082057.4 − 125859	0818 − 128	08 20 57.44761533	−12 58 59.1690971	0.00000600	0.0000877	−0.073	51944.3	49482.7	54907.7	37	633
ICRF J082120.5 − 580018	0820 − 578	08 21 20.52743955	−58 00 18.7511324	0.00005743	0.0010419	0.543	54723.8	54723.8	54723.8	1	6
ICRF J082433.0 + 243843	0821 + 248	08 24 33.00929523	24 38 43.1158404	0.00001558	0.0004512	−0.222	50741.4	50085.5	53609.2	3	204
ICRF J082447.2 + 555242	0820 + 560	08 24 47.23635309	55 52 42.6693506	0.00000549	0.0000453	−0.076	50647.9	46977.9	54803.7	79	4299
ICRF J082455.4 + 391641	0821 + 394	08 24 55.48385101	39 16 41.9040901	0.00000454	0.0000613	−0.070	51849.1	48194.7	54641.7	29	1151
ICRF J082511.8 + 133232	0822 + 137	08 25 11.89094406	13 32 32.5386869	0.00000727	0.0002094	−0.005	50995.7	50085.5	52009.7	4	301
ICRF J082526.8 − 501038	0823 − 500	08 25 26.86891686	−50 10 38.4881440	0.00019548	0.0013026	−0.575	50064.8	48162.4	53569.1	6	33
ICRF J082538.6 + 615728	0821 + 621	08 25 38.61219308	61 57 28.5793037	0.00001065	0.0000668	0.187	51302.8	49422.9	52543.7	15	1074
ICRF J082601.5 − 223027	0823 − 223	08 26 01.57293454	−22 30 27.2032544	0.00000974	0.0003104	−0.346	50854.7	46875.8	52306.7	9	197
ICRF J082804.7 − 373106	0826 − 373	08 28 04.78022012	−37 31 06.2809892	0.00000739	0.0001235	0.013	52669.1	47640.2	54684.7	53	564
ICRF J083109.1 − 222826	0828 − 222	08 31 09.14902512	−22 28 26.8041417	0.00012083	0.0033034	0.587	54278.7	54278.7	54278.7	1	27
ICRF J083148.8 + 042939	0829 + 046	08 31 48.87695516	04 29 39.0859429	0.00000392	0.0000732	0.001	52300.5	48649.8	54845.7	36	1304
ICRF J083223.2 + 491321	0828 + 493	08 32 23.21671411	49 13 21.0382485	0.00000652	0.0000685	0.089	51711.5	44343.6	54818.7	34	955
ICRF J083322.3 − 444138	0831 − 445	08 33 22.31576136	−44 41 38.7156450	0.00062448	0.0037702	−0.262	49027.6	48043.8	49895.6	6	15
ICRF J083454.9 + 553421	0831 + 557	08 34 54.90395243	55 34 21.0703658	0.00002110	0.0001512	−0.058	51879.7	47931.6	54844.7	22	588
ICRF J083700.3 − 340914	0835 − 339	08 37 00.31666672	−34 09 14.8586397	0.00027126	0.0099326	−0.868	53978.7	53978.7	53978.7	1	69
ICRF J083722.4 + 582501	0833 + 585	08 37 22.40966142	58 25 01.8449433	0.00000745	0.0000584	−0.019	51786.5	46977.9	54627.7	33	1140
ICRF J083740.2 + 245423	0834 + 250	08 37 40.24568630	24 54 23.1217065	0.00000546	0.0001146	−0.353	51946.3	50219.8	53609.2	5	393
ICRF J083915.8 + 285038	0836 + 290	08 39 15.82765836	28 50 38.8030216	0.00001429	0.0004474	−0.044	52886.4	51297.8	53068.7	2	68
ICRF J083930.7 + 180247	0836 + 182	08 39 30.72136647	18 02 47.1427585	0.00001457	0.0003528	−0.633	51211.2	50085.5	52543.7	5	246
ICRF J084047.5 + 131223	0838 + 133	08 40 47.58841798	13 12 23.5641152	0.00000694	0.0001935	−0.272	52752.4	52409.7	53609.2	2	126
ICRF J084124.3 + 705342	0836 + 710	08 41 24.36526906	70 53 42.1730054	0.00000937	0.0000465	0.081	52414.1	46977.9	54818.7	25	3172
ICRF J084127.0 − 754027	0842 − 754	08 41 27.03605311	−75 40 27.8733636	0.00011251	0.0004736	0.043	52282.7	48110.9	54457.4	3	23
ICRF J084205.0 + 183540	0839 + 187	08 42 05.09417058	18 35 40.9905528	0.00000444	0.0001030	0.107	51365.9	47875.8	54901.7	36	1097
ICRF J085009.6 − 121335	0847 − 120	08 50 09.63562185	−12 13 35.3758201	0.00000741	0.0002534	0.043	53991.0	53134.5	54901.7	7	163
ICRF J085441.9 + 575729	0850 + 581	08 54 41.99641123	57 57 29.9390674	0.00000774	0.0000702	−0.113	51981.0	48720.9	54648.7	19	1158
ICRF J085511.7 − 714906	0855 − 716	08 55 11.76992253	−71 49 06.4575254	0.00007762	0.0004436	0.147	54723.8	54723.8	54723.8	1	9

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J085657.2 + 211143	0854 + 213	08 56 57.24476019	21 11 43.6582896	0.00000610	0.0001173	−0.089	51426.1	50085.5	52009.7	4	446
ICRF J090216.8 − 141530	0859 − 140	09 02 16.83091664	−14 15 30.8751032	0.00000442	0.0000817	−0.202	52381.1	46875.8	54818.7	42	861
ICRF J090303.9 + 465104	0859 + 470	09 03 03.99009765	46 51 04.1374256	0.00000478	0.0000593	−0.048	51946.7	47005.8	54858.7	125	1949
ICRF J090353.1 + 675722	0859 + 681	09 03 53.15507857	67 57 22.6858748	0.00003128	0.0002541	0.296	50728.8	49827.5	54664.7	2	161
ICRF J090453.1 − 573505	0903 − 573	09 04 53.17928113	−57 35 05.7821238	0.00006070	0.0008027	0.144	53626.4	52887.6	54457.4	4	34
ICRF J090910.0 + 012135	0906 + 015	09 09 10.09159984	01 21 35.6177502	0.00000654	0.0001503	−0.162	50031.3	47005.8	53552.8	29	419
ICRF J090917.0 − 050052	0906 − 048	09 09 17.00358570	−05 00 52.8937365	0.00012456	0.0033116	−0.422	54314.7	54314.7	54314.7	1	22
ICRF J090939.8 + 020005	0907 + 022	09 09 39.84790584	02 00 05.2664920	0.00004571	0.0007669	−0.200	51120.1	49914.7	54643.7	2	51
ICRF J091552.4 + 293324	0912 + 297	09 15 52.40163935	29 33 24.0430020	0.00001202	0.0002793	0.074	51454.2	48194.7	54489.7	17	397
ICRF J091755.5 + 653015	0913 + 657	09 17 55.56762054	65 30 15.1091017	0.00158674	0.0108167	0.245	54440.7	54440.7	54440.7	1	5
ICRF J092043.1 − 295630	0918 − 297	09 20 43.19379503	−29 56 30.2932472	0.00001836	0.0006948	−0.224	54489.7	54489.7	54489.7	1	65
ICRF J092058.4 + 444153	0917 + 449	09 20 58.45848243	44 41 53.9850927	0.00000446	0.0000540	−0.077	52600.9	46977.9	54803.7	51	1790
ICRF J092129.3 − 261843	0919 − 260	09 21 29.35385535	−26 18 43.3861684	0.00005561	0.0013675		50206.8	46840.5	53573.1	382	10351
ICRF J092136.2 + 621552	0917 + 624	09 21 36.23106854	62 15 52.1803472	0.00000623	0.0000439	−0.137	51402.7	44343.6	54830.7	144	6910
ICRF J092703.0 + 390220	0923 + 392	09 27 03.01393281	39 02 20.8518566	0.00002885	0.0002387		49497.1	44090.1	54904.0	3579	216162
ICRF J092915.4 + 501335	0925 + 504	09 29 15.44020036	50 13 35.9897722	0.00001139	0.0001666	0.072	49962.4	49577.0	53306.8	3	221
ICRF J093032.5 − 853359	0936 − 853	09 30 32.57014658	−85 33 59.6921151	0.00219357	0.0028702	0.013	50279.8	48162.4	54457.4	5	20
ICRF J093035.0 + 464408	0927 + 469	09 30 35.08083051	46 44 08.6565353	0.00011090	0.0010022	0.174	53923.7	50306.3	54314.7	2	41
ICRF J093052.2 + 003458	0928 + 008	09 30 52.25354221	00 34 58.9413083	0.00002234	0.0009697	−0.540	50344.6	49914.7	54482.7	2	85
ICRF J094014.7 + 260329	0937 + 262	09 40 14.72277430	26 03 29.9461491	0.00001103	0.0002832	−0.017	50563.1	50219.8	53306.8	3	72
ICRF J094113.5 + 114532	0938 + 119	09 41 13.55872676	11 45 32.3387305	0.00022698	0.0022847	0.652	54292.7	54292.7	54292.7	1	15
ICRF J094314.5 + 615033	0939 + 620	09 43 14.50284956	61 50 33.3487942	0.00018862	0.0013010	−0.021	54440.7	54440.7	54440.7	1	19
ICRF J094538.1 + 353455	0942 + 358	09 45 38.12070861	35 34 55.0885113	0.00000809	0.0001378	−0.093	50568.2	50242.8	50854.6	2	188
ICRF J094635.0 + 101706	0943 + 105	09 46 35.06993408	10 17 06.1340434	0.00001064	0.0003647	0.212	52034.0	49914.7	54845.7	6	233
ICRF J094855.3 + 403944	0945 + 408	09 48 55.33815234	40 39 44.5869810	0.00000454	0.0000587	−0.122	52175.4	47931.6	54664.7	28	1320
ICRF J095439.7 + 263924	0951 + 268	09 54 39.79651721	26 39 24.5434066	0.00000853	0.0002126	0.130	53527.2	50219.8	54872.7	6	255
ICRF J095456.8 + 174331	0952 + 179	09 54 56.82361250	17 43 31.2222114	0.00000369	0.0000721	−0.052	51797.0	48158.8	54713.7	56	1286
ICRF J095524.7 + 690113	0951 + 692	09 55 24.77476250	69 01 13.7025453	0.00009325	0.0005898	0.117	49238.5	49225.8	49267.8	3	97
ICRF J095533.1 + 690355	0951 + 693	09 55 33.17306143	69 03 55.0609270	0.00001329	0.0000636	0.307	51318.5	49141.8	54601.7	75	2049
ICRF J095622.6 + 575355	0952 + 581	09 56 22.63444244	57 53 55.9043694	0.00007916	0.0005903	−0.029	49965.3	49577.0	50974.8	2	36
ICRF J095649.8 + 251516	0953 + 254	09 56 49.87537334	25 15 16.0499070	0.00003955	0.0005585		49668.4	44446.9	54890.0	857	24823
ICRF J095738.1 + 552257	0954 + 556	09 57 38.18456305	55 22 57.7686853	0.00016052	0.0014551	0.248	50466.4	49577.0	50989.8	3	46
ICRF J100111.9 + 342450	0958 + 346	10 01 11.94919908	34 24 50.4594476	0.00000691	0.0001299	0.076	53679.7	50219.8	54901.7	7	286
ICRF J100159.9 − 443800	0959 − 443	10 01 59.90841721	−44 38 00.6002464	0.00008296	0.0018087	−0.608	51102.0	48043.8	52409.7	5	26
ICRF J100601.7 + 345410	1003 + 351	10 06 01.75030199	34 54 10.4005583	0.00003894	0.0006632	0.080	54314.7	54314.7	54314.7	1	46

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J100604.1 − 740944	1005 − 739	10 06 04.14541874	−74 09 44.0875327	0.00010796	0.0005069	−0.011	53625.5	52887.6	54457.4	4	25
ICRF J100646.4 − 215920	1004 − 217	10 06 46.41368826	−21 59 20.4100145	0.00000858	0.0002217	−0.035	52123.1	50632.3	54901.7	8	222
ICRF J100741.4 + 135629	1004 + 141	10 07 41.49808563	13 56 29.6008672	0.00000318	0.0000523	−0.182	50987.6	47011.4	54718.7	315	4234
ICRF J101329.9 + 491840	1010 + 495	10 13 29.93231208	49 18 40.9849091	0.00074925	0.0181200	−0.894	52978.6	50306.3	54314.7	2	9
ICRF J101353.4 + 244916	1011 + 250	10 13 53.42876682	24 49 16.4407698	0.00000396	0.0000612	0.025	52292.6	48353.6	54725.7	34	1228
ICRF J101450.3 − 450841	1012 − 448	10 14 50.35495501	−45 08 41.1541762	0.00001637	0.0002949	0.370	53303.9	52306.7	54726.7	23	153
ICRF J101544.0 + 122707	1013 + 127	10 15 44.02338392	12 27 07.0703545	0.00000805	0.0002343	−0.188	51975.0	49914.7	54802.7	4	208
ICRF J101644.3 + 203747	1013 + 208	10 16 44.32210619	20 37 47.3054173	0.00000707	0.0001922	−0.089	51696.2	50085.5	54643.7	6	369
ICRF J101827.8 + 053029	1015 + 057	10 18 27.84827731	05 30 29.9620564	0.00000577	0.0001019	0.069	52764.1	49914.7	54907.7	8	332
ICRF J101828.7 − 312353	1016 − 311	10 18 28.75348320	−31 23 53.8492324	0.00001087	0.0001707	0.008	53311.9	52306.7	54741.8	26	254
ICRF J102202.0 + 412605	1019 + 416	10 22 02.02347866	41 26 05.3726239	0.00004190	0.0004646	−0.404	54187.7	54187.7	54187.7	1	51
ICRF J102311.5 + 394815	1020 + 400	10 23 11.56566179	39 48 15.3854217	0.00000468	0.0000690	−0.175	51582.0	46977.9	54739.7	27	1238
ICRF J102429.5 − 005255	1021 − 006	10 24 29.58667910	−00 52 55.4968353	0.00011006	0.0019461		49620.4	48664.3	50576.4	10	336
ICRF J102556.2 + 125349	1023 + 131	10 25 56.28536996	12 53 49.0220104	0.00000433	0.0000794	−0.209	51996.0	50085.5	53761.7	80	744
ICRF J102838.7 − 084438	1026 − 084	10 28 38.79633263	−08 44 38.5326713	0.00011402	0.0034669	−0.274	51559.4	51169.7	54482.7	2	17
ICRF J102933.0 − 185250	1027 − 186	10 29 33.09769988	−18 52 50.2888389	0.00000839	0.0001750	−0.314	52802.8	50632.3	54907.7	11	283
ICRF J103502.1 − 201134	1032 − 199	10 35 02.15530220	−20 11 34.3595425	0.00000457	0.0000741	−0.125	52857.1	47176.5	54741.8	57	1032
ICRF J103507.0 + 562846	1031 + 567	10 35 07.03999665	56 28 46.7960909	0.00003188	0.0002534	0.464	50327.4	47285.7	53059.7	17	216
ICRF J104117.1 + 061016	1038 + 064	10 41 17.16249895	06 10 16.9236835	0.00000342	0.0000672	−0.192	51880.3	47568.6	54810.7	61	1506
ICRF J104148.8 + 523355	1038 + 529	10 41 48.89763371	52 33 55.6081511	0.00004830	0.0004101	−0.361	49683.5	48650.8	53411.8	20	84
ICRF J104244.6 + 120331	1040 + 123	10 42 44.60522539	12 03 31.2636114	0.00000729	0.0001258	−0.056	50999.3	47659.7	54172.7	23	352
ICRF J104309.0 + 240835	1040 + 244	10 43 09.03576998	24 08 35.4093695	0.00000470	0.0000948	−0.065	53963.5	50219.8	54830.7	9	521
ICRF J104552.7 + 062436	1043 + 066	10 45 52.73328577	06 24 36.4523288	0.00001599	0.0005793	−0.614	50082.4	49914.7	51288.7	7	131
ICRF J104742.9 − 621714	1045 − 620	10 47 42.95227474	−62 17 14.6339610	0.00011302	0.0041450	−0.503	52870.0	52861.2	52872.9	2	4
ICRF J104827.6 + 714335	1044 + 719	10 48 27.61991250	71 43 35.9384312	0.00003472	0.0002741		51503.7	48103.4	54904.0	1032	111663
ICRF J104838.2 − 411400	1046 − 409	10 48 38.27117353	−41 14 00.1158878	0.00002359	0.0006876	−0.126	54529.6	54489.7	54723.8	2	47
ICRF J104921.8 − 223107	1046 − 222	10 49 21.86917781	−22 31 07.5098479	0.00006298	0.0023039	−0.820	54657.8	54657.8	54657.8	1	32
ICRF J104946.3 + 142938	1047 + 147	10 49 46.32758343	14 29 38.5738701	0.00001493	0.0003646	−0.311	54549.1	54112.8	54559.7	2	84
ICRF J105038.0 − 524948	1048 − 526	10 50 38.02847005	−52 49 48.3280622	0.00003979	0.0009358	0.400	54723.8	54723.8	54723.8	1	9
ICRF J105045.2 − 725432	1049 − 726	10 50 45.24980065	−72 54 32.3101736	0.00007306	0.0005033	0.252	54723.8	54723.8	54723.8	1	9
ICRF J105104.7 − 313814	1048 − 313	10 51 04.77752781	−31 38 14.3074730	0.00001135	0.0001201	−0.235	52852.4	47640.2	54741.8	29	343
ICRF J105123.5 − 651808	1049 − 650	10 51 23.52119273	−65 18 08.6246930	0.00052247	0.0025355	−0.110	53260.6	52887.6	54457.4	4	20
ICRF J105653.6 + 701145	1053 + 704	10 56 53.61750690	70 11 45.9156324	0.00000933	0.0000484	0.022	52247.9	49125.7	54907.7	48	2751
ICRF J105715.7 + 001203	1054 + 004	10 57 15.76745181	00 12 03.5763691	0.00007839	0.0016269	0.479	54278.7	54278.7	54278.7	1	33
ICRF J105800.4 − 302455	1055 − 301	10 58 00.42741563	−30 24 55.0270981	0.00001381	0.0002710	0.108	53600.8	53126.1	54684.7	12	95

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J105817.9 + 195150	1055 + 201	10 58 17.90083209	19 51 50.8698537	0.00001575	0.0003369	−0.080	50838.6	50085.5	54664.7	3	198
ICRF J105843.3 − 800354	1057 − 797	10 58 43.30977041	−80 03 54.1597166	0.00001730	0.0000446	−0.001	52085.5	47626.5	54907.7	573	6427
ICRF J105939.0 + 205721	1056 + 212	10 59 39.04268818	20 57 21.9559644	0.00001025	0.0002575	−0.223	51553.3	50085.5	54818.7	7	266
ICRF J110148.8 + 722537	1058 + 726	11 01 48.80537029	72 25 37.1183787	0.00004795	0.0003586	0.236	49972.3	49827.5	51297.8	2	132
ICRF J110214.2 + 275708	1059 + 282	11 02 14.28846457	27 57 08.6894474	0.00000811	0.0001528	−0.365	53254.6	50219.8	54858.7	6	271
ICRF J110303.5 + 115816	1100 + 122	11 03 03.52984202	11 58 16.6242581	0.00000840	0.0002256	0.116	53644.4	53126.1	54872.7	5	141
ICRF J110331.5 − 325116	1101 − 325	11 03 31.52641727	−32 51 16.6936884	0.00001380	0.0002005	−0.110	52904.1	47640.2	54684.7	26	172
ICRF J110708.6 − 444907	1104 − 445	11 07 08.69413960	−44 49 07.6185470	0.00000536	0.0000698	−0.124	49790.3	47626.5	54837.7	312	2042
ICRF J110712.6 − 682050	1105 − 680	11 07 12.69516327	−68 20 50.7272337	0.00003143	0.0002206	0.471	52575.7	48388.4	54726.7	24	137
ICRF J110741.7 + 723236	1104 + 728	11 07 41.72259656	72 32 36.0049449	0.00003934	0.0002051	−0.232	50879.3	49827.5	51927.8	9	72
ICRF J111036.3 + 481752	1107 + 485	11 10 36.32378471	48 17 52.4498407	0.00026186	0.0055869	0.439	52883.2	50306.3	54314.7	2	14
ICRF J111207.2 − 570339	1109 − 567	11 12 07.26958812	−57 03 39.7448286	0.00063962	0.0044940	−0.506	53660.3	52676.7	54457.4	4	8
ICRF J111826.9 − 463415	1116 − 462	11 18 26.95767382	−46 34 15.0012464	0.00001770	0.0002107	0.144	52605.4	48110.9	54706.7	33	135
ICRF J111857.3 + 123441	1116 + 128	11 18 57.30143101	12 34 41.7181417	0.00000368	0.0000722	−0.109	52235.6	47274.8	54489.7	53	1189
ICRF J112016.1 − 271906	1117 − 270	11 20 16.19175470	−27 19 06.3655283	0.00001543	0.0003803	−0.092	51201.4	50688.3	54664.7	2	62
ICRF J112027.8 + 142054	1117 + 146	11 20 27.80630398	14 20 54.9913295	0.00024090	0.0029047	−0.695	51662.7	49098.6	54440.7	6	26
ICRF J112229.7 + 180526	1119 + 183	11 22 29.71148406	18 05 26.3432857	0.00000716	0.0001565	−0.051	51902.2	50085.5	54125.8	4	337
ICRF J112402.7 + 233645	1121 + 238	11 24 02.70587619	23 36 45.8703380	0.00001535	0.0002442	−0.242	50631.0	50085.5	53314.8	10	137
ICRF J112740.1 + 565014	1124 + 571	11 27 40.13516072	56 50 14.7952187	0.00005023	0.0005192	0.235	51125.2	49577.0	54643.7	2	72
ICRF J112758.8 + 362028	1125 + 366	11 27 58.87081972	36 20 28.3514308	0.00001180	0.0002408	−0.193	52390.1	50242.8	54803.7	4	166
ICRF J112813.3 + 592514	1125 + 596	11 28 13.34067563	59 25 14.7986127	0.00001264	0.0001032	0.175	50696.6	49422.9	51393.6	5	477
ICRF J112931.7 − 443549	1127 − 443	11 29 31.72202175	−44 35 49.9378051	0.00006262	0.0016998	0.327	54723.8	54723.8	54723.8	1	7
ICRF J113007.0 − 144927	1127 − 145	11 30 07.05259287	−14 49 27.3881476	0.00000537	0.0000971	−0.089	50950.7	45259.2	54741.8	54	603
ICRF J113130.5 − 050019	1128 − 047	11 31 30.51674811	−05 00 19.6575660	0.00000938	0.0002830	−0.068	50472.7	49099.7	53185.7	9	266
ICRF J113143.2 − 581853	1129 − 580	11 31 43.28798551	−58 18 53.4435576	0.00001995	0.0001989	0.438	53766.6	49535.0	54726.7	18	115
ICRF J113219.1 − 742509	1130 − 741	11 32 19.11009277	−74 25 09.0232305	0.00013937	0.0006867	0.594	54723.8	54723.8	54723.8	1	9
ICRF J113411.4 + 724920	1131 + 730	11 34 11.40778994	72 49 20.0530464	0.00021273	0.0020557	0.666	50215.4	49827.5	54482.7	2	60
ICRF J113609.6 − 741545	1134 − 739	11 36 09.65979524	−74 15 45.2743083	0.00012199	0.0004927	0.317	53633.8	52887.6	54457.4	4	21
ICRF J113626.4 + 700927	1133 + 704	11 36 26.40841911	70 09 27.3070674	0.00003945	0.0001859	0.111	51643.1	49827.5	54088.1	13	185
ICRF J114505.0 + 193622	1142 + 198	11 45 05.00904409	19 36 22.7414177	0.00000911	0.0002615	0.138	52013.3	50386.8	53153.2	17	274
ICRF J114521.3 + 045526	1142 + 052	11 45 21.31518022	04 55 26.6888184	0.00001717	0.0004512	−0.104	52422.7	49914.7	54643.7	3	115
ICRF J114522.0 − 225031	1142 − 225	11 45 22.04679845	−22 50 31.3430261	0.00002112	0.0005717	−0.232	50826.8	50632.3	54482.7	3	93
ICRF J114608.1 − 244732	1143 − 245	11 46 08.10331081	−24 47 32.8963878	0.00000546	0.0000945	−0.092	52757.1	47640.2	54741.8	39	844
ICRF J114626.1 − 285918	1143 − 287	11 46 26.18858241	−28 59 18.5044265	0.00001009	0.0001926	−0.031	53131.5	50688.3	54741.8	18	154
ICRF J114626.9 + 584834	1143 + 590	11 46 26.91166115	58 48 34.2635507	0.00004471	0.0004086	0.119	51088.2	49577.0	54664.7	2	101

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J114628.4 − 332842	1143 − 332	11 46 28.45179042	−33 28 42.6307941	0.00004155	0.0015205	−0.128	54314.7	54314.7	54314.7	1	38
ICRF J114722.1 + 350107	1144 + 352	11 47 22.13055824	35 01 07.5224972	0.00002715	0.0003862	−0.136	50371.0	50242.8	51184.8	4	64
ICRF J114759.7 + 263542	1145 + 268	11 47 59.76390016	26 35 42.3326801	0.00000531	0.0001219	0.062	53583.0	50219.8	54901.7	8	330
ICRF J114850.3 + 592456	1146 + 596	11 48 50.35823538	59 24 56.3819632	0.00003754	0.0002868	−0.411	50875.8	49577.0	51787.8	7	120
ICRF J115031.5 − 193049	1147 − 192	11 50 31.52711433	−19 30 49.5484484	0.00001150	0.0004071	−0.215	54559.7	54559.7	54559.7	1	80
ICRF J115043.8 − 002354	1148 − 001	11 50 43.87075084	−00 23 54.2054013	0.00000577	0.0001631	−0.158	50449.0	47285.7	52809.7	25	480
ICRF J115113.4 − 672811	1148 − 671	11 51 13.42650836	−67 28 11.0939707	0.00003198	0.0002764	0.320	51566.8	48043.8	54670.7	22	82
ICRF J115312.4 + 805829	1150 + 812	11 53 12.49919940	80 58 29.1545750	0.00001889	0.0000451	0.049	51881.4	44343.6	54781.7	87	4955
ICRF J115324.4 + 493108	1150 + 497	11 53 24.46663282	49 31 08.8301947	0.00000571	0.0000642	0.062	52510.9	47931.6	54655.7	22	1203
ICRF J115734.8 + 163859	1155 + 169	11 57 34.83627098	16 38 59.6500655	0.00001118	0.0001998	0.131	50548.3	50085.5	52779.7	4	214
ICRF J115825.7 + 245017	1155 + 251	11 58 25.78753020	24 50 17.9640837	0.00001351	0.0002689	−0.092	50909.5	48179.7	54214.7	19	320
ICRF J115912.7 − 094052	1156 − 094	11 59 12.71173477	−09 40 52.0488742	0.00001290	0.0002838	−0.356	50425.3	47777.3	53066.7	19	199
ICRF J115921.4 − 214244	1156 − 214	11 59 21.43254876	−21 42 44.9126151	0.00001162	0.0004006	−0.168	54559.7	54559.7	54559.7	1	77
ICRF J120301.0 + 063441	1200 + 068	12 03 01.01262534	06 34 41.5382943	0.00008131	0.0006817	0.030	50771.2	49914.7	54664.7	2	61
ICRF J120321.9 + 041419	1200 + 045	12 03 21.93494846	04 14 19.0937862	0.00003869	0.0007169	0.021	54125.8	54125.8	54125.8	1	41
ICRF J120331.7 + 463255	1200 + 468	12 03 31.79776780	46 32 55.5600336	0.00035065	0.0049289	−0.038	52978.6	50306.3	54314.7	2	9
ICRF J120637.0 + 394103	1204 + 399	12 06 37.05337256	39 41 03.7471562	0.00001639	0.0002603	−0.282	51609.6	50242.8	54664.7	2	110
ICRF J120712.6 + 121145	1204 + 124	12 07 12.62454414	12 11 45.8466332	0.00001726	0.0002958	0.059	50840.0	49914.7	53220.7	4	111
ICRF J120902.4 − 240620	1206 − 238	12 09 02.44511625	−24 06 20.7588617	0.00001126	0.0003358	0.060	50943.0	50632.3	54643.7	3	155
ICRF J120935.2 − 401613	1206 − 399	12 09 35.24365190	−40 16 13.0977007	0.00006232	0.0019065	0.425	51861.8	48043.8	53134.5	2	20
ICRF J121256.0 + 192547	1210 + 197	12 12 56.09590136	19 25 47.0163926	0.00007522	0.0006449	−0.120	50972.5	50085.5	54643.7	3	70
ICRF J121459.9 + 082922	1212 + 087	12 14 59.91317592	08 29 22.5178005	0.00009578	0.0017055	0.357	50212.6	49914.7	54482.7	2	46
ICRF J121503.9 + 165437	1212 + 171	12 15 03.97914173	16 54 37.9570703	0.00000736	0.0001386	0.107	52400.2	50085.5	54816.7	8	320
ICRF J121555.6 + 344815	1213 + 350	12 15 55.60104196	34 48 15.2206760	0.00000498	0.0000794	−0.118	52159.9	48194.7	54725.7	29	1101
ICRF J121806.2 − 460029	1215 − 457	12 18 06.25225797	−46 00 29.0103400	0.00097403	0.0075955	−0.836	48746.5	48162.4	49330.5	2	6
ICRF J121906.4 + 482956	1216 + 487	12 19 06.41474411	48 29 56.1648065	0.00000596	0.0000613	−0.008	51616.5	46977.9	54620.7	27	1213
ICRF J121923.2 + 054929	1216 + 061	12 19 23.21607184	05 49 29.7000920	0.00002290	0.0004395	0.005	53502.0	50303.8	54125.8	3	79
ICRF J122011.8 + 020342	1217 + 023	12 20 11.88458571	02 03 42.2252454	0.00002106	0.0002186	0.073	50635.9	49914.7	53108.7	5	101
ICRF J122033.8 + 334312	1218 + 339	12 20 33.87554894	33 43 12.0378310	0.00019218	0.0053833	0.359	54278.7	54278.7	54278.7	1	10
ICRF J122131.6 + 281358	1219 + 285	12 21 31.69051570	28 13 58.5001957	0.00000529	0.0000905	−0.164	50442.1	44447.0	54739.7	50	753
ICRF J122452.4 + 033050	1222 + 037	12 24 52.42193774	03 30 50.2929645	0.00000539	0.0001292	−0.188	49973.3	46502.8	51499.8	67	608
ICRF J122454.3 − 831310	1221 − 829	12 24 54.38185745	−83 13 10.1013254	0.00243804	0.0047873	−0.110	50792.5	48043.8	54457.4	2	7
ICRF J122454.4 + 212246	1222 + 216	12 24 54.45840915	21 22 46.3887632	0.00000753	0.0002020	−0.316	51154.9	50085.5	53552.8	5	386
ICRF J122503.7 + 125313	1222 + 131	12 25 03.74333371	12 53 13.1392769	0.00000543	0.0002004	0.009	52851.6	50303.8	54713.7	27	499
ICRF J122635.2 − 190438	1223 − 188	12 26 35.27696944	−19 04 38.5331170	0.00001459	0.0005455	−0.383	54575.9	54559.7	54601.7	2	91

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J122836.9 − 030439	1226 − 028	12 28 36.91730059	−03 04 39.3116725	0.00001955	0.0005900	−0.104	51667.2	50526.8	53131.8	6	133
ICRF J122906.6 + 020308	1226 + 023	12 29 06.69973077	02 03 08.5982771	0.00009614	0.0019494		48925.9	44090.1	53761.7	1047	26684
ICRF J123049.4 + 122328	1228 + 126	12 30 49.42338230	12 23 28.0438581	0.00000282	0.0000430	−0.094	52501.6	46502.8	54903.8	1109	31747
ICRF J123055.5 − 113909	1228 − 113	12 30 55.55591732	−11 39 09.7965406	0.00004444	0.0013067	−0.485	50624.4	50576.2	51297.8	2	45
ICRF J123505.8 + 362119	1232 + 366	12 35 05.80646026	36 21 19.3213947	0.00002862	0.0004657	−0.345	50713.9	50242.8	54482.7	2	81
ICRF J123715.2 − 504623	1234 − 504	12 37 15.23907769	−50 46 23.1751136	0.00114205	0.0041733	−0.702	50432.5	48766.9	52941.7	4	13
ICRF J123943.0 − 102328	1237 − 101	12 39 43.06147929	−10 23 28.6925079	0.00000361	0.0000684	0.004	52645.9	49398.5	54887.7	40	1436
ICRF J123946.6 − 684530	1236 − 684	12 39 46.65138604	−68 45 30.8925726	0.00004205	0.0002813	−0.330	51914.7	48043.8	54706.7	19	62
ICRF J123959.4 − 113722	1237 − 113	12 39 59.43186287	−11 37 22.9964165	0.00004959	0.0021014	−0.817	50667.0	49883.8	53552.8	14	40
ICRF J124127.7 + 545819	1239 + 552	12 41 27.70389624	54 58 19.0577051	0.00032552	0.0041013	0.154	54440.7	54440.7	54440.7	1	8
ICRF J124129.5 + 602041	1239 + 606	12 41 29.59058112	60 20 41.3223094	0.00005485	0.0004419	−0.470	52239.0	49577.0	54112.8	6	76
ICRF J124209.8 + 372005	1239 + 376	12 42 09.81238342	37 20 05.6927165	0.00001101	0.0002085	−0.014	51345.3	50168.7	52991.8	12	218
ICRF J124357.6 + 162253	1241 + 166	12 43 57.64921054	16 22 53.3935688	0.00002587	0.0006660	−0.299	54314.7	54314.7	54314.7	1	57
ICRF J124410.8 + 172104	1241 + 176	12 44 10.82443172	17 21 04.5137231	0.00067859	0.0118022	−0.916	53818.0	53719.8	54112.8	2	8
ICRF J124553.7 − 161645	1243 − 160	12 45 53.74227766	−16 16 45.7046787	0.00000731	0.0001914	−0.003	52610.9	50632.3	54795.7	3	192
ICRF J124828.4 − 455947	1245 − 457	12 48 28.49515640	−45 59 47.1799598	0.00001521	0.0002924	0.391	53691.6	53018.7	54670.7	13	71
ICRF J124850.9 + 483953	1246 + 489	12 48 50.94801563	48 39 53.1542241	0.00066969	0.0141331	0.698	52087.9	50306.3	54314.7	2	9
ICRF J125359.5 − 405930	1251 − 407	12 53 59.53360367	−40 59 30.6873600	0.00014482	0.0044810	0.490	51285.3	49650.8	53134.5	5	17
ICRF J125437.2 − 200056	1251 − 197	12 54 37.25564698	−20 00 56.4087996	0.00002567	0.0009784	−0.429	54489.7	54489.7	54489.7	1	57
ICRF J125611.1 − 054721	1253 − 055	12 56 11.16656541	−05 47 21.5247030	0.00007102	0.0012656		47333.2	44090.1	50576.4	203	4891
ICRF J125614.2 + 565225	1254 + 571	12 56 14.23393227	56 52 25.2371251	0.00003235	0.0004261	−0.025	50741.7	49690.0	51246.6	2	74
ICRF J125759.0 − 315516	1255 − 316	12 57 59.06081737	−31 55 16.8516980	0.00000356	0.0000494	0.097	52324.3	47640.2	54893.7	725	6171
ICRF J125838.3 − 180003	1255 − 177	12 58 38.30170441	−18 00 03.1244074	0.00000679	0.0001241	−0.062	52912.0	50632.3	54901.7	9	177
ICRF J125854.4 − 221931	1256 − 220	12 58 54.47877943	−22 19 31.1249780	0.00000700	0.0002293	−0.168	52015.6	50632.3	53609.2	3	283
ICRF J130020.9 + 141718	1257 + 145	13 00 20.91881952	14 17 18.5316703	0.00000653	0.0001152	0.047	52803.1	48804.9	54648.7	35	605
ICRF J130042.4 − 325312	1257 − 326	13 00 42.42601137	−32 53 12.1133944	0.00002293	0.0007954	0.054	53007.0	52306.7	53411.8	3	88
ICRF J130533.0 − 103319	1302 − 102	13 05 33.01503417	−10 33 19.4280396	0.00000452	0.0001089	−0.218	51423.6	47176.5	54613.5	72	853
ICRF J130823.7 + 354637	1306 + 360	13 08 23.70914047	35 46 37.1639586	0.00000675	0.0001343	0.055	53679.6	52409.7	54907.7	7	246
ICRF J130838.1 − 825934	1303 − 827	13 08 38.19452054	−82 59 34.7944422	0.00165425	0.0043058	−0.029	53312.1	52887.6	54457.4	4	18
ICRF J130933.9 + 115424	1307 + 121	13 09 33.93245071	11 54 24.5531525	0.00000369	0.0000642	0.094	52210.2	49099.7	53824.7	114	1334
ICRF J131028.6 + 322043	1308 + 326	13 10 28.66384822	32 20 43.7829398	0.00002143	0.0002878		49839.0	44774.0	54904.0	2046	107498
ICRF J131103.2 + 551354	1308 + 554	13 11 03.21082487	55 13 54.3223262	0.00001721	0.0002347	−0.284	51953.3	49577.0	54893.7	8	133
ICRF J131736.4 + 342515	1315 + 346	13 17 36.49417645	34 25 15.9324898	0.00000517	0.0000902	0.091	52293.7	47946.4	54887.7	40	940
ICRF J131946.1 + 514805	1317 + 520	13 19 46.19809371	51 48 05.7774581	0.00006402	0.0004841	−0.084	52877.2	49577.0	54664.7	2	37
ICRF J132026.7 + 014036	1317 + 019	13 20 26.79485592	01 40 36.8116471	0.00001840	0.0005081	0.168	50393.6	49914.7	54643.7	2	79

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J132111.2 + 221612	1318 + 225	13 21 11.20255501	22 16 12.1084056	0.00000760	0.0001788	−0.041	50958.3	50085.5	53362.8	29	316
ICRF J132114.0 − 263610	1318 − 263	13 21 14.03691575	−26 36 10.4657985	0.00003434	0.0016085	−0.645	50778.5	50632.3	54664.7	3	100
ICRF J132304.2 − 445233	1320 − 446	13 23 04.24662605	−44 52 33.8541902	0.00026025	0.0027907	0.093	50479.4	48766.9	52409.7	6	32
ICRF J132351.5 + 794251	1323 + 799	13 23 51.56999732	79 42 51.8470584	0.00010943	0.0001847	0.015	51926.3	50688.3	54664.7	2	106
ICRF J132451.4 + 362242	1322 + 366	13 24 51.44115875	36 22 42.7741809	0.00016416	0.0048327	0.508	52445.7	51297.8	53134.5	2	8
ICRF J132527.6 − 430108	1322 − 427	13 25 27.61509104	−43 01 08.8056025	0.00003872	0.0007394	0.665	51173.6	48110.9	52409.7	8	72
ICRF J132616.5 + 315409	1323 + 321	13 26 16.51232948	31 54 09.5144454	0.00008016	0.0009922	−0.104	49489.4	48223.7	51386.3	8	97
ICRF J132649.2 − 525623	1323 − 527	13 26 49.22915127	−52 56 23.6332362	0.00003165	0.0007472	0.542	54723.8	54723.8	54723.8	1	12
ICRF J132905.8 + 500926	1327 + 504	13 29 05.80271123	50 09 26.4009666	0.00001192	0.0001528	−0.137	51768.6	49577.0	54901.7	7	296
ICRF J132952.8 + 315411	1327 + 321	13 29 52.86490560	31 54 11.0545488	0.00000423	0.0000719	−0.152	51607.4	50219.8	51883.6	2	488
ICRF J133011.0 − 700313	1326 − 697	13 30 11.07683211	−70 03 13.0779511	0.00005805	0.0003621	0.211	54723.8	54723.8	54723.8	1	16
ICRF J133037.6 + 250910	1328 + 254	13 30 37.69037604	25 09 10.8785630	0.00020728	0.0027253	−0.298	53496.3	52409.7	54187.7	2	18
ICRF J133108.2 + 303032	1328 + 307	13 31 08.28804901	30 30 32.9592518	0.00001954	0.0002606	0.253	51195.6	48787.9	53185.7	9	225
ICRF J133245.2 + 472222	1330 + 476	13 32 45.24642317	47 22 22.6676990	0.00000628	0.0000741	−0.131	51427.2	50306.3	53068.7	6	954
ICRF J133253.2 + 020045	1330 + 022	13 32 53.27053954	02 00 45.6995025	0.00000792	0.0002642	−0.350	54187.7	54187.7	54187.7	1	90
ICRF J133335.7 + 164904	1331 + 170	13 33 35.78263458	16 49 04.0148467	0.00001069	0.0002424	0.204	51043.4	50085.5	54643.7	4	280
ICRF J133634.0 − 152948	1333 − 152	13 36 34.08914571	−15 29 48.0704161	0.00001183	0.0004016	−0.265	54578.0	54559.7	54601.7	2	138
ICRF J133639.0 − 335757	1333 − 337	13 36 39.03275288	−33 57 57.0783023	0.00006659	0.0018822	−0.723	54489.7	54489.7	54489.7	1	37
ICRF J133749.6 + 550102	1335 + 552	13 37 49.64223536	55 01 02.1179278	0.00004882	0.0003838	0.129	50476.7	49577.0	54643.7	2	107
ICRF J133752.4 − 650924	1334 − 649	13 37 52.44517136	−65 09 24.8996051	0.00067986	0.0035312	−0.448	50236.1	48043.8	54457.4	3	13
ICRF J133919.8 − 262030	1336 − 260	13 39 19.89075991	−26 20 30.4955578	0.00001400	0.0004011	0.006	50901.5	50632.3	54643.7	3	165
ICRF J134013.3 − 033520	1337 − 033	13 40 13.30449743	−03 35 20.8035993	0.00022647	0.0023598	−0.502	54125.8	54125.8	54125.8	1	18
ICRF J134022.9 + 375443	1338 + 381	13 40 22.95181528	37 54 43.8334324	0.00001368	0.0002759	−0.222	51454.3	48942.5	52991.8	15	224
ICRF J134215.3 − 290041	1339 − 287	13 42 15.34561635	−29 00 41.8315406	0.00001756	0.0004489	−0.003	52065.4	50688.3	54818.7	4	130
ICRF J134649.0 − 602429	1343 − 601	13 46 49.04327124	−60 24 29.3552337	0.00036538	0.0015142	0.110	52991.2	52887.6	53138.8	4	22
ICRF J134733.3 + 121724	1345 + 125	13 47 33.36161542	12 17 24.2402572	0.00001072	0.0003382	−0.308	49912.4	47659.7	53193.7	12	189
ICRF J134934.6 + 534117	1347 + 539	13 49 34.65660955	53 41 17.0401780	0.00000628	0.0000633	−0.112	52039.0	47931.6	54713.7	26	1430
ICRF J135052.7 + 303453	1348 + 308	13 50 52.73621029	30 34 53.5904749	0.00000956	0.0001726	−0.110	53057.8	50219.8	54852.7	6	252
ICRF J135446.5 − 104102	1352 − 104	13 54 46.51868791	−10 41 02.6562064	0.00000479	0.0000951	−0.043	52668.6	50456.8	54907.7	43	670
ICRF J135546.6 − 632642	1352 − 632	13 55 46.61199420	−63 26 42.5731913	0.00039978	0.0017971	−0.062	51023.4	49535.0	52941.7	4	11
ICRF J135704.4 + 191907	1354 + 195	13 57 04.43665381	19 19 07.3724675	0.00000376	0.0000618	−0.236	49469.3	44447.0	54657.8	147	2590
ICRF J135706.0 − 174401	1354 − 174	13 57 06.07420483	−17 44 01.9049126	0.00000871	0.0001343	−0.101	52551.2	50456.8	54741.8	33	280
ICRF J135900.1 − 415252	1355 − 416	13 59 00.18460706	−41 52 52.6378395	0.00037269	0.0024173	−0.345	51888.4	48110.9	54076.8	6	19
ICRF J135927.1 + 015954	1356 + 022	13 59 27.14932395	01 59 54.5637166	0.00001497	0.0005747	−0.615	50395.5	49914.7	54482.7	2	114
ICRF J140445.8 − 013021	1402 − 012	14 04 45.89547782	−01 30 21.9469710	0.00000766	0.0001103	−0.082	52448.8	48664.8	54741.8	33	586

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J140501.1 + 041535	1402 + 044	14 05 01.11981424	04 15 35.8189966	0.00000426	0.0000982	−0.208	51001.5	48888.7	54713.7	58	975
ICRF J140700.3 + 282714	1404 + 286	14 07 00.39441357	28 27 14.6902360	0.00002394	0.0005152		49622.9	44341.9	54904.0	1827	62555
ICRF J140754.9 − 343128	1404 − 342	14 07 54.91699085	−34 31 28.2755232	0.00018268	0.0059286	0.343	54489.7	54489.7	54489.7	1	17
ICRF J140812.9 + 561332	1406 + 564	14 08 12.94626357	56 13 32.4843042	0.00003197	0.0003770	−0.652	50863.0	49577.0	54482.7	2	103
ICRF J140950.1 − 265736	1406 − 267	14 09 50.16977926	−26 57 36.9798902	0.00000896	0.0002966	0.032	51736.7	50632.3	54845.7	7	227
ICRF J141154.8 + 213423	1409 + 218	14 11 54.86222322	21 34 23.4372982	0.00000736	0.0001800	−0.105	52034.3	48863.2	53131.8	7	389
ICRF J141414.8 + 455448	1412 + 461	14 14 14.85256697	45 54 48.7201952	0.00025594	0.0063652	0.385	52978.6	50306.3	54314.7	2	9
ICRF J141526.0 − 370526	1412 − 368	14 15 26.01633363	−37 05 26.9704342	0.00001826	0.0002338	−0.328	53306.8	52306.7	54741.8	24	184
ICRF J141558.8 + 132023	1413 + 135	14 15 58.81750938	13 20 23.7129069	0.00000363	0.0000696	−0.094	51968.9	45138.8	54732.7	59	1460
ICRF J141604.1 + 344436	1413 + 349	14 16 04.18624339	34 44 36.4276060	0.00001604	0.0004037	0.100	50930.3	50219.8	51687.6	3	134
ICRF J141908.1 + 062834	1416 + 067	14 19 08.18018144	06 28 34.8036592	0.00001299	0.0002515	−0.122	52066.0	48194.7	54440.7	18	440
ICRF J141959.2 + 270625	1417 + 273	14 19 59.29708230	27 06 25.5528497	0.00000494	0.0000799	0.010	52870.2	48863.2	54872.7	18	859
ICRF J142136.9 − 193118	1418 − 192	14 21 36.95810113	−19 31 18.8512131	0.00001387	0.0004703	−0.311	54601.7	54601.7	54601.7	1	55
ICRF J142230.3 + 322310	1420 + 326	14 22 30.37895867	32 23 10.4401675	0.00000981	0.0001801	−0.313	51373.5	48863.2	53136.7	8	374
ICRF J142330.1 + 115951	1421 + 122	14 23 30.10127504	11 59 51.2404091	0.00031539	0.0033361	−0.468	53214.7	49914.7	54314.7	2	12
ICRF J142343.5 − 782934	1418 − 782	14 23 43.54932210	−78 29 34.8995832	0.00014708	0.0006808	−0.024	53671.2	52887.6	54457.4	4	22
ICRF J142452.2 − 724117	1420 − 724	14 24 52.23821895	−72 41 17.0947636	0.00007477	0.0003574	0.128	54723.8	54723.8	54723.8	1	14
ICRF J142637.0 + 362509	1424 + 366	14 26 37.08749725	36 25 09.5738155	0.00000768	0.0001205	−0.056	52513.8	50242.8	54893.7	10	438
ICRF J142700.3 + 234800	1424 + 240	14 27 00.39178893	23 48 00.0376180	0.00001209	0.0002725	−0.114	51050.1	48863.2	53306.8	9	288
ICRF J142921.8 + 540611	1427 + 543	14 29 21.87878876	54 06 11.1229539	0.00001649	0.0001680	−0.356	50443.0	49577.0	51604.8	7	232
ICRF J143023.7 + 420436	1428 + 422	14 30 23.74163330	42 04 36.4911889	0.00000909	0.0001303	0.118	51468.1	50242.8	54664.7	16	421
ICRF J143040.5 + 364903	1428 + 370	14 30 40.58369261	36 49 03.8889208	0.00000891	0.0002285	0.141	53597.4	53134.5	54907.7	4	123
ICRF J143239.8 + 361807	1430 + 365	14 32 39.82960880	36 18 07.9325784	0.00002469	0.0005265	−0.276	51322.2	50303.8	51687.6	10	85
ICRF J143257.6 − 180135	1430 − 178	14 32 57.69062238	−18 01 35.2486238	0.00001056	0.0002235	−0.584	51206.7	48160.3	54664.7	19	256
ICRF J143535.4 + 301224	1433 + 304	14 35 35.40218433	30 12 24.5191721	0.00002537	0.0003571	0.252	50590.8	48863.2	52809.7	7	225
ICRF J143640.9 + 232103	1434 + 235	14 36 40.98108755	23 21 03.2599184	0.00000710	0.0001656	−0.043	50780.9	50085.5	54482.7	5	272
ICRF J143645.8 + 633637	1435 + 638	14 36 45.80215514	63 36 37.8664255	0.00000842	0.0000580	0.080	51921.2	47023.7	54641.7	26	1542
ICRF J143809.4 − 220454	1435 − 218	14 38 09.46939868	−22 04 54.7484388	0.00000488	0.0001066	−0.047	51623.8	47176.5	54482.7	38	609
ICRF J143853.6 + 371035	1436 + 373	14 38 53.61097802	37 10 35.4166417	0.00001305	0.0002178	−0.012	50856.6	50242.8	51687.6	2	153
ICRF J143923.6 + 325354	1437 + 331	14 39 23.65451594	32 53 54.8241527	0.00006636	0.0012154	−0.363	51687.6	51687.6	51687.6	1	35
ICRF J144302.7 + 520137	1441 + 522	14 43 02.76064852	52 01 37.2984668	0.00005008	0.0008682	−0.134	53768.8	53768.8	53768.8	1	35
ICRF J144356.8 + 250144	1441 + 252	14 43 56.89219806	25 01 44.4907918	0.00000593	0.0001111	0.036	53969.4	52409.7	54880.7	8	343
ICRF J144358.6 + 633226	1442 + 637	14 43 58.60079140	63 32 26.3649277	0.00003820	0.0003056	0.083	51112.9	49827.5	54664.7	2	143
ICRF J144516.4 + 095836	1442 + 101	14 45 16.46524525	09 58 36.0728255	0.00000502	0.0000833	0.149	51778.5	47011.4	54901.7	52	915
ICRF J144635.3 + 172107	1444 + 175	14 46 35.34629568	17 21 07.5812849	0.00000685	0.0001933	−0.128	50878.5	50085.5	52751.7	5	305

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J144815.0 − 162024	1445 − 161	14 48 15.05414424	−16 20 24.5488418	0.00000660	0.0001296	−0.543	51571.6	47605.1	54802.7	49	483
ICRF J144828.7 + 760111	1448 + 762	14 48 28.77904214	76 01 11.5972889	0.00011573	0.0002374		48423.3	47019.5	49827.1	45	4375
ICRF J145353.6 + 264833	1451 + 270	14 53 53.60064927	26 48 33.4099627	0.00000869	0.0002278	−0.352	51232.3	50219.8	53306.8	3	200
ICRF J145427.4 − 374733	1451 − 375	14 54 27.40975442	−37 47 33.1448724	0.00000418	0.0000604	−0.006	52204.4	48110.9	54760.7	270	2982
ICRF J145726.7 − 353909	1454 − 354	14 57 26.71171326	−35 39 09.9714572	0.00001208	0.0002111	0.262	54087.4	53134.5	54768.6	21	153
ICRF J145743.4 + 243507	1455 + 247	14 57 43.42532055	24 35 07.7178248	0.00016209	0.0021734	−0.185	53341.8	53341.8	53341.8	1	20
ICRF J145907.5 + 714019	1458 + 718	14 59 07.58391245	71 40 19.8666961	0.00007181	0.0010782		51153.5	48194.5	54112.5	33	2029
ICRF J150502.3 − 343256	1501 − 343	15 05 02.37034781	−34 32 56.8197583	0.00002098	0.0006021	−0.172	54818.7	54818.7	54818.7	1	63
ICRF J150653.0 + 423923	1505 + 428	15 06 53.04185808	42 39 23.0353602	0.00001002	0.0001803	−0.051	51866.3	50242.8	53609.2	3	174
ICRF J150704.7 − 165230	1504 − 166	15 07 04.78696071	−16 52 30.2670781	0.00000366	0.0000695	−0.214	51945.7	46840.8	54741.8	96	1470
ICRF J150838.9 − 495302	1505 − 496	15 08 38.94449316	−49 53 02.3102928	0.00032088	0.0019117	−0.796	53166.0	52676.7	53411.7	3	12
ICRF J151053.5 − 054307	1508 − 055	15 10 53.59142086	−05 43 07.4173767	0.00000378	0.0000676	−0.015	52428.2	50576.2	54852.7	27	923
ICRF J151215.7 + 020316	1509 + 022	15 12 15.74171522	02 03 16.9794284	0.00002264	0.0008267	−0.651	53768.8	53768.8	53768.8	1	36
ICRF J151251.5 − 655302	1508 − 656	15 12 51.55065695	−65 53 02.2237667	0.00010040	0.0007545	0.048	53580.3	52887.6	54457.4	4	22
ICRF J151440.0 − 474829	1511 − 476	15 14 40.02459116	−47 48 29.8575859	0.00001452	0.0002663	0.428	53532.4	52676.7	54706.7	23	138
ICRF J151640.2 + 001501	1514 + 004	15 16 40.21905831	00 15 01.9089633	0.00000592	0.0001883	−0.255	51726.3	49914.7	53609.2	2	259
ICRF J151741.8 − 242219	1514 − 241	15 17 41.81313221	−24 22 19.4760251	0.00000318	0.0000551	−0.215	51597.7	46840.8	54684.7	293	7149
ICRF J152209.9 + 314414	1520 + 319	15 22 09.99172973	31 44 14.3819060	0.00000577	0.0001021	0.087	53740.8	50219.8	54852.7	7	440
ICRF J152225.4 − 293625	1519 − 294	15 22 25.48633643	−29 36 25.2307202	0.00000838	0.0001351	−0.043	53712.4	50688.3	54880.7	19	351
ICRF J152441.6 + 152121	1522 + 155	15 24 41.61147702	15 21 21.0508708	0.00000620	0.0001831	−0.171	52355.3	50085.5	53341.7	61	282
ICRF J152642.8 + 665054	1526 + 670	15 26 42.87421490	66 50 54.6419680	0.00006225	0.0003533	0.575	50902.2	49827.5	54643.7	2	121
ICRF J153452.4 + 013104	1532 + 016	15 34 52.45368142	01 31 04.2065916	0.00000426	0.0000742	−0.069	52126.6	47407.6	54643.7	43	687
ICRF J153454.6 − 352623	1531 − 352	15 34 54.68760070	−35 26 23.4970592	0.00001731	0.0006310	0.072	54489.7	54489.7	54489.7	1	72
ICRF J153811.9 − 652551	1533 − 652	15 38 11.91525813	−65 25 51.1957589	0.00012011	0.0014839	0.682	54723.8	54723.8	54723.8	1	11
ICRF J153815.9 + 001905	1535 + 004	15 38 15.95307868	00 19 05.3242162	0.00002173	0.0007088	−0.295	50626.7	49914.7	54482.7	3	97
ICRF J154049.4 + 144745	1538 + 149	15 40 49.49151734	14 47 45.8848470	0.00000352	0.0000625	−0.103	52036.7	45138.8	54235.7	61	1332
ICRF J154333.9 + 045219	1541 + 050	15 43 33.92576617	04 52 19.3198582	0.00002876	0.0010215	0.163	53863.5	49914.7	54314.7	2	39
ICRF J154917.4 + 503805	1547 + 507	15 49 17.46855479	50 38 05.7882265	0.00000587	0.0000648	0.008	51701.5	47005.8	54713.7	27	1169
ICRF J155059.1 − 825806	1540 − 828	15 50 59.14046591	−82 58 06.8384784	0.00252791	0.0040571	−0.211	50482.6	48043.8	54457.4	3	10
ICRF J155332.6 + 125651	1551 + 130	15 53 32.69787636	12 56 51.7164791	0.00001116	0.0003727	0.049	51060.7	50085.5	52464.7	6	193
ICRF J155402.4 − 270440	1550 − 269	15 54 02.46979712	−27 04 40.2331201	0.00001670	0.0003946	0.182	50869.7	50632.3	54664.7	3	134
ICRF J155658.8 − 791404	1549 − 790	15 56 58.86989203	−79 14 04.2815029	0.00004138	0.0001211	0.223	50031.8	47626.5	54726.7	37	227
ICRF J155821.9 − 140959	1555 − 140	15 58 21.94809663	−14 09 59.0518922	0.00002273	0.0004938	−0.296	50576.0	48704.1	51169.7	8	119
ICRF J155941.4 − 244238	1556 − 245	15 59 41.40907451	−24 42 38.8320005	0.00000984	0.0001384	−0.163	52620.0	50632.3	54768.6	20	240
ICRF J160140.4 + 431647	1600 + 432	16 01 40.44389630	43 16 47.7566660	0.00011344	0.0018364	0.211	50184.6	49883.8	50560.6	2	9

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J160140.5 + 431646	1600 + 431	16 01 40.51541404	43 16 46.4774011	0.00015534	0.0034736	0.471	50053.0	49883.8	50560.6	2	4
ICRF J160207.2 + 332653	1600 + 335	16 02 07.26346106	33 26 53.0724368	0.00000404	0.0000621	−0.046	52256.9	48103.5	54818.7	40	1384
ICRF J160316.5 − 293355	1600 − 294	16 03 16.57145685	−29 33 55.4238604	0.00001647	0.0005253	−0.107	54577.1	54559.7	54601.7	2	140
ICRF J160341.9 + 110548	1601 + 112	16 03 41.93124888	11 05 48.6790921	0.00000972	0.0004398	0.262	51632.4	49914.7	54887.7	5	105
ICRF J160431.0 − 444131	1600 − 445	16 04 31.02073543	−44 41 31.9731923	0.00003385	0.0006814	−0.205	53039.6	49535.0	54440.7	10	47
ICRF J160437.3 + 571436	1603 + 573	16 04 37.35462827	57 14 36.6609410	0.00002634	0.0002114	0.160	51191.8	49577.0	53306.8	3	203
ICRF J160517.5 − 113926	1602 − 115	16 05 17.53165324	−11 39 26.8307937	0.00000785	0.0002108	0.122	54451.6	53552.8	54887.7	6	311
ICRF J160913.3 + 264129	1607 + 268	16 09 13.32076181	26 41 29.0362080	0.00001419	0.0002811	0.073	49659.1	44090.5	53306.8	15	309
ICRF J161021.8 − 395858	1606 − 398	16 10 21.87908922	−39 58 58.3284422	0.00001688	0.0003880	−0.034	52901.7	52306.7	54684.7	21	95
ICRF J161042.0 + 241449	1608 + 243	16 10 42.02677273	24 14 49.0116609	0.00000749	0.0001518	−0.231	53222.2	50219.8	54872.7	8	322
ICRF J161341.0 + 341247	1611 + 343	16 13 41.06424258	34 12 47.9089281	0.00001343	0.0002432		49839.0	44774.0	54904.0	1766	134105
ICRF J161720.5 − 253723	1614 − 255	16 17 20.57094356	−25 37 23.6556827	0.00002241	0.0007765	−0.307	54559.7	54559.7	54559.7	1	74
ICRF J161749.2 − 771718	1610 − 771	16 17 49.27640906	−77 17 18.4674722	0.00018412	0.0006413		51173.2	47626.7	54719.8	276	3211
ICRF J161749.9 + 024643	1615 + 029	16 17 49.90812194	02 46 43.1049263	0.00000800	0.0001720	0.086	52916.0	49914.7	54893.7	9	351
ICRF J161903.6 + 061302	1616 + 063	16 19 03.68767530	06 13 02.2431696	0.00000467	0.0001104	−0.168	52097.2	48194.7	54872.7	24	789
ICRF J162031.2 + 490153	1619 + 491	16 20 31.22519532	49 01 53.2569193	0.00002071	0.0004167	−0.188	51038.6	50306.3	54643.7	2	77
ICRF J162424.8 + 574116	1623 + 578	16 24 24.80754879	57 41 16.2809707	0.00001467	0.0001328	−0.113	51624.9	49577.0	54880.7	5	209
ICRF J162557.6 + 413440	1624 + 416	16 25 57.66971410	41 34 40.6292986	0.00000509	0.0000654	0.007	51191.2	46527.7	54739.7	53	1325
ICRF J162606.0 − 295126	1622 − 297	16 26 06.02083867	−29 51 26.9710860	0.00000560	0.0000798	−0.096	52091.1	46840.8	54893.7	75	945
ICRF J162837.5 + 473410	1627 + 476	16 28 37.50448717	47 34 10.4154438	0.00054969	0.0062535	0.624	52444.2	50306.3	54314.7	2	15
ICRF J163011.2 + 213134	1628 + 216	16 30 11.23084515	21 31 34.3107579	0.00028810	0.0053229	0.830	50854.6	50854.6	50854.6	1	9
ICRF J163231.9 + 823216	1637 + 826	16 32 31.96990024	82 32 16.3999540	0.00002455	0.0000462	−0.217	53123.2	50688.3	54865.7	137	3821
ICRF J163515.4 + 380804	1633 + 382	16 35 15.49297028	38 08 04.5006228	0.00000368	0.0000456	−0.035	48559.2	44447.0	54837.7	484	15672
ICRF J163638.1 + 211255	1634 + 213	16 36 38.18345081	21 12 55.5950221	0.00001716	0.0003007	−0.121	50407.8	50085.5	53020.8	5	196
ICRF J163745.1 + 471733	1636 + 473	16 37 45.13054817	47 17 33.8311747	0.00000739	0.0000887	−0.082	53366.3	50306.3	54845.7	9	315
ICRF J164202.1 − 062123	1639 − 062	16 42 02.17771607	−06 21 23.6949098	0.00000461	0.0000803	0.047	54391.6	53126.1	54837.7	9	500
ICRF J164205.2 − 200724	1639 − 200	16 42 05.29092217	−20 07 24.8490258	0.00002135	0.0007362	−0.020	54601.7	54601.7	54601.7	1	52
ICRF J164258.8 + 394836	1641 + 399	16 42 58.80996455	39 48 36.9940174	0.00007111	0.0006876		47166.4	44090.1	50242.7	1089	45187
ICRF J164333.3 − 231607	1640 − 231	16 43 33.39050847	−23 16 07.8587301	0.00003018	0.0007135	−0.358	53992.8	53992.8	53992.8	1	31
ICRF J164416.1 − 771548	1637 − 771	16 44 16.12010009	−77 15 48.8126057	0.00033887	0.0009327	−0.744	53569.8	52887.6	54457.4	4	18
ICRF J164733.5 + 270558	1645 + 271	16 47 33.59843500	27 05 58.2939863	0.00007146	0.0009794	0.286	53869.6	50219.8	54314.7	2	46
ICRF J164741.8 + 172011	1645 + 174	16 47 41.83943160	17 20 11.8367147	0.00017470	0.0042672	0.009	54314.7	54314.7	54314.7	1	10
ICRF J164801.5 + 222433	1645 + 224	16 48 01.53555050	22 24 33.1480371	0.00001713	0.0003265	0.174	50746.0	50085.5	52975.7	4	121
ICRF J164842.3 − 330148	1645 − 329	16 48 42.35109264	−33 01 48.9315026	0.00001719	0.0006111	−0.226	54489.7	54489.7	54489.7	1	75
ICRF J165016.6 − 504448	1646 − 506	16 50 16.62700224	−50 44 48.2111732	0.00040165	0.0024059	0.803	52828.9	52676.7	52948.7	3	6

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J165037.5 + 082452	1648 + 084	16 50 37.56271659	08 24 52.2314315	0.00001746	0.0003548	−0.159	53786.7	49914.7	54314.7	2	50
ICRF J165039.5 − 294346	1647 − 296	16 50 39.54410263	−29 43 46.9545334	0.00000969	0.0001062	−0.407	52789.7	48346.0	54741.8	37	312
ICRF J165258.5 + 390249	1651 + 391	16 52 58.50957694	39 02 49.8224174	0.00000727	0.0001281	−0.253	53345.4	50242.8	54880.7	5	326
ICRF J165352.2 + 394536	1652 + 398	16 53 52.21668494	39 45 36.6089458	0.00000387	0.0000476	−0.068	51890.2	46976.8	54810.7	313	4916
ICRF J165801.4 + 344328	1656 + 348	16 58 01.41920004	34 43 28.4021412	0.00000871	0.0001026	−0.103	52170.5	48853.8	54627.7	17	532
ICRF J165802.7 + 473749	1656 + 477	16 58 02.77959728	47 37 49.2310389	0.00000549	0.0000672	−0.009	52304.9	49184.9	54732.7	20	1088
ICRF J165809.0 + 074127	1655 + 077	16 58 09.01146700	07 41 27.5405227	0.00000356	0.0000651	−0.128	52442.9	47407.6	54620.7	34	943
ICRF J165833.4 + 051516	1656 + 053	16 58 33.44732673	05 15 16.4440483	0.00000397	0.0000720	−0.037	51155.4	44773.8	54725.7	59	1571
ICRF J165844.0 − 073917	1656 − 075	16 58 44.06199336	−07 39 17.6939570	0.00000591	0.0001581	−0.025	54234.2	52306.7	54907.7	7	497
ICRF J170124.6 + 395437	1659 + 399	17 01 24.63481659	39 54 37.0915943	0.00000844	0.0001248	0.041	54145.9	53523.9	54865.7	4	152
ICRF J170717.7 + 453610	1705 + 456	17 07 17.75341186	45 36 10.5529303	0.00000597	0.0000678	−0.035	52543.0	48434.7	54746.7	20	952
ICRF J170745.6 + 133105	1705 + 135	17 07 45.63728315	13 31 05.2329805	0.00000905	0.0002263	−0.067	51053.2	50085.5	53213.7	8	213
ICRF J170918.6 − 352522	1705 − 353	17 09 18.66632554	−35 25 22.1976894	0.00018187	0.0052035	0.324	54489.7	54489.7	54489.7	1	15
ICRF J170941.0 + 431844	1708 + 433	17 09 41.08658230	43 18 44.5325556	0.00001102	0.0001454	−0.113	54070.8	53719.8	54076.8	2	119
ICRF J171350.7 − 322612	1710 − 323	17 13 50.79019382	−32 26 12.2081288	0.00003677	0.0012005	−0.453	54489.7	54489.7	54489.7	1	41
ICRF J172155.9 − 255840	1718 − 259	17 21 55.97912858	−25 58 40.6931598	0.00005995	0.0016106	0.255	54601.7	54601.7	54601.7	1	22
ICRF J172236.7 + 585622	1721 + 589	17 22 36.72656643	58 56 22.2607960	0.00003411	0.0002584	−0.094	52567.1	49577.0	53306.8	4	100
ICRF J172320.7 + 341757	1721 + 343	17 23 20.79594615	34 17 57.9645739	0.00003765	0.0008186	−0.302	54125.8	54125.8	54125.8	1	32
ICRF J172339.7 + 523648	1722 + 526	17 23 39.74636137	52 36 48.3949722	0.00007913	0.0008018	−0.037	51195.8	49577.0	54664.7	2	66
ICRF J172341.0 − 650036	1718 − 649	17 23 41.02938963	−65 00 36.6113150	0.00002498	0.0002160	0.098	52226.3	48110.9	54670.7	22	93
ICRF J172414.1 + 330303	1722 + 330	17 24 14.19784046	33 03 03.9390630	0.00000852	0.0001929	−0.214	52884.9	50219.8	54818.7	5	300
ICRF J172807.0 + 121539	1725 + 123	17 28 07.05121458	12 15 39.4857443	0.00000732	0.0002271	−0.152	51274.8	49914.7	54845.7	12	217
ICRF J172818.6 + 501310	1727 + 502	17 28 18.62400474	50 13 10.4701931	0.00002038	0.0001904	0.044	51840.4	47459.8	54214.7	17	235
ICRF J172824.9 + 042704	1725 + 044	17 28 24.95272422	04 27 04.9139217	0.00000405	0.0000709	−0.152	52011.5	47931.6	54601.7	28	1113
ICRF J173548.0 + 361645	1734 + 363	17 35 48.08662457	36 16 45.6115018	0.00000908	0.0001156	0.145	51442.5	49939.8	53066.7	8	390
ICRF J173549.0 + 504911	1734 + 508	17 35 49.00517207	50 49 11.5659859	0.00001091	0.0001717	−0.059	49731.1	49429.9	51074.2	5	291
ICRF J173713.7 + 062103	1734 + 063	17 37 13.72903528	06 21 03.5722392	0.00001001	0.0003235	−0.191	50120.7	49914.7	54482.7	2	133
ICRF J173735.7 − 563403	1733 − 565	17 37 35.77025298	−56 34 03.1573599	0.00038270	0.0019417	0.760	50220.1	48388.4	52878.7	6	19
ICRF J173840.5 + 322409	1736 + 324	17 38 40.50182158	32 24 09.0257504	0.00000981	0.0002602	−0.212	51149.2	50219.8	54872.7	3	170
ICRF J174036.9 + 521143	1739 + 522	17 40 36.97784943	52 11 43.4074427	0.00001958	0.0002155		49623.7	44343.3	54904.0	2094	187178
ICRF J174425.4 − 514443	1740 − 517	17 44 25.45037564	−51 44 43.7929482	0.00048513	0.0032918	0.703	49096.2	48766.9	50413.7	2	5
ICRF J174456.6 + 554217	1744 + 557	17 44 56.60706995	55 42 17.1611150	0.00000844	0.0000735	0.164	52482.3	50303.8	54263.7	26	887
ICRF J174527.1 − 075303	1742 − 078	17 45 27.10494421	−07 53 03.9476819	0.00000879	0.0002948	0.186	52444.7	52306.7	53609.2	3	130
ICRF J174554.3 + 670349	1745 + 670	17 45 54.35777069	67 03 49.2984168	0.00013681	0.0006721	0.487	54202.6	49827.5	54314.7	2	40
ICRF J174726.6 + 465850	1746 + 470	17 47 26.64728108	46 58 50.9262505	0.00000621	0.0000805	−0.008	52527.0	49422.9	54816.7	20	807

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J174832.8 + 700550	1749 + 701	17 48 32.84032810	70 05 50.7688101	0.00001167	0.0000616	−0.060	51544.6	44343.6	54732.7	30	920
ICRF J175151.2 − 252400	1748 − 253	17 51 51.26257348	−25 24 00.0637902	0.00008784	0.0021743	0.316	51710.0	48110.9	52409.7	5	58
ICRF J175322.6 + 440945	1751 + 441	17 53 22.64789038	44 09 45.6862867	0.00000545	0.0000627	−0.037	52508.3	47931.6	54634.7	22	1287
ICRF J175535.5 + 202357	1753 + 204	17 55 35.52096706	20 23 57.1375145	0.00004630	0.0015275	−0.759	50580.3	50085.5	54643.7	3	82
ICRF J175559.7 + 182021	1753 + 183	17 55 59.78232352	18 20 17.6697507	0.00023892	0.0037546	0.866	52261.3	50303.8	52409.7	4	32
ICRF J175603.6 + 574847	1755 + 578	17 56 03.62817099	57 48 47.9966952	0.00016262	0.0016067	0.335	51136.0	49577.0	54643.7	2	26
ICRF J175633.7 + 155343	1754 + 159	17 56 33.72561177	15 53 43.8332351	0.00000681	0.0001926	−0.246	51468.6	50085.5	53761.7	15	183
ICRF J175900.3 + 234346	1756 + 237	17 59 00.35808904	23 43 46.9537086	0.00001945	0.0003098	0.009	50568.0	50085.5	52989.7	4	128
ICRF J180242.6 − 394007	1759 − 396	18 02 42.68004643	−39 40 07.9079345	0.00001202	0.0002676	−0.047	53559.5	52306.7	54901.7	10	132
ICRF J180650.6 + 694928	1807 + 698	18 06 50.68064942	69 49 28.1085502	0.00000799	0.0000414	0.030	53624.7	44343.6	54844.7	916	64919
ICRF J180821.8 + 454220	1806 + 456	18 08 21.88588016	45 42 20.8663862	0.00000663	0.0000997	−0.135	52049.8	49422.9	54747.7	21	682
ICRF J181422.7 + 411305	1812 + 412	18 14 22.70617954	41 13 05.6086005	0.00001610	0.0002602	−0.400	50682.9	50242.8	54643.7	2	130
ICRF J181657.0 + 530744	1815 + 531	18 16 57.07076064	53 07 44.4997153	0.00004765	0.0005428	−0.307	53404.3	49577.0	54112.8	3	63
ICRF J181935.0 − 634548	1814 − 637	18 19 35.00263632	−63 45 48.2057193	0.00010390	0.0012813	−0.694	50235.0	48162.4	53108.7	4	16
ICRF J182057.8 − 252812	1817 − 254	18 20 57.84869182	−25 28 12.5836842	0.00000798	0.0002443	−0.109	52083.2	48804.9	53134.5	21	485
ICRF J182314.1 + 793849	1826 + 796	18 23 14.10850830	79 38 49.0019179	0.00003747	0.0001000	0.300	50540.5	47019.9	52767.7	25	631
ICRF J182402.8 + 104423	1821 + 107	18 24 02.85524914	10 44 23.7739931	0.00000388	0.0000828	−0.191	52071.5	45466.3	54664.7	39	1282
ICRF J182432.0 + 032205	1822 + 033	18 24 32.06622749	03 22 05.9343863	0.00005393	0.0017382	−0.565	54314.7	54314.7	54314.7	1	35
ICRF J182536.5 − 171849	1822 − 173	18 25 36.53227899	−17 18 49.8481568	0.00008820	0.0020537	0.113	52028.5	51732.8	52306.7	2	33
ICRF J182819.4 − 212338	1825 − 214	18 28 19.48710863	−21 23 38.7686957	0.00016387	0.0034160	−0.179	54657.8	54657.8	54657.8	1	14
ICRF J182840.1 − 053050	1825 − 055	18 28 40.15366517	−05 30 50.8695741	0.00057406	0.0130597	−0.953	53992.8	53992.8	53992.8	1	5
ICRF J183100.0 − 271406	1827 − 272	18 31 00.04483418	−27 14 06.1836695	0.00002808	0.0017940	−0.363	53768.8	53768.8	53768.8	1	43
ICRF J183211.0 − 203948	1829 − 207	18 32 11.04647946	−20 39 48.2036523	0.00003158	0.0007028	0.519	52230.3	50632.3	53551.7	3	110
ICRF J183243.4 + 135744	1830 + 139	18 32 43.47109973	13 57 44.4006510	0.00001127	0.0003226	−0.222	50952.6	50085.5	53509.7	7	222
ICRF J183250.1 + 283335	1830 + 285	18 32 50.18562512	28 33 35.9552936	0.00000466	0.0000773	−0.298	52072.0	48357.8	54718.7	26	1018
ICRF J183453.1 − 731514	1828 − 733	18 34 53.19788356	−73 15 14.3338078	0.00023208	0.0010914	−0.261	54723.8	54723.8	54723.8	1	9
ICRF J183537.2 − 714958	1829 − 718	18 35 37.20425392	−71 49 58.2200253	0.00083964	0.0038204	0.335	51081.5	48766.9	54457.4	4	15
ICRF J183705.5 − 691733	1831 − 693	18 37 05.56396275	−69 17 33.3297059	0.00016832	0.0013995	0.334	54723.8	54723.8	54723.8	1	9
ICRF J184057.1 + 390045	1839 + 389	18 40 57.15423614	39 00 45.7241751	0.00001790	0.0003140	−0.303	51056.7	50242.8	54664.7	2	163
ICRF J184208.9 + 794617	1845 + 797	18 42 08.98991617	79 46 17.1283029	0.00003228	0.0000858	−0.361	50971.1	47761.7	53719.8	34	726
ICRF J184511.1 + 400751	1843 + 400	18 45 11.13144411	40 07 51.5782538	0.00004636	0.0004083	0.511	52691.8	50022.8	53068.7	3	56
ICRF J184847.5 − 271818	1845 − 273	18 48 47.50417641	−27 18 18.0717660	0.00001696	0.0005705	−0.454	54601.7	54601.7	54601.7	1	50
ICRF J185027.5 + 282513	1848 + 283	18 50 27.58983845	28 25 13.1553126	0.00001340	0.0002839	−0.559	51218.7	50219.8	54482.7	4	71
ICRF J185228.5 + 485547	1851 + 488	18 52 28.54781817	48 55 47.4814787	0.00001596	0.0002497	0.042	51223.1	50306.3	54482.7	2	82
ICRF J185457.2 + 735119	1856 + 737	18 54 57.29992124	73 51 19.9069914	0.00001465	0.0000671	0.115	51587.9	47011.4	54739.7	25	740

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J185700.4 − 532500	1852 − 534	18 57 00.45261929	−53 25 00.3537797	0.00096801	0.0238745	0.454	50989.8	50989.8	50989.8	1	3
ICRF J185802.3 + 031316	1855 + 031	18 58 02.35260055	03 13 16.3012572	0.00052223	0.0125363	−0.248	53978.7	53978.7	53978.7	1	13
ICRF J185905.0 − 250947	1856 − 252	18 59 05.03807842	−25 09 47.1083740	0.00003250	0.0011569	−0.269	54818.7	54818.7	54818.7	1	42
ICRF J190255.9 + 315941	1901 + 319	19 02 55.93889898	31 59 41.7017097	0.00000391	0.0000531	−0.139	52030.5	48103.5	54818.7	52	2357
ICRF J190353.0 + 014526	1901 + 016	19 03 53.06319049	01 45 26.3088096	0.00003674	0.0007678	0.321	54076.8	54076.8	54076.8	1	44
ICRF J190414.3 + 153638	1901 + 155	19 04 14.36112095	15 36 38.4510807	0.00001589	0.0005211	−0.198	51615.1	50085.5	53314.8	18	67
ICRF J190829.4 − 294216	1905 − 297	19 08 29.43327871	−29 42 16.9428747	0.00003979	0.0016836	0.402	54559.7	54559.7	54559.7	1	52
ICRF J190946.5 + 483431	1908 + 484	19 09 46.56276934	48 34 31.8199243	0.00002840	0.0003146	−0.071	54023.2	50306.3	54314.7	2	55
ICRF J191158.2 + 161146	1909 + 161	19 11 58.25741154	16 11 46.8654736	0.00000722	0.0001869	0.109	52415.5	50085.5	54887.7	11	296
ICRF J191240.0 − 801005	1903 − 802	19 12 40.01912850	−80 10 05.9464641	0.00005939	0.0001476	0.054	52227.2	47626.5	54670.7	21	87
ICRF J191254.2 + 051800	1910 + 052	19 12 54.25765004	05 18 00.4215776	0.00003840	0.0005454	0.059	52207.1	50919.8	52409.7	3	70
ICRF J192218.6 + 084157	1919 + 086	19 22 18.63364784	08 41 57.3732905	0.00012730	0.0044274	−0.596	50700.6	50700.6	50700.6	1	9
ICRF J192324.6 − 632045	1918 − 634	19 23 24.60604302	−63 20 45.7655989	0.00005440	0.0004893	0.088	54723.8	54723.8	54723.8	1	14
ICRF J192439.4 + 154043	1922 + 155	19 24 39.45587746	15 40 43.9417130	0.00000892	0.0002067	−0.070	50590.8	50085.5	52423.7	5	438
ICRF J192539.7 − 221935	1922 − 224	19 25 39.79018897	−22 19 35.1124955	0.00001221	0.0001408	0.135	54673.3	53523.9	54810.7	3	953
ICRF J192559.6 + 210626	1923 + 210	19 25 59.60535560	21 06 26.1620442	0.00000298	0.0000424	0.062	53603.7	45138.8	54903.8	643	22655
ICRF J192748.4 + 735801	1928 + 738	19 27 48.49516756	73 58 01.5698707	0.00001114	0.0000467	−0.036	51114.5	44343.6	54718.7	155	3936
ICRF J192809.1 − 203543	1925 − 206	19 28 09.18336376	−20 35 43.7845230	0.00001023	0.0003710	−0.409	54578.2	54559.7	54601.7	2	139
ICRF J192840.8 + 084848	1926 + 087	19 28 40.85549919	08 48 48.4129566	0.00000665	0.0002198	−0.319	52241.1	49541.8	54489.7	15	476
ICRF J193052.7 + 153234	1928 + 154	19 30 52.76699644	15 32 34.4272915	0.00000892	0.0001889	0.209	52508.2	52306.7	52765.7	3	132
ICRF J193244.8 − 453637	1929 − 457	19 32 44.88778041	−45 36 37.9287770	0.00001654	0.0002986	0.342	53893.6	53223.4	54670.7	11	56
ICRF J193331.1 − 694258	1928 − 698	19 33 31.15986784	−69 42 58.9144745	0.00014125	0.0005304	−0.279	53470.3	53223.4	53569.1	2	7
ICRF J193435.0 + 104340	1932 + 106	19 34 35.02555658	10 43 40.3656754	0.00004665	0.0016685	−0.285	50084.6	49690.0	51169.7	2	30
ICRF J193510.4 + 203154	1932 + 204	19 35 10.47291316	20 31 54.1543598	0.00000512	0.0001004	−0.054	52102.5	48804.9	54627.7	25	1110
ICRF J193603.5 + 713131	1936 + 714	19 36 03.56081522	71 31 31.7852163	0.00004344	0.0002821	0.293	51654.4	49827.5	54664.7	3	132
ICRF J193925.0 − 634245	1934 − 638	19 39 25.02625710	−63 42 45.6244926	0.00029900	0.0015854	−0.010	49338.5	48766.9	50182.6	3	13
ICRF J193957.2 − 100241	1937 − 101	19 39 57.25657378	−10 02 41.5206099	0.00000509	0.0001107	−0.082	51903.5	48110.9	54664.7	30	689
ICRF J194121.7 − 621121	1936 − 623	19 41 21.76860913	−62 11 21.0559897	0.00006919	0.0008044	−0.527	52239.6	48162.4	54670.7	13	32
ICRF J194606.2 + 230004	1943 + 228	19 46 06.25140484	23 00 04.4144890	0.00001573	0.0004107	−0.444	51335.3	48797.8	52620.7	6	172
ICRF J194943.4 + 504131	1948 + 505	19 49 43.49231647	50 41 31.9727624	0.00002974	0.0004998	0.222	50543.7	49577.0	54664.7	3	146
ICRF J195005.5 + 080713	1947 + 079	19 50 05.53991482	08 07 13.9808872	0.00000829	0.0002069	0.031	49352.1	47005.8	52306.7	39	431
ICRF J195037.4 − 580439	1946 − 582	19 50 37.40169391	−58 04 39.7485177	0.00004254	0.0005897	0.335	54723.8	54723.8	54723.8	1	16
ICRF J195330.8 + 353759	1951 + 355	19 53 30.87571805	35 37 59.3593137	0.00001421	0.0002633	0.402	51099.4	48919.9	53131.8	11	300
ICRF J195510.7 − 611519	1950 − 613	19 55 10.77042866	−61 15 19.1396749	0.00014964	0.0014490	0.563	49275.5	48766.9	50182.6	3	15
ICRF J195511.5 + 135816	1952 + 138	19 55 11.57141116	13 58 16.2410381	0.00002003	0.0006024	−0.328	50650.8	50085.5	52429.7	4	84

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J195646.0 + 282057	1954 + 282	19 56 46.04047289	28 20 57.9771953	0.00001135	0.0002565	−0.022	52463.7	52409.7	53306.8	2	83
ICRF J195734.4 + 342754	1955 + 343	19 57 34.45493015	34 27 54.6288211	0.00020896	0.0040719	−0.157	53832.5	49690.0	54292.7	2	10
ICRF J195740.5 + 333827	1955 + 335	19 57 40.54992566	33 38 27.9433799	0.00002230	0.0002618	−0.495	51434.2	49098.6	52711.7	6	163
ICRF J195928.3 + 404402	1957 + 406	19 59 28.35645829	40 44 02.0966496	0.00007869	0.0007873	0.208	52782.5	50974.8	53068.7	3	27
ICRF J200241.9 + 150114	2000 + 148	20 02 41.99923864	15 01 14.5740022	0.00000681	0.0001637	−0.182	52696.9	50085.5	54818.7	6	423
ICRF J200324.1 − 325145	2000 − 330	20 03 24.11634022	−32 51 45.1328362	0.00000696	0.0001424	−0.235	52826.5	48043.8	54684.7	36	485
ICRF J200530.9 + 775243	2007 + 777	20 05 30.99853637	77 52 43.2475892	0.00001366	0.0000426	−0.018	49660.3	44343.6	54852.7	268	15005
ICRF J200617.6 + 642445	2005 + 642	20 06 17.69456118	64 24 45.4180969	0.00002251	0.0001441	0.107	50329.9	49422.9	53185.7	7	214
ICRF J200744.9 + 402948	2005 + 403	20 07 44.94485508	40 29 48.6041649	0.00004210	0.0004739	0.485	49340.8	44773.8	54643.7	11	114
ICRF J200824.4 − 041829	2005 − 044	20 08 24.42918136	−04 18 29.2990464	0.00003837	0.0010073	0.608	53768.8	53768.8	53768.8	1	20
ICRF J200925.3 − 484953	2005 − 489	20 09 25.39069157	−48 49 53.7214413	0.00002310	0.0001790	0.448	52451.8	47626.5	54713.7	75	287
ICRF J201114.2 − 064403	2008 − 068	20 11 14.21582849	−06 44 03.5554174	0.00000604	0.0001592	−0.543	52419.6	48346.0	54741.8	36	829
ICRF J201428.5 + 505909	2013 + 508	20 14 28.59007307	50 59 09.5283038	0.00021528	0.0018540	−0.261	53389.7	50306.3	54314.7	2	13
ICRF J201613.8 + 163234	2013 + 163	20 16 13.86002618	16 32 34.1130734	0.00000623	0.0001306	−0.076	52227.5	50085.5	54865.7	7	406
ICRF J201713.0 + 744047	2017 + 745	20 17 13.07932060	74 40 47.9999208	0.00001567	0.0000593	0.005	51556.1	47288.7	54880.7	37	1487
ICRF J202045.8 + 282659	2018 + 282	20 20 45.87074394	28 26 59.1949276	0.00043239	0.0052008	−0.127	52453.4	50219.8	54314.7	2	11
ICRF J202206.6 + 613658	2021 + 614	20 22 06.68174818	61 36 58.8047862	0.00000653	0.0000483	0.087	51345.0	44343.6	54845.7	46	2588
ICRF J202319.0 + 315302	2021 + 317	20 23 19.01734280	31 53 02.3061150	0.00000490	0.0000707	−0.050	51595.0	45775.8	54852.7	40	1164
ICRF J202355.8 + 542735	2022 + 542	20 23 55.84400810	54 27 35.8286624	0.00001908	0.0002350	−0.151	49711.2	49577.0	53306.8	2	139
ICRF J202456.5 + 171813	2022 + 171	20 24 56.56344960	17 18 13.1976871	0.00000772	0.0002347	−0.127	51038.4	50085.5	54482.7	6	220
ICRF J202509.6 + 031644	2022 + 031	20 25 09.63215102	03 16 44.5046163	0.00001460	0.0003846	−0.051	50534.3	49914.7	54643.7	2	145
ICRF J202510.8 + 334300	2023 + 335	20 25 10.84210380	33 43 00.2144724	0.00001032	0.0001295	−0.244	50981.1	48223.7	52830.7	9	328
ICRF J202935.0 − 533907	2025 − 538	20 29 35.05517337	−53 39 07.2911903	0.00010490	0.0031833	−0.115	54723.8	54723.8	54723.8	1	8
ICRF J203007.4 − 032512	2027 − 035	20 30 07.47576554	−03 25 12.5446952	0.00009632	0.0015907	0.050	54440.7	54440.7	54440.7	1	21
ICRF J203147.2 + 023937	2029 + 024	20 31 47.25111474	02 39 37.2836171	0.00000800	0.0002700	−0.251	53992.6	53768.8	54278.7	2	180
ICRF J203147.9 + 545503	2030 + 547	20 31 47.95853978	54 55 03.1395172	0.00000715	0.0000821	−0.079	51974.7	47023.7	54494.7	20	996
ICRF J203548.8 − 684633	2030 − 689	20 35 48.87649687	−68 46 33.8407364	0.00004579	0.0002470	−0.137	53669.4	53223.4	54578.6	9	35
ICRF J203837.0 + 511912	2037 + 511	20 38 37.03473972	51 19 12.6625810	0.00000440	0.0000416	0.001	53095.9	45138.8	54907.7	1211	50404
ICRF J204008.7 − 250746	2037 − 253	20 40 08.77291773	−25 07 46.6632913	0.00000899	0.0001143	−0.334	52240.4	47686.1	54741.8	48	499
ICRF J204719.6 − 163905	2044 − 168	20 47 19.66702203	−16 39 05.8429586	0.00001810	0.0006076	−0.328	50886.1	50632.3	54643.7	2	79
ICRF J204819.5 + 431042	2046 + 429	20 48 19.52626485	43 10 42.0583574	0.00124030	0.0152314	−0.175	53624.9	52409.7	53928.7	2	5
ICRF J205051.1 + 312727	2048 + 312	20 50 51.13147204	31 27 27.3740758	0.00001706	0.0001869	0.101	52451.6	48194.7	54664.7	18	332
ICRF J205133.7 + 744140	2051 + 745	20 51 33.73460186	74 41 40.4981296	0.00003392	0.0001071	−0.318	51490.7	47011.4	53486.7	28	337
ICRF J205741.6 − 373402	2054 − 377	20 57 41.60345541	−37 34 02.9903675	0.00001518	0.0003482	−0.059	51569.5	48162.4	53131.8	12	120
ICRF J205941.5 − 364554	2056 − 369	20 59 41.59681380	−36 45 54.6077823	0.00007530	0.0038924	−0.411	54601.7	54601.7	54601.7	1	15

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J210101.6 − 293327	2058 − 297	21 01 01.65997639	−29 33 27.8361770	0.00001113	0.0002253	0.135	52846.3	50688.3	54768.6	17	145
ICRF J210159.1 − 421916	2058 − 425	21 01 59.11408303	−42 19 16.1622108	0.00013271	0.0028620	0.448	51004.8	48162.4	52409.7	6	27
ICRF J210217.0 + 470216	2100 + 468	21 02 17.05607181	47 02 16.2533701	0.00003790	0.0006138	0.050	52066.0	49177.8	53126.1	4	41
ICRF J210544.9 − 782534	2059 − 786	21 05 44.96144716	−78 25 34.5470251	0.00004717	0.0001412	0.119	52065.8	47626.5	54706.7	24	99
ICRF J210659.7 − 654743	2102 − 659	21 06 59.72193838	−65 47 43.5855033	0.00006831	0.0005995	0.016	53229.9	52861.2	54593.7	11	40
ICRF J211630.8 − 805355	2109 − 811	21 16 30.84588551	−80 53 55.2231002	0.00006620	0.0001236	−0.123	51064.5	48043.8	54706.7	32	163
ICRF J211810.5 − 301911	2115 − 305	21 18 10.59764370	−30 19 11.6058292	0.00020582	0.0024998	−0.750	51557.0	48162.4	53642.7	4	12
ICRF J212104.0 − 611124	2117 − 614	21 21 04.07417079	−61 11 24.6246564	0.00003676	0.0003037	0.501	53723.3	52861.2	54726.7	15	55
ICRF J212155.0 − 640430	2117 − 642	21 21 55.02144250	−64 04 30.0414361	0.00072733	0.0045372	−0.278	53565.2	52887.6	54457.4	4	14
ICRF J212313.3 + 100754	2120 + 099	21 23 13.35859284	10 07 54.9444328	0.00003926	0.0012636	−0.430	50334.7	49914.7	50700.6	2	58
ICRF J212344.5 + 053522	2121 + 053	21 23 44.51740226	05 35 22.0930770	0.00003013	0.0004380		49839.0	44774.0	54904.0	1243	42449
ICRF J213019.0 − 092737	2127 − 096	21 30 19.08825689	−09 27 37.4352232	0.00000580	0.0001076	−0.053	53328.6	50576.2	54858.7	7	277
ICRF J213032.8 + 050217	2128 + 048	21 30 32.87739291	05 02 17.4741657	0.00001691	0.0003452	−0.066	50223.0	47288.7	52409.7	27	162
ICRF J213135.2 − 120704	2128 − 123	21 31 35.26175118	−12 07 04.7960612	0.00004653	0.0011181		48077.2	45466.0	50688.4	846	12033
ICRF J213334.0 + 823906	2136 + 824	21 33 34.07967014	82 39 06.0533114	0.00027689	0.0005763	−0.777	51272.1	50688.3	54482.7	2	78
ICRF J213638.5 + 004154	2134 + 004	21 36 38.58630635	00 41 54.2129045	0.00006871	0.0018723		47002.2	44090.1	49914.3	974	20490
ICRF J213841.9 − 181044	2135 − 184	21 38 41.92862885	−18 10 44.3753458	0.00091634	0.0139967	−0.500	52176.0	50632.3	54314.7	3	12
ICRF J214152.4 − 372912	2138 − 377	21 41 52.44897381	−37 29 12.9911615	0.00002057	0.0003443	0.088	53799.6	53126.1	54741.8	15	67
ICRF J214335.5 + 174348	2141 + 175	21 43 35.54457708	17 43 48.7874674	0.00000540	0.0001375	−0.079	53860.6	53126.1	54803.7	8	297
ICRF J214518.7 + 111527	2142 + 110	21 45 18.77507729	11 15 27.3123526	0.00000770	0.0002166	−0.255	51537.5	49914.7	54845.7	5	344
ICRF J214622.9 − 152543	2143 − 156	21 46 22.97933395	−15 25 43.8856129	0.00000419	0.0000805	−0.097	52761.8	48196.8	54907.7	56	1066
ICRF J214710.1 + 092946	2144 + 092	21 47 10.16296927	09 29 46.6723567	0.00000471	0.0001037	−0.019	51425.2	46527.7	54872.7	30	1002
ICRF J214755.2 + 083011	2145 + 082	21 47 55.21940927	08 30 11.8975672	0.00003058	0.0013094	−0.660	50121.6	49914.7	50654.8	2	93
ICRF J214805.4 + 065738	2145 + 067	21 48 05.45867319	06 57 38.6042344	0.00002640	0.0003709		48954.2	44774.0	53134.3	2052	89165
ICRF J214935.2 + 075625	2147 + 077	21 49 35.26381734	07 56 25.3482976	0.00006787	0.0017836	0.019	50193.0	49914.7	50700.6	2	48
ICRF J215137.8 + 055212	2149 + 056	21 51 37.87549312	05 52 12.9545524	0.00000296	0.0000526	−0.238	53496.9	45466.3	54777.8	400	5717
ICRF J215155.5 − 302753	2149 − 307	21 51 55.52398143	−30 27 53.6979987	0.00000528	0.0000910	−0.252	53038.0	47640.2	54713.7	39	920
ICRF J215203.1 − 780706	2146 − 783	21 52 03.15457825	−78 07 06.6392494	0.00006617	0.0002229	0.545	51747.4	47626.5	54726.7	26	81
ICRF J215506.4 + 225022	2152 + 226	21 55 06.45849760	22 50 22.2812384	0.00001287	0.0001803	−0.205	50527.9	50085.5	53020.8	5	189
ICRF J215705.9 − 694123	2152 − 699	21 57 05.98055302	−69 41 23.6856532	0.00015438	0.0010074	0.844	50322.9	48110.9	52948.7	7	23
ICRF J215728.8 + 312701	2155 + 312	21 57 28.82387714	31 27 01.3518787	0.00001000	0.0002334	−0.109	52273.9	50219.8	54880.7	6	156
ICRF J215806.2 − 150109	2155 − 152	21 58 06.28190211	−15 01 09.3278616	0.00000394	0.0000857	−0.162	51257.7	46835.8	54112.8	80	1026
ICRF J215852.0 − 301332	2155 − 304	21 58 52.06512138	−30 13 32.1181085	0.00000896	0.0001140	−0.227	52581.1	48766.9	54741.8	29	400
ICRF J220143.5 + 504856	2159 + 505	22 01 43.53724629	50 48 56.3890080	0.00002269	0.0002316	−0.568	50688.7	49577.0	54643.7	3	212
ICRF J220243.2 + 421639	2200 + 420	22 02 43.29137194	42 16 39.9799287	0.00000372	0.0000420	−0.019	49553.9	44090.5	54837.7	1023	50807

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J220314.9 + 314538	2201 + 315	22 03 14.97578945	31 45 38.2699899	0.00002620	0.0004767		49527.2	45492.3	53562.0	824	26710
ICRF J220326.8 + 172548	2201 + 171	22 03 26.89368175	17 25 48.2477462	0.00000613	0.0001536	−0.090	51636.1	50085.5	54482.7	6	284
ICRF J220417.6 + 044002	2201 + 044	22 04 17.65233749	04 40 02.0225244	0.00003152	0.0007675	−0.339	54278.7	54278.7	54278.7	1	42
ICRF J220547.3 + 743621	2205 + 743	22 05 47.38895045	74 36 21.0555568	0.00006140	0.0002555	−0.360	54278.7	54278.7	54278.7	1	76
ICRF J220610.4 − 183538	2203 − 188	22 06 10.41649964	−18 35 38.7468764	0.00028566	0.0052317	−0.430	51492.1	50632.3	54187.7	3	21
ICRF J220752.8 + 165217	2205 + 166	22 07 52.86568240	16 52 17.8155788	0.00000881	0.0002778	0.195	52025.7	50085.5	54887.7	7	307
ICRF J220803.1 + 651938	2206 + 650	22 08 03.11040015	65 19 38.7901612	0.00032003	0.0019144	0.585	50728.5	49827.5	54482.7	2	31
ICRF J220847.2 − 632547	2205 − 636	22 08 47.24158807	−63 25 47.4884228	0.00014011	0.0016361	0.520	52865.1	52861.2	52872.9	2	6
ICRF J220921.4 + 374218	2207 + 374	22 09 21.42502140	37 42 18.2265941	0.00005791	0.0009853	0.199	51673.5	50242.8	54664.7	2	34
ICRF J220945.3 + 355601	2207 + 356	22 09 45.33433252	35 56 01.1296007	0.00001636	0.0004715	−0.449	50882.8	50242.8	54482.7	2	53
ICRF J221124.0 − 132809	2208 − 137	22 11 24.09945438	−13 28 09.7238974	0.00000814	0.0001477	−0.122	51875.3	50576.2	54865.7	4	117
ICRF J221302.4 − 252930	2210 − 257	22 13 02.49798276	−25 29 30.0805475	0.00000676	0.0001235	−0.116	51805.4	46875.8	54684.7	37	526
ICRF J221438.5 − 383545	2211 − 388	22 14 38.56965543	−38 35 45.0088598	0.00012050	0.0013575	0.135	51438.1	48766.9	52409.7	7	42
ICRF J221620.0 + 351814	2214 + 350	22 16 20.00990099	35 18 14.1802625	0.00000465	0.0000754	−0.090	52949.2	49750.8	54887.7	23	901
ICRF J221700.8 + 242145	2214 + 241	22 17 00.82117652	24 21 45.9578660	0.00000857	0.0002285	−0.164	51362.7	50219.8	53306.8	4	100
ICRF J221748.2 + 022010	2215 + 020	22 17 48.23793972	02 20 10.7121237	0.00001129	0.0003342	−0.072	51399.8	49914.7	54901.7	5	137
ICRF J221810.9 + 152035	2215 + 150	22 18 10.91390415	15 20 35.7175340	0.00000361	0.0000732	0.072	54654.2	53560.8	54907.7	8	654
ICRF J221819.0 − 503841	2215 − 508	22 18 19.02478840	−50 38 41.7306325	0.00050982	0.0021694	−0.020	53029.7	52887.6	53138.8	4	19
ICRF J221852.0 − 033536	2216 − 038	22 18 52.03772395	−03 35 36.8794566	0.00000304	0.0000547	0.087	48160.5	44773.8	54816.7	474	10545
ICRF J221914.0 + 180635	2216 + 178	22 19 14.09247653	18 06 35.5809092	0.00001170	0.0003022	0.138	52091.7	50085.5	54865.7	6	179
ICRF J222538.0 + 211806	2223 + 210	22 25 38.04713545	21 18 06.4150549	0.00000785	0.0001409	−0.025	50790.6	50085.5	52968.7	4	265
ICRF J223040.2 − 394252	2227 − 399	22 30 40.27856870	−39 42 52.0671100	0.00001448	0.0004215	0.151	51623.5	48162.4	52409.7	8	89
ICRF J223222.5 − 165901	2229 − 172	22 32 22.56457074	−16 59 01.8921888	0.00002940	0.0006187	−0.224	51341.5	50632.3	54643.7	4	81
ICRF J223236.4 + 114350	2230 + 114	22 32 36.40890517	11 43 50.9040717	0.00000307	0.0000516	−0.119	50638.6	46527.7	54781.7	190	3827
ICRF J223622.4 + 282857	2234 + 282	22 36 22.47084969	28 28 57.4132261	0.00003501	0.0004739		50314.7	45725.4	54904.0	2141	84357
ICRF J223634.0 − 143322	2233 − 148	22 36 34.08715533	−14 33 22.1895510	0.00000940	0.0002198	−0.413	50524.4	47176.5	52480.8	29	282
ICRF J223638.5 + 732252	2235 + 731	22 36 38.59702445	73 22 52.6623019	0.00001475	0.0000646	0.261	52605.6	49827.5	54803.7	110	1135
ICRF J224149.7 + 095352	2239 + 096	22 41 49.71729499	09 53 52.4447374	0.00001411	0.0003980	0.093	50832.6	49914.7	53609.2	2	161
ICRF J224307.8 − 625057	2239 − 631	22 43 07.83930112	−62 50 57.3222293	0.00003775	0.0003995	0.274	53633.5	53223.4	54578.6	9	30
ICRF J224553.6 + 050056	2243 + 047	22 45 53.65411834	05 00 56.9623044	0.00000867	0.0001948	−0.086	52352.9	49914.7	54880.7	5	273
ICRF J224618.2 − 120651	2243 − 123	22 46 18.23197613	−12 06 51.2774796	0.00002474	0.0008928		49443.2	44774.0	54112.5	893	19508
ICRF J224900.5 + 210702	2246 + 208	22 49 00.56671628	21 07 02.8357424	0.00000946	0.0002839	0.089	50723.2	50085.5	52975.7	4	193
ICRF J225357.7 + 160853	2251 + 158	22 53 57.74793616	16 08 53.5609470	0.00006206	0.0009731		49334.1	44090.1	54578.2	1083	31559
ICRF J225504.2 − 084404	2252 − 090	22 55 04.23979579	−08 44 04.0214838	0.00000593	0.0001094	−0.234	51932.1	47394.1	54741.8	47	653
ICRF J225536.7 + 420252	2253 + 417	22 55 36.70784831	42 02 52.5326236	0.00000505	0.0000653	−0.048	51961.8	47005.8	54872.7	63	1291

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(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J225710.6 − 362743	2254 − 367	22 57 10.60677155	−36 27 43.9953697	0.00010012	0.0023481	−0.457	52710.0	52306.7	53138.8	4	19
ICRF J225717.5 + 024317	2254 + 024	22 57 17.56309815	02 43 17.5117291	0.00000460	0.0000997	−0.256	52078.4	47394.1	54657.8	39	699
ICRF J230042.9 + 165514	2258 + 166	23 00 42.99114476	16 55 14.3913295	0.00001512	0.0002574	0.004	52558.8	52409.7	52765.7	3	88
ICRF J230153.4 + 060912	2259 + 058	23 01 53.46116994	06 09 12.8211451	0.00002294	0.0007216	−0.438	50618.2	49914.7	54643.7	2	121
ICRF J230305.8 − 303011	2300 − 307	23 03 05.82077241	−30 30 11.4733505	0.00015428	0.0022923	0.265	51293.5	48110.9	52306.7	4	22
ICRF J230428.2 + 062008	2301 + 060	23 04 28.29127676	06 20 08.3080763	0.00002754	0.0010637	−0.498	50358.8	49914.7	54482.7	2	72
ICRF J230436.4 + 233107	2302 + 232	23 04 36.43640329	23 31 07.6110505	0.00000706	0.0001823	−0.256	51472.1	50085.5	53362.8	28	237
ICRF J230700.9 + 380242	2304 + 377	23 07 00.99527267	38 02 42.2254719	0.00035958	0.0047199	−0.078	52686.0	50242.8	54314.7	2	10
ICRF J230914.3 − 305912	2306 − 312	23 09 14.33140800	−30 59 12.5840531	0.00001330	0.0003434	−0.042	53605.0	53126.1	54684.7	15	88
ICRF J231028.5 + 105530	2307 + 106	23 10 28.51774467	10 55 30.6967141	0.00000626	0.0001365	0.074	52624.9	49914.7	54893.7	6	320
ICRF J231147.4 + 454356	2309 + 454	23 11 47.40896553	45 43 56.0164564	0.00000795	0.0001198	−0.217	53353.9	50306.3	54818.7	6	314
ICRF J231351.9 − 472911	2311 − 477	23 13 51.90012627	−47 29 11.7222263	0.00055501	0.0025251	0.284	53041.3	52887.6	53138.8	3	14
ICRF J231409.3 − 445549	2311 − 452	23 14 09.38275788	−44 55 49.2376978	0.00004565	0.0009500	−0.210	51116.5	48162.4	52948.7	7	30
ICRF J231448.5 − 313839	2312 − 319	23 14 48.50058272	−31 38 39.5264841	0.00000743	0.0001238	−0.212	53009.2	48110.9	54741.8	34	600
ICRF J231643.3 − 334912	2314 − 340	23 16 43.38635153	−33 49 12.4854595	0.00003563	0.0003652	−0.297	53364.6	52306.7	54741.8	15	90
ICRF J231646.9 − 404121	2314 − 409	23 16 46.91998211	−40 41 21.0871784	0.00003507	0.0010656	−0.690	54601.7	54601.7	54601.7	1	15
ICRF J232154.9 + 320407	2319 + 317	23 21 54.95598893	32 04 07.6224628	0.00000545	0.0001052	0.096	54058.5	53126.1	54893.7	7	267
ICRF J232159.8 + 273246	2319 + 272	23 21 59.86222742	27 32 46.4436995	0.00000391	0.0000655	0.001	52174.2	47023.7	54657.8	43	1677
ICRF J232220.3 + 444542	2319 + 444	23 22 20.35808399	44 45 42.3534651	0.00000902	0.0001872	−0.038	52452.7	50306.3	54781.7	4	161
ICRF J232225.9 + 505751	2320 + 506	23 22 25.98218320	50 57 51.9636985	0.00000537	0.0000589	0.106	52386.2	48720.9	54901.7	26	1828
ICRF J232331.9 − 031705	2320 − 035	23 23 31.95375451	−03 17 05.0237932	0.00000436	0.0000924	−0.362	50811.6	47394.1	54768.6	106	822
ICRF J232407.1 − 371422	2321 − 375	23 24 07.11180376	−37 14 22.4555235	0.00001566	0.0001755	−0.129	53212.7	52306.7	54684.7	19	146
ICRF J232653.7 − 020213	2324 − 023	23 26 53.77676183	−02 02 13.7820517	0.00011105	0.0008198	0.337	53768.8	53768.8	53768.8	1	14
ICRF J232733.5 + 094009	2325 + 093	23 27 33.58056222	09 40 09.4627727	0.00001122	0.0003034	−0.200	51293.0	49914.7	53609.2	2	193
ICRF J232747.9 − 144755	2325 − 150	23 27 47.96426730	−14 47 55.7510225	0.00000588	0.0001321	−0.047	51574.0	47176.5	54684.7	31	606
ICRF J233040.8 + 110018	2328 + 107	23 30 40.85225174	11 00 18.7098281	0.00000524	0.0001217	−0.340	51136.7	46977.9	52767.7	32	632
ICRF J233138.6 − 155657	2329 − 162	23 31 38.65244503	−15 56 57.0096852	0.00000439	0.0000854	−0.092	52387.6	47176.5	54741.8	29	968
ICRF J233159.4 − 381147	2329 − 384	23 31 59.47613236	−38 11 47.6505007	0.00001091	0.0001404	−0.141	53102.8	47640.2	54741.8	34	289
ICRF J233219.0 − 411837	2329 − 415	23 32 19.04840940	−41 18 37.5837399	0.00004242	0.0010857	−0.453	54601.7	54601.7	54601.7	1	13
ICRF J233355.2 − 234340	2331 − 240	23 33 55.23782851	−23 43 40.6581030	0.00000730	0.0001351	−0.477	51320.9	46875.8	53153.2	36	355
ICRF J233612.1 − 523621	2333 − 528	23 36 12.14452180	−52 36 21.9504777	0.00010977	0.0010104	0.447	49319.6	48110.9	50049.5	6	20
ICRF J233756.6 − 175220	2335 − 181	23 37 56.62778690	−17 52 20.4107847	0.00002861	0.0011119	−0.068	50838.5	50632.3	54482.7	2	56
ICRF J233757.3 − 023057	2335 − 027	23 37 57.33907287	−02 30 57.6292276	0.00000381	0.0000709	−0.055	52685.0	47941.3	54887.7	61	983
ICRF J233829.3 + 270153	2335 + 267	23 38 29.38322439	27 01 53.2583763	0.00003985	0.0005050	−0.398	52773.6	51297.8	53068.7	2	48
ICRF J234029.0 + 264156	2337 + 264	23 40 29.02947504	26 41 56.8047738	0.00000756	0.0001352	−0.066	50050.9	48357.8	51927.8	16	665

(continued on next page)

(Table 19: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J234118.7 + 192805	2338 + 191	23 41 18.79616599	19 28 05.4866466	0.00004145	0.0007819	−0.524	51456.3	50085.5	54643.7	3	48
ICRF J234312.3 + 233945	2340 + 233	23 43 12.38702775	23 39 45.6477901	0.00001233	0.0002814	−0.182	50460.1	50085.5	53020.8	4	126
ICRF J234636.8 + 093045	2344 + 092	23 46 36.83854476	09 30 45.5148840	0.00000456	0.0000937	0.009	50425.0	47288.7	52291.8	35	659
ICRF J234722.8 + 431053	2344 + 429	23 47 22.87424242	43 10 53.2190164	0.00003119	0.0004316	−0.402	51166.5	50242.8	54643.7	2	81
ICRF J234802.6 − 163112	2345 − 167	23 48 02.60852518	−16 31 12.0222445	0.00000454	0.0000898	−0.355	48835.8	46440.9	52340.7	163	1273
ICRF J235156.1 − 010913	2349 − 014	23 51 56.12260565	−01 09 13.3149650	0.00004482	0.0014458	−0.706	54292.7	54292.7	54292.7	1	38
ICRF J235311.4 − 274325	2350 − 280	23 53 11.46050638	−27 43 25.5764321	0.00004073	0.0012308	0.085	54818.7	54818.7	54818.7	1	34
ICRF J235347.4 − 303748	2351 − 309	23 53 47.45886169	−30 37 48.5027876	0.00001290	0.0002046	−0.111	54109.9	53126.1	54741.8	13	90
ICRF J235421.6 + 455304	2351 + 456	23 54 21.68022839	45 53 04.2365363	0.00000489	0.0000571	0.026	52872.5	47011.4	54865.7	55	1967
ICRF J235509.4 + 495008	2352 + 495	23 55 09.45814510	49 50 08.3395036	0.00001895	0.0001960	−0.275	49788.4	47019.9	51246.6	15	298
ICRF J235622.7 + 815252	2353 + 816	23 56 22.79391573	81 52 52.2552239	0.00007044	0.0001467	−0.165	52579.8	50688.3	54664.7	4	235
ICRF J235846.0 + 195520	2356 + 196	23 58 46.08512827	19 55 20.3023557	0.00001733	0.0005665	−0.260	50297.0	50085.5	54482.7	3	177

[a] ICRF Designations, constructed from the source coordinates
with the format ICRF JHHMMSS.s+DDMMSS or ICRF JHHMMSS.s-DDMMSS;
they follow the recommendations of the IAU Task Group on Designations.
[b] IERS Designations, previously constructed from B1950
coordinates; the complete format, including acronym and epoch in addition
to the coordinates, is IERS BHHMM+DDd or IERS BHHMM-DDd.

Table 20: Coordinates of 2197 ICRF2 VCS-only Sources at S/X-band

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J000020.3 − 322101	2357 − 326	00 00 20.39994757	−32 21 01.2335157	0.00003337	0.0009246	−0.004	52306.7	52306.7	52306.7	1	40
ICRF J000053.0 + 405401	2358 + 406	00 00 53.08156778	40 54 01.7930799	0.00015641	0.0020936	−0.164	50242.8	50242.8	50242.8	1	22
ICRF J000105.3 − 155107	2358 − 161	00 01 05.32876820	−15 51 07.0760497	0.00003183	0.0008911	−0.749	50632.3	50632.3	50632.3	1	58
ICRF J000107.0 + 605122	2358 + 605	00 01 07.09959766	60 51 22.8029987	0.00031887	0.0035918	−0.102	52306.7	52306.7	52306.7	1	11
ICRF J000315.9 − 194150	0000 − 199	00 03 15.94932322	−19 41 50.3978977	0.00032832	0.0136435	−0.943	54088.1	54088.1	54088.1	1	11
ICRF J000318.6 − 192722	0000 − 197	00 03 18.67502432	−19 27 22.3548546	0.00003436	0.0009446	−0.224	50650.0	50632.3	50688.3	2	76
ICRF J000319.3 + 212944	0000 + 212	00 03 19.35003510	21 29 44.5075377	0.00004271	0.0012525	−0.474	50123.1	50085.5	50156.3	2	66
ICRF J000404.9 − 114858	0001 − 120	00 04 04.91499899	−11 48 58.3857370	0.00000876	0.0002781	−0.072	51045.0	50576.2	53134.5	3	109
ICRF J000416.1 + 461517	0001 + 459	00 04 16.12765548	46 15 17.9699957	0.00003053	0.0006328	0.096	50306.3	50306.3	50306.3	1	75
ICRF J000504.3 + 542824	0002 + 541	00 05 04.36344925	54 28 24.9264790	0.00008595	0.0011305	0.452	49577.0	49577.0	49577.0	1	60
ICRF J000517.9 − 164804	0002 − 170	00 05 17.93380986	−16 48 04.6789988	0.00002731	0.0008697	−0.547	50632.3	50632.3	50632.3	1	64
ICRF J000520.2 + 052410	0002 + 051	00 05 20.21551394	05 24 10.8008742	0.00013788	0.0021965	−0.105	49914.7	49914.7	49914.7	1	26
ICRF J000601.1 − 295550	0003 − 302	00 06 01.12321682	−29 55 50.0977736	0.00019870	0.0055662	0.859	52409.7	52409.7	52409.7	1	16
ICRF J000623.0 + 123553	0003 + 123	00 06 23.05612254	12 35 53.0975671	0.00005871	0.0010812	0.275	54112.8	54112.8	54112.8	1	24
ICRF J000648.7 + 242236	0004 + 240	00 06 48.78942386	24 22 36.3930433	0.00009003	0.0017127	0.146	50132.3	50085.5	50156.3	2	59
ICRF J000748.4 + 570610	0005 + 568	00 07 48.46857138	57 06 10.4389368	0.00032221	0.0034085	0.436	49577.0	49577.0	49577.0	1	13
ICRF J000800.8 + 114400	0005 + 114	00 08 00.83831184	11 44 00.7743079	0.00006217	0.0011516	−0.149	52409.7	52409.7	52409.7	1	40
ICRF J000826.2 − 255911	0005 − 262	00 08 26.25252167	−25 59 11.5409502	0.00003569	0.0011737	0.389	50666.2	50632.3	50688.3	2	86
ICRF J000833.4 + 683722	0005 + 683	00 08 33.47285133	68 37 22.0478090	0.00031945	0.0012626	−0.117	52749.3	49827.5	54112.8	2	22
ICRF J000833.6 − 360125	0006 − 363	00 08 33.66140030	−36 01 25.0525148	0.00041773	0.0327983	0.693	53552.8	53552.8	53552.8	1	8
ICRF J000903.9 + 062821	0006 + 061	00 09 03.93185186	06 28 21.2397796	0.00001371	0.0004352	0.205	52409.7	52409.7	52409.7	1	72
ICRF J000904.1 + 400146	0006 + 397	00 09 04.17357336	40 01 46.7049948	0.00003162	0.0006552	−0.321	50242.8	50242.8	50242.8	1	73
ICRF J001030.0 + 441242	0007 + 439	00 10 30.04647965	44 12 42.5046631	0.00003251	0.0010122	0.256	54088.1	54088.1	54088.1	1	48
ICRF J001035.7 − 302747	0008 − 307	00 10 35.74244613	−30 27 47.4140428	0.00015422	0.0046194	0.780	52306.7	52306.7	52306.7	1	17
ICRF J001045.1 − 294513	0008 − 300	00 10 45.17737584	−29 45 13.1787193	0.00006044	0.0031704	−0.555	54088.1	54088.1	54088.1	1	43
ICRF J001053.6 − 215704	0008 − 222	00 10 53.64999205	−21 57 04.2204083	0.00001079	0.0003698	−0.181	50663.0	50632.3	50688.3	2	133
ICRF J001131.9 + 704531	0008 + 704	00 11 31.90287510	70 45 31.6257033	0.00004715	0.0003779	0.007	49827.5	49827.5	49827.5	1	101
ICRF J001140.4 − 143404	0009 − 148	00 11 40.45590174	−14 34 04.6334014	0.00005088	0.0013275	0.335	54112.8	54112.8	54112.8	1	38
ICRF J001229.3 + 470434	0009 + 467	00 12 29.30288583	47 04 34.7396644	0.00007134	0.0013420	−0.445	53573.0	53573.0	53573.0	1	35
ICRF J001237.6 + 655110	0009 + 655	00 12 37.67114974	65 51 10.8231614	0.00061629	0.0040160	0.042	53153.2	53153.2	53153.2	1	10
ICRF J001247.3 + 335338	0010 + 336	00 12 47.38219736	33 53 38.4717555	0.00004242	0.0008568	−0.582	53503.7	53503.7	53503.7	1	41
ICRF J001259.9 − 395426	0010 − 401	00 12 59.90983609	−39 54 26.0561624	0.00002580	0.0007151	0.292	52342.6	52306.7	52409.7	2	43
ICRF J001316.4 + 463608	0010 + 463	00 13 16.48886274	46 36 08.6707019	0.00011939	0.0013146	−0.611	50306.3	50306.3	50306.3	1	37
ICRF J001320.7 − 151347	0010 − 155	00 13 20.70183091	−15 13 47.7818949	0.00009114	0.0033808	−0.369	54088.1	54088.1	54088.1	1	16
ICRF J001354.1 − 042352	0011 − 046	00 13 54.13096496	−04 23 52.2943757	0.00001228	0.0004318	−0.337	50576.2	50576.2	50576.2	1	88

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J001356.3 + 191041	0011 + 189	00 13 56.37611420	19 10 41.9154122	0.00003786	0.0011536	−0.101	50109.4	50085.5	50156.3	2	77
ICRF J001448.7 + 611743	0012 + 610	00 14 48.79215207	61 17 43.5420962	0.00009715	0.0007133	0.480	52409.7	52409.7	52409.7	1	18
ICRF J001502.4 − 181250	0012 − 184	00 15 02.49204541	−18 12 50.8832442	0.00001225	0.0003974	0.266	50657.1	50632.3	50688.3	2	131
ICRF J001506.1 + 321613	0012 + 319	00 15 06.14740520	32 16 13.3097781	0.00001845	0.0004743	−0.219	53523.9	53523.9	53523.9	1	86
ICRF J001534.3 − 180725	0013 − 184	00 15 34.32451170	−18 07 25.5821027	0.00010906	0.0031332	−0.600	54112.8	54112.8	54112.8	1	20
ICRF J001735.8 − 051241	0015 − 054	00 17 35.81721774	−05 12 41.7681233	0.00003100	0.0010185	−0.363	53561.9	53561.9	53561.9	1	54
ICRF J001751.7 + 531219	0015 + 529	00 17 51.75984325	53 12 19.1217239	0.00005577	0.0006435	−0.336	49577.0	49577.0	49577.0	1	77
ICRF J001759.0 − 274821	0015 − 280	00 17 59.00583249	−27 48 21.5745659	0.00019196	0.0050280	0.495	53573.0	53573.0	53573.0	1	33
ICRF J001939.7 + 260252	0017 + 257	00 19 39.78058269	26 02 52.2784459	0.00001847	0.0005741	−0.290	50219.8	50219.8	50219.8	1	74
ICRF J001942.6 − 303119	0017 − 307	00 19 42.67532353	−30 31 19.3482183	0.00002313	0.0007599	0.087	52306.7	52306.7	52306.7	1	47
ICRF J002102.8 + 715020	0018 + 715	00 21 02.81374705	71 50 20.7710670	0.00022806	0.0017525	−0.546	49827.5	49827.5	49827.5	1	31
ICRF J002127.3 + 731241	0018 + 729	00 21 27.37482251	73 12 41.9312197	0.00045308	0.0015436	0.242	53041.4	49827.5	54112.8	2	24
ICRF J002206.6 + 452533	0019 + 451	00 22 06.61132885	45 25 33.8601981	0.00002540	0.0004858	0.034	50306.3	50306.3	50306.3	1	81
ICRF J002225.4 + 001456	0019 − 000	00 22 25.42593021	00 14 56.1613786	0.00009584	0.0028576	−0.190	50576.2	50576.2	50576.2	1	18
ICRF J002335.4 + 445635	0020 + 446	00 23 35.44245528	44 56 35.7573595	0.00004493	0.0010439	0.382	50306.3	50306.3	50306.3	1	51
ICRF J002400.6 − 081110	0021 − 084	00 24 00.67272891	−08 11 10.0486110	0.00007063	0.0021062	−0.260	53440.2	53153.2	53523.9	2	31
ICRF J002421.5 + 464406	0021 + 464	00 24 21.53760346	46 44 06.2285494	0.00004496	0.0012365	0.148	50306.3	50306.3	50306.3	1	54
ICRF J002445.9 − 041201	0022 − 044	00 24 45.98322022	−04 12 01.5488383	0.00001649	0.0005258	−0.181	50576.2	50576.2	50576.2	1	64
ICRF J002524.2 − 222747	0022 − 227	00 25 24.24744536	−22 27 47.5969650	0.00002431	0.0008110	−0.063	54088.1	54088.1	54088.1	1	78
ICRF J002526.1 + 391935	0022 + 390	00 25 26.15767775	39 19 35.4395037	0.00001290	0.0002575	−0.425	50242.8	50242.8	50242.8	1	75
ICRF J002549.1 − 260212	0023 − 263	00 25 49.15626788	−26 02 12.6149312	0.00007109	0.0020401	0.375	52409.7	52409.7	52409.7	1	28
ICRF J002641.7 + 350842	0024 + 348	00 26 41.72457427	35 08 42.2765490	0.00023308	0.0047705	−0.612	50219.8	50219.8	50219.8	1	12
ICRF J002651.4 − 111252	0024 − 114	00 26 51.44303605	−11 12 52.4253828	0.00006387	0.0016862	0.223	53552.8	53552.8	53552.8	1	30
ICRF J002703.2 + 595852	0024 + 597	00 27 03.28647270	59 58 52.9600213	0.00026821	0.0017568	0.173	49577.0	49577.0	49577.0	1	11
ICRF J002705.7 + 092957	0024 + 092	00 27 05.79362565	09 29 57.7635423	0.00005079	0.0009324	0.339	52306.7	52306.7	52306.7	1	28
ICRF J002900.9 − 011341	0026 − 015	00 29 00.98604496	−01 13 41.7604847	0.00004920	0.0009446	0.369	53126.1	53126.1	53126.1	1	36
ICRF J002903.5 + 050934	0026 + 048	00 29 03.59227306	05 09 34.8676363	0.00015914	0.0023565	−0.513	49914.7	49914.7	49914.7	1	30
ICRF J003014.4 + 703740	0027 + 703	00 30 14.41300212	70 37 40.0605498	0.00003928	0.0003408	−0.046	49827.5	49827.5	49827.5	1	117
ICRF J003031.8 − 021156	0027 − 024	00 30 31.82375224	−02 11 56.1335027	0.00001515	0.0004998	−0.209	53130.3	53126.1	53134.5	2	68
ICRF J003156.4 − 142619	0029 − 147	00 31 56.41188946	−14 26 19.3470091	0.00006460	0.0018802	−0.534	53129.4	53126.1	53134.5	2	36
ICRF J003443.4 + 275425	0032 + 276	00 34 43.48618479	27 54 25.7213732	0.00002177	0.0005738	−0.263	50219.8	50219.8	50219.8	1	55
ICRF J003544.0 + 143801	0033 + 143	00 35 44.08792240	14 38 01.9720229	0.00002541	0.0008077	0.142	54112.8	54112.8	54112.8	1	49
ICRF J003546.2 − 083554	0033 − 088	00 35 46.25051310	−08 35 54.0449447	0.00014899	0.0049037	−0.889	53523.9	53523.9	53523.9	1	6
ICRF J003635.1 + 143403	0033 + 142	00 36 35.10909957	14 34 03.6202098	0.00003150	0.0007800	−0.210	52409.7	52409.7	52409.7	1	46
ICRF J003714.8 − 214524	0034 − 220	00 37 14.82592389	−21 45 24.7135356	0.00005181	0.0014307	−0.567	54088.1	54088.1	54088.1	1	38

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J003726.0 + 110950	0034 + 108	00 37 26.04142426	11 09 50.9210655	0.00002158	0.0006157	−0.274	49914.7	49914.7	49914.7	1	108
ICRF J003732.1 + 080813	0034 + 078	00 37 32.19717614	08 08 13.0574396	0.00001688	0.0005158	−0.234	53561.9	53561.9	53561.9	1	77
ICRF J003746.1 + 365910	0035 + 367	00 37 46.14323988	36 59 10.8850961	0.00028491	0.0027156	0.740	50242.8	50242.8	50242.8	1	12
ICRF J003818.0 + 122731	0035 + 121	00 38 18.01644892	12 27 31.2516734	0.00064141	0.0189996	−0.982	50115.9	50085.5	50156.3	2	14
ICRF J003820.7 − 032958	0035 − 037	00 38 20.79434604	−03 29 58.9622726	0.00002398	0.0007560	−0.284	53573.0	53573.0	53573.0	1	77
ICRF J003828.4 + 503525	0035 + 503	00 38 28.41348698	50 35 25.8332986	0.00010360	0.0006748	−0.215	53651.4	50306.3	54112.8	2	33
ICRF J003829.9 − 212004	0036 − 216	00 38 29.95469596	−21 20 04.0231282	0.00015427	0.0033589	0.409	50661.5	50632.3	50688.3	2	48
ICRF J003906.2 − 094246	0036 − 099	00 39 06.29166037	−09 42 46.8868232	0.00004123	0.0017971	−0.092	54088.1	54088.1	54088.1	1	15
ICRF J003916.9 − 185405	0036 − 191	00 39 16.92438996	−18 54 05.6200081	0.00033411	0.0099397	0.751	53560.8	53560.8	53560.8	1	8
ICRF J003946.9 + 490033	0037 + 487	00 39 46.99884357	49 00 33.1753187	0.00002986	0.0005479	0.155	50306.3	50306.3	50306.3	1	80
ICRF J004017.5 − 324327	0037 − 329	00 40 17.54075021	−32 43 27.8244134	0.00009427	0.0023084	−0.375	52306.7	52306.7	52306.7	1	19
ICRF J004030.6 − 322520	0038 − 326	00 40 30.65507682	−32 25 20.3346836	0.00042124	0.0171017	0.619	52306.7	52306.7	52306.7	1	9
ICRF J004057.6 − 014632	0038 − 020	00 40 57.61158383	−01 46 32.0264563	0.00001289	0.0004074	−0.354	50576.2	50576.2	50576.2	1	65
ICRF J004117.2 + 133927	0038 + 133	00 41 17.21099103	13 39 27.5274745	0.00011465	0.0019549	−0.270	54112.8	54112.8	54112.8	1	19
ICRF J004244.3 + 100949	0040 + 098	00 42 44.37172196	10 09 49.2070344	0.00004117	0.0009743	0.450	49914.7	49914.7	49914.7	1	77
ICRF J004442.2 + 185505	0042 + 186	00 44 42.22790128	18 55 05.0346529	0.00004618	0.0016799	0.593	53126.1	53126.1	53126.1	1	36
ICRF J004450.7 + 680302	0041 + 677	00 44 50.75960812	68 03 02.6856161	0.00005206	0.0004657	−0.180	53560.8	53560.8	53560.8	1	59
ICRF J004607.8 + 245632	0043 + 246	00 46 07.82574115	24 56 32.5243374	0.00001099	0.0002472	0.088	53128.1	53126.1	53306.8	2	91
ICRF J004647.5 + 390047	0044 + 387	00 46 47.57831015	39 00 47.1486395	0.00003518	0.0006624	−0.284	50242.8	50242.8	50242.8	1	60
ICRF J004700.4 + 565742	0044 + 566	00 47 00.42879964	56 57 42.3950995	0.00002877	0.0004198	0.021	49577.0	49577.0	49577.0	1	130
ICRF J004743.8 + 243515	0045 + 243	00 47 43.87132950	24 35 15.9955733	0.00004887	0.0014977	−0.792	50122.2	50085.5	50156.3	2	85
ICRF J004858.7 + 064006	0046 + 063	00 48 58.72313512	06 40 06.4748074	0.00004144	0.0012425	0.390	53129.7	53126.1	53134.5	2	28
ICRF J004922.9 − 311627	0046 − 315	00 49 22.90071217	−31 16 27.3156721	0.00033949	0.0155407	0.726	52306.7	52306.7	52306.7	1	10
ICRF J004937.9 + 512813	0046 + 511	00 49 37.99120117	51 28 13.6925314	0.00003850	0.0006446	−0.303	49959.0	49577.0	50306.3	2	126
ICRF J005021.5 − 045220	0047 − 051	00 50 21.53480228	−04 52 20.5953473	0.00004185	0.0013399	−0.474	50576.2	50576.2	50576.2	1	40
ICRF J005108.2 − 065002	0048 − 071	00 51 08.20981506	−06 50 02.2290926	0.00000977	0.0003238	−0.290	50576.2	50576.2	50576.2	1	73
ICRF J005136.4 + 445935	0048 + 447	00 51 36.47366080	44 59 35.9585067	0.00008293	0.0007959	0.269	50306.3	50306.3	50306.3	1	45
ICRF J005227.8 + 440254	0049 + 437	00 52 27.82588947	44 02 54.5161062	0.00002611	0.0004304	−0.122	50272.2	50242.8	50306.3	2	106
ICRF J005232.8 + 862744	0046 + 861	00 52 32.85485469	86 27 44.2505111	0.00342413	0.0051506	0.490	53573.0	53573.0	53573.0	1	13
ICRF J005252.5 − 282554	0050 − 287	00 52 52.55633535	−28 25 54.1852239	0.00062248	0.0281282	−0.901	53573.0	53573.0	53573.0	1	9
ICRF J005336.5 − 072729	0051 − 077	00 53 36.51571062	−07 27 29.6196140	0.00011561	0.0032473	−0.272	53560.8	53560.8	53560.8	1	15
ICRF J005417.6 + 681111	0051 + 679	00 54 17.62159478	68 11 11.1767459	0.00015393	0.0011403	−0.110	49827.5	49827.5	49827.5	1	38
ICRF J005417.6 + 705356	0051 + 706	00 54 17.68494238	70 53 56.6180107	0.00009612	0.0008882	0.271	49827.5	49827.5	49827.5	1	63
ICRF J005432.9 − 195301	0052 − 201	00 54 32.94845203	−19 53 01.0027203	0.00002707	0.0008645	−0.153	53537.8	53523.9	53561.9	2	93
ICRF J005511.7 − 121757	0052 − 125	00 55 11.78259264	−12 17 57.0972882	0.00001146	0.0003882	−0.206	53552.8	53552.8	53552.8	1	90

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J005717.0 − 002433	0054 − 006	00 57 17.00238136	−00 24 33.1744478	0.00014489	0.0059544	0.726	53573.0	53573.0	53573.0	1	8
ICRF J005802.2 − 323420	0055 − 328	00 58 02.23032214	−32 34 20.7481551	0.00009328	0.0038260	−0.548	52306.7	52306.7	52306.7	1	20
ICRF J005832.0 + 331117	0055 + 329	00 58 32.06903851	33 11 17.2144874	0.00002420	0.0007097	−0.224	53560.8	53560.8	53560.8	1	60
ICRF J005833.8 + 062006	0055 + 060	00 58 33.80447037	06 20 06.0735328	0.00004171	0.0013328	−0.239	53128.7	53126.1	53134.5	2	19
ICRF J005952.2 + 581223	0056 + 579	00 59 52.20903410	58 12 23.6833746	0.00006313	0.0004667	0.267	52306.7	52306.7	52306.7	1	39
ICRF J010038.2 + 334506	0057 + 334	01 00 38.29071500	33 45 06.1217039	0.00002983	0.0007648	−0.191	53561.9	53561.9	53561.9	1	56
ICRF J010051.6 + 680820	0057 + 678	01 00 51.66361162	68 08 20.5350636	0.00029040	0.0016571	0.148	49827.5	49827.5	49827.5	1	24
ICRF J010116.9 + 500444	0058 + 498	01 01 16.99753790	50 04 44.9894915	0.00015525	0.0013563	−0.747	52748.7	50306.3	54088.1	2	48
ICRF J010152.3 − 283120	0059 − 287	01 01 52.38972541	−28 31 20.4206917	0.00030176	0.0078408	0.596	50688.3	50688.3	50688.3	1	13
ICRF J010157.7 + 163940	0059 + 163	01 01 57.71954542	16 39 40.9530047	0.00004226	0.0025781	−0.436	51490.9	50085.5	53134.5	4	57
ICRF J010256.3 − 264636	0100 − 270	01 02 56.35398865	−26 46 36.5148938	0.00017584	0.0060835	0.199	54112.8	54112.8	54112.8	1	20
ICRF J010458.2 − 241628	0102 − 245	01 04 58.20537130	−24 16 28.4451407	0.00001599	0.0005424	−0.313	50659.4	50632.3	50688.3	2	132
ICRF J010549.9 + 481903	0102 + 480	01 05 49.92815913	48 19 03.1926880	0.00001298	0.0002415	−0.134	50306.3	50306.3	50306.3	1	90
ICRF J010600.2 + 340202	0103 + 337	01 06 00.29336917	34 02 02.9884749	0.00004953	0.0011647	0.515	50219.8	50219.8	50219.8	1	39
ICRF J010610.9 + 253930	0103 + 253	01 06 10.96898367	25 39 30.4956046	0.00006250	0.0017723	−0.845	50219.8	50219.8	50219.8	1	37
ICRF J010622.9 − 015538	0103 − 021	01 06 22.99424141	−01 55 38.4150553	0.00003094	0.0007635	0.096	50576.2	50576.2	50576.2	1	62
ICRF J010643.2 − 031536	0104 − 035	01 06 43.22871688	−03 15 36.2960289	0.00002504	0.0007563	−0.107	53573.0	53573.0	53573.0	1	73
ICRF J010652.6 + 195102	0104 + 195	01 06 52.63125405	19 51 02.5618903	0.00002118	0.0006353	−0.497	53503.7	53503.7	53503.7	1	64
ICRF J010745.9 + 131205	0105 + 129	01 07 45.96189887	13 12 05.1913284	0.00002881	0.0008700	−0.543	54088.1	54088.1	54088.1	1	56
ICRF J010747.8 + 261108	0105 + 259	01 07 47.88625279	26 11 08.6726205	0.00007369	0.0025502	−0.708	50219.8	50219.8	50219.8	1	29
ICRF J010826.8 − 003724	0105 − 008	01 08 26.84261443	−00 37 24.1652150	0.00005702	0.0011010	0.487	50576.2	50576.2	50576.2	1	46
ICRF J010946.3 + 613330	0106 + 612	01 09 46.34445705	61 33 30.4554106	0.00005311	0.0001860	−0.082	52306.7	52306.7	52306.7	1	53
ICRF J011012.8 + 680541	0106 + 678	01 10 12.87345665	68 05 41.2185179	0.00024612	0.0016181	0.055	49827.5	49827.5	49827.5	1	25
ICRF J011030.9 − 041531	0107 − 045	01 10 30.90278916	−04 15 31.0258767	0.00002737	0.0009727	−0.394	54112.8	54112.8	54112.8	1	32
ICRF J011035.5 − 164827	0108 − 170	01 10 35.51118979	−16 48 27.7033885	0.00033054	0.0078024	0.562	53153.2	53153.2	53153.2	1	8
ICRF J011050.0 − 074141	0108 − 079	01 10 50.02098339	−07 41 41.1141258	0.00001163	0.0003789	−0.115	50576.2	50576.2	50576.2	1	66
ICRF J011156.8 − 131701	0109 − 135	01 11 56.85796667	−13 17 01.1970719	0.00002241	0.0008044	−0.444	53561.9	53561.9	53561.9	1	55
ICRF J011212.9 + 352219	0109 + 351	01 12 12.94440267	35 22 19.3366943	0.00001540	0.0003302	−0.298	50242.8	50242.8	50242.8	1	64
ICRF J011250.3 + 320817	0110 + 318	01 12 50.33304741	32 08 17.4329678	0.00001517	0.0004043	−0.090	50219.8	50219.8	50219.8	1	72
ICRF J011546.5 − 304919	0113 − 310	01 15 46.50553812	−30 49 19.4001560	0.00003322	0.0010029	−0.581	53126.1	53126.1	53126.1	1	36
ICRF J011638.0 + 242253	0113 + 241	01 16 38.06769457	24 22 53.7240499	0.00009756	0.0020359	−0.258	50144.2	50085.5	50156.3	2	35
ICRF J011651.5 − 205210	0114 − 211	01 16 51.56103995	−20 52 10.8021857	0.01036400	0.2626178	−0.992	52409.7	52409.7	52409.7	1	3
ICRF J011725.2 + 141812	0114 + 140	01 17 25.20320275	14 18 12.4199334	0.00012807	0.0021038	−0.389	50136.1	50085.5	50156.3	2	49
ICRF J011901.2 + 082954	0116 + 082	01 19 01.27435539	08 29 54.6928702	0.00006646	0.0017983	−0.398	52409.7	52409.7	52409.7	1	15
ICRF J011943.6 − 165408	0117 − 171	01 19 43.64593528	−16 54 08.9721752	0.00003698	0.0012470	0.607	53552.8	53552.8	53552.8	1	55

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J012100.7 − 280622	0118 − 283	01 21 00.74193927	−28 06 22.1777062	0.00020120	0.0058839	0.731	53503.7	53503.7	53503.7	1	15
ICRF J012217.4 − 005615	0119 − 011	01 22 17.46999699	−00 56 15.6975303	0.00003160	0.0013325	−0.662	54112.8	54112.8	54112.8	1	38
ICRF J012245.4 + 295412	0119 + 296	01 22 45.43001742	29 54 12.6429636	0.00001791	0.0004485	−0.169	53130.3	53126.1	53134.5	2	68
ICRF J012302.2 + 304406	0120 + 304	01 23 02.28144119	30 44 06.9182239	0.00003944	0.0013107	0.018	53573.0	53573.0	53573.0	1	50
ICRF J012343.0 + 261522	0120 + 259	01 23 43.04519489	26 15 22.4261789	0.00001876	0.0005958	−0.252	50219.8	50219.8	50219.8	1	69
ICRF J012346.3 − 092303	0121 − 096	01 23 46.38468296	−09 23 03.3327753	0.00009866	0.0031861	0.484	53560.8	53560.8	53560.8	1	17
ICRF J012421.4 − 341621	0122 − 345	01 24 21.45937850	−34 16 21.4532471	0.00004118	0.0013335	−0.232	52793.9	52306.7	53126.1	2	37
ICRF J012455.8 + 280511	0122 + 278	01 24 55.87921345	28 05 11.3910405	0.00002368	0.0006928	−0.044	50219.8	50219.8	50219.8	1	61
ICRF J012507.7 + 471803	0122 + 470	01 25 07.70674540	47 18 03.0848148	0.00007949	0.0010816	0.147	50306.3	50306.3	50306.3	1	28
ICRF J012518.8 − 254904	0122 − 260	01 25 18.83747246	−25 49 04.3897944	0.00002191	0.0007436	−0.222	53561.9	53561.9	53561.9	1	56
ICRF J012607.8 + 704652	0122 + 705	01 26 07.84360323	70 46 52.3861005	0.00027643	0.0030622	−0.673	49827.5	49827.5	49827.5	1	10
ICRF J012615.0 − 222233	0123 − 226	01 26 15.00163184	−22 22 33.6023730	0.00002612	0.0008011	−0.630	53126.1	53126.1	53126.1	1	55
ICRF J012704.7 + 732312	0123 + 731	01 27 04.71654715	73 23 12.6698576	0.00249051	0.0099301	−0.821	53573.0	53573.0	53573.0	1	7
ICRF J012808.0 + 490105	0125 + 487	01 28 08.06338438	49 01 05.9858202	0.00003166	0.0005663	0.456	50306.3	50306.3	50306.3	1	70
ICRF J012955.3 + 144647	0127 + 145	01 29 55.34717058	14 46 47.8360559	0.00002856	0.0007932	−0.445	50164.5	50085.5	54482.7	3	130
ICRF J013126.7 + 383439	0128 + 383	01 31 26.71349931	38 34 39.2217813	0.00005221	0.0013386	−0.046	53560.8	53560.8	53560.8	1	19
ICRF J013203.0 + 221650	0129 + 220	01 32 03.07877651	22 16 50.3351505	0.00002264	0.0005416	−0.164	54112.8	54112.8	54112.8	1	47
ICRF J013220.4 + 562040	0129 + 560	01 32 20.44728196	56 20 40.3705467	0.00004952	0.0006212	0.277	49577.0	49577.0	49577.0	1	99
ICRF J013244.1 + 432532	0129 + 431	01 32 44.12680458	43 25 32.6612366	0.00002927	0.0005891	−0.229	50242.8	50242.8	50242.8	1	69
ICRF J013300.8 − 443043	0130 − 447	01 33 00.86354131	−44 30 43.6390089	0.00057534	0.0450515	−0.300	53134.5	53134.5	53134.5	1	8
ICRF J013412.7 + 000345	0131 − 001	01 34 12.70417317	00 03 45.1359175	0.00010045	0.0019684	−0.086	50576.2	50576.2	50576.2	1	28
ICRF J013432.0 − 384333	0132 − 389	01 34 32.03009962	−38 43 33.3820706	0.00004129	0.0012398	−0.060	52354.5	52306.7	52409.7	2	28
ICRF J013440.7 + 692510	0130 + 691	01 34 40.75983478	69 25 10.8963332	0.00092241	0.0033809	0.643	49827.5	49827.5	49827.5	1	12
ICRF J013537.5 − 200845	0133 − 204	01 35 37.50940551	−20 08 45.8619471	0.00000801	0.0002381	−0.060	50660.3	50632.3	50688.3	2	180
ICRF J013715.6 + 214544	0134 + 215	01 37 15.62499129	21 45 44.2703802	0.00006985	0.0009743	0.515	53561.9	53561.9	53561.9	1	26
ICRF J013809.8 − 271127	0135 − 274	01 38 09.81821269	−27 11 27.9340753	0.00003193	0.0010506	0.247	53573.0	53573.0	53573.0	1	57
ICRF J013851.8 − 054008	0136 − 059	01 38 51.85124099	−05 40 08.2422997	0.00002510	0.0007347	0.232	50576.2	50576.2	50576.2	1	59
ICRF J013857.4 − 225447	0136 − 231	01 38 57.46565382	−22 54 47.3303665	0.00001288	0.0004736	0.006	50660.7	50632.3	50688.3	2	142
ICRF J014004.4 − 153255	0137 − 158	01 40 04.43519932	−15 32 55.6801184	0.00001477	0.0005047	−0.154	53561.9	53561.9	53561.9	1	88
ICRF J014043.0 + 634606	0137 + 635	01 40 43.07795609	63 46 06.8915244	0.00023352	0.0006663	0.153	52306.7	52306.7	52306.7	1	16
ICRF J014054.6 + 434245	0137 + 434	01 40 54.66446641	43 42 45.2069602	0.00004864	0.0006609	−0.288	54088.1	54088.1	54088.1	1	47
ICRF J014133.7 − 020221	0139 − 022	01 41 33.79015161	−02 02 21.5528650	0.00002612	0.0008066	−0.151	53573.0	53573.0	53573.0	1	53
ICRF J014303.1 + 412920	0140 + 412	01 43 03.18455718	41 29 20.4457184	0.00002084	0.0004446	−0.194	50242.8	50242.8	50242.8	1	79
ICRF J014310.1 − 320056	0140 − 322	01 43 10.13155304	−32 00 56.6520055	0.00002401	0.0007825	−0.183	52306.7	52306.7	52306.7	1	31
ICRF J014331.0 + 121542	0140 + 120	01 43 31.09222054	12 15 42.9334511	0.00010474	0.0011752	0.219	53129.3	53126.1	53134.5	2	26

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J014346.8 + 491541	0140 + 490	01 43 46.87989537	49 15 41.5865983	0.00059622	0.0066517	0.050	50306.3	50306.3	50306.3	1	8
ICRF J014433.5 + 270503	0141 + 268	01 44 33.55386987	27 05 03.1179001	0.00008347	0.0011696	0.011	53560.8	53560.8	53560.8	1	17
ICRF J014454.0 − 393810	0142 − 398	01 44 54.09317727	−39 38 10.5504010	0.00085790	0.0357782	0.915	52409.7	52409.7	52409.7	1	4
ICRF J014503.3 − 273334	0142 − 278	01 45 03.39461388	−27 33 34.3287467	0.00001241	0.0003889	−0.093	50688.3	50688.3	50688.3	1	81
ICRF J014552.9 + 231919	0143 + 230	01 45 52.90629154	23 19 19.2969567	0.00003805	0.0010059	−0.573	50138.2	50085.5	50156.3	2	117
ICRF J014737.7 + 485937	0144 + 487	01 47 37.77517162	48 59 37.5107221	0.00036490	0.0039043	0.150	50306.3	50306.3	50306.3	1	11
ICRF J014746.5 + 584044	0144 + 584	01 47 46.54120187	58 40 44.9726846	0.00027126	0.0026486	0.847	53700.4	49577.0	54112.8	2	22
ICRF J014824.3 + 385405	0145 + 386	01 48 24.37758089	38 54 05.2199926	0.00003136	0.0005524	−0.305	50242.8	50242.8	50242.8	1	65
ICRF J014949.7 + 185720	0147 + 187	01 49 49.71894590	18 57 20.6111304	0.00003182	0.0008132	−0.162	50130.2	50085.5	50156.3	2	122
ICRF J015106.0 − 173244	0148 − 177	01 51 06.08335997	−17 32 44.7177092	0.00001030	0.0003311	−0.091	50632.3	50632.3	50632.3	1	90
ICRF J015106.2 + 251728	0148 + 250	01 51 06.23386345	25 17 28.6621943	0.00005568	0.0020972	−0.611	53561.9	53561.9	53561.9	1	30
ICRF J015123.4 − 343513	0149 − 348	01 51 23.48914489	−34 35 13.8765734	0.00003383	0.0011053	0.061	52306.7	52306.7	52306.7	1	32
ICRF J015148.0 − 171955	0149 − 175	01 51 48.04991127	−17 19 55.0373475	0.00077948	0.0341370	0.328	53573.0	53573.0	53573.0	1	6
ICRF J015212.2 + 371605	0149 + 370	01 52 12.21995434	37 16 05.6668444	0.00002124	0.0004589	−0.224	50242.8	50242.8	50242.8	1	80
ICRF J015233.6 − 294247	0150 − 299	01 52 33.69293231	−29 42 47.9263665	0.00010731	0.0045375	0.030	53560.8	53560.8	53560.8	1	25
ICRF J015234.5 + 335033	0149 + 335	01 52 34.57645494	33 50 33.1584056	0.00002628	0.0005472	−0.276	50219.8	50219.8	50219.8	1	66
ICRF J015243.1 + 002039	0150 + 000	01 52 43.14999445	00 20 39.7109736	0.00003540	0.0011740	−0.367	53127.6	53126.1	53134.5	2	22
ICRF J015301.5 − 190656	0150 − 193	01 53 01.51127353	−19 06 56.6888850	0.00013639	0.0048956	−0.882	54088.1	54088.1	54088.1	1	29
ICRF J015325.8 + 711506	0149 + 710	01 53 25.85108747	71 15 06.4628546	0.00032760	0.0013542	−0.209	49827.5	49827.5	49827.5	1	32
ICRF J015402.7 + 082351	0151 + 081	01 54 02.77011507	08 23 51.0719706	0.00011979	0.0027210	−0.061	53134.5	53134.5	53134.5	1	11
ICRF J015503.7 + 043830	0152 + 043	01 55 03.72556256	04 38 30.3468674	0.00007385	0.0017892	−0.136	49914.7	49914.7	49914.7	1	29
ICRF J015558.9 + 223011	0153 + 222	01 55 58.93537916	22 30 11.8657703	0.00004834	0.0010404	0.118	50141.6	50085.5	50156.3	2	96
ICRF J015631.4 + 391430	0153 + 389	01 56 31.41013245	39 14 30.9233605	0.00001887	0.0004031	−0.030	53126.1	53126.1	53126.1	1	86
ICRF J015710.5 + 001124	0154 − 000	01 57 10.53490396	00 11 24.4846319	0.00002589	0.0008547	−0.331	53573.0	53573.0	53573.0	1	71
ICRF J015800.1 + 212442	0155 + 211	01 58 00.10797671	21 24 42.7878910	0.00005133	0.0009620	−0.365	54088.1	54088.1	54088.1	1	39
ICRF J015843.7 − 141307	0156 − 144	01 58 43.71964767	−14 13 07.1181809	0.00002554	0.0007036	0.296	50632.3	50632.3	50632.3	1	77
ICRF J015856.2 + 130702	0156 + 128	01 58 56.27379107	13 07 02.7411110	0.00004083	0.0015382	−0.403	50134.3	50085.5	50156.3	2	87
ICRF J020040.8 + 032249	0158 + 031	02 00 40.81646868	03 22 49.5072588	0.00001701	0.0005804	−0.219	53560.8	53560.8	53560.8	1	67
ICRF J020051.1 − 154236	0158 − 159	02 00 51.14882808	−15 42 36.8619178	0.00116672	0.0331308	−0.783	53573.0	53573.0	53573.0	1	3
ICRF J020058.3 − 135617	0158 − 141	02 00 58.31718545	−13 56 17.9829047	0.00014506	0.0056637	−0.128	53561.9	53561.9	53561.9	1	11
ICRF J020151.5 + 034309	0159 + 034	02 01 51.50875532	03 43 09.2592053	0.00003424	0.0012062	−0.300	49914.7	49914.7	49914.7	1	53
ICRF J020213.8 − 194819	0159 − 200	02 02 13.84768802	−19 48 19.4896279	0.00003922	0.0014887	0.253	53560.8	53560.8	53560.8	1	49
ICRF J020243.6 + 420516	0159 + 418	02 02 43.65330305	42 05 16.3329890	0.00001973	0.0003995	−0.231	50242.8	50242.8	50242.8	1	81
ICRF J020345.3 + 304129	0200 + 304	02 03 45.35604864	30 41 29.1087951	0.00019955	0.0022549	−0.164	50219.8	50219.8	50219.8	1	14
ICRF J020346.6 + 541157	0200 + 539	02 03 46.65714013	54 11 57.6254727	0.00033212	0.0037883	−0.670	49577.0	49577.0	49577.0	1	17

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J020428.6 − 332850	0202 − 337	02 04 28.66415499	−33 28 50.4527047	0.00008931	0.0030687	0.830	53126.1	53126.1	53126.1	1	22
ICRF J020454.7 + 440306	0201 + 438	02 04 54.78909354	44 03 06.9046867	0.00007843	0.0007314	0.137	50281.8	50242.8	50306.3	2	57
ICRF J020455.5 + 364917	0201 + 365	02 04 55.59599773	36 49 17.9974357	0.00001859	0.0004545	−0.212	50242.8	50242.8	50242.8	1	81
ICRF J020513.1 + 144432	0202 + 145	02 05 13.11724590	14 44 32.3861483	0.00001534	0.0004965	−0.198	53561.9	53561.9	53561.9	1	88
ICRF J020521.3 + 241632	0202 + 240	02 05 21.32273531	24 16 32.8508721	0.00003407	0.0007171	−0.008	53130.3	53126.1	53134.5	2	42
ICRF J020555.5 − 344409	0203 − 349	02 05 55.50981896	−34 44 09.1778858	0.00034047	0.0141713	0.665	52306.7	52306.7	52306.7	1	10
ICRF J020620.0 − 221219	0204 − 224	02 06 20.07356610	−22 12 19.6563003	0.00001650	0.0005297	−0.290	50659.4	50632.3	50688.3	2	155
ICRF J020626.0 − 115039	0203 − 120	02 06 26.08475631	−11 50 39.7250313	0.00001582	0.0005756	−0.086	54112.8	54112.8	54112.8	1	55
ICRF J020703.0 + 624612	0203 + 625	02 07 03.01672856	62 46 12.0673888	0.00004352	0.0002259	0.498	52306.7	52306.7	52306.7	1	67
ICRF J020734.9 + 315206	0204 + 316	02 07 34.98962271	31 52 06.4633702	0.00001655	0.0004703	−0.098	50219.8	50219.8	50219.8	1	79
ICRF J020822.3 − 265018	0206 − 270	02 08 22.35589589	−26 50 18.8776442	0.00001808	0.0006647	0.105	53153.2	53153.2	53153.2	1	81
ICRF J020826.3 − 004744	0205 − 010	02 08 26.34589531	−00 47 44.2934068	0.00001270	0.0003926	−0.243	50576.2	50576.2	50576.2	1	63
ICRF J020908.6 + 293245	0206 + 293	02 09 08.64447530	29 32 45.7434968	0.00009040	0.0017093	0.520	50219.8	50219.8	50219.8	1	24
ICRF J020935.9 + 643725	0205 + 643	02 09 35.98807522	64 37 25.7702899	0.00007563	0.0005035	0.445	52409.7	52409.7	52409.7	1	60
ICRF J020951.7 + 722926	0205 + 722	02 09 51.79043533	72 29 26.6699604	0.00005311	0.0001969	0.423	52409.7	52409.7	52409.7	1	89
ICRF J021023.1 − 144459	0207 − 149	02 10 23.18039037	−14 44 59.0199115	0.00004612	0.0014301	−0.326	53503.7	53503.7	53503.7	1	26
ICRF J021113.1 + 105134	0208 + 106	02 11 13.17738582	10 51 34.7988557	0.00002706	0.0006742	−0.138	49914.7	49914.7	49914.7	1	100
ICRF J021149.7 − 155818	0209 − 162	02 11 49.76160349	−15 58 18.8488015	0.00033558	0.0135499	−0.963	53573.0	53573.0	53573.0	1	14
ICRF J021305.1 + 121310	0210 + 119	02 13 05.18305486	12 13 10.9098848	0.00004423	0.0016511	−0.702	54112.8	54112.8	54112.8	1	29
ICRF J021310.5 + 182025	0210 + 181	02 13 10.52929467	18 20 25.4476302	0.00004250	0.0011491	−0.309	50117.8	50085.5	50156.3	2	79
ICRF J021348.1 + 365234	0210 + 366	02 13 48.19194128	36 52 34.0064266	0.00003485	0.0007415	−0.517	54088.1	54088.1	54088.1	1	35
ICRF J021357.8 + 871728	0159 + 870	02 13 57.84611357	87 17 28.7259858	0.00077288	0.0005071	−0.074	53126.1	53126.1	53126.1	1	60
ICRF J021417.9 + 514451	0210 + 515	02 14 17.93429737	51 44 51.9452284	0.00052934	0.0032779	0.596	54112.8	54112.8	54112.8	1	13
ICRF J021542.0 − 022256	0213 − 026	02 15 42.01727839	−02 22 56.7520390	0.00001161	0.0003820	0.079	50576.2	50576.2	50576.2	1	73
ICRF J021555.0 + 052425	0213 + 051	02 15 55.01076479	05 24 25.5548133	0.00001798	0.0005873	−0.032	54088.1	54088.1	54088.1	1	77
ICRF J021617.1 + 443743	0213 + 443	02 16 17.17159724	44 37 43.3889231	0.00019859	0.0059751	0.079	50306.3	50306.3	50306.3	1	14
ICRF J021638.8 − 101703	0214 − 105	02 16 38.87599357	−10 17 03.0022391	0.00009054	0.0037477	−0.640	54112.8	54112.8	54112.8	1	18
ICRF J021648.1 − 324740	0214 − 330	02 16 48.18543068	−32 47 40.8498325	0.00002708	0.0009124	−0.092	52306.7	52306.7	52306.7	1	43
ICRF J021702.6 − 082052	0214 − 085	02 17 02.66231068	−08 20 52.3512122	0.00001750	0.0006377	−0.365	50576.2	50576.2	50576.2	1	72
ICRF J021717.1 + 083703	0214 + 083	02 17 17.12496784	08 37 03.8983975	0.00002122	0.0005701	−0.067	53126.1	53126.1	53126.1	1	61
ICRF J021757.2 − 163110	0215 − 167	02 17 57.24949274	−16 31 10.4737409	0.00001545	0.0006432	−0.136	50632.3	50632.3	50632.3	1	82
ICRF J021921.1 − 184238	0217 − 189	02 19 21.16175729	−18 42 38.7474280	0.00001214	0.0004262	−0.034	50660.5	50632.3	50688.3	2	175
ICRF J021923.3 + 472740	0216 + 472	02 19 23.35993582	47 27 40.0081946	0.00003465	0.0005448	−0.044	53561.9	53561.9	53561.9	1	66
ICRF J021926.6 + 480638	0216 + 478	02 19 26.67616165	48 06 38.8611287	0.00181145	0.0030069	0.836	53134.5	53134.5	53134.5	1	5
ICRF J022000.7 + 165228	0217 + 166	02 20 00.75883967	16 52 28.5886747	0.00011032	0.0022318	−0.780	50133.6	50085.5	50156.3	2	56

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J022028.2 − 130519	0218 − 133	02 20 28.21757499	−13 05 19.0678284	0.00005178	0.0011608	0.442	50576.2	50576.2	50576.2	1	48
ICRF J022035.1 − 215112	0218 − 220	02 20 35.15014959	−21 51 12.0799223	0.00001961	0.0007244	−0.338	50662.7	50632.3	50688.3	2	129
ICRF J022048.0 + 324106	0217 + 324	02 20 48.05305866	32 41 06.4639583	0.00002139	0.0004815	0.470	50219.8	50219.8	50219.8	1	64
ICRF J022200.7 − 161516	0219 − 164	02 22 00.72503131	−16 15 16.5478179	0.00001933	0.0005895	0.016	50632.3	50632.3	50632.3	1	82
ICRF J022343.7 − 165637	0221 − 171	02 23 43.76370107	−16 56 37.7003682	0.00005371	0.0016262	−0.561	53128.3	53126.1	53134.5	2	34
ICRF J022504.6 + 184648	0222 + 185	02 25 04.66883130	18 46 48.7667236	0.00003635	0.0010379	−0.382	50139.2	50085.5	50156.3	2	116
ICRF J022519.1 + 295512	0222 + 296	02 25 19.19529423	29 55 12.1293496	0.00003111	0.0008392	−0.227	53560.8	53560.8	53560.8	1	55
ICRF J022541.9 + 113425	0223 + 113	02 25 41.90989787	11 34 25.4646433	0.00001993	0.0006370	0.100	53573.0	53573.0	53573.0	1	72
ICRF J022610.3 + 342130	0223 + 341	02 26 10.33320558	34 21 30.2863026	0.00001548	0.0004037	0.197	50219.8	50219.8	50219.8	1	64
ICRF J022740.5 − 302603	0225 − 306	02 27 40.53670446	−30 26 03.6288147	0.00002780	0.0010292	−0.356	52306.7	52306.7	52306.7	1	47
ICRF J022800.4 + 500559	0224 + 498	02 28 00.46571088	50 05 59.0096283	0.00004126	0.0004428	−0.129	53552.8	53552.8	53552.8	1	54
ICRF J022812.4 + 421203	0225 + 419	02 28 12.46714951	42 12 03.4448831	0.00008922	0.0009833	0.066	53561.9	53561.9	53561.9	1	28
ICRF J022825.6 + 541908	0224 + 540	02 28 25.69181100	54 19 08.1339205	0.00062543	0.0049847	0.843	53503.7	53503.7	53503.7	1	10
ICRF J022833.7 − 371956	0226 − 375	02 28 33.73430550	−37 19 56.3381067	0.00051639	0.0340577	0.719	52368.5	52306.7	52409.7	2	5
ICRF J022853.2 − 033737	0226 − 038	02 28 53.21123485	−03 37 37.1258989	0.00001375	0.0004495	−0.123	50576.2	50576.2	50576.2	1	73
ICRF J023105.0 − 160649	0228 − 163	02 31 05.03530551	−16 06 49.0150125	0.00011195	0.0021637	0.363	53573.0	53573.0	53573.0	1	34
ICRF J023151.8 − 393547	0229 − 398	02 31 51.81631503	−39 35 47.2630347	0.00002483	0.0006437	0.298	52350.4	52306.7	52409.7	2	33
ICRF J023227.6 + 262838	0229 + 262	02 32 27.62326512	26 28 38.5905468	0.00001073	0.0003378	−0.045	50219.8	50219.8	50219.8	1	80
ICRF J023236.7 − 283926	0230 − 288	02 32 36.74121827	−28 39 26.3064139	0.00039921	0.0182214	0.589	54112.8	54112.8	54112.8	1	6
ICRF J023320.4 + 344253	0230 + 344	02 33 20.42006735	34 42 53.9893979	0.00007687	0.0010732	−0.043	53560.8	53560.8	53560.8	1	30
ICRF J023407.1 + 044643	0231 + 045	02 34 07.15543577	04 46 43.0922256	0.00005492	0.0012308	−0.206	53561.9	53561.9	53561.9	1	31
ICRF J023714.0 + 052649	0234 + 052	02 37 14.03815238	05 26 49.9691959	0.00032724	0.0047993	−0.008	49914.7	49914.7	49914.7	1	12
ICRF J023716.7 − 262353	0235 − 266	02 37 16.76176680	−26 23 53.1458235	0.00009713	0.0042996	0.296	52409.7	52409.7	52409.7	1	12
ICRF J023816.5 + 471218	0234 + 469	02 38 16.50328881	47 12 18.5510668	0.00007142	0.0009022	0.244	53134.5	53134.5	53134.5	1	28
ICRF J024005.2 + 421622	0236 + 420	02 40 05.25264852	42 16 22.5196568	0.00003834	0.0009536	−0.005	53573.0	53573.0	53573.0	1	56
ICRF J024042.8 + 184800	0237 + 185	02 40 42.81625911	18 48 00.0540404	0.00004900	0.0008841	−0.139	50127.6	50085.5	50156.3	2	121
ICRF J024056.1 − 050442	0238 − 052	02 40 56.17268455	−05 04 42.2025878	0.00013447	0.0023369	0.213	53560.8	53560.8	53560.8	1	21
ICRF J024235.9 − 213225	0240 − 217	02 42 35.90988180	−21 32 25.9351732	0.00001694	0.0005531	0.120	50659.4	50632.3	50688.3	2	149
ICRF J024312.4 − 055055	0240 − 060	02 43 12.46947025	−05 50 55.2960798	0.00001003	0.0003402	−0.098	50576.2	50576.2	50576.2	1	73
ICRF J024330.8 + 712017	0238 + 711	02 43 30.89140003	71 20 17.9031778	0.00009174	0.0007174	−0.323	54088.1	54088.1	54088.1	1	62
ICRF J024445.6 + 132007	0242 + 131	02 44 45.69334239	13 20 07.2213465	0.00002197	0.0006302	−0.160	53561.9	53561.9	53561.9	1	54
ICRF J024516.8 + 240535	0242 + 238	02 45 16.85603732	24 05 35.1699541	0.00021507	0.0033767	0.650	50147.3	50085.5	50156.3	2	39
ICRF J024524.9 − 110716	0242 − 113	02 45 24.95219592	−11 07 16.8134382	0.00005969	0.0017024	−0.576	54112.8	54112.8	54112.8	1	26
ICRF J024621.0 + 353637	0243 + 354	02 46 21.07629510	35 36 37.9978431	0.00002572	0.0005781	−0.311	54088.1	54088.1	54088.1	1	78
ICRF J024621.4 − 293505	0244 − 297	02 46 21.46125486	−29 35 05.9213481	0.00014331	0.0044180	0.097	50688.3	50688.3	50688.3	1	27

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J024658.4 − 123630	0244 − 128	02 46 58.46980523	−12 36 30.7974850	0.00002034	0.0007256	−0.510	50576.2	50576.2	50576.2	1	58
ICRF J024741.2 + 325431	0244 + 327	02 47 41.23229808	32 54 31.8360651	0.00002344	0.0005647	−0.010	53573.0	53573.0	53573.0	1	78
ICRF J024807.7 − 163146	0245 − 167	02 48 07.73222049	−16 31 46.3855027	0.00002156	0.0008562	−0.064	50632.3	50632.3	50632.3	1	64
ICRF J024814.8 + 043440	0245 + 043	02 48 14.82811688	04 34 40.8590181	0.00007172	0.0033389	−0.303	53560.8	53560.8	53560.8	1	12
ICRF J025035.5 − 262742	0248 − 266	02 50 35.56931771	−26 27 42.5192007	0.00007714	0.0028341	−0.553	53134.5	53134.5	53134.5	1	22
ICRF J025154.6 + 561619	0248 + 560	02 51 54.62814977	56 16 19.5232268	0.00002587	0.0002924	−0.238	52440.6	52409.7	53306.8	2	58
ICRF J025247.9 − 221925	0250 − 225	02 52 47.95364511	−22 19 25.4661213	0.00001507	0.0005132	0.063	50660.3	50632.3	50688.3	2	158
ICRF J025308.8 + 383524	0249 + 383	02 53 08.88807551	38 35 24.9990546	0.00001281	0.0003050	−0.259	50242.8	50242.8	50242.8	1	81
ICRF J025333.6 + 321720	0250 + 320	02 53 33.65014371	32 17 20.8912585	0.00003828	0.0008619	0.031	53523.9	53523.9	53523.9	1	32
ICRF J025357.6 + 510256	0250 + 508	02 53 57.60791581	51 02 56.4557997	0.00003067	0.0004540	0.306	50030.8	49577.0	50306.3	2	135
ICRF J025424.7 + 234326	0251 + 235	02 54 24.71814382	23 43 26.4742637	0.00001419	0.0004207	−0.001	53560.8	53560.8	53560.8	1	80
ICRF J025442.6 + 393134	0251 + 393	02 54 42.63205929	39 31 34.7112337	0.00001634	0.0003433	−0.051	50242.8	50242.8	50242.8	1	81
ICRF J025612.8 − 213729	0253 − 218	02 56 12.83891753	−21 37 29.1454502	0.00001800	0.0007735	−0.231	50661.7	50632.3	50688.3	2	139
ICRF J025701.3 + 655635	0252 + 657	02 57 01.34301856	65 56 35.4267555	0.00010231	0.0009211	0.107	49827.5	49827.5	49827.5	1	49
ICRF J025741.0 − 121201	0255 − 124	02 57 41.00462862	−12 12 01.3795613	0.00004624	0.0013806	0.481	53503.7	53503.7	53503.7	1	34
ICRF J025745.6 + 184705	0254 + 185	02 57 45.62878555	18 47 05.3557978	0.00015436	0.0042170	−0.738	50150.9	50085.5	50156.3	2	13
ICRF J025752.5 + 784347	0251 + 785	02 57 52.57023700	78 43 47.0581304	0.00018149	0.0003149	−0.405	50627.7	49827.5	50688.3	2	71
ICRF J025759.0 + 433837	0254 + 434	02 57 59.07771985	43 38 37.6744865	0.00002967	0.0005104	−0.026	53552.8	53552.8	53552.8	1	71
ICRF J025814.0 − 390940	0256 − 393	02 58 14.04495445	−39 09 40.6836861	0.00003478	0.0009799	0.428	52350.4	52306.7	52409.7	2	33
ICRF J025816.7 − 252958	0256 − 256	02 58 16.79546096	−25 29 58.7908316	0.00005450	0.0018123	−0.844	53561.9	53561.9	53561.9	1	37
ICRF J025850.5 + 054108	0256 + 054	02 58 50.52634087	05 41 08.0388910	0.00006433	0.0017339	−0.307	49914.7	49914.7	49914.7	1	29
ICRF J025929.6 + 192544	0256 + 192	02 59 29.65595449	19 25 44.3268036	0.00002049	0.0005370	0.130	53523.9	53523.9	53523.9	1	83
ICRF J025937.6 + 423549	0256 + 423	02 59 37.69445155	42 35 49.8112592	0.00006215	0.0007049	0.219	53449.4	50242.8	54112.8	2	35
ICRF J030001.3 − 053120	0257 − 057	03 00 01.30004082	−05 31 20.3611322	0.00002473	0.0005877	−0.430	53153.2	53153.2	53153.2	1	47
ICRF J030106.7 − 181217	0258 − 184	03 01 06.71579723	−18 12 17.7812583	0.00174161	0.0277316	0.851	53561.9	53561.9	53561.9	1	4
ICRF J030116.2 − 312615	0259 − 316	03 01 16.24429698	−31 26 15.7885142	0.00003006	0.0009760	0.203	53126.1	53126.1	53126.1	1	29
ICRF J030116.6 − 165245	0258 − 170	03 01 16.62300857	−16 52 45.0854973	0.00035724	0.0090844	0.626	53560.8	53560.8	53560.8	1	11
ICRF J030133.7 + 060227	0258 + 058	03 01 33.71391478	06 02 27.2823965	0.00002062	0.0006048	−0.141	49914.7	49914.7	49914.7	1	117
ICRF J030222.7 + 533146	0258 + 533	03 02 22.73534090	53 31 46.4839242	0.00016421	0.0015035	0.230	49577.0	49577.0	49577.0	1	32
ICRF J030422.0 + 682137	0259 + 681	03 04 22.00384248	68 21 37.4746010	0.00004878	0.0003664	0.313	49827.5	49827.5	49827.5	1	111
ICRF J030441.3 + 334843	0301 + 336	03 04 41.36244468	33 48 43.5305081	0.00001562	0.0003801	0.072	50219.8	50219.8	50219.8	1	77
ICRF J030510.2 + 173459	0302 + 173	03 05 10.22422242	17 34 59.0923321	0.00004145	0.0014202	−0.359	50123.8	50085.5	50156.3	2	98
ICRF J030548.1 + 052331	0303 + 051	03 05 48.19161145	05 23 31.5282814	0.00006442	0.0015191	0.400	49914.7	49914.7	49914.7	1	60
ICRF J030902.5 − 360403	0307 − 362	03 09 02.51075024	−36 04 03.7469999	0.00041847	0.0260190	0.566	53503.7	53503.7	53503.7	1	7
ICRF J031002.0 − 082339	0307 − 085	03 10 02.04909568	−08 23 39.2978680	0.00018288	0.0036782	0.820	53153.2	53153.2	53153.2	1	19

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J031243.6 + 013317	0310 + 013	03 12 43.60323605	01 33 17.5647455	0.00001351	0.0004618	−0.329	49914.7	49914.7	49914.7	1	130
ICRF J031313.4 + 022835	0310 + 022	03 13 13.40545828	02 28 35.3064424	0.00001888	0.0005521	−0.011	53573.0	53573.0	53573.0	1	88
ICRF J031527.6 − 165629	0313 − 171	03 15 27.67835450	−16 56 29.7119227	0.00009740	0.0020149	0.250	50632.3	50632.3	50632.3	1	35
ICRF J031754.9 + 564357	0314 + 565	03 17 54.94286733	56 43 57.7911162	0.00008480	0.0008405	−0.093	52409.7	52409.7	52409.7	1	36
ICRF J031814.4 − 002948	0315 − 006	03 18 14.42732530	−00 29 48.9330811	0.00020736	0.0026297	0.014	53560.8	53560.8	53560.8	1	16
ICRF J031857.8 + 162832	0316 + 162	03 18 57.80262301	16 28 32.6981890	0.00005187	0.0010649	−0.203	50129.7	50085.5	50156.3	2	101
ICRF J031922.0 + 694925	0314 + 696	03 19 22.07103848	69 49 25.6181400	0.00015824	0.0008164	−0.544	53378.0	49827.5	54088.1	2	42
ICRF J032046.4 − 383728	0318 − 388	03 20 46.40484206	−38 37 28.5038990	0.00040281	0.0195407	0.588	52347.9	52306.7	52409.7	2	10
ICRF J032128.7 − 312256	0319 − 315	03 21 28.74026717	−31 22 56.3360139	0.00007911	0.0034178	0.357	52306.7	52306.7	52306.7	1	26
ICRF J032136.8 + 435922	0318 + 438	03 21 36.86836954	43 59 22.4817474	0.00013712	0.0015061	0.187	50242.8	50242.8	50242.8	1	28
ICRF J032159.8 − 052612	0319 − 056	03 21 59.87036875	−05 26 12.4294219	0.00002643	0.0007732	−0.059	53474.5	53153.2	53503.7	2	48
ICRF J032227.2 + 661028	0317 + 659	03 22 27.22882537	66 10 28.3000926	0.00004711	0.0003482	−0.138	53671.6	49827.5	54112.8	2	68
ICRF J032251.8 + 394802	0319 + 396	03 22 51.83004460	39 48 02.2590985	0.00008041	0.0009748	−0.146	53561.9	53561.9	53561.9	1	36
ICRF J032309.8 + 014550	0320 + 015	03 23 09.87231922	01 45 50.5075249	0.00002383	0.0007386	−0.056	49914.7	49914.7	49914.7	1	80
ICRF J032314.7 + 044612	0320 + 045	03 23 14.72283070	04 46 12.5739816	0.00008266	0.0036304	−0.652	54088.1	54088.1	54088.1	1	30
ICRF J032417.5 − 225417	0322 − 230	03 24 17.55329478	−22 54 17.9252427	0.00039684	0.0210455	0.275	53552.8	53552.8	53552.8	1	5
ICRF J032441.1 + 341045	0321 + 340	03 24 41.16131825	34 10 45.8569044	0.00001694	0.0004019	0.163	50219.8	50219.8	50219.8	1	78
ICRF J032444.2 − 291821	0322 − 294	03 24 44.29549395	−29 18 21.2221485	0.00010104	0.0041345	−0.515	53503.7	53503.7	53503.7	1	14
ICRF J032513.3 − 241548	0323 − 244	03 25 13.34464959	−24 15 48.0527564	0.00001449	0.0005020	−0.020	50660.7	50632.3	50688.3	2	142
ICRF J032520.3 + 465506	0321 + 467	03 25 20.30387489	46 55 06.6356187	0.00008246	0.0012271	0.441	50306.3	50306.3	50306.3	1	42
ICRF J032759.2 + 004422	0325 + 005	03 27 59.21553372	00 44 22.7274529	0.00006487	0.0012073	0.122	49914.7	49914.7	49914.7	1	46
ICRF J032759.9 − 220206	0325 − 222	03 27 59.92401632	−22 02 06.3958756	0.00001946	0.0006235	−0.043	50661.0	50632.3	50688.3	2	117
ICRF J032844.3 + 255208	0325 + 256	03 28 44.34855633	25 52 08.3990655	0.00012310	0.0019336	0.228	54112.8	54112.8	54112.8	1	19
ICRF J032915.3 + 351005	0326 + 349	03 29 15.35488489	35 10 05.9909917	0.00001229	0.0002945	0.204	50219.8	50219.8	50219.8	1	79
ICRF J032954.0 − 235708	0327 − 241	03 29 54.07556109	−23 57 08.7735062	0.00001005	0.0003378	−0.059	50661.8	50632.3	50688.3	2	154
ICRF J033032.6 + 465623	0327 + 467	03 30 32.62734204	46 56 23.2929914	0.00003311	0.0005726	0.064	50306.3	50306.3	50306.3	1	77
ICRF J033034.7 + 363941	0327 + 364	03 30 34.76566704	36 39 41.0336846	0.00028173	0.0037802	0.004	50242.8	50242.8	50242.8	1	15
ICRF J033108.9 − 252443	0329 − 255	03 31 08.92059221	−25 24 43.2658619	0.00004420	0.0015886	−0.264	53573.0	53573.0	53573.0	1	53
ICRF J033150.7 − 105155	0329 − 110	03 31 50.75659207	−10 51 55.5033742	0.00002646	0.0009911	−0.397	50576.2	50576.2	50576.2	1	50
ICRF J033557.0 − 070955	0333 − 073	03 35 57.05518499	−07 09 55.8543380	0.00014740	0.0040466	−0.273	53560.8	53560.8	53560.8	1	12
ICRF J033635.0 − 130204	0334 − 131	03 36 35.03580597	−13 02 04.6600514	0.00001273	0.0004690	−0.130	50576.2	50576.2	50576.2	1	73
ICRF J033645.6 − 203637	0334 − 207	03 36 45.61160879	−20 36 37.1761987	0.00011622	0.0033427	−0.784	54088.1	54088.1	54088.1	1	23
ICRF J033909.3 + 600856	0335 + 599	03 39 09.39294909	60 08 56.9749280	0.00030698	0.0030394	0.498	49577.0	49577.0	49577.0	1	24
ICRF J034010.7 + 473227	0336 + 473	03 40 10.78883880	47 32 27.3149839	0.00002502	0.0005259	0.203	50306.3	50306.3	50306.3	1	87
ICRF J034032.5 − 025454	0338 − 030	03 40 32.59569412	−02 54 54.2300609	0.00002385	0.0008534	−0.329	54112.8	54112.8	54112.8	1	31

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J034109.9 + 335221	0337 + 337	03 41 09.97368776	33 52 21.6453293	0.00003714	0.0006617	0.722	50219.8	50219.8	50219.8	1	56
ICRF J034210.3 + 480946	0338 + 480	03 42 10.35264899	48 09 46.9413186	0.00009015	0.0016400	−0.532	50306.3	50306.3	50306.3	1	39
ICRF J034244.9 − 135451	0340 − 140	03 42 44.98794784	−13 54 51.6651340	0.00028491	0.0108502	−0.517	53561.9	53561.9	53561.9	1	6
ICRF J034319.5 − 253017	0341 − 256	03 43 19.52399425	−25 30 17.4030230	0.00007291	0.0026442	−0.174	50666.9	50632.3	50688.3	2	34
ICRF J034441.4 + 682747	0339 + 683	03 44 41.44128397	68 27 47.8104804	0.00007068	0.0006144	−0.330	53573.0	53573.0	53573.0	1	72
ICRF J034634.5 + 540059	0342 + 538	03 46 34.50418633	54 00 59.1086498	0.00003800	0.0004835	−0.270	52409.7	52409.7	52409.7	1	56
ICRF J034729.5 + 200453	0344 + 199	03 47 29.55915981	20 04 53.0442136	0.00005762	0.0012695	−0.280	50139.4	50085.5	50156.3	2	71
ICRF J034756.8 + 555731	0344 + 558	03 47 56.81207141	55 57 31.5782142	0.00003204	0.0003012	−0.100	53523.9	53523.9	53523.9	1	87
ICRF J034757.1 + 233955	0344 + 235	03 47 57.11173537	23 39 55.3229758	0.00012912	0.0032314	−0.847	50132.1	50085.5	50156.3	2	41
ICRF J034839.2 − 161017	0346 − 163	03 48 39.27073628	−16 10 17.7522498	0.00001268	0.0004392	−0.103	50632.3	50632.3	50632.3	1	81
ICRF J034845.1 + 414914	0345 + 416	03 48 45.12238417	41 49 14.6759743	0.00005785	0.0008065	−0.334	53153.2	53153.2	53153.2	1	40
ICRF J034945.2 + 210445	0346 + 209	03 49 45.23009284	21 04 45.9664407	0.00016552	0.0039361	−0.478	50136.5	50085.5	50156.3	2	25
ICRF J035025.0 + 513838	0346 + 514	03 50 25.05153327	51 38 38.7342049	0.00011072	0.0012278	−0.401	52409.7	52409.7	52409.7	1	31
ICRF J035043.3 − 323259	0348 − 326	03 50 43.31628070	−32 32 59.4282454	0.00013751	0.0044768	0.904	52306.7	52306.7	52306.7	1	29
ICRF J035054.2 + 050621	0348 + 049	03 50 54.20318861	05 06 21.1876179	0.00052693	0.0038303	−0.347	49914.7	49914.7	49914.7	1	14
ICRF J035110.9 − 115322	0348 − 120	03 51 10.97693282	−11 53 22.6647244	0.00003112	0.0011728	−0.465	50576.2	50576.2	50576.2	1	45
ICRF J035211.0 − 251450	0350 − 253	03 52 11.05233937	−25 14 50.2680283	0.00001747	0.0006070	−0.142	53560.8	53560.8	53560.8	1	86
ICRF J035403.6 + 662126	0349 + 662	03 54 03.69925435	66 21 26.1253683	0.00014210	0.0008075	0.165	54088.1	54088.1	54088.1	1	23
ICRF J035424.1 + 044107	0351 + 045	03 54 24.12892082	04 41 07.2636638	0.00004851	0.0015974	−0.628	49914.7	49914.7	49914.7	1	58
ICRF J035425.0 − 161622	0352 − 164	03 54 25.02818369	−16 16 22.4501992	0.00008913	0.0027448	−0.495	53503.7	53503.7	53503.7	1	26
ICRF J035446.1 + 800928	0346 + 800	03 54 46.12583619	80 09 28.8478741	0.00027229	0.0006985	−0.758	50688.3	50688.3	50688.3	1	58
ICRF J035608.4 + 290342	0353 + 289	03 56 08.46195317	29 03 42.3210942	0.00004248	0.0013938	0.165	50219.8	50219.8	50219.8	1	38
ICRF J035625.1 + 604357	0352 + 605	03 56 25.19879255	60 43 57.9798373	0.00009271	0.0010467	−0.364	49577.0	49577.0	49577.0	1	64
ICRF J035743.2 − 075114	0355 − 079	03 57 43.29326868	−07 51 14.5676342	0.00001844	0.0006435	−0.438	50576.2	50576.2	50576.2	1	64
ICRF J035902.6 + 600522	0354 + 599	03 59 02.63997401	60 05 22.0694252	0.00004099	0.0005368	0.032	49577.0	49577.0	49577.0	1	81
ICRF J035927.9 + 275824	0356 + 278	03 59 27.93557467	27 58 24.0474275	0.00001833	0.0005229	0.157	53561.9	53561.9	53561.9	1	85
ICRF J035944.9 + 322047	0356 + 322	03 59 44.91293135	32 20 47.1558710	0.00001328	0.0002813	0.267	50219.8	50219.8	50219.8	1	79
ICRF J040011.7 + 055043	0357 + 057	04 00 11.73537431	05 50 43.1229506	0.00002613	0.0006906	0.078	49914.7	49914.7	49914.7	1	75
ICRF J040106.6 − 160639	0358 − 162	04 01 06.63674497	−16 06 39.0106371	0.00002593	0.0009760	0.090	53573.0	53573.0	53573.0	1	57
ICRF J040121.4 − 292126	0359 − 294	04 01 21.48367371	−29 21 26.8311219	0.00017584	0.0039184	0.642	50688.3	50688.3	50688.3	1	24
ICRF J040216.7 − 145820	0359 − 151	04 02 16.78724427	−14 58 20.9951480	0.00004767	0.0014079	−0.452	53560.8	53560.8	53560.8	1	43
ICRF J040549.2 + 380332	0402 + 379	04 05 49.26234428	38 03 32.2355703	0.00009135	0.0009127	0.288	50242.8	50242.8	50242.8	1	33
ICRF J040634.3 + 063714	0403 + 064	04 06 34.30730208	06 37 14.9905121	0.00019659	0.0030157	−0.198	49914.7	49914.7	49914.7	1	10
ICRF J040729.0 + 074207	0404 + 075	04 07 29.08670578	07 42 07.4721308	0.00002273	0.0005986	0.435	52409.7	52409.7	52409.7	1	48
ICRF J040733.9 − 330346	0405 − 331	04 07 33.91377793	−33 03 46.3576574	0.00002278	0.0007514	−0.047	52306.7	52306.7	52306.7	1	57

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J040749.1 + 682131	0402 + 682	04 07 49.16533501	68 21 31.6358909	0.00102063	0.0039754	−0.597	49827.5	49827.5	49827.5	1	14
ICRF J040859.6 − 052940	0406 − 056	04 08 59.64995596	−05 29 40.5395684	0.00002272	0.0007749	−0.196	53313.6	50576.2	53503.7	2	77
ICRF J040925.8 + 064035	0406 + 065	04 09 25.84770466	06 40 35.1028990	0.00002648	0.0007386	−0.199	53561.9	53561.9	53561.9	1	50
ICRF J040937.3 − 165535	0407 − 170	04 09 37.33407458	−16 55 35.5308878	0.00025199	0.0065787	−0.661	50632.3	50632.3	50632.3	1	12
ICRF J040940.5 − 194801	0407 − 199	04 09 40.54940577	−19 48 01.7775673	0.00033198	0.0104407	0.938	54112.8	54112.8	54112.8	1	9
ICRF J041045.6 + 765645	0403 + 768	04 10 45.61081971	76 56 45.3105471	0.00015347	0.0008712	−0.195	52409.7	52409.7	52409.7	1	22
ICRF J041233.4 + 001048	0409 + 000	04 12 33.45640016	00 10 48.4929646	0.00013290	0.0052010	0.102	49914.7	49914.7	49914.7	1	15
ICRF J041238.1 + 043806	0409 + 045	04 12 38.18710244	04 38 06.0360583	0.00009097	0.0020795	0.560	49914.7	49914.7	49914.7	1	44
ICRF J041245.9 + 185637	0409 + 188	04 12 45.94418254	18 56 37.0767465	0.00004082	0.0009001	0.261	50138.8	50085.5	50156.3	2	105
ICRF J041328.2 − 061501	0411 − 063	04 13 28.23954840	−06 15 01.4870857	0.00020100	0.0062068	−0.618	53153.2	53153.2	53153.2	1	7
ICRF J041337.0 + 525052	0409 + 527	04 13 37.08641324	52 50 52.9442304	0.00005524	0.0009015	0.381	53573.0	53573.0	53573.0	1	64
ICRF J041437.2 + 341851	0411 + 341	04 14 37.25574837	34 18 51.2071581	0.00002450	0.0005518	−0.036	50219.8	50219.8	50219.8	1	37
ICRF J041437.7 + 053442	0411 + 054	04 14 37.76781859	05 34 42.3354282	0.00025030	0.0080116	−0.076	51171.8	49914.7	54314.7	2	7
ICRF J041556.5 + 445249	0412 + 447	04 15 56.52651983	44 52 49.6833933	0.00002333	0.0003560	−0.274	50306.3	50306.3	50306.3	1	64
ICRF J041604.3 − 205627	0413 − 210	04 16 04.35974234	−20 56 27.5177458	0.00000921	0.0003061	−0.251	50660.3	50632.3	50688.3	2	144
ICRF J041610.0 − 340303	0414 − 341	04 16 10.05435381	−34 03 03.9582439	0.00046575	0.0099857	0.526	52306.7	52306.7	52306.7	1	10
ICRF J041620.5 − 333932	0414 − 337	04 16 20.51040933	−33 39 32.3625197	0.00034089	0.0131375	0.824	52306.7	52306.7	52306.7	1	12
ICRF J041900.4 − 213235	0416 − 216	04 19 00.41820803	−21 32 35.6750893	0.00032341	0.0077094	0.860	54112.8	54112.8	54112.8	1	12
ICRF J041919.4 + 572259	0415 + 572	04 19 19.41303156	57 22 59.9862556	0.00015137	0.0014278	0.504	49577.0	49577.0	49577.0	1	30
ICRF J041947.2 − 301023	0417 − 302	04 19 47.20548551	−30 10 23.8356372	0.00056374	0.0151865	0.417	52637.9	52306.7	53134.5	2	5
ICRF J042018.3 − 150126	0418 − 151	04 20 18.39336632	−15 01 26.5761896	0.00001536	0.0005576	−0.220	50632.3	50632.3	50632.3	1	81
ICRF J042151.7 + 435210	0418 + 437	04 21 51.77491665	43 52 10.4296904	0.00005058	0.0007623	−0.165	53560.8	53560.8	53560.8	1	46
ICRF J042221.2 + 305809	0419 + 308	04 22 21.22400710	30 58 09.7155795	0.00046536	0.0038647	0.893	54088.1	54088.1	54088.1	1	18
ICRF J042408.5 + 020424	0421 + 019	04 24 08.56203944	02 04 24.9641635	0.00001313	0.0004636	−0.207	49914.7	49914.7	49914.7	1	96
ICRF J042457.6 + 080517	0422 + 079	04 24 57.60285580	08 05 17.3272874	0.00001390	0.0003932	0.102	53573.0	53573.0	53573.0	1	90
ICRF J042553.5 − 161240	0423 − 163	04 25 53.57267537	−16 12 40.2482870	0.00027865	0.0066705	0.570	50632.3	50632.3	50632.3	1	14
ICRF J042630.2 + 295222	0423 + 297	04 26 30.22611957	29 52 22.9336479	0.00005024	0.0010400	−0.111	54112.8	54112.8	54112.8	1	28
ICRF J042726.1 − 070031	0425 − 071	04 27 26.15923764	−07 00 31.2637603	0.00001144	0.0003525	−0.095	53532.4	53503.7	53560.8	2	159
ICRF J042746.0 + 413301	0424 + 414	04 27 46.04556689	41 33 01.0999002	0.00001270	0.0002402	0.202	50242.8	50242.8	50242.8	1	90
ICRF J042805.8 + 325952	0424 + 328	04 28 05.80872626	32 59 52.0437647	0.00002258	0.0004609	−0.381	50219.8	50219.8	50219.8	1	50
ICRF J042952.7 + 331901	0426 + 332	04 29 52.72112613	33 19 01.8584620	0.00002619	0.0005681	−0.025	53523.9	53523.9	53523.9	1	72
ICRF J043103.7 + 203734	0428 + 205	04 31 03.76136151	20 37 34.2649550	0.00007954	0.0014881	−0.156	52306.7	52306.7	52306.7	1	17
ICRF J043128.0 − 040627	0428 − 042	04 31 28.08857899	−04 06 27.3194347	0.00005119	0.0014272	−0.122	53552.8	53552.8	53552.8	1	31
ICRF J043157.3 + 173135	0429 + 174	04 31 57.37925517	17 31 35.7753296	0.00005132	0.0014287	−0.651	50135.1	50085.5	50156.3	2	90
ICRF J043229.0 − 161405	0430 − 163	04 32 29.08230119	−16 14 05.6692584	0.00001852	0.0006109	−0.407	53503.7	53503.7	53503.7	1	51

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J043236.5 + 413828	0429 + 415	04 32 36.50262850	41 38 28.4488035	0.00001794	0.0003750	0.092	50242.8	50242.8	50242.8	1	41
ICRF J043244.5 − 330911	0430 − 332	04 32 44.56441736	−33 09 11.9294760	0.00012285	0.0047625	0.797	52306.7	52306.7	52306.7	1	9
ICRF J043419.0 − 144255	0432 − 148	04 34 19.02511547	−14 42 55.3572696	0.00001654	0.0005733	−0.313	50632.3	50632.3	50632.3	1	79
ICRF J043534.5 + 253259	0432 + 254	04 35 34.58294300	25 32 59.6968674	0.00007996	0.0020594	0.428	50219.8	50219.8	50219.8	1	21
ICRF J043704.3 + 294013	0433 + 295	04 37 04.37510272	29 40 13.8184969	0.00039807	0.0052002	−0.451	52409.7	52409.7	52409.7	1	6
ICRF J043736.5 − 295404	0435 − 300	04 37 36.56867618	−29 54 04.1186711	0.00002002	0.0006218	0.008	53523.9	53523.9	53523.9	1	69
ICRF J043804.9 + 300445	0434 + 299	04 38 04.94831393	30 04 45.5178697	0.00001391	0.0003697	−0.289	50219.8	50219.8	50219.8	1	56
ICRF J043837.8 − 084821	0436 − 089	04 38 37.87652581	−08 48 21.5084773	0.00021492	0.0030232	0.311	50576.2	50576.2	50576.2	1	23
ICRF J043850.4 − 201226	0436 − 203	04 38 50.48948886	−20 12 26.3940511	0.00015943	0.0043688	−0.702	50657.3	50632.3	50688.3	2	47
ICRF J043855.8 + 215310	0435 + 217	04 38 55.88495143	21 53 10.3069710	0.00002368	0.0006075	−0.026	53560.8	53560.8	53560.8	1	70
ICRF J043902.2 + 052043	0436 + 052	04 39 02.26217381	05 20 43.6741441	0.00003486	0.0007589	0.107	53134.5	53134.5	53134.5	1	35
ICRF J043917.7 + 304507	0436 + 306	04 39 17.77456164	30 45 07.5523405	0.00001969	0.0005291	−0.212	50219.8	50219.8	50219.8	1	48
ICRF J043953.2 − 301745	0437 − 303	04 39 53.20152544	−30 17 45.6241501	0.00021031	0.0059677	0.903	52409.7	52409.7	52409.7	1	23
ICRF J044007.8 + 424440	0436 + 426	04 40 07.87162307	42 44 40.2581455	0.00001670	0.0003233	0.171	50242.8	50242.8	50242.8	1	76
ICRF J044021.1 + 143756	0437 + 145	04 40 21.13929599	14 37 56.9518124	0.00003558	0.0011355	0.151	53126.1	53126.1	53126.1	1	28
ICRF J044027.7 + 272840	0437 + 273	04 40 27.73948823	27 28 40.6812144	0.00008209	0.0015028	−0.126	50219.8	50219.8	50219.8	1	19
ICRF J044133.7 − 334003	0439 − 337	04 41 33.76804858	−33 40 03.9174817	0.00006558	0.0015685	−0.128	52306.7	52306.7	52306.7	1	24
ICRF J044237.6 − 282530	0440 − 285	04 42 37.65720820	−28 25 30.8361905	0.00001910	0.0006882	0.012	50688.3	50688.3	50688.3	1	59
ICRF J044412.4 + 104247	0441 + 106	04 44 12.46608469	10 42 47.2633797	0.00013711	0.0048063	−0.787	49914.7	49914.7	49914.7	1	26
ICRF J044501.4 + 071553	0442 + 071	04 45 01.42872887	07 15 53.9135925	0.00005622	0.0018162	−0.660	49914.7	49914.7	49914.7	1	56
ICRF J044737.2 − 220336	0445 − 221	04 47 37.28233766	−22 03 36.8036863	0.00120077	0.0162510	0.777	52409.7	52409.7	52409.7	1	5
ICRF J044817.3 − 210944	0446 − 212	04 48 17.38171194	−21 09 44.8304633	0.00008074	0.0018618	0.573	53560.8	53560.8	53560.8	1	27
ICRF J044821.7 + 095051	0445 + 097	04 48 21.73840716	09 50 51.4609110	0.00002071	0.0004930	0.007	53523.9	53523.9	53523.9	1	57
ICRF J044823.9 − 262614	0446 − 265	04 48 23.96464173	−26 26 14.8214798	0.00143625	0.0359625	0.650	54112.8	54112.8	54112.8	1	3
ICRF J044835.1 + 362931	0445 + 364	04 48 35.16160643	36 29 31.4163891	0.00002945	0.0005949	0.499	50242.8	50242.8	50242.8	1	67
ICRF J044849.4 − 093531	0446 − 096	04 48 49.46973725	−09 35 31.5015725	0.00036372	0.0165024	−0.776	53573.0	53573.0	53573.0	1	9
ICRF J044850.4 + 112754	0446 + 113	04 48 50.41214501	11 27 54.3684604	0.00008027	0.0019917	−0.734	49914.7	49914.7	49914.7	1	41
ICRF J044912.5 + 175431	0446 + 178	04 49 12.51165039	17 54 31.5963224	0.00008781	0.0016487	−0.272	53134.5	53134.5	53134.5	1	10
ICRF J044942.2 − 391109	0448 − 392	04 49 42.25468953	−39 11 09.4697880	0.00002384	0.0007027	−0.052	52358.2	52306.7	52409.7	2	38
ICRF J044942.9 − 005722	0447 − 010	04 49 42.90595102	−00 57 22.3526484	0.00002957	0.0009069	−0.563	53561.9	53561.9	53561.9	1	59
ICRF J045035.9 − 183700	0448 − 187	04 50 35.90963046	−18 37 00.4083033	0.00001360	0.0004702	−0.157	50660.1	50632.3	50688.3	2	145
ICRF J045043.6 + 405613	0447 + 408	04 50 43.67962376	40 56 13.9679837	0.00003347	0.0005265	0.437	52409.7	52409.7	52409.7	1	45
ICRF J045051.9 + 224905	0447 + 227	04 50 51.94470531	22 49 05.8986577	0.00002291	0.0005783	0.033	53552.8	53552.8	53552.8	1	82
ICRF J045302.2 + 012835	0450 + 013	04 53 02.23861791	01 28 35.6289550	0.00002258	0.0005618	0.204	53126.1	53126.1	53126.1	1	45
ICRF J045520.7 + 065538	0452 + 068	04 55 20.71294506	06 55 38.8722482	0.00029226	0.0059956	−0.342	53560.8	53560.8	53560.8	1	5

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J045647.1 + 040052	0454 + 039	04 56 47.17473081	04 00 52.9467146	0.00003060	0.0011449	0.504	49914.7	49914.7	49914.7	1	64
ICRF J045707.7 + 064507	0454 + 066	04 57 07.70993106	06 45 07.2601381	0.00002159	0.0006076	0.177	49914.7	49914.7	49914.7	1	101
ICRF J045720.2 − 084905	0454 − 088	04 57 20.21286929	−08 49 05.4848987	0.00006505	0.0014439	0.215	50576.2	50576.2	50576.2	1	43
ICRF J045754.3 − 181916	0455 − 183	04 57 54.32521992	−18 19 16.0728084	0.00004787	0.0017977	0.296	53561.9	53561.9	53561.9	1	26
ICRF J045854.8 + 550842	0454 + 550	04 58 54.83994156	55 08 42.0578368	0.00012844	0.0012557	0.544	49577.0	49577.0	49577.0	1	48
ICRF J045933.0 + 310634	0456 + 310	04 59 33.03370778	31 06 34.2874753	0.00002307	0.0005798	−0.022	50219.8	50219.8	50219.8	1	51
ICRF J050027.4 + 425330	0456 + 428	05 00 27.47291416	42 53 30.8549604	0.00018866	0.0015706	−0.658	52409.7	52409.7	52409.7	1	19
ICRF J050145.7 + 712833	0456 + 714	05 01 45.77994137	71 28 33.9635931	0.00006954	0.0004235	−0.068	53134.5	53134.5	53134.5	1	45
ICRF J050159.9 − 135504	0459 − 139	05 01 59.94488677	−13 55 04.8259433	0.00009757	0.0024483	0.273	53552.8	53552.8	53552.8	1	26
ICRF J050232.4 + 384954	0459 + 387	05 02 32.49293652	38 49 54.9417688	0.00011751	0.0010544	−0.370	52409.7	52409.7	52409.7	1	37
ICRF J050237.9 + 413919	0459 + 415	05 02 37.98820882	41 39 19.3479360	0.00001842	0.0002868	−0.407	52409.7	52409.7	52409.7	1	81
ICRF J050244.3 − 354114	0500 − 357	05 02 44.36647332	−35 41 14.7942244	0.00042796	0.0223695	0.784	52521.2	52306.7	53126.1	3	11
ICRF J050348.0 − 212831	0501 − 215	05 03 48.08961437	−21 28 31.3368742	0.00018532	0.0093848	−0.209	52409.7	52409.7	52409.7	1	9
ICRF J050350.2 + 442439	0500 + 443	05 03 50.22395257	44 24 39.3814324	0.00002867	0.0003849	−0.377	52409.7	52409.7	52409.7	1	71
ICRF J050356.0 − 063803	0501 − 067	05 03 56.04946733	−06 38 03.4976349	0.00113900	0.0317526	−0.963	53573.0	53573.0	53573.0	1	7
ICRF J050356.7 + 340328	0500 + 339	05 03 56.78493850	34 03 28.1154416	0.00025129	0.0023838	0.453	50219.8	50219.8	50219.8	1	11
ICRF J050551.2 − 041926	0503 − 043	05 05 51.23835253	−04 19 26.6174314	0.00009623	0.0034546	0.068	54112.8	54112.8	54112.8	1	15
ICRF J050557.1 − 161558	0503 − 163	05 05 57.16061578	−16 15 58.0072847	0.00007330	0.0022982	−0.773	53560.8	53560.8	53560.8	1	37
ICRF J050634.0 + 214100	0503 + 216	05 06 34.03334007	21 41 00.1596452	0.00002279	0.0006147	−0.091	53561.9	53561.9	53561.9	1	72
ICRF J050723.6 + 464542	0503 + 466	05 07 23.65880953	46 45 42.3386928	0.00002667	0.0005228	−0.273	50306.3	50306.3	50306.3	1	69
ICRF J050827.2 + 605627	0503 + 608	05 08 27.25937425	60 56 27.3367512	0.00088415	0.0038125	−0.820	53503.7	53503.7	53503.7	1	7
ICRF J050905.8 + 352817	0505 + 354	05 09 05.84613229	35 28 17.2865906	0.00002861	0.0006441	0.014	50242.8	50242.8	50242.8	1	77
ICRF J050925.9 + 054135	0506 + 056	05 09 25.96447318	05 41 35.3333648	0.00001282	0.0004431	−0.219	49914.7	49914.7	49914.7	1	133
ICRF J051046.3 − 314253	0508 − 317	05 10 46.34091825	−31 42 53.9300171	0.00001775	0.0005730	−0.121	53523.9	53523.9	53523.9	1	64
ICRF J051150.3 + 263154	0508 + 264	05 11 50.37153217	26 31 54.8661235	0.00002721	0.0012032	0.321	54112.8	54112.8	54112.8	1	42
ICRF J051157.6 + 011049	0509 + 011	05 11 57.61250261	01 10 49.4350942	0.00012424	0.0032647	−0.415	49914.7	49914.7	49914.7	1	22
ICRF J051239.0 + 203742	0509 + 205	05 12 39.07510293	20 37 42.7964472	0.00028939	0.0062863	−0.035	53560.8	53560.8	53560.8	1	5
ICRF J051242.2 + 292703	0509 + 293	05 12 42.20585527	29 27 03.6106308	0.00004931	0.0008507	0.449	53561.9	53561.9	53561.9	1	46
ICRF J051252.5 + 404143	0509 + 406	05 12 52.54284196	40 41 43.6203433	0.00001545	0.0001991	−0.403	52409.7	52409.7	52409.7	1	126
ICRF J051340.0 + 010021	0511 + 009	05 13 40.03252654	01 00 21.6542460	0.00002307	0.0007358	−0.136	49914.7	49914.7	49914.7	1	93
ICRF J051342.8 − 201611	0511 − 203	05 13 42.85838145	−20 16 11.4878515	0.00012479	0.0063399	−0.758	54088.1	54088.1	54088.1	1	25
ICRF J051417.3 − 202920	0512 − 205	05 14 17.34753808	−20 29 20.5112871	0.00003194	0.0009724	−0.102	53552.8	53552.8	53552.8	1	70
ICRF J051640.4 + 274310	0513 + 276	05 16 40.47722470	27 43 10.2776376	0.00006186	0.0010121	0.403	53126.1	53126.1	53126.1	1	33
ICRF J051646.6 + 105754	0514 + 109	05 16 46.64626875	10 57 54.7871384	0.00002074	0.0007123	0.142	49959.5	49914.7	54482.7	2	102
ICRF J051656.3 + 073253	0514 + 074	05 16 56.36492262	07 32 53.2437375	0.00080466	0.0221144	−0.978	53561.9	53561.9	53561.9	1	7

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J051657.1 − 153710	0514 − 156	05 16 57.18557104	−15 37 10.3670796	0.00039107	0.0075876	0.401	53573.0	53573.0	53573.0	1	5
ICRF J051724.0 − 175624	0515 − 179	05 17 24.04696803	−17 56 24.1481615	0.00009090	0.0026180	−0.413	53561.9	53561.9	53561.9	1	28
ICRF J051728.1 − 052040	0515 − 053	05 17 28.11016064	−05 20 40.8421334	0.00002113	0.0007560	0.092	53536.3	53523.9	53560.8	2	95
ICRF J051728.8 + 453704	0513 + 455	05 17 28.89946102	45 37 04.8651561	0.00003002	0.0003997	−0.027	50306.3	50306.3	50306.3	1	60
ICRF J051751.3 + 064803	0515 + 067	05 17 51.34416205	06 48 03.2106915	0.00002241	0.0006202	−0.229	49914.7	49914.7	49914.7	1	105
ICRF J051805.1 + 330613	0514 + 330	05 18 05.14244722	33 06 13.3646794	0.00002353	0.0004912	−0.518	50219.8	50219.8	50219.8	1	69
ICRF J051806.0 − 245501	0516 − 249	05 18 06.05163394	−24 55 01.9121207	0.00044285	0.0091999	0.431	54112.8	54112.8	54112.8	1	8
ICRF J051812.0 + 473055	0514 + 474	05 18 12.08980880	47 30 55.5283960	0.00004958	0.0006112	−0.334	50306.3	50306.3	50306.3	1	48
ICRF J051910.8 + 084856	0516 + 087	05 19 10.81112767	08 48 56.7344975	0.00001134	0.0003776	0.050	53134.5	53134.5	53134.5	1	72
ICRF J052123.5 − 173730	0519 − 176	05 21 23.55742085	−17 37 30.1849057	0.00005660	0.0019528	−0.458	53560.8	53560.8	53560.8	1	40
ICRF J052145.9 + 211251	0518 + 211	05 21 45.96584207	21 12 51.4517285	0.00003970	0.0009058	−0.423	50150.9	50085.5	50156.3	2	104
ICRF J052217.4 + 011331	0519 + 011	05 22 17.46745083	01 13 31.1863432	0.00002296	0.0006718	0.062	49914.7	49914.7	49914.7	1	112
ICRF J052244.6 − 162752	0520 − 165	05 22 44.65498722	−16 27 52.4053323	0.00002288	0.0007619	0.085	53561.9	53561.9	53561.9	1	63
ICRF J052311.0 + 600745	0518 + 600	05 23 11.00817507	60 07 45.7197365	0.00100303	0.0056179	0.256	53127.5	53126.1	53134.5	2	6
ICRF J052318.4 − 261409	0521 − 262	05 23 18.46955817	−26 14 09.5556023	0.00002354	0.0008841	−0.190	50663.6	50632.3	50688.3	2	102
ICRF J052355.7 + 411350	0520 + 411	05 23 55.78024656	41 13 50.8103856	0.00003170	0.0004921	0.113	50242.8	50242.8	50242.8	1	76
ICRF J052413.4 + 703452	0518 + 705	05 24 13.43341450	70 34 52.9061786	0.00009376	0.0006058	0.008	54088.1	54088.1	54088.1	1	53
ICRF J052454.6 − 281841	0522 − 283	05 24 54.63031129	−28 18 41.6201562	0.00003904	0.0013540	−0.049	54112.8	54112.8	54112.8	1	35
ICRF J052506.5 − 233810	0523 − 236	05 25 06.50597683	−23 38 10.8060833	0.00003757	0.0011293	0.115	53552.8	53552.8	53552.8	1	80
ICRF J052953.5 − 051941	0527 − 053	05 29 53.53344426	−05 19 41.6167114	0.00014432	0.0026388	0.576	53561.9	53561.9	53561.9	1	10
ICRF J053012.5 + 372332	0526 + 373	05 30 12.54928191	37 23 32.6192912	0.00004314	0.0006909	−0.080	52409.7	52409.7	52409.7	1	53
ICRF J053202.0 − 384854	0530 − 388	05 32 02.06168312	−38 48 54.3331681	0.00019121	0.0076432	−0.935	53523.9	53523.9	53523.9	1	9
ICRF J053207.5 − 030707	0529 − 031	05 32 07.51926309	−03 07 07.0379579	0.00002412	0.0006431	0.479	53532.0	53503.7	53573.0	2	76
ICRF J053257.1 − 394109	0531 − 397	05 32 57.18562108	−39 41 09.0068225	0.00120590	0.0359189	0.475	52306.7	52306.7	52306.7	1	4
ICRF J053356.4 + 421054	0530 + 421	05 33 56.48497280	42 10 54.4215907	0.00003612	0.0007265	0.195	50242.8	50242.8	50242.8	1	67
ICRF J053620.2 + 503826	0532 + 506	05 36 20.23190300	50 38 26.2517064	0.00001424	0.0001952	−0.006	49964.9	49577.0	53306.8	3	145
ICRF J053622.3 − 200531	0534 − 201	05 36 22.30104609	−20 05 31.3922383	0.00012623	0.0043548	0.630	52982.8	52409.7	53126.1	2	10
ICRF J053730.0 + 444103	0533 + 446	05 37 30.06062687	44 41 03.5396461	0.00004830	0.0006479	0.009	50306.3	50306.3	50306.3	1	55
ICRF J053854.7 + 510723	0534 + 510	05 38 54.79521579	51 07 23.4065382	0.00002856	0.0005744	0.327	53573.0	53573.0	53573.0	1	90
ICRF J054014.3 + 250755	0537 + 251	05 40 14.34275409	25 07 55.3490631	0.00003729	0.0009060	−0.335	50219.8	50219.8	50219.8	1	27
ICRF J054113.3 + 674523	0535 + 677	05 41 13.39699741	67 45 23.2728023	0.00037397	0.0027537	0.240	49827.5	49827.5	49827.5	1	17
ICRF J054114.7 + 555043	0537 + 558	05 41 14.75779866	55 50 43.5702583	0.00004709	0.0007960	−0.642	54112.8	54112.8	54112.8	1	32
ICRF J054116.1 + 531224	0537 + 531	05 41 16.17405718	53 12 24.8349594	0.00003192	0.0004467	0.409	49577.0	49577.0	49577.0	1	99
ICRF J054149.2 + 472907	0538 + 474	05 41 49.24550347	47 29 07.6109382	0.00002465	0.0003947	0.084	50306.3	50306.3	50306.3	1	71
ICRF J054255.8 − 091331	0540 − 092	05 42 55.87741010	−09 13 31.0065600	0.00004180	0.0010344	0.139	53503.7	53503.7	53503.7	1	38

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J054338.8 + 823828	0532 + 826	05 43 38.84682009	82 38 28.7647497	0.00030948	0.0012242	0.300	53561.9	53561.9	53561.9	1	49
ICRF J054401.1 + 454102	0540 + 456	05 44 01.16617603	45 41 02.7926730	0.00014948	0.0016626	−0.272	50306.3	50306.3	50306.3	1	34
ICRF J054407.5 − 224109	0542 − 227	05 44 07.56709126	−22 41 09.9820318	0.00001472	0.0004580	−0.065	53542.4	53523.9	53560.8	2	154
ICRF J054414.0 + 525806	0540 + 529	05 44 14.07480570	52 58 06.5047707	0.00551486	0.0707627	−0.261	54088.1	54088.1	54088.1	1	5
ICRF J054452.1 + 111849	0542 + 112	05 44 52.19979492	11 18 49.9256671	0.00082331	0.0055300	−0.086	49914.7	49914.7	49914.7	1	6
ICRF J054706.2 + 122346	0544 + 123	05 47 06.27631416	12 23 46.2449170	0.00002033	0.0006027	−0.021	54112.8	54112.8	54112.8	1	55
ICRF J054932.3 − 275238	0547 − 278	05 49 32.34718631	−27 52 38.8595255	0.00009100	0.0030306	−0.776	53561.9	53561.9	53561.9	1	29
ICRF J054954.1 + 305447	0546 + 308	05 49 54.18062359	30 54 47.5990944	0.00022765	0.0024711	0.160	53552.8	53552.8	53552.8	1	15
ICRF J055111.2 + 082911	0548 + 084	05 51 11.22932386	08 29 11.2210572	0.00006411	0.0012142	0.323	53539.9	53523.9	53573.0	2	40
ICRF J055155.2 − 190920	0549 − 191	05 51 55.26032486	−19 09 20.9689705	0.00005968	0.0016068	0.034	53560.8	53560.8	53560.8	1	43
ICRF J055250.1 + 031327	0550 + 032	05 52 50.10150010	03 13 27.2431110	0.00003656	0.0007951	−0.205	49914.7	49914.7	49914.7	1	52
ICRF J055253.0 + 724045	0546 + 726	05 52 53.00000741	72 40 45.1126340	0.00068569	0.0023573	−0.721	52409.7	52409.7	52409.7	1	18
ICRF J055341.8 − 084001	0551 − 086	05 53 41.89155143	−08 40 01.9013071	0.00025195	0.0053862	−0.686	53561.9	53561.9	53561.9	1	14
ICRF J055400.8 + 685754	0548 + 689	05 54 00.80672186	68 57 54.4437877	0.00258888	0.0098290	0.915	52490.3	49827.5	54088.1	2	8
ICRF J055409.5 + 354131	0550 + 356	05 54 09.52930296	35 41 31.4005550	0.00007219	0.0014618	−0.716	54112.8	54112.8	54112.8	1	20
ICRF J055800.0 + 341848	0554 + 343	05 58 00.08861481	34 18 48.3876527	0.00002453	0.0004879	0.125	53503.7	53503.7	53503.7	1	78
ICRF J055802.5 − 131741	0555 − 132	05 58 02.54671012	−13 17 41.1957248	0.00000848	0.0002758	−0.214	50576.2	50576.2	50576.2	1	86
ICRF J055844.3 − 005506	0556 − 009	05 58 44.39146287	−00 55 06.9237353	0.00023280	0.0081794	0.564	53523.9	53523.9	53523.9	1	12
ICRF J055900.4 + 374955	0555 + 378	05 59 00.45213109	37 49 55.5196427	0.00003187	0.0006838	−0.645	50242.8	50242.8	50242.8	1	73
ICRF J055913.3 + 580403	0554 + 580	05 59 13.39422388	58 04 03.4469853	0.00012893	0.0010155	0.472	49577.0	49577.0	49577.0	1	55
ICRF J055946.4 − 181747	0557 − 182	05 59 46.40377212	−18 17 47.5653005	0.00074750	0.0143608	0.409	53560.8	53560.8	53560.8	1	4
ICRF J060258.9 + 421210	0559 + 422	06 02 58.94406578	42 12 10.0092100	0.00001445	0.0003009	−0.436	50242.8	50242.8	50242.8	1	90
ICRF J060314.3 + 062227	0600 + 063	06 03 14.35554910	06 22 27.9510418	0.00022979	0.0039757	0.825	53503.7	53503.7	53503.7	1	16
ICRF J060355.8 + 295705	0600 + 299	06 03 55.85190830	29 57 05.3581124	0.00006510	0.0011845	0.003	50219.8	50219.8	50219.8	1	34
ICRF J060425.1 − 422530	0602 − 424	06 04 25.17465637	−42 25 30.0934262	0.00004534	0.0013716	−0.320	52347.9	52306.7	52409.7	2	30
ICRF J060435.6 + 441358	0600 + 442	06 04 35.62876855	44 13 58.5492768	0.00012064	0.0011788	−0.612	50306.3	50306.3	50306.3	1	38
ICRF J060449.3 + 105540	0602 + 109	06 04 49.36968079	10 55 40.3732637	0.00021075	0.0019486	0.002	49914.7	49914.7	49914.7	1	35
ICRF J060506.4 − 352217	0603 − 353	06 05 06.46517805	−35 22 17.4662069	0.00004606	0.0015664	−0.351	52359.6	52306.7	52409.7	2	37
ICRF J060510.1 + 093913	0602 + 096	06 05 10.11311626	09 39 13.6126161	0.00004972	0.0014530	−0.054	49914.7	49914.7	49914.7	1	41
ICRF J060542.2 + 575316	0601 + 578	06 05 42.22785116	57 53 16.3553628	0.00053398	0.0029781	0.379	49577.0	49577.0	49577.0	1	17
ICRF J060643.5 − 072430	0604 − 074	06 06 43.54628632	−07 24 30.2323241	0.00001595	0.0004630	−0.012	53560.8	53560.8	53560.8	1	86
ICRF J060657.4 − 002457	0604 − 004	06 06 57.44373829	−00 24 57.4579035	0.00040693	0.0159728	0.389	53552.8	53552.8	53552.8	1	4
ICRF J060723.2 + 473946	0603 + 476	06 07 23.25498374	47 39 46.9419812	0.00002220	0.0003688	0.069	50306.3	50306.3	50306.3	1	72
ICRF J060801.5 − 152036	0605 − 153	06 08 01.53193703	−15 20 36.9784311	0.00004505	0.0015583	0.283	54112.8	54112.8	54112.8	1	23
ICRF J060811.4 − 384726	0606 − 387	06 08 11.46157390	−38 47 26.5929479	0.00041293	0.0202604	0.629	53523.9	53523.9	53523.9	1	9

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J060845.2 − 271710	0606 − 272	06 08 45.23683628	−27 17 10.8316603	0.00005554	0.0016635	−0.420	53503.7	53503.7	53503.7	1	31
ICRF J061024.2 + 780136	0602 + 780	06 10 24.27938185	78 01 36.1924696	0.00038239	0.0024690	0.052	54088.1	54088.1	54088.1	1	19
ICRF J061038.7 − 230145	0608 − 230	06 10 38.78731537	−23 01 45.8367727	0.00014800	0.0043094	−0.553	53560.8	53560.8	53560.8	1	21
ICRF J061135.0 − 115545	0609 − 119	06 11 35.06511858	−11 55 45.8282728	0.00014806	0.0033478	−0.155	53561.9	53561.9	53561.9	1	19
ICRF J061210.3 + 622534	0607 + 624	06 12 10.32509144	62 25 34.0130510	0.00027560	0.0020009	0.507	54112.8	54112.8	54112.8	1	18
ICRF J061228.6 − 433748	0610 − 436	06 12 28.60514297	−43 37 48.3703290	0.00034977	0.0262101	−0.382	52409.7	52409.7	52409.7	1	9
ICRF J061229.6 − 313858	0610 − 316	06 12 29.66434990	−31 38 58.1861841	0.00014177	0.0098425	−0.270	53134.5	53134.5	53134.5	1	9
ICRF J061251.1 + 412237	0609 + 413	06 12 51.18522973	41 22 37.4083288	0.00001074	0.0002223	−0.417	50242.8	50242.8	50242.8	1	90
ICRF J061417.2 − 253653	0612 − 255	06 14 17.21081672	−25 36 53.5251140	0.00002280	0.0007308	−0.057	53560.8	53560.8	53560.8	1	89
ICRF J061449.1 + 510213	0610 + 510	06 14 49.15927951	51 02 13.1191900	0.00005156	0.0010452	−0.148	50306.3	50306.3	50306.3	1	63
ICRF J061504.0 + 481904	0611 + 483	06 15 04.05333255	48 19 04.7295759	0.00002856	0.0004616	0.230	50306.3	50306.3	50306.3	1	78
ICRF J061607.9 − 030648	0613 − 030	06 16 07.94132715	−03 06 48.8534117	0.00004204	0.0015110	0.128	53523.9	53523.9	53523.9	1	39
ICRF J061641.8 − 104108	0614 − 106	06 16 41.80762164	−10 41 08.4545679	0.00005805	0.0013644	−0.177	53552.8	53552.8	53552.8	1	31
ICRF J061702.0 − 220028	0614 − 219	06 17 02.04276145	−22 00 28.1727218	0.00002990	0.0009917	−0.356	53552.8	53552.8	53552.8	1	68
ICRF J061733.4 − 171525	0615 − 172	06 17 33.41839994	−17 15 25.0887925	0.00043513	0.0060673	0.635	53573.0	53573.0	53573.0	1	17
ICRF J061756.9 + 781607	0610 + 782	06 17 56.93289291	78 16 07.3941770	0.00010467	0.0002231	0.260	53523.9	53523.9	53523.9	1	88
ICRF J061808.2 + 462016	0614 + 463	06 18 08.20367040	46 20 16.2117577	0.00002768	0.0005304	0.228	53560.8	53560.8	53560.8	1	75
ICRF J061808.6 + 420759	0614 + 421	06 18 08.61993947	42 07 59.8463007	0.00005042	0.0012480	−0.818	54088.1	54088.1	54088.1	1	40
ICRF J061904.1 − 114054	0616 − 116	06 19 04.10256273	−11 40 54.8901814	0.00002259	0.0006760	0.441	53153.2	53153.2	53153.2	1	60
ICRF J061909.9 + 073641	0616 + 076	06 19 09.97105617	07 36 41.2205241	0.00020214	0.0016635	0.427	53126.1	53126.1	53126.1	1	21
ICRF J062019.5 + 210229	0617 + 210	06 20 19.52842093	21 02 29.5458625	0.00011545	0.0024102	−0.652	50120.1	50085.5	50156.3	2	45
ICRF J062029.3 − 282736	0618 − 284	06 20 29.35872388	−28 27 36.0846229	0.00003139	0.0009313	0.355	53503.7	53503.7	53503.7	1	65
ICRF J062032.1 − 251517	0618 − 252	06 20 32.11695978	−25 15 17.4854213	0.00000980	0.0003154	−0.006	50659.2	50632.3	50688.3	2	148
ICRF J062118.7 + 760504	0614 + 761	06 21 18.79321907	76 05 04.5575823	0.00241699	0.0042045	−0.332	49827.5	49827.5	49827.5	1	10
ICRF J062228.5 − 192718	0620 − 194	06 22 28.53709754	−19 27 18.1782350	0.00009573	0.0047174	−0.713	54112.8	54112.8	54112.8	1	9
ICRF J062252.2 + 332610	0619 + 334	06 22 52.22194595	33 26 10.4104875	0.00004273	0.0011651	−0.289	53573.0	53573.0	53573.0	1	63
ICRF J062257.9 − 010927	0620 − 011	06 22 57.94235761	−01 09 27.1220746	0.00012606	0.0053306	0.272	53393.0	53153.2	53552.8	2	20
ICRF J062317.8 + 224135	0620 + 227	06 23 17.81186380	22 41 35.7659123	0.00095840	0.0130340	−0.322	50144.5	50085.5	50156.3	2	6
ICRF J062321.7 + 584901	0618 + 588	06 23 21.77921759	58 49 01.8777315	0.00018138	0.0012372	0.264	49577.0	49577.0	49577.0	1	42
ICRF J062328.9 + 383049	0620 + 385	06 23 28.93955402	38 30 49.8079833	0.00002206	0.0005014	0.064	53560.8	53560.8	53560.8	1	76
ICRF J062356.5 + 455439	0620 + 459	06 23 56.51184019	45 54 39.5096767	0.00013420	0.0012737	0.491	50306.3	50306.3	50306.3	1	36
ICRF J062401.6 − 010328	0621 − 010	06 24 01.68528595	−01 03 28.1240734	0.00026907	0.0140323	0.738	53503.7	53503.7	53503.7	1	9
ICRF J062518.2 + 444001	0621 + 446	06 25 18.26538975	44 40 01.6261343	0.00002229	0.0004531	0.155	50306.3	50306.3	50306.3	1	81
ICRF J062545.9 + 144019	0622 + 147	06 25 45.92225380	14 40 19.7523071	0.00007033	0.0015040	−0.246	52409.7	52409.7	52409.7	1	25
ICRF J062843.2 − 280519	0626 − 280	06 28 43.27905303	−28 05 19.3838581	0.00002978	0.0009075	−0.455	53556.1	53552.8	53561.9	2	93

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J062850.3 + 283550	0625 + 286	06 28 50.31892016	28 35 50.4290736	0.00011956	0.0015034	0.438	53523.9	53523.9	53523.9	1	22
ICRF J062955.0 − 050500	0627 − 050	06 29 55.03102429	−05 05 00.0710649	0.00013353	0.0028645	0.104	53503.7	53503.7	53503.7	1	19
ICRF J063007.2 + 173812	0627 + 176	06 30 07.25850338	17 38 12.9314211	0.00002180	0.0006936	−0.300	50129.1	50085.5	50156.3	2	195
ICRF J063053.9 − 132334	0628 − 133	06 30 53.90310053	−13 23 34.4938968	0.00002686	0.0008261	0.059	53153.2	53153.2	53153.2	1	58
ICRF J063101.0 + 202059	0628 + 203	06 31 01.06253890	20 20 59.2105079	0.00002787	0.0008861	−0.305	50130.2	50085.5	50156.3	2	138
ICRF J063120.2 − 141031	0629 − 141	06 31 20.22619065	−14 10 31.7427515	0.00002368	0.0008134	−0.091	53523.9	53523.9	53523.9	1	89
ICRF J063134.6 + 531127	0627 + 532	06 31 34.68596533	53 11 27.7569302	0.00040765	0.0019672	0.787	49577.0	49577.0	49577.0	1	29
ICRF J063201.6 − 125032	0629 − 128	06 32 01.64486617	−12 50 32.7799558	0.00011294	0.0047958	−0.515	54088.1	54088.1	54088.1	1	21
ICRF J063230.7 + 320053	0629 + 320	06 32 30.78279386	32 00 53.6316043	0.00008736	0.0013377	0.158	50219.8	50219.8	50219.8	1	13
ICRF J063326.7 − 222322	0631 − 223	06 33 26.75332905	−22 23 22.3533731	0.00001414	0.0004870	0.008	53134.5	53134.5	53134.5	1	72
ICRF J063334.4 + 364249	0630 + 367	06 33 34.41168117	36 42 49.7448611	0.00168179	0.0172923	0.328	53573.0	53573.0	53573.0	1	5
ICRF J063352.2 + 494345	0630 + 497	06 33 52.20666346	49 43 45.9238807	0.00006355	0.0008502	0.246	50306.3	50306.3	50306.3	1	49
ICRF J063600.6 − 211312	0633 − 211	06 36 00.60167940	−21 13 12.2010611	0.00002256	0.0006948	−0.195	53561.9	53561.9	53561.9	1	88
ICRF J063611.0 + 500959	0632 + 502	06 36 11.01656479	50 09 59.6275838	0.00008316	0.0007329	−0.483	51305.5	49577.0	54112.8	3	68
ICRF J063648.3 − 054707	0634 − 057	06 36 48.32950725	−05 47 07.5455546	0.00001842	0.0006416	−0.177	53523.9	53523.9	53523.9	1	88
ICRF J063708.8 − 294238	0635 − 296	06 37 08.85978210	−29 42 38.7922857	0.00049141	0.0256803	0.654	54112.8	54112.8	54112.8	1	4
ICRF J063743.3 + 812527	0627 + 814	06 37 43.38457608	81 25 27.7047903	0.00658132	0.0063928	0.723	53561.9	53561.9	53561.9	1	7
ICRF J063751.0 + 145857	0634 + 150	06 37 51.05224956	14 58 57.2861522	0.00005825	0.0017447	−0.667	50132.4	50085.5	50156.3	2	71
ICRF J063802.8 + 593322	0633 + 595	06 38 02.87192935	59 33 22.2146823	0.00004856	0.0004706	0.478	49577.0	49577.0	49577.0	1	83
ICRF J063921.9 + 732458	0633 + 734	06 39 21.96121296	73 24 58.0406813	0.00005806	0.0003344	0.459	49827.5	49827.5	49827.5	1	114
ICRF J063928.7 − 214157	0637 − 216	06 39 28.72554990	−21 41 57.8152838	0.00063643	0.0232767	−0.444	53560.8	53560.8	53560.8	1	3
ICRF J064145.1 + 094704	0639 + 098	06 41 45.19598033	09 47 04.3676174	0.00208304	0.0416844	−0.947	53503.7	53503.7	53503.7	1	3
ICRF J064206.1 + 881155	0603 + 882	06 42 06.13505635	88 11 55.0171270	0.00304461	0.0017301	0.226	53561.9	53561.9	53561.9	1	13
ICRF J064225.0 + 112832	0639 + 115	06 42 25.01579865	11 28 32.9079432	0.00140105	0.0235608	−0.934	53523.9	53523.9	53523.9	1	4
ICRF J064227.8 + 524759	0638 + 528	06 42 27.82182704	52 47 59.2725598	0.00004798	0.0008925	0.020	53573.0	53573.0	53573.0	1	67
ICRF J064258.1 + 350918	0639 + 352	06 42 58.13959089	35 09 18.3785220	0.00005175	0.0014203	−0.036	53561.9	53561.9	53561.9	1	26
ICRF J064307.4 − 245121	0641 − 248	06 43 07.46893440	−24 51 21.3123115	0.00003881	0.0012133	−0.158	54088.1	54088.1	54088.1	1	50
ICRF J064322.0 + 072452	0640 + 074	06 43 22.07331499	07 24 52.4470065	0.00009659	0.0019044	0.474	53503.7	53503.7	53503.7	1	21
ICRF J064326.4 + 085738	0640 + 090	06 43 26.44506745	08 57 38.0105153	0.00015535	0.0021821	−0.389	53344.2	53134.5	53523.9	2	13
ICRF J064332.3 − 133549	0641 − 135	06 43 32.36174130	−13 35 49.8781889	0.00001668	0.0004781	0.088	53503.7	53503.7	53503.7	1	86
ICRF J064425.2 − 345941	0642 − 349	06 44 25.28102293	−34 59 41.9495435	0.00003661	0.0014235	−0.064	52306.7	52306.7	52306.7	1	34
ICRF J064444.8 + 291104	0641 + 292	06 44 44.81577391	29 11 04.0176751	0.00016141	0.0018418	−0.438	54112.8	54112.8	54112.8	1	14
ICRF J064547.2 + 054122	0643 + 057	06 45 47.27652545	05 41 22.3857060	0.00010889	0.0029430	0.453	53552.8	53552.8	53552.8	1	18
ICRF J064615.2 + 304123	0643 + 307	06 46 15.23807948	30 41 23.6317216	0.00006123	0.0009427	0.070	50219.8	50219.8	50219.8	1	31
ICRF J064630.9 − 390339	0644 − 390	06 46 30.92037562	−39 03 39.1167549	0.00020239	0.0102311	0.574	53407.4	53134.5	53503.7	2	23

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J064729.9 − 160527	0645 − 160	06 47 29.96694432	−16 05 27.3595833	0.00002325	0.0008672	−0.422	53523.9	53523.9	53523.9	1	66
ICRF J064828.4 − 174405	0646 − 176	06 48 28.49855775	−17 44 05.4409300	0.00001924	0.0006069	−0.186	53552.8	53552.8	53552.8	1	71
ICRF J064847.1 + 490720	0644 + 491	06 48 47.11859364	49 07 20.7297535	0.00046557	0.0042845	0.456	50306.3	50306.3	50306.3	1	10
ICRF J065025.6 − 015222	0647 − 018	06 50 25.69822976	−01 52 22.1632426	0.00008999	0.0025136	−0.152	53126.1	53126.1	53126.1	1	18
ICRF J065031.2 + 600144	0646 + 600	06 50 31.25435513	60 01 44.5558800	0.00004021	0.0004137	0.591	49577.0	49577.0	49577.0	1	88
ICRF J065038.1 + 035808	0647 + 040	06 50 38.13415680	03 58 08.4391741	0.00004698	0.0011097	0.096	53552.8	53552.8	53552.8	1	43
ICRF J065045.1 − 084000	0648 − 086	06 50 45.17527347	−08 40 00.1822392	0.00005055	0.0014364	0.009	53503.7	53503.7	53503.7	1	25
ICRF J065048.1 + 561634	0646 + 563	06 50 48.19063002	56 16 34.4903261	0.00005064	0.0007617	0.091	53561.9	53561.9	53561.9	1	58
ICRF J065300.5 − 062532	0650 − 063	06 53 00.59761279	−06 25 32.7028834	0.00002330	0.0008159	−0.573	53552.8	53552.8	53552.8	1	64
ICRF J065327.4 + 050851	0650 + 052	06 53 27.48383281	05 08 51.0629677	0.00022836	0.0030205	0.756	53523.9	53523.9	53523.9	1	17
ICRF J065357.8 − 192939	0651 − 194	06 53 57.80562745	−19 29 39.6775959	0.00001751	0.0005021	−0.142	53503.7	53503.7	53503.7	1	73
ICRF J065422.0 + 504223	0650 + 507	06 54 22.09316306	50 42 23.8734505	0.00002678	0.0005075	0.047	53573.0	53573.0	53573.0	1	89
ICRF J065423.7 + 451423	0650 + 453	06 54 23.71365666	45 14 23.5456493	0.00001972	0.0003929	0.224	50306.3	50306.3	50306.3	1	81
ICRF J065548.7 − 241620	0653 − 242	06 55 48.76813384	−24 16 20.7995070	0.00015349	0.0055476	−0.067	53153.2	53153.2	53153.2	1	17
ICRF J065611.1 − 032306	0653 − 033	06 56 11.12058191	−03 23 06.7824030	0.00000846	0.0002472	0.036	53134.5	53134.5	53134.5	1	81
ICRF J065640.8 + 320932	0653 + 322	06 56 40.88918244	32 09 32.5480953	0.00003744	0.0008177	−0.182	54112.8	54112.8	54112.8	1	32
ICRF J065903.2 − 062110	0656 − 062	06 59 03.25244861	−06 21 10.6063988	0.00036953	0.0144227	−0.301	53126.1	53126.1	53126.1	1	5
ICRF J065949.9 − 274518	0657 − 276	06 59 49.91698051	−27 45 18.5112083	0.00003079	0.0010355	0.157	53560.8	53560.8	53560.8	1	65
ICRF J070106.6 + 693629	0655 + 696	07 01 06.61648814	69 36 29.4155278	0.00053127	0.0021670	−0.156	49827.5	49827.5	49827.5	1	27
ICRF J070231.7 + 264411	0659 + 268	07 02 31.79087460	26 44 11.0276016	0.00001652	0.0003534	−0.072	53666.8	50219.8	54088.1	2	101
ICRF J070232.8 + 854952	0645 + 858	07 02 32.81869394	85 49 52.4776793	0.00292529	0.0028861	−0.854	50688.3	50688.3	50688.3	1	20
ICRF J070235.7 − 101506	0700 − 101	07 02 35.75685546	−10 15 06.4172479	0.00002125	0.0006151	0.195	53126.1	53126.1	53126.1	1	73
ICRF J070240.4 − 284150	0700 − 286	07 02 40.40266789	−28 41 50.0484126	0.00003886	0.0017893	−0.660	53503.7	53503.7	53503.7	1	43
ICRF J070246.2 + 544435	0658 + 548	07 02 46.26274864	54 44 35.7342486	0.00016211	0.0019987	0.389	53126.1	53126.1	53126.1	1	24
ICRF J070319.0 − 005103	0700 − 007	07 03 19.08661474	−00 51 03.1579048	0.00000920	0.0002764	0.066	53134.5	53134.5	53134.5	1	72
ICRF J070406.2 − 130722	0701 − 130	07 04 06.23626303	−13 07 22.3176388	0.00014727	0.0035650	0.214	53561.9	53561.9	53561.9	1	20
ICRF J070409.5 + 470056	0700 + 470	07 04 09.55826700	47 00 56.0394062	0.00006267	0.0010125	−0.559	50306.3	50306.3	50306.3	1	51
ICRF J070544.5 + 395832	0702 + 400	07 05 44.52252195	39 58 32.0201059	0.00024124	0.0036433	−0.788	54112.8	54112.8	54112.8	1	6
ICRF J070700.6 + 611011	0702 + 612	07 07 00.61565096	61 10 11.6072909	0.00023423	0.0014107	0.777	49577.0	49577.0	49577.0	1	21
ICRF J070803.3 − 142115	0705 − 142	07 08 03.37552013	−14 21 15.8168431	0.00006258	0.0015377	0.003	52409.7	52409.7	52409.7	1	33
ICRF J070824.4 + 345542	0705 + 350	07 08 24.44768916	34 55 42.1184698	0.00023263	0.0071400	−0.896	54088.1	54088.1	54088.1	1	9
ICRF J070909.2 + 373753	0705 + 377	07 09 09.22252687	37 37 53.1816224	0.00003519	0.0006283	0.570	53573.0	53573.0	53573.0	1	73
ICRF J070945.0 − 025517	0707 − 028	07 09 45.05458616	−02 55 17.4967214	0.00002106	0.0006142	0.054	53560.8	53560.8	53560.8	1	72
ICRF J071043.6 − 385037	0709 − 387	07 10 43.63621684	−38 50 37.0399616	0.00014404	0.0044937	0.866	52368.5	52306.7	52409.7	2	25
ICRF J071044.3 + 422055	0707 + 424	07 10 44.32630447	42 20 55.0426718	0.00022693	0.0019386	−0.575	50242.8	50242.8	50242.8	1	20

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J071046.6 − 203323	0708 − 204	07 10 46.62254728	−20 33 23.9464267	0.00035044	0.0078076	0.177	53561.9	53561.9	53561.9	1	9
ICRF J071243.6 + 503322	0708 + 506	07 12 43.68355801	50 33 22.7069866	0.00002524	0.0003949	0.266	53560.8	53560.8	53560.8	1	90
ICRF J071312.8 + 505343	0709 + 509	07 13 12.89631977	50 53 43.8911276	0.00007864	0.0011995	−0.215	50306.3	50306.3	50306.3	1	49
ICRF J071355.6 + 193500	0710 + 196	07 13 55.67917253	19 35 00.4087352	0.00001286	0.0003463	−0.145	53128.5	53126.1	53306.8	2	74
ICRF J071436.1 + 740810	0708 + 742	07 14 36.12495636	74 08 10.1439854	0.00006126	0.0002808	0.232	54088.1	54088.1	54088.1	1	70
ICRF J071533.3 − 092154	0713 − 092	07 15 33.39355665	−09 21 54.2740456	0.00020739	0.0065058	0.343	53134.5	53134.5	53134.5	1	9
ICRF J071814.1 − 181304	0716 − 181	07 18 14.15806049	−18 13 04.0539618	0.00003361	0.0009497	0.467	53552.8	53552.8	53552.8	1	46
ICRF J071919.4 + 330709	0716 + 332	07 19 19.41966375	33 07 09.7086964	0.00002004	0.0004125	−0.047	53126.1	53126.1	53126.1	1	59
ICRF J072021.4 + 473744	0716 + 477	07 20 21.49775893	47 37 44.1248830	0.00003251	0.0005356	0.051	50306.3	50306.3	50306.3	1	65
ICRF J072102.4 + 154042	0718 + 157	07 21 02.41358332	15 40 42.9708353	0.00004553	0.0014161	−0.309	53561.9	53561.9	53561.9	1	46
ICRF J072123.9 + 040644	0718 + 042	07 21 23.91000307	04 06 44.2141572	0.00002676	0.0008096	0.135	49914.7	49914.7	49914.7	1	83
ICRF J072201.2 + 372228	0718 + 374	07 22 01.25965840	37 22 28.6336203	0.00003438	0.0005891	−0.308	50242.8	50242.8	50242.8	1	61
ICRF J072227.6 − 303804	0720 − 305	07 22 27.69669774	−30 38 04.5919555	0.00132420	0.0297287	0.881	52306.7	52306.7	52306.7	1	5
ICRF J072448.4 + 030825	0722 + 032	07 24 48.40892504	03 08 25.0898405	0.00005991	0.0020306	−0.141	49914.7	49914.7	49914.7	1	22
ICRF J072524.4 − 264032	0723 − 265	07 25 24.41314538	−26 40 32.6796406	0.00002170	0.0007580	−0.368	53539.5	53503.7	53573.0	2	114
ICRF J072550.1 − 190419	0723 − 189	07 25 50.16561199	−19 04 19.0731585	0.00003874	0.0013143	−0.694	53126.1	53126.1	53126.1	1	50
ICRF J072636.3 + 063642	0723 + 067	07 26 36.36410175	06 36 42.8519089	0.00004288	0.0012121	−0.061	53560.8	53560.8	53560.8	1	40
ICRF J072703.1 + 484410	0723 + 488	07 27 03.10058783	48 44 10.1268335	0.00002016	0.0003750	0.105	50306.3	50306.3	50306.3	1	78
ICRF J072810.8 + 674847	0723 + 679	07 28 10.89567408	67 48 47.0329002	0.00004514	0.0001910	−0.118	53523.9	53523.9	53523.9	1	88
ICRF J072829.7 − 223136	0726 − 224	07 28 29.79846539	−22 31 36.7154210	0.00029530	0.0113881	0.425	53134.5	53134.5	53134.5	1	5
ICRF J072849.6 + 570124	0724 + 571	07 28 49.63163894	57 01 24.3745156	0.00003320	0.0004905	0.084	49577.0	49577.0	49577.0	1	116
ICRF J072917.8 − 132002	0726 − 132	07 29 17.81770946	−13 20 02.2718039	0.00003226	0.0009160	0.005	53126.1	53126.1	53126.1	1	50
ICRF J072957.3 − 343919	0728 − 345	07 29 57.36530219	−34 39 19.5931667	0.00022000	0.0096037	0.640	52306.7	52306.7	52306.7	1	16
ICRF J073025.8 − 024124	0727 − 025	07 30 25.87760717	−02 41 24.9037751	0.00001367	0.0004385	0.048	50576.2	50576.2	50576.2	1	77
ICRF J073028.4 − 053546	0728 − 054	07 30 28.43648666	−05 35 46.9005945	0.00013881	0.0039431	0.082	54112.8	54112.8	54112.8	1	15
ICRF J073038.2 − 320820	0728 − 320	07 30 38.29831766	−32 08 20.1765594	0.00006855	0.0026355	0.130	52306.7	52306.7	52306.7	1	32
ICRF J073106.6 − 234147	0728 − 235	07 31 06.66798582	−23 41 47.8698541	0.00001772	0.0005491	−0.127	53134.5	53134.5	53134.5	1	51
ICRF J073131.5 − 222420	0729 − 222	07 31 31.50842471	−22 24 20.8656573	0.00004208	0.0012160	0.306	53126.1	53126.1	53126.1	1	47
ICRF J073158.9 + 143336	0729 + 146	07 31 58.99695505	14 33 36.4929567	0.00004642	0.0010131	−0.252	53561.9	53561.9	53561.9	1	43
ICRF J073222.7 + 015035	0729 + 019	07 32 22.78867123	01 50 35.3843170	0.00001301	0.0004068	0.218	53134.5	53134.5	53134.5	1	77
ICRF J073352.5 + 502209	0730 + 504	07 33 52.52056433	50 22 09.0622153	0.00001013	0.0001368	0.411	51762.9	49577.0	53573.0	6	434
ICRF J073357.4 + 045614	0731 + 050	07 33 57.45988102	04 56 14.4974974	0.00001953	0.0006581	−0.188	49914.7	49914.7	49914.7	1	91
ICRF J073502.3 + 475008	0731 + 479	07 35 02.31167937	47 50 08.4274368	0.00002168	0.0003418	0.185	50306.3	50306.3	50306.3	1	80
ICRF J073558.6 + 013003	0733 + 016	07 35 58.63465252	01 30 03.6387385	0.00016021	0.0020602	0.486	49914.7	49914.7	49914.7	1	33
ICRF J073613.6 + 295422	0733 + 300	07 36 13.66107711	29 54 22.1859314	0.00001990	0.0006129	−0.107	50219.8	50219.8	50219.8	1	55

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J073633.6 − 043311	0734 − 044	07 36 33.62711515	−04 33 11.8599376	0.00035653	0.0092465	−0.031	53560.8	53560.8	53560.8	1	5
ICRF J073658.0 + 260449	0733 + 261	07 36 58.07370619	26 04 49.9453270	0.00002250	0.0005525	0.066	50219.8	50219.8	50219.8	1	40
ICRF J073707.1 − 072038	0734 − 072	07 37 07.13302922	−07 20 38.0389507	0.00011726	0.0019669	0.281	53561.9	53561.9	53561.9	1	17
ICRF J073758.9 + 643043	0733 + 646	07 37 58.98065187	64 30 43.3443619	0.00044442	0.0019300	−0.246	49827.5	49827.5	49827.5	1	33
ICRF J073857.1 − 062658	0736 − 063	07 38 57.17553815	−06 26 58.0560695	0.00001710	0.0005053	0.095	50576.2	50576.2	50576.2	1	61
ICRF J073913.1 + 752747	0732 + 755	07 39 13.19537958	75 27 47.7108456	0.00103366	0.0040365	0.108	49827.5	49827.5	49827.5	1	15
ICRF J074014.7 − 244436	0738 − 246	07 40 14.71670478	−24 44 36.6825006	0.00003926	0.0012698	0.583	53126.1	53126.1	53126.1	1	57
ICRF J074033.5 + 285247	0737 + 289	07 40 33.54383837	28 52 47.2463866	0.00006661	0.0017438	−0.241	53573.0	53573.0	53573.0	1	37
ICRF J074053.3 + 671908	0735 + 674	07 40 53.39830722	67 19 08.2294299	0.00089095	0.0095735	0.867	49827.5	49827.5	49827.5	1	14
ICRF J074125.7 + 270645	0738 + 272	07 41 25.73282206	27 06 45.3917852	0.00002846	0.0006166	0.019	50219.8	50219.8	50219.8	1	44
ICRF J074155.6 − 264730	0739 − 266	07 41 55.68128112	−26 47 30.4934421	0.00007097	0.0035180	−0.169	53134.5	53134.5	53134.5	1	24
ICRF J074239.7 + 544424	0738 + 548	07 42 39.79067458	54 44 24.6669484	0.00004084	0.0005668	0.393	49577.0	49577.0	49577.0	1	114
ICRF J074242.0 − 382903	0740 − 383	07 42 42.00475476	−38 29 03.9205509	0.00050740	0.0188007	0.831	52747.8	52306.7	53552.8	3	12
ICRF J074305.1 + 171424	0740 + 173	07 43 05.10679893	17 14 24.4129741	0.00002958	0.0010777	−0.543	50133.0	50085.5	50156.3	2	146
ICRF J074309.8 + 394130	0739 + 398	07 43 09.88652408	39 41 30.7812149	0.00002019	0.0005044	−0.350	50242.8	50242.8	50242.8	1	90
ICRF J074344.8 − 380356	0741 − 379	07 43 44.82059410	−38 03 56.4133833	0.00017756	0.0085105	0.749	52910.4	52306.7	53523.9	3	38
ICRF J074344.9 + 232839	0740 + 235	07 43 44.97241117	23 28 39.0045288	0.00038328	0.0040326	0.490	50156.3	50156.3	50156.3	1	8
ICRF J074352.4 − 044020	0741 − 045	07 43 52.40663173	−04 40 20.5300131	0.00001958	0.0006145	−0.023	53503.7	53503.7	53503.7	1	75
ICRF J074541.6 + 314256	0742 + 318	07 45 41.67151573	31 42 56.6161382	0.00002475	0.0005925	−0.412	50219.8	50219.8	50219.8	1	40
ICRF J074559.3 + 331334	0742 + 333	07 45 59.32400985	33 13 34.1358514	0.00005249	0.0012278	0.217	53560.8	53560.8	53560.8	1	26
ICRF J074618.2 − 155534	0744 − 158	07 46 18.23602393	−15 55 34.7457835	0.00004667	0.0013076	−0.549	52306.7	52306.7	52306.7	1	35
ICRF J074714.6 + 763917	0740 + 767	07 47 14.60754429	76 39 17.2715352	0.00008840	0.0004095	0.443	49827.5	49827.5	49827.5	1	118
ICRF J074719.6 − 331046	0745 − 330	07 47 19.68319257	−33 10 46.9713367	0.00003795	0.0011860	0.688	52306.7	52306.7	52306.7	1	51
ICRF J074741.8 − 291902	0745 − 291	07 47 41.88962879	−29 19 02.0614884	0.00036922	0.0156805	0.066	53126.1	53126.1	53126.1	1	7
ICRF J074803.0 − 163950	0745 − 165	07 48 03.08382473	−16 39 50.2541059	0.00001781	0.0006271	−0.165	53552.8	53552.8	53552.8	1	82
ICRF J074848.6 − 165027	0746 − 167	07 48 48.67855360	−16 50 27.4013193	0.00003789	0.0011846	0.653	52409.7	52409.7	52409.7	1	56
ICRF J074922.4 + 742041	0743 + 744	07 49 22.45666933	74 20 41.5925884	0.00009555	0.0006904	0.484	49827.5	49827.5	49827.5	1	101
ICRF J074927.3 + 105733	0746 + 110	07 49 27.38561652	10 57 33.1279495	0.00167759	0.0313703	−0.958	54088.1	54088.1	54088.1	1	12
ICRF J075008.3 + 501506	0746 + 503	07 50 08.34282986	50 15 06.8111709	0.00011312	0.0009875	0.197	51041.6	49577.0	54112.8	3	50
ICRF J075043.2 + 790917	0742 + 792	07 50 43.26541805	79 09 17.0024655	0.00026649	0.0011092	0.523	52233.0	49827.5	54088.1	3	66
ICRF J075047.1 − 070604	0748 − 069	07 50 47.14842878	−07 06 04.0257853	0.00006769	0.0016148	−0.013	53503.7	53503.7	53503.7	1	37
ICRF J075057.7 + 824158	0740 + 828	07 50 57.75561436	82 41 58.0319160	0.00008599	0.0003146	0.065	50688.3	50688.3	50688.3	1	73
ICRF J075102.2 + 015215	0748 + 019	07 51 02.28149505	01 52 15.7622690	0.00015247	0.0024794	−0.274	53573.0	53573.0	53573.0	1	28
ICRF J075105.4 − 333135	0749 − 333	07 51 05.47042989	−33 31 35.9984205	0.00021022	0.0073083	0.677	52306.7	52306.7	52306.7	1	17
ICRF J075110.2 − 004651	0748 − 006	07 51 10.20501691	−00 46 51.0552009	0.00045772	0.0049032	0.082	54112.8	54112.8	54112.8	1	5

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J075145.9 + 684026	0746 + 688	07 51 45.98484005	68 40 26.8331133	0.00031575	0.0011687	0.549	53560.8	53560.8	53560.8	1	29
ICRF J075153.6 + 331319	0748 + 333	07 51 53.67323041	33 13 19.8183213	0.00001790	0.0004589	−0.049	50219.8	50219.8	50219.8	1	49
ICRF J075240.9 + 373024	0749 + 376	07 52 40.90786934	37 30 24.3122028	0.00003104	0.0006588	−0.461	50242.8	50242.8	50242.8	1	75
ICRF J075303.3 + 423130	0749 + 426	07 53 03.33747791	42 31 30.7656496	0.00002366	0.0004625	−0.181	50242.8	50242.8	50242.8	1	76
ICRF J075426.4 − 114716	0752 − 116	07 54 26.45641965	−11 47 16.9487452	0.00001025	0.0003363	0.080	53134.5	53134.5	53134.5	1	81
ICRF J075445.6 + 482350	0751 + 485	07 54 45.67046099	48 23 50.7483777	0.00003604	0.0005533	0.259	50306.3	50306.3	50306.3	1	78
ICRF J075650.6 − 154205	0754 − 155	07 56 50.69897361	−15 42 05.4364232	0.00001536	0.0004657	−0.261	53503.7	53503.7	53503.7	1	66
ICRF J075654.6 + 634759	0752 + 639	07 56 54.61043944	63 47 59.0365245	0.00006566	0.0009009	0.109	49827.5	49827.5	49827.5	1	92
ICRF J075659.5 + 515100	0753 + 519	07 56 59.54317263	51 51 00.2380782	0.00003383	0.0004751	0.042	53905.2	49577.0	54088.1	2	74
ICRF J075807.6 + 113646	0755 + 117	07 58 07.65763563	11 36 46.0506813	0.00089195	0.0053949	−0.281	49914.7	49914.7	49914.7	1	7
ICRF J080012.7 − 230250	0758 − 229	08 00 12.79086282	−23 02 50.5392012	0.00006316	0.0025446	−0.121	53523.9	53523.9	53523.9	1	32
ICRF J080024.2 − 395917	0758 − 398	08 00 24.26948794	−39 59 17.6027063	0.00017284	0.0090215	0.727	52977.5	52306.7	53552.8	4	43
ICRF J080108.2 + 440110	0757 + 441	08 01 08.27615986	44 01 10.1563423	0.00002751	0.0006016	0.063	53573.0	53573.0	53573.0	1	85
ICRF J080125.9 − 333619	0759 − 334	08 01 25.95236633	−33 36 19.8948959	0.00013423	0.0048962	0.681	52486.0	52306.7	53126.1	2	32
ICRF J080146.4 − 283106	0759 − 283	08 01 46.49399810	−28 31 06.8746466	0.00007720	0.0032723	0.074	53126.1	53126.1	53126.1	1	32
ICRF J080224.5 + 592134	0758 + 594	08 02 24.59270044	59 21 34.7951969	0.00012175	0.0013831	0.697	52903.2	49577.0	54112.8	2	30
ICRF J080241.5 + 250910	0759 + 252	08 02 41.58743622	25 09 10.8981080	0.00005176	0.0011373	0.640	50219.8	50219.8	50219.8	1	17
ICRF J080339.3 − 080521	0801 − 079	08 03 39.30688944	−08 05 21.3903472	0.00006523	0.0014797	0.139	53560.8	53560.8	53560.8	1	35
ICRF J080352.1 + 640314	0759 + 641	08 03 52.15965825	64 03 14.3684824	0.00065160	0.0058543	−0.825	49827.5	49827.5	49827.5	1	16
ICRF J080356.4 + 042102	0801 + 044	08 03 56.44437625	04 21 02.7413759	0.00007542	0.0028354	−0.590	49914.7	49914.7	49914.7	1	23
ICRF J080433.7 − 171204	0802 − 170	08 04 33.70137116	−17 12 04.2008220	0.00093635	0.0294107	0.944	53561.9	53561.9	53561.9	1	3
ICRF J080451.4 − 274911	0802 − 276	08 04 51.45121046	−27 49 11.3209165	0.00003120	0.0009120	0.026	50688.3	50688.3	50688.3	1	51
ICRF J080508.5 + 112157	0802 + 115	08 05 08.50569856	11 21 57.1893761	0.00010154	0.0026013	−0.790	53573.0	53573.0	53573.0	1	45
ICRF J080512.8 − 011113	0802 − 010	08 05 12.88847642	−01 11 13.7952946	0.00000901	0.0003043	−0.110	50576.2	50576.2	50576.2	1	90
ICRF J080538.5 + 210651	0802 + 212	08 05 38.53424806	21 06 51.5924358	0.00003481	0.0008817	−0.378	50132.7	50085.5	50156.3	2	108
ICRF J080612.7 − 265233	0804 − 267	08 06 12.72259399	−26 52 33.3087105	0.00001655	0.0005617	0.029	50660.8	50632.3	50688.3	2	114
ICRF J080624.9 − 172444	0804 − 172	08 06 24.96568681	−17 24 44.3354886	0.00011486	0.0028824	−0.147	53561.9	53561.9	53561.9	1	27
ICRF J080633.4 − 291134	0804 − 290	08 06 33.44528292	−29 11 34.9045236	0.00008170	0.0033649	0.237	53134.5	53134.5	53134.5	1	27
ICRF J080633.4 + 450432	0803 + 452	08 06 33.47247901	45 04 32.2718825	0.00003985	0.0005143	0.534	50306.3	50306.3	50306.3	1	61
ICRF J080644.7 − 351941	0804 − 351	08 06 44.76676957	−35 19 41.4646876	0.00071123	0.0225212	0.441	52365.6	52306.7	52409.7	2	7
ICRF J080701.0 + 511738	0803 + 514	08 07 01.01355758	51 17 38.6764008	0.00003700	0.0004942	0.503	49908.1	49577.0	50306.3	2	163
ICRF J080709.6 − 054113	0804 − 055	08 07 09.61759169	−05 41 13.9148539	0.00001771	0.0006486	−0.220	50576.2	50576.2	50576.2	1	75
ICRF J080735.9 − 120743	0805 − 119	08 07 35.99890905	−12 07 43.7145356	0.00004706	0.0015524	−0.083	50576.2	50576.2	50576.2	1	37
ICRF J080738.5 + 135217	0804 + 140	08 07 38.50487936	13 52 17.3616639	0.00001571	0.0005482	−0.142	53126.1	53126.1	53126.1	1	75
ICRF J080816.4 + 731511	0802 + 733	08 08 16.49149639	73 15 11.9902446	0.00011732	0.0008032	−0.072	49827.5	49827.5	49827.5	1	67

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J080836.7 + 264636	0805 + 269	08 08 36.76496080	26 46 36.7401207	0.00010200	0.0017499	−0.062	50219.8	50219.8	50219.8	1	11
ICRF J080949.1 + 521858	0806 + 524	08 09 49.18708670	52 18 58.2527460	0.00020037	0.0017067	0.523	53560.8	53560.8	53560.8	1	27
ICRF J081026.4 + 101040	0807 + 103	08 10 26.42396595	10 10 40.9958279	0.00053252	0.0064875	0.654	53561.9	53561.9	53561.9	1	3
ICRF J081058.9 + 413402	0807 + 417	08 10 58.99425799	41 34 02.8063576	0.00004522	0.0008368	−0.563	50242.8	50242.8	50242.8	1	62
ICRF J081100.6 + 571412	0806 + 573	08 11 00.60920093	57 14 12.4952016	0.00020536	0.0011088	0.401	49577.0	49577.0	49577.0	1	47
ICRF J081228.5 − 181042	0810 − 180	08 12 28.51594364	−18 10 42.8130119	0.00002107	0.0006850	0.319	50632.3	50632.3	50632.3	1	65
ICRF J081303.8 + 254211	0810 + 258	08 13 03.83407797	25 42 11.0320105	0.00002856	0.0006148	0.465	50219.8	50219.8	50219.8	1	21
ICRF J081347.1 + 243559	0810 + 247	08 13 47.13767566	24 35 59.1494556	0.00008828	0.0014371	−0.535	50132.0	50085.5	50156.3	2	67
ICRF J081407.9 − 180626	0811 − 179	08 14 07.90022359	−18 06 26.0427208	0.00149990	0.0341031	−0.732	53573.0	53573.0	53573.0	1	5
ICRF J081455.1 − 252143	0812 − 252	08 14 55.12998151	−25 21 43.9240171	0.00014292	0.0027406	0.299	50663.1	50632.3	50688.3	2	40
ICRF J081529.4 + 095440	0812 + 100	08 15 29.47330589	09 54 40.7035861	0.00037597	0.0063067	0.768	53134.5	53134.5	53134.5	1	5
ICRF J081640.4 − 242106	0814 − 241	08 16 40.41238216	−24 21 06.5708339	0.00002116	0.0006566	−0.288	53126.1	53126.1	53126.1	1	69
ICRF J081710.5 + 235223	0814 + 240	08 17 10.54773696	23 52 23.9520403	0.00007372	0.0010431	−0.250	53560.8	53560.8	53560.8	1	28
ICRF J081727.4 − 030737	0814 − 029	08 17 27.48604533	−03 07 37.3112793	0.00014815	0.0028884	0.609	50576.2	50576.2	50576.2	1	21
ICRF J081728.5 + 322702	0814 + 326	08 17 28.54229055	32 27 02.9261272	0.00005289	0.0009599	0.452	50219.8	50219.8	50219.8	1	20
ICRF J081741.0 + 553733	0813 + 557	08 17 41.01991398	55 37 33.2829715	0.00002393	0.0002207	0.164	53134.5	53134.5	53134.5	1	90
ICRF J081749.7 − 093330	0815 − 094	08 17 49.74954200	−09 33 30.5284649	0.00003389	0.0012253	−0.587	53561.9	53561.9	53561.9	1	50
ICRF J081758.8 − 293631	0815 − 294	08 17 58.85020972	−29 36 31.4217977	0.00003444	0.0011146	0.150	53503.7	53503.7	53503.7	1	50
ICRF J081856.2 + 051737	0816 + 054	08 18 56.23684771	05 17 37.2659373	0.00001221	0.0004098	−0.051	53126.1	53126.1	53126.1	1	88
ICRF J081902.3 + 322637	0815 + 326	08 19 02.32857841	32 26 37.2159710	0.00003340	0.0007196	0.435	50219.8	50219.8	50219.8	1	21
ICRF J081918.8 + 274730	0816 + 279	08 19 18.85573034	27 47 30.6897560	0.00004172	0.0013137	−0.301	53573.0	53573.0	53573.0	1	58
ICRF J081936.6 − 063048	0817 − 063	08 19 36.64750267	−06 30 48.1726528	0.00010554	0.0037760	0.239	53556.6	53523.9	54112.8	2	18
ICRF J082140.0 − 032312	0819 − 032	08 21 40.03745945	−03 23 12.5344359	0.00006814	0.0022938	−0.317	50576.2	50576.2	50576.2	1	19
ICRF J082257.5 + 404149	0819 + 408	08 22 57.55594418	40 41 49.7669575	0.00001604	0.0003658	0.074	50242.8	50242.8	50242.8	1	77
ICRF J082324.7 + 222303	0820 + 225	08 23 24.75915801	22 23 03.2876737	0.00003618	0.0010893	0.244	50133.8	50085.5	50156.3	2	88
ICRF J082341.1 + 292828	0820 + 296	08 23 41.13198910	29 28 28.1992066	0.00004368	0.0009304	0.097	50219.8	50219.8	50219.8	1	22
ICRF J082352.0 − 093925	0821 − 094	08 23 52.02334279	−09 39 25.9079348	0.00017218	0.0049296	−0.089	53552.8	53552.8	53552.8	1	14
ICRF J082404.0 − 182740	0821 − 182	08 24 04.06600764	−18 27 40.8385207	0.00002824	0.0009770	−0.089	53560.8	53560.8	53560.8	1	62
ICRF J082449.2 − 242852	0822 − 243	08 24 49.26025300	−24 28 52.5517375	0.00014117	0.0056319	0.063	53561.9	53561.9	53561.9	1	22
ICRF J082451.6 − 152745	0822 − 152	08 24 51.62140904	−15 27 45.9153739	0.00312117	0.0186440	0.626	54088.1	54088.1	54088.1	1	8
ICRF J082504.7 + 083111	0822 + 086	08 25 04.77656233	08 31 11.0892260	0.00014356	0.0025634	−0.675	53573.0	53573.0	53573.0	1	29
ICRF J082551.3 − 321823	0823 − 321	08 25 51.37262026	−32 18 23.2343985	0.00006476	0.0021139	−0.085	53153.2	53153.2	53153.2	1	24
ICRF J082738.5 + 352505	0824 + 355	08 27 38.58823303	35 25 05.0771894	0.00001370	0.0002882	−0.174	50242.8	50242.8	50242.8	1	77
ICRF J082753.6 + 521758	0824 + 524	08 27 53.69809834	52 17 58.2959128	0.00023050	0.0014974	0.033	49577.0	49577.0	49577.0	1	34
ICRF J082904.8 + 175415	0826 + 180	08 29 04.82910684	17 54 15.8571667	0.00742467	0.1442532	−0.998	54088.1	54088.1	54088.1	1	4

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J083216.0 + 183212	0829 + 187	08 32 16.04024901	18 32 12.1337700	0.00004133	0.0010774	−0.111	50123.9	50085.5	50156.3	2	96
ICRF J083238.4 + 104019	0829 + 108	08 32 38.47715313	10 40 19.6552253	0.00006784	0.0019885	−0.402	49914.7	49914.7	49914.7	1	39
ICRF J083249.3 + 155408	0830 + 160	08 32 49.39706099	15 54 08.6226885	0.00002763	0.0007595	−0.180	53560.8	53560.8	53560.8	1	58
ICRF J083314.3 + 112336	0830 + 115	08 33 14.36667401	11 23 36.2356947	0.00003059	0.0008321	0.375	49914.7	49914.7	49914.7	1	95
ICRF J083318.9 + 035032	0830 + 040	08 33 18.91302164	03 50 32.3512138	0.00003701	0.0012405	−0.172	49914.7	49914.7	49914.7	1	45
ICRF J083353.8 + 422401	0830 + 425	08 33 53.88537352	42 24 01.8503665	0.00002813	0.0004969	0.071	50242.8	50242.8	50242.8	1	66
ICRF J083417.5 + 601947	0830 + 605	08 34 17.54593422	60 19 47.0664913	0.00009374	0.0011944	0.386	49577.0	49577.0	49577.0	1	55
ICRF J083520.6 − 451035	0833 − 450	08 35 20.65500780	−45 10 35.1547903	0.00173892	0.0113591	−0.408	48132.8	48043.8	48162.4	2	4
ICRF J083616.2 + 213903	0833 + 218	08 36 16.21689918	21 39 03.5784228	0.00014551	0.0024590	−0.839	54088.1	54088.1	54088.1	1	27
ICRF J083622.8 + 272852	0833 + 276	08 36 22.88866154	27 28 52.5336417	0.00001698	0.0004162	0.064	50219.8	50219.8	50219.8	1	59
ICRF J083636.8 + 412554	0833 + 416	08 36 36.89265636	41 25 54.7121693	0.00002428	0.0006518	−0.068	50242.8	50242.8	50242.8	1	57
ICRF J083650.7 − 223310	0834 − 223	08 36 50.76879288	−22 33 10.0897746	0.00010336	0.0024825	−0.105	50652.1	50632.3	50688.3	2	48
ICRF J083949.1 + 031953	0837 + 035	08 39 49.19581660	03 19 53.8587694	0.00002121	0.0005760	−0.282	49914.7	49914.7	49914.7	1	108
ICRF J083949.6 + 010426	0837 + 012	08 39 49.61100079	01 04 26.7364685	0.00001760	0.0005521	0.038	49914.7	49914.7	49914.7	1	127
ICRF J083956.5 + 422755	0836 + 426	08 39 56.56134841	42 27 55.8153800	0.00002604	0.0005267	0.077	50242.8	50242.8	50242.8	1	77
ICRF J084132.6 − 313635	0839 − 314	08 41 32.60251974	−31 36 35.6901884	0.00012923	0.0041139	0.711	53153.2	53153.2	53153.2	1	19
ICRF J084307.0 + 453742	0839 + 458	08 43 07.09424901	45 37 42.8974945	0.00052734	0.0109459	0.315	50306.3	50306.3	50306.3	1	8
ICRF J084331.6 + 421529	0840 + 424	08 43 31.63741909	42 15 29.5250537	0.00017561	0.0031168	0.201	50242.8	50242.8	50242.8	1	14
ICRF J084349.1 + 683317	0839 + 687	08 43 49.10150993	68 33 17.1548626	0.00005885	0.0004724	0.094	53488.9	49827.5	54088.1	2	64
ICRF J084429.0 + 383055	0841 + 386	08 44 29.09781690	38 30 55.7099936	0.00002055	0.0005036	−0.191	50242.8	50242.8	50242.8	1	79
ICRF J084452.3 − 374209	0842 − 375	08 44 52.32109636	−37 42 09.3824020	0.00027160	0.0134005	0.791	52363.9	52306.7	52409.7	2	18
ICRF J084517.1 + 043947	0842 + 048	08 45 17.14370708	04 39 47.3544646	0.00022596	0.0026818	0.544	49914.7	49914.7	49914.7	1	26
ICRF J084542.4 − 371854	0843 − 371	08 45 42.49627449	−37 18 54.9968403	0.00055422	0.0203783	0.276	52409.7	52409.7	52409.7	1	3
ICRF J084600.7 − 261054	0843 − 259	08 46 00.73387471	−26 10 54.1571916	0.00022619	0.0049679	−0.129	50659.2	50632.3	50688.3	2	25
ICRF J084610.8 − 342433	0844 − 342	08 46 10.89376793	−34 24 33.5821861	0.00022453	0.0080104	0.802	52306.7	52306.7	52306.7	1	21
ICRF J084656.6 − 260750	0844 − 259	08 46 56.61658631	−26 07 50.6601136	0.00012965	0.0041342	0.734	53503.7	53503.7	53503.7	1	28
ICRF J084711.1 − 175450	0844 − 177	08 47 11.17009946	−17 54 50.1370418	0.00012119	0.0031374	0.494	53535.1	53523.9	53560.8	2	23
ICRF J084715.1 + 383110	0844 + 387	08 47 15.16916655	38 31 09.9844293	0.00009873	0.0011657	−0.099	53361.6	51449.7	53552.8	2	22
ICRF J084728.0 + 572338	0843 + 575	08 47 28.06032753	57 23 38.3348763	0.00118692	0.0096124	0.867	49577.0	49577.0	49577.0	1	17
ICRF J084734.2 + 460928	0844 + 463	08 47 34.29851717	46 09 28.0054724	0.00002038	0.0003600	0.262	50306.3	50306.3	50306.3	1	68
ICRF J084756.7 − 070316	0845 − 068	08 47 56.73724037	−07 03 16.9025641	0.00001789	0.0006196	−0.436	53503.7	53503.7	53503.7	1	80
ICRF J084758.7 − 052033	0845 − 051	08 47 58.72491427	−05 20 33.9003908	0.00001273	0.0004025	0.166	53134.5	53134.5	53134.5	1	81
ICRF J084945.6 − 354101	0847 − 354	08 49 45.62346981	−35 41 01.2786452	0.00002237	0.0006834	0.166	52359.1	52306.7	52409.7	2	55
ICRF J084957.9 + 510829	0846 + 513	08 49 57.97682961	51 08 29.0234509	0.00002690	0.0003858	0.267	53561.9	53561.9	53561.9	1	86
ICRF J085024.7 + 374709	0847 + 379	08 50 24.72978591	37 47 09.4777059	0.00002037	0.0004781	−0.170	50242.8	50242.8	50242.8	1	73

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J085128.4 + 084515	0848 + 089	08 51 28.42549857	08 45 15.3120175	0.00038231	0.0051191	0.357	49914.7	49914.7	49914.7	1	6
ICRF J085205.1 + 283359	0849 + 287	08 52 05.16957689	28 33 59.7313635	0.00002382	0.0006016	−0.080	53126.1	53126.1	53126.1	1	76
ICRF J085230.8 − 152808	0850 − 152	08 52 30.84722033	−15 28 08.4757744	0.00006400	0.0017396	−0.196	53573.0	53573.0	53573.0	1	33
ICRF J085348.1 + 065447	0851 + 071	08 53 48.19001414	06 54 47.2363248	0.00005786	0.0014707	0.531	49914.7	49914.7	49914.7	1	54
ICRF J085432.1 − 254020	0852 − 254	08 54 32.17979747	−25 40 20.8382166	0.00006189	0.0023405	−0.031	53523.9	53523.9	53523.9	1	42
ICRF J085435.0 + 072024	0851 + 075	08 54 35.03640333	07 20 24.1246377	0.00002545	0.0006948	−0.013	53560.8	53560.8	53560.8	1	59
ICRF J085448.5 + 803422	0847 + 807	08 54 48.59874042	80 34 22.3819892	0.00010517	0.0005268	0.280	54088.1	54088.1	54088.1	1	51
ICRF J085450.5 + 621850	0850 + 625	08 54 50.57627953	62 18 50.1906492	0.00017092	0.0014421	−0.087	49827.5	49827.5	49827.5	1	47
ICRF J085654.8 + 714623	0851 + 719	08 56 54.86893438	71 46 23.9026036	0.00107171	0.0023952	−0.387	53561.9	53561.9	53561.9	1	11
ICRF J085805.3 − 195036	0855 − 196	08 58 05.36323202	−19 50 36.9350854	0.00000954	0.0003370	0.070	50659.0	50632.3	50688.3	2	151
ICRF J085841.6 + 140540	0855 + 142	08 58 41.60035619	14 05 40.3715986	0.00007252	0.0029391	−0.407	53523.9	53523.9	53523.9	1	10
ICRF J085920.8 − 330924	0857 − 329	08 59 20.81256232	−33 09 24.7272468	0.00247472	0.0547391	0.927	52306.7	52306.7	52306.7	1	3
ICRF J090021.4 + 410822	0857 + 413	09 00 21.43384487	41 08 22.9890745	0.00002861	0.0007033	−0.071	53573.0	53573.0	53573.0	1	83
ICRF J090039.7 − 124232	0858 − 125	09 00 39.76562966	−12 42 32.6252079	0.00021380	0.0060648	−0.194	53560.8	53560.8	53560.8	1	11
ICRF J090040.0 − 280820	0858 − 279	09 00 40.03880136	−28 08 20.3464696	0.00003380	0.0009749	−0.042	50891.2	50688.3	54643.7	2	39
ICRF J090044.2 − 313128	0858 − 313	09 00 44.29429820	−31 31 28.5777492	0.00048967	0.0187260	0.924	52306.7	52306.7	52306.7	1	5
ICRF J090111.8 + 044858	0858 + 050	09 01 11.86429506	04 48 58.8341875	0.00001998	0.0006124	−0.358	53561.9	53561.9	53561.9	1	81
ICRF J090219.2 + 540257	0858 + 542	09 02 19.28741323	54 02 57.2540888	0.00009717	0.0012452	0.310	53573.0	53573.0	53573.0	1	45
ICRF J090230.9 + 431014	0859 + 433	09 02 30.91996730	43 10 14.1657057	0.00001790	0.0003759	−0.124	50242.8	50242.8	50242.8	1	80
ICRF J090300.0 − 172105	0900 − 171	09 03 00.01977880	−17 21 05.2320881	0.00002692	0.0008808	−0.433	53560.8	53560.8	53560.8	1	58
ICRF J090337.9 − 311739	0901 − 310	09 03 37.93480235	−31 17 39.1303065	0.00012985	0.0055468	0.480	53046.4	52409.7	53523.9	2	35
ICRF J090358.5 + 515100	0900 + 520	09 03 58.57442767	51 51 00.6617784	0.00024227	0.0023483	0.568	49577.0	49577.0	49577.0	1	27
ICRF J090415.6 + 423804	0900 + 428	09 04 15.62848948	42 38 04.7646282	0.00002616	0.0004888	−0.273	50242.8	50242.8	50242.8	1	76
ICRF J090420.5 − 311125	0902 − 309	09 04 20.51592103	−31 11 25.6788554	0.00026844	0.0145220	0.665	52409.7	52409.7	52409.7	1	5
ICRF J090452.1 − 255251	0902 − 256	09 04 52.18604273	−25 52 51.7559604	0.00003434	0.0008864	0.039	50660.7	50632.3	50688.3	2	71
ICRF J090527.4 + 485049	0902 + 490	09 05 27.46389144	48 50 49.9650405	0.00001700	0.0003025	0.098	50306.3	50306.3	50306.3	1	79
ICRF J090541.7 + 284928	0902 + 290	09 05 41.76987067	28 49 28.3015448	0.00005468	0.0008537	0.516	50219.8	50219.8	50219.8	1	39
ICRF J090615.5 + 463619	0902 + 468	09 06 15.53964568	46 36 19.0254139	0.00011248	0.0021007	−0.398	50306.3	50306.3	50306.3	1	31
ICRF J090651.3 − 201954	0904 − 201	09 06 51.30534350	−20 19 54.8044343	0.00001281	0.0004253	−0.076	53552.8	53552.8	53552.8	1	79
ICRF J090752.9 + 681544	0903 + 684	09 07 52.94639184	68 15 44.9204805	0.00020072	0.0012047	0.336	49827.5	49827.5	49827.5	1	51
ICRF J090754.0 − 202649	0905 − 202	09 07 54.04048448	−20 26 49.4752557	0.00002356	0.0009575	−0.571	53503.7	53503.7	53503.7	1	63
ICRF J090835.8 + 415046	0905 + 420	09 08 35.86339671	41 50 46.2053512	0.00135876	0.0229253	0.944	54112.8	54112.8	54112.8	1	3
ICRF J090855.9 + 160954	0906 + 163	09 08 55.92534855	16 09 54.7639408	0.00005558	0.0020987	−0.751	50109.9	50085.5	50156.3	2	61
ICRF J090912.1 + 083541	0906 + 087	09 09 12.15750189	08 35 41.0991674	0.00003054	0.0007553	−0.423	53538.0	53523.9	53561.9	2	81
ICRF J090933.4 + 425346	0906 + 430	09 09 33.49711097	42 53 46.4818256	0.00001484	0.0002197	0.264	53134.5	53134.5	53134.5	1	89

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J090944.9 − 023130	0907 − 023	09 09 44.92413443	−02 31 30.3567190	0.00014378	0.0037201	0.518	53560.8	53560.8	53560.8	1	19
ICRF J090945.2 − 180833	0907 − 179	09 09 45.25921493	−18 08 33.9474497	0.00013279	0.0050789	−0.712	53561.9	53561.9	53561.9	1	21
ICRF J091051.0 − 052629	0908 − 052	09 10 51.00210607	−05 26 29.2003927	0.00070097	0.0114907	−0.157	53153.2	53153.2	53153.2	1	5
ICRF J091133.4 + 195814	0908 + 201	09 11 33.45962355	19 58 14.0903451	0.00024258	0.0028564	−0.285	50140.9	50085.5	50156.3	2	23
ICRF J091147.7 + 334916	0908 + 340	09 11 47.76148375	33 49 16.7941569	0.00004962	0.0017331	0.408	50219.8	50219.8	50219.8	1	25
ICRF J091224.7 + 220506	0909 + 222	09 12 24.78462663	22 05 06.2481863	0.00002923	0.0005989	−0.211	53126.1	53126.1	53126.1	1	47
ICRF J091231.5 − 275217	0910 − 276	09 12 31.58684102	−27 52 17.2272060	0.00058598	0.0120088	0.382	53560.8	53560.8	53560.8	1	7
ICRF J091251.1 + 442204	0909 + 445	09 12 51.12910643	44 22 04.6453858	0.00162182	0.0127006	−0.623	53573.0	53573.0	53573.0	1	7
ICRF J091353.3 + 440257	0910 + 442	09 13 53.36564638	44 02 57.2008231	0.00015213	0.0026854	−0.740	54088.1	54088.1	54088.1	1	16
ICRF J091439.4 + 351204	0911 + 354	09 14 39.42354458	35 12 04.5912071	0.00003573	0.0007367	0.235	50242.8	50242.8	50242.8	1	67
ICRF J091537.6 − 042916	0913 − 042	09 15 37.67769324	−04 29 16.2970496	0.00018012	0.0025371	0.285	53554.9	53552.8	53573.0	2	19
ICRF J091551.6 + 000713	0913 + 003	09 15 51.69512944	00 07 13.3108109	0.00006769	0.0018327	−0.367	54112.8	54112.8	54112.8	1	21
ICRF J091648.9 + 385428	0913 + 391	09 16 48.90457395	38 54 28.1463066	0.00001599	0.0003293	−0.001	50242.8	50242.8	50242.8	1	81
ICRF J091727.0 − 213134	0915 − 213	09 17 27.01632482	−21 31 34.4621473	0.00001433	0.0005304	−0.209	50660.1	50632.3	50688.3	2	139
ICRF J091739.0 − 134542	0915 − 135	09 17 39.00068531	−13 45 42.2375988	0.00001987	0.0007009	−0.563	53530.1	53503.7	53560.8	2	132
ICRF J091901.9 − 073905	0916 − 074	09 19 01.96268275	−07 39 05.1096809	0.00007505	0.0021385	0.029	53153.2	53153.2	53153.2	1	30
ICRF J091908.7 + 332441	0916 + 336	09 19 08.78711973	33 24 41.9429830	0.00002385	0.0006120	0.221	50219.8	50219.8	50219.8	1	56
ICRF J091952.5 + 782526	0913 + 786	09 19 52.55971830	78 25 26.5583567	0.00022033	0.0009055	0.735	50525.1	49827.5	50688.3	2	58
ICRF J092026.2 − 363147	0918 − 363	09 20 26.20114623	−36 31 47.5153746	0.00005320	0.0017348	−0.589	52356.8	52306.7	52409.7	2	37
ICRF J092123.9 + 713612	0916 + 718	09 21 23.94514038	71 36 12.4015541	0.00008877	0.0004675	−0.261	53126.1	53126.1	53126.1	1	62
ICRF J092223.6 − 052907	0919 − 052	09 22 23.67288377	−05 29 07.1842964	0.00001906	0.0006420	−0.361	53523.9	53523.9	53523.9	1	79
ICRF J092331.3 + 412527	0920 + 416	09 23 31.30495969	41 25 27.4392438	0.00001632	0.0003411	−0.076	50242.8	50242.8	50242.8	1	88
ICRF J092338.8 − 213547	0921 − 213	09 23 38.88518518	−21 35 47.1276575	0.00002791	0.0008219	0.206	50654.8	50632.3	50688.3	2	87
ICRF J092347.9 + 310754	0920 + 313	09 23 47.94865748	31 07 54.1430738	0.00011530	0.0017421	−0.564	53561.9	53561.9	53561.9	1	20
ICRF J092351.5 + 281525	0920 + 284	09 23 51.52341520	28 15 25.0221887	0.00002884	0.0006373	0.183	50219.8	50219.8	50219.8	1	46
ICRF J092444.9 + 451157	0921 + 454	09 24 44.99425694	45 11 57.9158132	0.00021669	0.0017214	−0.274	53573.0	53573.0	53573.0	1	33
ICRF J092507.8 + 001913	0922 + 005	09 25 07.81502656	00 19 13.9340736	0.00002246	0.0007734	0.240	49914.7	49914.7	49914.7	1	89
ICRF J092511.9 − 202735	0922 − 202	09 25 11.94736631	−20 27 35.6100692	0.00012620	0.0038983	0.258	52409.7	52409.7	52409.7	1	24
ICRF J092543.6 + 312710	0922 + 316	09 25 43.65026553	31 27 10.8040720	0.00009184	0.0022390	0.245	50219.8	50219.8	50219.8	1	20
ICRF J092549.9 + 165812	0923 + 171	09 25 49.96445316	16 58 12.2034038	0.00014763	0.0036010	−0.182	53560.8	53560.8	53560.8	1	6
ICRF J092551.8 + 361235	0922 + 364	09 25 51.85138556	36 12 35.6749628	0.00002203	0.0004068	−0.023	53561.9	53561.9	53561.9	1	59
ICRF J092600.4 + 402949	0922 + 407	09 26 00.42685115	40 29 49.6726269	0.00001220	0.0002804	−0.089	50242.8	50242.8	50242.8	1	90
ICRF J092706.0 + 571745	0923 + 575	09 27 06.05342523	57 17 45.3423274	0.00011691	0.0012513	0.067	53134.5	53134.5	53134.5	1	27
ICRF J092824.1 + 444604	0925 + 449	09 28 24.13710382	44 46 04.7993904	0.00003688	0.0005802	0.262	50306.3	50306.3	50306.3	1	72
ICRF J092833.4 − 040908	0926 − 039	09 28 33.46942328	−04 09 08.8483800	0.00005155	0.0021026	−0.679	53126.1	53126.1	53126.1	1	37

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J092833.9 − 304943	0926 − 306	09 28 33.98818980	−30 49 43.9975770	0.00015161	0.0048557	0.718	52306.7	52306.7	52306.7	1	27
ICRF J092902.2 − 182045	0926 − 181	09 29 02.26149122	−18 20 45.7601088	0.00005337	0.0024570	−0.301	54088.1	54088.1	54088.1	1	33
ICRF J092943.0 + 861221	0916 + 864	09 29 43.05599511	86 12 21.2773543	0.00250571	0.0054549	−0.061	50688.3	50688.3	50688.3	1	8
ICRF J092957.5 − 380148	0927 − 378	09 29 57.50799817	−38 01 48.1684617	0.00003344	0.0008684	0.614	52363.6	52306.7	52409.7	2	38
ICRF J093053.7 + 742005	0925 + 745	09 30 53.78263734	74 20 05.9108411	0.00038711	0.0016926	−0.344	49827.5	49827.5	49827.5	1	33
ICRF J093055.2 + 350337	0927 + 352	09 30 55.27909120	35 03 37.6081619	0.00001181	0.0002778	−0.085	50242.8	50242.8	50242.8	1	81
ICRF J093102.7 − 101325	0928 − 100	09 31 02.71232732	−10 13 25.0243180	0.00015262	0.0050858	0.651	53561.9	53561.9	53561.9	1	4
ICRF J093105.3 + 141416	0928 + 144	09 31 05.34244527	14 14 16.5189730	0.00002857	0.0008925	−0.540	50129.6	50085.5	50156.3	2	138
ICRF J093151.7 + 275050	0928 + 280	09 31 51.78273674	27 50 50.6104341	0.00133062	0.0129599	−0.010	54112.8	54112.8	54112.8	1	3
ICRF J093219.5 − 201637	0930 − 200	09 32 19.58644832	−20 16 37.2060630	0.00011075	0.0035447	−0.073	53561.9	53561.9	53561.9	1	26
ICRF J093236.4 − 340558	0930 − 338	09 32 36.49494786	−34 05 58.4915288	0.00017237	0.0092174	−0.449	53126.1	53126.1	53126.1	1	17
ICRF J093241.1 + 530633	0929 + 533	09 32 41.15082292	53 06 33.8004351	0.00003903	0.0005724	−0.089	49577.0	49577.0	49577.0	1	107
ICRF J093254.5 + 650741	0928 + 653	09 32 54.57749500	65 07 41.2958086	0.00010203	0.0011401	−0.394	53560.8	53560.8	53560.8	1	33
ICRF J093317.0 − 081910	0930 − 080	09 33 17.09537860	−08 19 10.8506986	0.00002376	0.0008850	−0.218	53560.8	53560.8	53560.8	1	63
ICRF J093334.4 − 113925	0931 − 114	09 33 34.45353701	−11 39 25.4767296	0.00002500	0.0007929	−0.429	50576.2	50576.2	50576.2	1	67
ICRF J093406.6 + 392632	0930 + 396	09 34 06.67004438	39 26 32.1345428	0.00009994	0.0021880	0.404	53561.9	53561.9	53561.9	1	17
ICRF J093415.7 + 490821	0930 + 493	09 34 15.76228124	49 08 21.7306153	0.00004129	0.0005557	0.496	50306.3	50306.3	50306.3	1	68
ICRF J093501.0 + 071918	0932 + 075	09 35 01.07564781	07 19 18.5954208	0.00027816	0.0075177	0.702	49914.7	49914.7	49914.7	1	8
ICRF J093509.2 − 333237	0933 − 333	09 35 09.22981938	−33 32 37.7080875	0.00008333	0.0038680	0.400	52409.7	52409.7	52409.7	1	35
ICRF J093513.6 + 091507	0932 + 094	09 35 13.64139456	09 15 07.8324618	0.00004415	0.0012235	−0.233	49914.7	49914.7	49914.7	1	44
ICRF J093515.6 − 193908	0932 − 194	09 35 15.61536793	−19 39 08.7690199	0.00057721	0.0126844	−0.815	53560.8	53560.8	53560.8	1	7
ICRF J093529.2 + 192935	0932 + 197	09 35 29.21937480	19 29 35.0684859	0.00014587	0.0056226	−0.884	53573.0	53573.0	53573.0	1	30
ICRF J093531.8 + 363317	0932 + 367	09 35 31.83994456	36 33 17.5671502	0.00003576	0.0006832	0.151	53134.5	53134.5	53134.5	1	34
ICRF J093712.3 + 500852	0933 + 503	09 37 12.32735576	50 08 52.0972911	0.00002054	0.0003460	−0.371	50171.0	49577.0	50306.3	2	97
ICRF J093856.1 − 070800	0936 − 069	09 38 56.10425579	−07 08 00.6175626	0.00002220	0.0006135	−0.061	53573.0	53573.0	53573.0	1	73
ICRF J093919.1 − 173135	0936 − 172	09 39 19.19512006	−17 31 35.7785426	0.00012338	0.0039878	−0.411	53153.2	53153.2	53153.2	1	22
ICRF J093949.6 + 414154	0936 + 419	09 39 49.61583517	41 41 54.1912693	0.00002173	0.0004655	−0.217	50242.8	50242.8	50242.8	1	81
ICRF J094102.5 − 133550	0938 − 133	09 41 02.54946575	−13 35 50.9844136	0.00001544	0.0005011	−0.256	53560.8	53560.8	53560.8	1	89
ICRF J094148.1 + 272838	0938 + 277	09 41 48.11603221	27 28 38.8159430	0.00003178	0.0006522	−0.134	53126.1	53126.1	53126.1	1	58
ICRF J094221.4 − 075953	0939 − 077	09 42 21.46141702	−07 59 53.2045392	0.00002201	0.0007915	−0.550	53503.7	53503.7	53503.7	1	60
ICRF J094317.2 + 170218	0940 + 172	09 43 17.22396002	17 02 18.9630743	0.00004513	0.0015743	−0.607	50115.7	50085.5	50156.3	2	75
ICRF J094319.1 + 361452	0940 + 364	09 43 19.15347606	36 14 52.0728921	0.00002798	0.0006132	−0.037	53561.9	53561.9	53561.9	1	60
ICRF J094336.9 − 081930	0941 − 080	09 43 36.94438939	−08 19 30.8134537	0.00024481	0.0051965	−0.294	50576.2	50576.2	50576.2	1	14
ICRF J094348.0 + 202809	0941 + 206	09 43 48.09847388	20 28 09.9585293	0.00016472	0.0053983	−0.828	54088.1	54088.1	54088.1	1	16
ICRF J094452.1 + 520234	0941 + 522	09 44 52.15527733	52 02 34.2164787	0.00004298	0.0007431	−0.349	49577.0	49577.0	49577.0	1	96

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J094542.0 + 463650	0942 + 468	09 45 42.09267445	46 36 50.5962342	0.00005104	0.0006948	0.125	50306.3	50306.3	50306.3	1	50
ICRF J094544.0 − 015303	0943 − 016	09 45 44.03729509	−01 53 03.9552975	0.00002979	0.0010879	0.008	53552.8	53552.8	53552.8	1	50
ICRF J094616.0 + 502009	0942 + 505	09 46 16.04499778	50 20 09.3473875	0.00005696	0.0011485	−0.039	53560.8	53560.8	53560.8	1	40
ICRF J094650.2 − 202044	0944 − 201	09 46 50.21161438	−20 20 44.4608862	0.00038112	0.0078093	0.154	53153.2	53153.2	53153.2	1	8
ICRF J094704.8 + 590741	0943 + 593	09 47 04.86492080	59 07 41.4758605	0.00006206	0.0009195	−0.490	53561.9	53561.9	53561.9	1	49
ICRF J094809.5 − 322347	0945 − 321	09 48 09.51254362	−32 23 47.4407334	0.00007621	0.0021632	0.115	52306.7	52306.7	52306.7	1	29
ICRF J094811.5 − 290144	0945 − 287	09 48 11.54416081	−29 01 44.1675163	0.00094553	0.0211017	0.740	53503.7	53503.7	53503.7	1	4
ICRF J095003.4 + 061503	0947 + 064	09 50 03.46749647	06 15 03.8169818	0.00004987	0.0015982	−0.201	53134.5	53134.5	53134.5	1	32
ICRF J095227.3 + 504850	0949 + 510	09 52 27.30875148	50 48 50.6413808	0.00187199	0.0170732	−0.699	53573.0	53573.0	53573.0	1	3
ICRF J095359.2 + 172056	0951 + 175	09 53 59.23094565	17 20 56.6435478	0.00051466	0.0115193	0.390	53560.8	53560.8	53560.8	1	6
ICRF J095447.4 + 743557	0950 + 748	09 54 47.44220566	74 35 57.1455051	0.00049414	0.0014035	0.152	49827.5	49827.5	49827.5	1	36
ICRF J095505.0 + 483819	0951 + 488	09 55 05.00115998	48 38 19.0425233	0.00009268	0.0010094	−0.062	53561.9	53561.9	53561.9	1	36
ICRF J095718.1 − 135001	0954 − 135	09 57 18.18305171	−13 50 01.1763934	0.00001627	0.0005391	−0.288	53546.3	53523.9	53573.0	2	149
ICRF J095830.8 − 361240	0956 − 359	09 58 30.89334594	−36 12 40.8033013	0.00029640	0.0125398	0.698	53523.9	53523.9	53523.9	1	21
ICRF J095837.8 + 503957	0955 + 509	09 58 37.80943784	50 39 57.4831769	0.00002143	0.0003399	−0.236	51921.2	49577.0	54112.8	3	134
ICRF J095838.2 − 411033	0956 − 409	09 58 38.29608310	−41 10 33.1768759	0.00016346	0.0060706	0.788	52355.8	52306.7	52409.7	2	21
ICRF J095957.6 − 082826	0957 − 082	09 59 57.64770851	−08 28 26.0489206	0.00009847	0.0049587	−0.637	54088.1	54088.1	54088.1	1	23
ICRF J100040.8 − 313952	0958 − 314	10 00 40.83676572	−31 39 52.3597997	0.00013718	0.0073287	−0.247	53134.5	53134.5	53134.5	1	18
ICRF J100110.2 + 291137	0958 + 294	10 01 10.20562992	29 11 37.5364191	0.00001805	0.0004340	0.237	50219.8	50219.8	50219.8	1	47
ICRF J100157.7 + 101549	0959 + 105	10 01 57.73495486	10 15 49.7045693	0.00005477	0.0027664	−0.360	49914.7	49914.7	49914.7	1	26
ICRF J100230.5 + 123209	0959 + 127	10 02 30.53667520	12 32 09.5506330	0.00041909	0.0105827	0.786	53560.8	53560.8	53560.8	1	3
ICRF J100252.8 + 121614	1000 + 125	10 02 52.84518360	12 16 14.5882669	0.00050911	0.0052916	0.698	49914.7	49914.7	49914.7	1	6
ICRF J100357.5 + 324403	1001 + 329	10 03 57.56465463	32 44 03.5422568	0.00006268	0.0012849	0.520	50219.8	50219.8	50219.8	1	31
ICRF J100704.3 − 020710	1004 − 018	10 07 04.34994042	−02 07 10.9186074	0.00001562	0.0004975	−0.013	50576.2	50576.2	50576.2	1	89
ICRF J100715.2 − 124745	1004 − 125	10 07 15.22772837	−12 47 45.9955393	0.00002548	0.0009772	−0.350	53503.7	53503.7	53503.7	1	55
ICRF J100731.3 − 333306	1005 − 333	10 07 31.38742477	−33 33 06.7160702	0.00003956	0.0012957	−0.102	53126.1	53126.1	53126.1	1	28
ICRF J100800.8 + 062121	1005 + 066	10 08 00.81615886	06 21 21.2159686	0.00001457	0.0004812	−0.400	49914.7	49914.7	49914.7	1	115
ICRF J100843.8 − 093323	1006 − 093	10 08 43.86533457	−09 33 23.3591191	0.00003096	0.0010539	−0.034	50576.2	50576.2	50576.2	1	57
ICRF J100949.8 + 062200	1007 + 066	10 09 49.80803603	06 22 00.9816964	0.00032248	0.0091883	−0.749	53573.0	53573.0	53573.0	1	19
ICRF J101015.7 + 825014	1003 + 830	10 10 15.78316110	82 50 14.3841720	0.00016601	0.0003247	0.671	50688.3	50688.3	50688.3	1	68
ICRF J101051.6 − 020019	1008 − 017	10 10 51.66669070	−02 00 19.5743469	0.00001886	0.0006688	−0.342	50576.2	50576.2	50576.2	1	67
ICRF J101051.8 + 333017	1007 + 337	10 10 51.82900782	33 30 17.7605196	0.00002000	0.0005180	−0.225	50219.8	50219.8	50219.8	1	53
ICRF J101105.5 − 284740	1008 − 285	10 11 05.51733852	−28 47 40.4165813	0.00003301	0.0010744	−0.119	53560.8	53560.8	53560.8	1	62
ICRF J101115.6 + 010642	1008 + 013	10 11 15.63922645	01 06 42.5142428	0.00006823	0.0029652	−0.795	53561.9	53561.9	53561.9	1	32
ICRF J101130.2 − 042327	1009 − 041	10 11 30.23968770	−04 23 27.7137784	0.00213956	0.0449349	−0.288	54030.8	53573.0	54088.1	2	9

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J101216.3 + 231214	1009 + 234	10 12 16.38973154	23 12 14.6100658	0.00001175	0.0003348	0.054	53134.5	53134.5	53134.5	1	89
ICRF J101224.0 − 374005	1010 − 374	10 12 24.07487484	−37 40 05.8994692	0.00061148	0.0236901	0.851	53523.9	53523.9	53523.9	1	11
ICRF J101313.1 − 254654	1010 − 255	10 13 13.10508394	−25 46 54.6930150	0.00002915	0.0009319	0.070	53126.1	53126.1	53126.1	1	55
ICRF J101349.6 + 344550	1010 + 350	10 13 49.61403383	34 45 50.7835186	0.00001038	0.0002476	0.023	50242.8	50242.8	50242.8	1	90
ICRF J101504.1 + 492600	1011 + 496	10 15 04.13985728	49 26 00.7044313	0.00006617	0.0009060	−0.417	50306.3	50306.3	50306.3	1	51
ICRF J101557.0 + 010913	1013 + 014	10 15 57.05511439	01 09 13.7473507	0.00005177	0.0011669	0.238	53561.9	53561.9	53561.9	1	41
ICRF J101809.2 − 314414	1015 − 314	10 18 09.26689419	−31 44 14.0612650	0.00080152	0.0276390	−0.468	52306.7	52306.7	52306.7	1	5
ICRF J101950.8 + 632001	1016 + 635	10 19 50.87682449	63 20 01.6266182	0.00004796	0.0003564	0.106	53978.8	49827.5	54088.1	2	78
ICRF J102027.2 + 432056	1017 + 436	10 20 27.20308673	43 20 56.3387814	0.00005995	0.0007777	0.308	53560.8	53560.8	53560.8	1	49
ICRF J102117.4 + 343721	1018 + 348	10 21 17.47469702	34 37 21.6648700	0.00001413	0.0003364	−0.330	50219.8	50219.8	50219.8	1	80
ICRF J102213.1 + 423925	1019 + 429	10 22 13.13232934	42 39 25.6122435	0.00002192	0.0004347	0.045	50242.8	50242.8	50242.8	1	88
ICRF J102230.2 + 304105	1019 + 309	10 22 30.29842082	30 41 05.1167519	0.00004135	0.0008736	−0.551	52306.7	52306.7	52306.7	1	37
ICRF J102255.1 + 185334	1020 + 191	10 22 55.15670913	18 53 34.2623038	0.00017437	0.0034768	0.766	50310.0	50085.5	54482.7	3	48
ICRF J102257.5 − 095822	1020 − 097	10 22 57.51751729	−09 58 22.5910053	0.00042620	0.0130499	−0.921	53573.0	53573.0	53573.0	1	17
ICRF J102400.4 − 323416	1021 − 323	10 24 00.42384322	−32 34 16.0590623	0.00005258	0.0017283	0.156	53134.5	53134.5	53134.5	1	20
ICRF J102453.6 + 233233	1022 + 237	10 24 53.63734412	23 32 33.9629893	0.00002465	0.0005696	−0.364	53523.9	53523.9	53523.9	1	73
ICRF J102545.4 − 050954	1023 − 049	10 25 45.42295045	−05 09 54.1329967	0.00008382	0.0023585	−0.450	53560.8	53560.8	53560.8	1	19
ICRF J102713.0 + 480313	1024 + 483	10 27 13.07991022	48 03 13.5351334	0.00004164	0.0006515	−0.621	50306.3	50306.3	50306.3	1	70
ICRF J102724.1 + 742826	1023 + 747	10 27 24.14682349	74 28 26.0979847	0.00011567	0.0007141	−0.103	53561.9	53561.9	53561.9	1	50
ICRF J102820.4 + 025522	1025 + 031	10 28 20.40126777	02 55 22.4721769	0.00002172	0.0008297	−0.533	49914.7	49914.7	49914.7	1	99
ICRF J102821.2 + 240121	1025 + 242	10 28 21.25988779	24 01 21.7753544	0.00007179	0.0031239	−0.094	53573.0	53573.0	53573.0	1	32
ICRF J102921.8 + 051938	1026 + 055	10 29 21.83061946	05 19 38.7810256	0.00009505	0.0014752	−0.046	54088.1	54088.1	54088.1	1	24
ICRF J103122.0 + 744158	1027 + 749	10 31 22.02402922	74 41 58.3454251	0.00025668	0.0015676	0.595	49827.5	49827.5	49827.5	1	35
ICRF J103144.7 + 602030	1028 + 605	10 31 44.75627352	60 20 30.3643147	0.00024748	0.0013176	0.112	49577.0	49577.0	49577.0	1	40
ICRF J103152.3 − 222824	1029 − 222	10 31 52.31211831	−22 28 24.9749593	0.00012269	0.0032509	0.587	50662.2	50632.3	50688.3	2	30
ICRF J103155.0 − 042352	1029 − 041	10 31 55.00184414	−04 23 52.8685406	0.00003740	0.0011082	0.630	53561.9	53561.9	53561.9	1	59
ICRF J103206.2 − 140019	1029 − 137	10 32 06.22645172	−14 00 19.4699930	0.00040664	0.0064384	0.449	53573.0	53573.0	53573.0	1	10
ICRF J103307.6 − 360156	1030 − 357	10 33 07.66070928	−36 01 56.8123669	0.00018113	0.0061294	0.928	53126.1	53126.1	53126.1	1	13
ICRF J103322.0 + 393551	1030 + 398	10 33 22.06100090	39 35 51.0832314	0.00001500	0.0003012	0.373	50242.8	50242.8	50242.8	1	87
ICRF J103351.4 + 605107	1030 + 611	10 33 51.42897465	60 51 07.3343632	0.00008090	0.0011899	−0.314	49577.0	49577.0	49577.0	1	72
ICRF J103506.0 + 504006	1032 + 509	10 35 06.01945883	50 40 06.1011194	0.00005140	0.0007776	−0.569	51852.6	49577.0	54088.1	3	95
ICRF J103632.9 + 220312	1033 + 223	10 36 32.98066260	22 03 12.2062781	0.00007951	0.0013516	−0.158	50138.9	50085.5	50156.3	2	65
ICRF J103647.5 − 060541	1034 − 058	10 36 47.57300992	−06 05 41.1846427	0.00002208	0.0006820	0.073	50576.2	50576.2	50576.2	1	73
ICRF J103739.3 + 042401	1035 + 046	10 37 39.33955620	04 24 01.7451182	0.00003152	0.0009070	0.404	53560.8	53560.8	53560.8	1	53
ICRF J103742.4 − 282304	1035 − 281	10 37 42.45747747	−28 23 04.1106705	0.00008352	0.0021722	−0.770	50688.3	50688.3	50688.3	1	34

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J103743.8 + 283459	1034 + 288	10 37 43.83526301	28 34 59.4603364	0.00003077	0.0006627	−0.137	50219.8	50219.8	50219.8	1	57
ICRF J103814.6 − 432545	1036 − 431	10 38 14.69615820	−43 25 45.8960764	0.00022894	0.0076965	0.951	53134.5	53134.5	53134.5	1	15
ICRF J103818.1 + 424442	1035 + 430	10 38 18.19050457	42 44 42.7609238	0.00004920	0.0006608	−0.342	53561.9	53561.9	53561.9	1	40
ICRF J103846.7 + 051229	1036 + 054	10 38 46.77987569	05 12 29.0867545	0.00000664	0.0001860	−0.185	52011.6	49914.7	53552.8	4	310
ICRF J103906.7 − 154106	1036 − 154	10 39 06.70510609	−15 41 06.6914201	0.00001688	0.0005536	−0.304	50632.3	50632.3	50632.3	1	64
ICRF J104127.1 + 210141	1038 + 212	10 41 27.10294709	21 01 41.4638739	0.00043427	0.0053749	0.562	53573.0	53573.0	53573.0	1	15
ICRF J104410.6 + 532220	1041 + 536	10 44 10.67299535	53 22 20.5412109	0.00003778	0.0006671	−0.103	49577.0	49577.0	49577.0	1	102
ICRF J104514.3 + 173548	1042 + 178	10 45 14.35978506	17 35 48.0835837	0.00001629	0.0004672	−0.585	52768.4	50085.5	53503.7	3	83
ICRF J104540.6 − 292726	1043 − 291	10 45 40.62564120	−29 27 26.3365059	0.00009310	0.0033115	0.268	50688.3	50688.3	50688.3	1	23
ICRF J104624.0 + 535426	1043 + 541	10 46 24.03837465	53 54 26.2359067	0.00015133	0.0012947	0.477	49577.0	49577.0	49577.0	1	44
ICRF J104703.9 − 130832	1044 − 128	10 47 03.93094178	−13 08 32.4173893	0.00004330	0.0012792	0.091	50576.2	50576.2	50576.2	1	52
ICRF J104706.8 + 002937	1044 + 007	10 47 06.86395464	00 29 37.0809402	0.00050648	0.0057352	0.228	53560.8	53560.8	53560.8	1	3
ICRF J104807.7 + 005543	1045 + 011	10 48 07.74455574	00 55 43.4825876	0.00006058	0.0015124	−0.533	49914.7	49914.7	49914.7	1	58
ICRF J104822.8 + 014148	1045 + 019	10 48 22.86784993	01 41 48.1120614	0.00023352	0.0042287	0.709	49914.7	49914.7	49914.7	1	18
ICRF J105058.1 + 343010	1048 + 347	10 50 58.12295087	34 30 10.9405368	0.00007895	0.0012639	−0.531	50219.8	50219.8	50219.8	1	25
ICRF J105101.3 + 202719	1048 + 207	10 51 01.37428058	20 27 19.9708567	0.00001537	0.0004327	0.060	53126.1	53126.1	53126.1	1	86
ICRF J105115.8 + 464417	1048 + 470	10 51 15.89544682	46 44 17.3703685	0.00032018	0.0016592	−0.531	50306.3	50306.3	50306.3	1	18
ICRF J105432.4 + 392812	1051 + 397	10 54 32.42218420	39 28 12.3822151	0.00006065	0.0007439	−0.027	54088.1	54088.1	54088.1	1	37
ICRF J105724.4 − 234201	1054 − 234	10 57 24.42131875	−23 42 01.7113047	0.00015604	0.0040595	0.854	50646.3	50632.3	50688.3	2	12
ICRF J105754.1 − 250929	1055 − 248	10 57 54.13366888	−25 09 29.0629402	0.00002024	0.0007902	0.130	50659.4	50632.3	50688.3	2	97
ICRF J105755.4 − 243348	1055 − 242	10 57 55.40991861	−24 33 48.8739185	0.00110804	0.0229286	0.593	51700.4	50632.3	54314.7	3	7
ICRF J105802.9 + 430441	1055 + 433	10 58 02.92080794	43 04 41.5054021	0.00002278	0.0003710	−0.567	50242.8	50242.8	50242.8	1	83
ICRF J105811.0 − 030927	1055 − 028	10 58 11.01069186	−03 09 27.2548483	0.00004388	0.0011218	−0.480	53134.5	53134.5	53134.5	1	32
ICRF J105837.7 + 562811	1055 + 567	10 58 37.72751617	56 28 11.2071955	0.00043875	0.0016625	0.394	49577.0	49577.0	49577.0	1	31
ICRF J105912.4 − 113422	1056 − 113	10 59 12.42641379	−11 34 22.7796529	0.00002468	0.0009003	−0.016	50576.2	50576.2	50576.2	1	75
ICRF J110130.0 + 390432	1058 + 393	11 01 30.06957669	39 04 32.6333217	0.00002524	0.0004811	−0.538	50242.8	50242.8	50242.8	1	81
ICRF J110153.4 + 624150	1058 + 629	11 01 53.45081908	62 41 50.6060681	0.00006445	0.0008469	0.455	49827.5	49827.5	49827.5	1	100
ICRF J110203.1 + 224156	1059 + 229	11 02 03.14444225	22 41 56.1264052	0.00004241	0.0009187	−0.454	53561.9	53561.9	53561.9	1	43
ICRF J110242.7 + 594119	1059 + 599	11 02 42.76281797	59 41 19.5857105	0.00008809	0.0007572	0.185	53867.6	49577.0	54112.8	2	37
ICRF J110313.3 + 301442	1100 + 305	11 03 13.30189911	30 14 42.7020603	0.00001834	0.0004800	−0.571	50219.8	50219.8	50219.8	1	56
ICRF J110323.0 + 220337	1100 + 223	11 03 23.06767643	22 03 37.7202211	0.00004475	0.0010074	−0.364	50133.5	50085.5	50156.3	2	93
ICRF J110405.5 + 793252	1100 + 798	11 04 05.55921846	79 32 52.9546031	0.00249982	0.0029871	0.898	50401.4	49827.5	50688.3	2	24
ICRF J110446.1 − 243125	1102 − 242	11 04 46.17644667	−24 31 25.8000450	0.00001323	0.0004356	−0.168	50660.3	50632.3	50688.3	2	132
ICRF J110453.6 + 603855	1101 + 609	11 04 53.69464298	60 38 55.3150202	0.00006663	0.0009773	−0.227	53276.1	49577.0	54088.1	2	50
ICRF J110511.0 − 392842	1102 − 392	11 05 11.08157945	−39 28 42.1382955	0.00022612	0.0104351	0.747	53472.9	53153.2	53552.8	2	25

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J110538.9 + 020257	1103 + 023	11 05 38.99267209	02 02 57.4756468	0.00012112	0.0025635	−0.369	53134.5	53134.5	53134.5	1	21
ICRF J110607.2 + 281247	1103 + 284	11 06 07.26171940	28 12 47.0649189	0.00001976	0.0005153	0.163	53560.8	53560.8	53560.8	1	72
ICRF J110715.0 + 162802	1104 + 167	11 07 15.04744432	16 28 02.2448133	0.00003324	0.0012516	−0.651	50128.2	50085.5	50156.3	2	126
ICRF J110725.8 + 521931	1104 + 525	11 07 25.82778170	52 19 31.6366406	0.00003574	0.0005653	−0.541	53503.7	53503.7	53503.7	1	69
ICRF J110823.4 + 433053	1105 + 437	11 08 23.47693551	43 30 53.6570719	0.00001887	0.0003140	−0.470	50242.8	50242.8	50242.8	1	81
ICRF J110845.4 + 020240	1106 + 023	11 08 45.48837979	02 02 40.9023040	0.00033457	0.0062716	0.541	53523.9	53523.9	53523.9	1	7
ICRF J110928.8 + 374431	1106 + 380	11 09 28.85384008	37 44 31.1044984	0.00006152	0.0011495	0.601	52306.7	52306.7	52306.7	1	40
ICRF J111000.4 − 185848	1107 − 187	11 10 00.40688328	−18 58 48.7441658	0.00006862	0.0018244	−0.376	50661.7	50632.3	50688.3	2	59
ICRF J111013.0 + 602842	1107 + 607	11 10 13.08810710	60 28 42.5667114	0.00012538	0.0015847	0.519	49577.0	49577.0	49577.0	1	61
ICRF J111046.3 + 440325	1107 + 443	11 10 46.34580450	44 03 25.9251838	0.00002147	0.0003366	−0.454	50273.9	50242.8	50306.3	2	135
ICRF J111120.0 + 195536	1108 + 201	11 11 20.06576034	19 55 36.0002856	0.00029425	0.0034888	−0.782	50118.4	50085.5	50156.3	2	28
ICRF J111209.5 + 072449	1109 + 076	11 12 09.55853877	07 24 49.1180402	0.00001629	0.0005023	0.081	53560.8	53560.8	53560.8	1	74
ICRF J111238.7 + 344639	1109 + 350	11 12 38.76914249	34 46 39.1096300	0.00002880	0.0006161	−0.314	53561.9	53561.9	53561.9	1	71
ICRF J111249.8 − 215829	1110 − 217	11 12 49.84868073	−21 58 29.3513484	0.00008840	0.0023898	−0.322	50656.8	50632.3	50688.3	2	32
ICRF J111301.4 − 354948	1110 − 355	11 13 01.48207610	−35 49 48.2661716	0.00028113	0.0182970	0.298	53134.5	53134.5	53134.5	1	9
ICRF J111432.5 − 081639	1112 − 080	11 14 32.55068096	−08 16 39.0032511	0.00002083	0.0007175	−0.005	50576.2	50576.2	50576.2	1	80
ICRF J111558.8 − 305927	1113 − 307	11 15 58.81409192	−30 59 27.4286511	0.00050414	0.0134414	0.778	53503.7	53503.7	53503.7	1	10
ICRF J111609.9 + 082922	1113 + 087	11 16 09.97338399	08 29 22.0328582	0.00002782	0.0008147	−0.458	49914.7	49914.7	49914.7	1	100
ICRF J111817.1 − 123254	1115 − 122	11 18 17.14138209	−12 32 54.2622805	0.00001948	0.0006856	0.014	50576.2	50576.2	50576.2	1	76
ICRF J111820.6 − 305458	1115 − 306	11 18 20.61025367	−30 54 58.5206345	0.00043863	0.0185532	0.952	52306.7	52306.7	52306.7	1	8
ICRF J111914.3 + 600457	1116 + 603	11 19 14.34550912	60 04 57.2050454	0.00017761	0.0012822	0.081	53777.0	49577.0	54088.1	2	29
ICRF J111942.8 + 041027	1117 + 044	11 19 42.82421174	04 10 27.9274646	0.00002160	0.0006078	0.099	49914.7	49914.7	49914.7	1	97
ICRF J112012.0 − 124337	1117 − 124	11 20 12.08053978	−12 43 37.8294859	0.00002131	0.0007717	0.050	50576.2	50576.2	50576.2	1	80
ICRF J112038.4 + 070447	1118 + 073	11 20 38.44387953	07 04 47.1746104	0.00031287	0.0052931	0.882	49914.7	49914.7	49914.7	1	18
ICRF J112055.5 − 142029	1118 − 140	11 20 55.56363654	−14 20 29.9249534	0.00001822	0.0005832	−0.020	50632.3	50632.3	50632.3	1	72
ICRF J112125.1 − 055356	1118 − 056	11 21 25.10806631	−05 53 56.4399172	0.00001360	0.0004598	0.054	50576.2	50576.2	50576.2	1	89
ICRF J112142.1 − 071106	1119 − 069	11 21 42.12288999	−07 11 06.3411838	0.00003393	0.0009562	0.173	53573.0	53573.0	53573.0	1	67
ICRF J112143.1 − 044236	1119 − 044	11 21 43.11448442	−04 42 36.1492533	0.00038101	0.0108089	0.838	53561.9	53561.9	53561.9	1	10
ICRF J112205.7 − 253233	1119 − 252	11 22 05.74320514	−25 32 33.8313881	0.00002094	0.0006838	−0.234	50660.6	50632.3	50688.3	2	103
ICRF J112256.4 − 274248	1120 − 274	11 22 56.41008377	−27 42 48.4593259	0.00016023	0.0056583	0.705	53560.8	53560.8	53560.8	1	22
ICRF J112402.5 − 150158	1121 − 147	11 24 02.56566856	−15 01 58.9484375	0.00013147	0.0029956	0.572	53573.0	53573.0	53573.0	1	28
ICRF J112431.5 + 230755	1121 + 234	11 24 31.58828665	23 07 55.9531201	0.00001573	0.0003557	−0.234	54112.8	54112.8	54112.8	1	52
ICRF J112558.7 + 200554	1123 + 203	11 25 58.74197708	20 05 54.3377086	0.00004558	0.0009358	−0.139	50121.5	50085.5	50156.3	2	112
ICRF J112644.1 − 382844	1124 − 382	11 26 44.13309814	−38 28 44.0430830	0.00027370	0.0130271	0.661	53426.4	53126.1	53552.8	2	27
ICRF J112653.1 + 062556	1124 + 067	11 26 53.14595151	06 25 56.9412411	0.00005759	0.0011118	−0.115	53560.8	53560.8	53560.8	1	37

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J112657.5 − 055552	1124 − 056	11 26 57.52341853	−05 55 52.7816128	0.00039448	0.0158725	0.074	53561.9	53561.9	53561.9	1	4
ICRF J112657.6 + 451606	1124 + 455	11 26 57.65498645	45 16 06.2829452	0.00003469	0.0011223	−0.308	50306.3	50306.3	50306.3	1	48
ICRF J112712.4 − 073512	1124 − 073	11 27 12.43628180	−07 35 12.1641227	0.00001100	0.0003659	0.044	50576.2	50576.2	50576.2	1	81
ICRF J112736.5 + 055532	1125 + 062	11 27 36.52556417	05 55 32.0599859	0.00006559	0.0017246	−0.430	53126.1	53126.1	53126.1	1	25
ICRF J112835.5 + 210237	1125 + 213	11 28 35.54142531	21 02 37.3598303	0.00021609	0.0034148	−0.375	50131.3	50085.5	50156.3	2	17
ICRF J112955.7 − 370757	1127 − 368	11 29 55.78400125	−37 07 57.3605459	0.00043890	0.0184761	0.793	53503.7	53503.7	53503.7	1	17
ICRF J113004.4 − 360804	1127 − 358	11 30 04.41730808	−36 08 04.0525150	0.00058142	0.0264771	0.797	52409.7	52409.7	52409.7	1	5
ICRF J113035.9 + 084643	1128 + 090	11 30 35.95151013	08 46 43.1071547	0.00001591	0.0004607	0.161	53134.5	53134.5	53134.5	1	84
ICRF J113042.4 + 303135	1128 + 308	11 30 42.42916863	30 31 35.3878544	0.00001964	0.0004796	−0.112	50219.8	50219.8	50219.8	1	65
ICRF J113303.0 + 001548	1130 + 005	11 33 03.03003148	00 15 48.9806739	0.00001549	0.0004974	−0.007	53561.9	53561.9	53561.9	1	88
ICRF J113520.7 − 305629	1132 − 306	11 35 20.77721396	−30 56 29.9174212	0.00041358	0.0156491	0.796	53523.9	53523.9	53523.9	1	10
ICRF J113558.2 − 042827	1133 − 041	11 35 58.23497963	−04 28 27.8871286	0.00001453	0.0004053	−0.031	53560.8	53560.8	53560.8	1	90
ICRF J113627.3 + 340739	1133 + 344	11 36 27.34391845	34 07 39.4845297	0.00002377	0.0004754	−0.068	53561.9	53561.9	53561.9	1	90
ICRF J113821.1 + 474515	1135 + 480	11 38 21.13816533	47 45 15.3970842	0.00004872	0.0009262	0.080	50306.3	50306.3	50306.3	1	51
ICRF J113902.7 + 403254	1136 + 408	11 39 02.73423539	40 32 54.8414004	0.00002611	0.0004380	−0.328	50242.8	50242.8	50242.8	1	77
ICRF J113910.7 − 135043	1136 − 135	11 39 10.70257949	−13 50 43.6395355	0.00004187	0.0013031	−0.018	50576.2	50576.2	50576.2	1	45
ICRF J113929.5 − 155251	1136 − 156	11 39 29.57606513	−15 52 51.6533171	0.00001657	0.0005614	0.285	50632.3	50632.3	50632.3	1	49
ICRF J113951.5 + 765432	1136 + 771	11 39 51.53868451	76 54 32.3465703	0.00009563	0.0005717	0.354	49827.5	49827.5	49827.5	1	102
ICRF J114010.5 − 273040	1137 − 272	11 40 10.59751148	−27 30 40.6702411	0.00081679	0.0418830	0.546	53573.0	53573.0	53573.0	1	11
ICRF J114112.2 + 641005	1138 + 644	11 41 12.22823091	64 10 05.5058028	0.00016561	0.0014134	−0.184	49827.5	49827.5	49827.5	1	49
ICRF J114207.7 + 154754	1139 + 160	11 42 07.73595976	15 47 54.1772722	0.00017333	0.0056002	−0.848	53573.0	53573.0	53573.0	1	29
ICRF J114326.0 + 183438	1140 + 188	11 43 26.06966329	18 34 38.3620655	0.00004837	0.0014581	−0.034	50126.1	50085.5	50156.3	2	61
ICRF J114341.6 + 663331	1140 + 668	11 43 41.60308315	66 33 31.2290849	0.00013677	0.0012824	0.382	49827.5	49827.5	49827.5	1	35
ICRF J114408.7 + 005436	1141 + 011	11 44 08.71376451	00 54 36.3353855	0.00006910	0.0015838	−0.139	53560.8	53560.8	53560.8	1	33
ICRF J114538.5 + 442021	1143 + 446	11 45 38.51956817	44 20 21.9150651	0.00080761	0.0132748	−0.652	50306.3	50306.3	50306.3	1	3
ICRF J114644.2 + 535643	1144 + 542	11 46 44.20432733	53 56 43.0835546	0.00005963	0.0017559	−0.170	49577.0	49577.0	49577.0	1	45
ICRF J114807.1 − 004645	1145 − 005	11 48 07.19178506	−00 46 45.6728613	0.00016435	0.0048924	−0.730	53560.8	53560.8	53560.8	1	11
ICRF J114837.7 + 184008	1146 + 189	11 48 37.77678823	18 40 08.9695493	0.00009691	0.0011708	0.255	50138.9	50085.5	50156.3	2	65
ICRF J114855.8 − 040409	1146 − 037	11 48 55.88479338	−04 04 09.5633297	0.00001833	0.0005237	−0.091	50576.2	50576.2	50576.2	1	61
ICRF J114908.9 + 282434	1146 + 286	11 49 08.90551406	28 24 34.8943684	0.00002260	0.0005029	0.026	53561.9	53561.9	53561.9	1	86
ICRF J114933.9 + 355908	1146 + 362	11 49 33.97567688	35 59 08.0949898	0.00002760	0.0006852	−0.284	54112.8	54112.8	54112.8	1	42
ICRF J115016.6 + 433205	1147 + 438	11 50 16.60268491	43 32 05.9055649	0.00012097	0.0021050	−0.179	50242.8	50242.8	50242.8	1	28
ICRF J115023.9 − 064026	1147 − 063	11 50 23.98669831	−06 40 26.5709334	0.00001867	0.0006326	−0.606	53503.7	53503.7	53503.7	1	73
ICRF J115032.7 + 063029	1147 + 067	11 50 32.72903731	06 30 29.4191856	0.00004911	0.0011272	−0.028	53573.0	53573.0	53573.0	1	52
ICRF J115103.2 − 172359	1148 − 171	11 51 03.20365622	−17 23 59.8430607	0.00002462	0.0007824	−0.169	50632.3	50632.3	50632.3	1	46

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J115232.8 + 493938	1149 + 499	11 52 32.87105839	49 39 38.7679120	0.00001330	0.0002097	−0.447	52409.7	52409.7	52409.7	1	118
ICRF J115251.9 + 330718	1150 + 334	11 52 51.91012408	33 07 18.7642573	0.00003260	0.0011275	−0.020	53560.8	53560.8	53560.8	1	45
ICRF J115255.4 − 051948	1150 − 050	11 52 55.49158471	−05 19 48.5352590	0.00010556	0.0022058	0.006	53561.9	53561.9	53561.9	1	26
ICRF J115312.5 + 091402	1150 + 095	11 53 12.55210914	09 14 02.2779181	0.00004249	0.0012366	−0.089	49914.7	49914.7	49914.7	1	53
ICRF J115322.3 − 110512	1150 − 108	11 53 22.31374002	−11 05 12.5881922	0.00002764	0.0009187	−0.009	50576.2	50576.2	50576.2	1	62
ICRF J115348.5 + 095554	1151 + 102	11 53 48.52737674	09 55 54.8888668	0.00003076	0.0010984	−0.629	49914.7	49914.7	49914.7	1	80
ICRF J115354.6 + 403652	1151 + 408	11 53 54.65898044	40 36 52.6188096	0.00002214	0.0003443	−0.320	50242.8	50242.8	50242.8	1	69
ICRF J115406.1 − 324242	1151 − 324	11 54 06.16645893	−32 42 42.9822372	0.00002516	0.0007554	−0.426	52306.7	52306.7	52306.7	1	45
ICRF J115421.7 − 350529	1151 − 348	11 54 21.78712655	−35 05 29.0803479	0.00009698	0.0042617	0.488	52363.9	52306.7	52409.7	2	27
ICRF J115503.1 − 310758	1152 − 308	11 55 03.15771514	−31 07 58.7276847	0.00002517	0.0008820	−0.187	52370.6	52306.7	52409.7	2	58
ICRF J115511.0 + 455539	1152 + 462	11 55 11.00923543	45 55 39.6248802	0.00027937	0.0053024	−0.382	50306.3	50306.3	50306.3	1	12
ICRF J115536.8 − 121635	1153 − 119	11 55 36.81937616	−12 16 35.5032931	0.00012415	0.0031411	−0.161	50576.2	50576.2	50576.2	1	24
ICRF J115545.5 − 101752	1153 − 100	11 55 45.55150086	−10 17 52.2491257	0.00032794	0.0058377	0.206	53573.0	53573.0	53573.0	1	7
ICRF J115700.6 + 064112	1154 + 069	11 57 00.65243124	06 41 12.5922629	0.00003656	0.0012959	−0.449	54112.8	54112.8	54112.8	1	26
ICRF J115826.7 + 482516	1155 + 486	11 58 26.76952369	48 25 16.2292041	0.00002140	0.0004004	−0.165	50306.3	50306.3	50306.3	1	64
ICRF J115911.2 − 222836	1156 − 221	11 59 11.26726424	−22 28 36.9018672	0.00002005	0.0006964	0.214	50662.5	50632.3	50688.3	2	102
ICRF J115911.8 + 095446	1156 + 101	11 59 11.86818637	09 54 46.9917824	0.00014914	0.0057658	0.749	53560.8	53560.8	53560.8	1	8
ICRF J115951.9 − 214853	1157 − 215	11 59 51.90611824	−21 48 53.7073457	0.00001131	0.0003591	−0.210	50659.8	50632.3	50688.3	2	112
ICRF J120011.3 + 530046	1157 + 532	12 00 11.38429225	53 00 46.8776052	0.00003715	0.0005494	−0.190	53990.6	53561.9	54088.1	2	54
ICRF J120123.2 + 002828	1158 + 007	12 01 23.25081248	00 28 28.3156302	0.00019821	0.0077530	−0.954	53573.0	53573.0	53573.0	1	33
ICRF J120144.2 + 143136	1159 + 148	12 01 44.26887504	14 31 36.4491158	0.00001518	0.0003861	0.153	53560.8	53560.8	53560.8	1	89
ICRF J120234.2 − 052802	1200 − 051	12 02 34.22485665	−05 28 02.4911633	0.00001037	0.0003357	0.124	50576.2	50576.2	50576.2	1	81
ICRF J120303.5 + 603119	1200 + 608	12 03 03.50716028	60 31 19.1626117	0.00008410	0.0012714	0.157	54088.1	54088.1	54088.1	1	31
ICRF J120329.8 + 480313	1200 + 483	12 03 29.85302572	48 03 13.6258755	0.00000894	0.0002035	−0.009	52409.7	52409.7	52409.7	1	90
ICRF J120533.2 − 263404	1202 − 262	12 05 33.21232486	−26 34 04.4635969	0.00001885	0.0006408	−0.533	50666.5	50632.3	50688.3	2	95
ICRF J120658.0 + 052952	1204 + 057	12 06 58.02671333	05 29 52.2473521	0.00007030	0.0026168	0.513	49914.7	49914.7	49914.7	1	36
ICRF J120727.9 + 275458	1204 + 281	12 07 27.90047360	27 54 58.8499133	0.00001236	0.0003370	−0.201	50219.8	50219.8	50219.8	1	72
ICRF J120728.3 − 270310	1204 − 267	12 07 28.35230558	−27 03 10.0840689	0.00014474	0.0035596	−0.624	53561.9	53561.9	53561.9	1	24
ICRF J120741.6 − 010636	1205 − 008	12 07 41.67761289	−01 06 36.6904189	0.00001342	0.0004280	−0.063	53134.5	53134.5	53134.5	1	80
ICRF J120827.4 + 541319	1205 + 545	12 08 27.49949114	54 13 19.5178907	0.00025191	0.0017391	−0.189	49577.0	49577.0	49577.0	1	32
ICRF J120833.6 + 005421	1205 + 011	12 08 33.65431356	00 54 21.9233597	0.00046640	0.0135250	−0.671	53573.0	53573.0	53573.0	1	8
ICRF J120854.2 + 544158	1206 + 549	12 08 54.25637558	54 41 58.1645669	0.00004606	0.0008702	0.104	49577.0	49577.0	49577.0	1	92
ICRF J120914.6 − 203238	1206 − 202	12 09 14.61098892	−20 32 38.9898312	0.00001284	0.0004037	−0.022	50666.4	50632.3	50688.3	2	92
ICRF J120922.7 + 411941	1206 + 416	12 09 22.78802980	41 19 41.3699003	0.00002524	0.0003971	−0.373	50242.8	50242.8	50242.8	1	86
ICRF J120940.0 − 321453	1207 − 319	12 09 40.04465170	−32 14 53.1078060	0.00001023	0.0003244	−0.084	52363.2	52306.7	52409.7	2	133

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J120945.0 + 254703	1207 + 260	12 09 45.09512189	25 47 03.7300150	0.00001513	0.0004117	−0.202	50219.8	50219.8	50219.8	1	70
ICRF J121004.1 − 121744	1207 − 120	12 10 04.16440046	−12 17 44.9412684	0.00027363	0.0032786	0.770	54112.8	54112.8	54112.8	1	12
ICRF J121106.6 + 182034	1208 + 186	12 11 06.68830082	18 20 34.2832721	0.00005061	0.0008759	0.040	50124.4	50085.5	50156.3	2	111
ICRF J121157.7 − 192607	1209 − 191	12 11 57.73867408	−19 26 07.6584396	0.00013348	0.0025184	0.456	50654.7	50632.3	50688.3	2	35
ICRF J121203.6 − 222151	1209 − 220	12 12 03.69760661	−22 21 51.5130042	0.00001530	0.0005107	−0.464	50658.2	50632.3	50688.3	2	123
ICRF J121322.9 − 100325	1210 − 097	12 13 22.94286442	−10 03 25.2684330	0.00001917	0.0006985	0.004	50576.2	50576.2	50576.2	1	55
ICRF J121404.1 + 330945	1211 + 334	12 14 04.11580067	33 09 45.5952812	0.00002768	0.0005140	−0.067	50219.8	50219.8	50219.8	1	56
ICRF J121624.4 − 103315	1213 − 102	12 16 24.40256046	−10 33 15.6204491	0.00001414	0.0005077	−0.010	50576.2	50576.2	50576.2	1	80
ICRF J121711.0 + 583526	1214 + 588	12 17 11.01865591	58 35 26.2477134	0.00004456	0.0006432	0.030	49577.0	49577.0	49577.0	1	119
ICRF J121758.7 − 002946	1215 − 002	12 17 58.72904166	−00 29 46.3004644	0.00007956	0.0024324	−0.573	50576.2	50576.2	50576.2	1	14
ICRF J121826.0 + 110505	1215 + 113	12 18 26.09228648	11 05 05.2622892	0.00001074	0.0003099	0.097	53126.1	53126.1	53126.1	1	84
ICRF J121834.9 − 011954	1216 − 010	12 18 34.92978155	−01 19 54.3421439	0.00001628	0.0005193	0.216	50576.2	50576.2	50576.2	1	80
ICRF J121935.7 + 660031	1217 + 662	12 19 35.79395516	66 00 31.8438850	0.00037465	0.0017711	0.486	53560.8	53560.8	53560.8	1	14
ICRF J122003.6 + 710531	1217 + 713	12 20 03.62840054	71 05 31.1333777	0.00006092	0.0003612	−0.106	52519.9	49827.5	53134.5	3	92
ICRF J122008.2 + 343121	1217 + 348	12 20 08.29415642	34 31 21.7429857	0.00002920	0.0006811	−0.615	50219.8	50219.8	50219.8	1	67
ICRF J122059.2 + 380855	1218 + 384	12 20 59.22931948	38 08 55.7067203	0.00002179	0.0004170	−0.539	50242.8	50242.8	50242.8	1	85
ICRF J122123.9 − 024149	1218 − 024	12 21 23.94114396	−02 41 49.6091447	0.00001794	0.0005650	0.210	50576.2	50576.2	50576.2	1	73
ICRF J122127.0 + 441129	1218 + 444	12 21 27.04465813	44 11 29.6716269	0.00002223	0.0004767	0.052	50306.3	50306.3	50306.3	1	72
ICRF J122216.0 − 164554	1219 − 164	12 22 16.09899778	−16 45 54.8752271	0.00026721	0.0070492	0.742	54112.8	54112.8	54112.8	1	10
ICRF J122339.3 + 461118	1221 + 464	12 23 39.33660245	46 11 18.6026839	0.00005316	0.0006864	−0.121	50306.3	50306.3	50306.3	1	49
ICRF J122354.6 + 065002	1221 + 071	12 23 54.62417512	06 50 02.5759482	0.00039899	0.0066570	0.683	49914.7	49914.7	49914.7	1	10
ICRF J122451.5 + 433519	1222 + 438	12 24 51.50533625	43 35 19.2870920	0.00003364	0.0007740	−0.152	50242.8	50242.8	50242.8	1	69
ICRF J122550.5 + 391422	1223 + 395	12 25 50.56907939	39 14 22.6864509	0.00002121	0.0004858	−0.241	50242.8	50242.8	50242.8	1	67
ICRF J122654.4 − 132838	1224 − 132	12 26 54.41876199	−13 28 38.9850595	0.00003534	0.0012233	−0.311	53552.8	53552.8	53552.8	1	47
ICRF J122657.9 + 434058	1224 + 439	12 26 57.90440741	43 40 58.4464599	0.00037866	0.0107572	−0.802	53561.9	53561.9	53561.9	1	7
ICRF J122726.6 − 443638	1224 − 443	12 27 26.68265463	−44 36 38.3452666	0.00006007	0.0017076	−0.436	53126.1	53126.1	53126.1	1	9
ICRF J122755.7 + 493256	1225 + 498	12 27 55.72472597	49 32 56.0462280	0.00003960	0.0008748	0.015	53573.0	53573.0	53573.0	1	73
ICRF J122758.7 + 363511	1225 + 368	12 27 58.72544812	36 35 11.8271784	0.00006909	0.0010842	−0.590	50242.8	50242.8	50242.8	1	44
ICRF J122819.2 + 023229	1225 + 028	12 28 19.25669165	02 32 29.3952155	0.00002452	0.0007497	−0.098	53560.8	53560.8	53560.8	1	55
ICRF J122824.9 + 312837	1225 + 317	12 28 24.96599822	31 28 37.6291548	0.00001659	0.0004566	−0.236	50219.8	50219.8	50219.8	1	72
ICRF J122851.7 + 485801	1226 + 492	12 28 51.76787306	48 58 01.2912998	0.00005468	0.0012486	0.417	50306.3	50306.3	50306.3	1	44
ICRF J122906.0 + 633500	1226 + 638	12 29 06.02602805	63 35 00.9797975	0.00040498	0.0038746	0.031	49827.5	49827.5	49827.5	1	17
ICRF J123007.0 + 583007	1227 + 587	12 30 07.05729260	58 30 07.7635457	0.00013772	0.0023376	0.482	49577.0	49577.0	49577.0	1	36
ICRF J123014.0 + 251807	1227 + 255	12 30 14.08935832	25 18 07.1363149	0.00001965	0.0005359	−0.357	50219.8	50219.8	50219.8	1	69
ICRF J123044.9 − 312123	1228 − 310	12 30 44.93265567	−31 21 23.3106804	0.00008266	0.0057358	−0.307	52575.0	52306.7	53134.5	3	37

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J123127.5 + 041801	1228 + 045	12 31 27.58583501	04 18 01.8898569	0.00010093	0.0014744	0.104	49914.7	49914.7	49914.7	1	47
ICRF J123200.0 − 022404	1229 − 021	12 32 00.01598564	−02 24 04.7942884	0.00001243	0.0003761	0.135	50576.2	50576.2	50576.2	1	78
ICRF J123215.8 − 101525	1229 − 099	12 32 15.85984962	−10 15 25.1684897	0.00009577	0.0024717	−0.111	53561.9	53561.9	53561.9	1	22
ICRF J123234.7 + 482132	1230 + 486	12 32 34.78762303	48 21 32.9400434	0.00004307	0.0007653	0.202	50306.3	50306.3	50306.3	1	61
ICRF J123312.8 + 805433	1231 + 811	12 33 12.89320574	80 54 33.9711597	0.00011953	0.0004149	−0.037	54112.8	54112.8	54112.8	1	54
ICRF J123313.1 − 102518	1230 − 101	12 33 13.16483977	−10 25 18.4385723	0.00002517	0.0008177	0.445	50576.2	50576.2	50576.2	1	66
ICRF J123413.3 + 475351	1231 + 481	12 34 13.33080080	47 53 51.2351958	0.00004673	0.0008807	0.079	50306.3	50306.3	50306.3	1	61
ICRF J123736.4 + 192440	1235 + 196	12 37 36.42037536	19 24 40.6198906	0.00001847	0.0006404	−0.318	50123.5	50085.5	50156.3	2	179
ICRF J123756.5 + 203418	1235 + 208	12 37 56.59093364	20 34 18.8495111	0.00006374	0.0010686	0.536	53560.8	53560.8	53560.8	1	40
ICRF J123802.4 + 072321	1235 + 076	12 38 02.44563343	07 23 21.8174903	0.00001894	0.0005582	0.017	49914.7	49914.7	49914.7	1	114
ICRF J123852.7 − 382556	1236 − 381	12 38 52.73151805	−38 25 56.9912848	0.00025564	0.0119651	0.182	52745.8	52306.7	53126.1	3	14
ICRF J123932.7 + 044305	1236 + 049	12 39 32.75564362	04 43 05.2333344	0.00001888	0.0006185	−0.215	49914.7	49914.7	49914.7	1	105
ICRF J124034.7 + 695830	1238 + 702	12 40 34.70036606	69 58 30.6098754	0.00008677	0.0006864	−0.228	53827.2	49827.5	54088.1	2	49
ICRF J124047.9 + 240514	1238 + 243	12 40 47.98495910	24 05 14.1518631	0.00016816	0.0028428	−0.369	50219.8	50219.8	50219.8	1	18
ICRF J124310.6 − 294322	1240 − 294	12 43 10.66193601	−29 43 22.5045183	0.00001480	0.0004580	0.123	53126.1	53126.1	53126.1	1	67
ICRF J124345.0 + 744237	1241 + 749	12 43 45.03361534	74 42 37.1144999	0.00048327	0.0025514	0.235	49827.5	49827.5	49827.5	1	25
ICRF J124414.6 − 263325	1241 − 262	12 44 14.64198843	−26 33 25.0000455	0.00003119	0.0010725	0.159	53560.8	53560.8	53560.8	1	57
ICRF J124449.1 + 404806	1242 + 410	12 44 49.18711793	40 48 06.1510717	0.00028762	0.0056917	0.918	50242.8	50242.8	50242.8	1	15
ICRF J124707.5 + 704645	1245 + 710	12 47 07.55335879	70 46 45.1246058	0.00068562	0.0028563	0.226	54112.8	54112.8	54112.8	1	8
ICRF J124733.3 + 672316	1245 + 676	12 47 33.32954415	67 23 16.4507419	0.00024365	0.0019330	−0.255	53639.6	49827.5	54088.1	2	19
ICRF J124759.3 − 234859	1245 − 235	12 47 59.35111406	−23 48 59.2803112	0.00015675	0.0037231	0.480	50656.9	50632.3	50688.3	2	50
ICRF J124818.7 + 582028	1246 + 586	12 48 18.78465833	58 20 28.7170778	0.00006751	0.0011199	0.320	49577.0	49577.0	49577.0	1	70
ICRF J124822.9 − 063209	1245 − 062	12 48 22.97565261	−06 32 09.8175039	0.00000912	0.0003070	0.041	50576.2	50576.2	50576.2	1	81
ICRF J124823.8 − 195918	1245 − 197	12 48 23.89812760	−19 59 18.5889413	0.00004936	0.0011483	0.571	50661.5	50632.3	50688.3	2	69
ICRF J124918.4 + 281743	1246 + 285	12 49 18.40928923	28 17 43.6146181	0.00003510	0.0007076	−0.347	53126.1	53126.1	53126.1	1	51
ICRF J125006.8 + 015804	1247 + 022	12 50 06.84194383	01 58 04.1466993	0.00029740	0.0055186	0.800	53134.5	53134.5	53134.5	1	13
ICRF J125009.2 + 162121	1247 + 166	12 50 09.22712185	16 21 21.4617571	0.00014175	0.0020030	0.010	53560.8	53560.8	53560.8	1	21
ICRF J125028.2 + 134340	1247 + 139	12 50 28.21799279	13 43 40.3883868	0.00090293	0.0172383	−0.914	53573.0	53573.0	53573.0	1	6
ICRF J125032.5 + 021632	1247 + 025	12 50 32.58079229	02 16 32.1737162	0.00001457	0.0004806	−0.091	53561.9	53561.9	53561.9	1	81
ICRF J125114.4 − 171713	1248 − 170	12 51 14.47512123	−17 17 13.1596354	0.00002107	0.0007487	−0.344	53561.9	53561.9	53561.9	1	66
ICRF J125139.2 − 351839	1248 − 350	12 51 39.22513092	−35 18 39.5799716	0.00020511	0.0113894	0.490	53134.5	53134.5	53134.5	1	14
ICRF J125258.3 − 331959	1250 − 330	12 52 58.39734731	−33 19 59.5605387	0.00001645	0.0005500	−0.007	53126.1	53126.1	53126.1	1	41
ICRF J125311.9 + 530111	1250 + 532	12 53 11.92041728	53 01 11.7378133	0.00025733	0.0018348	0.681	49577.0	49577.0	49577.0	1	23
ICRF J125428.8 + 453604	1252 + 458	12 54 28.82867546	45 36 04.3260845	0.00004040	0.0008943	0.226	50306.3	50306.3	50306.3	1	70
ICRF J125431.4 − 131716	1251 − 130	12 54 31.46828216	−13 17 16.2149857	0.00004787	0.0020536	0.429	53560.8	53560.8	53560.8	1	23

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J125445.4 + 023328	1252 + 028	12 54 45.46652938	02 33 28.9620277	0.00009191	0.0022847	0.344	53573.0	53573.0	53573.0	1	29
ICRF J125457.5 − 442456	1252 − 441	12 54 57.51308867	−44 24 56.6066545	0.00032030	0.0240419	−0.335	53126.1	53126.1	53126.1	1	8
ICRF J125458.9 + 085947	1252 + 092	12 54 58.95771792	08 59 47.5486060	0.00008550	0.0030618	−0.827	54088.1	54088.1	54088.1	1	17
ICRF J125531.7 + 181750	1253 + 185	12 55 31.75995251	18 17 50.9114250	0.00002722	0.0008392	0.116	50129.9	50085.5	50156.3	2	110
ICRF J125625.5 − 215521	1253 − 216	12 56 25.51122860	−21 55 21.1499093	0.00027368	0.0070578	−0.591	53561.9	53561.9	53561.9	1	10
ICRF J125731.7 + 795802	1256 + 802	12 57 31.72585453	79 58 02.4888150	0.00436884	0.0209007	0.298	50688.3	50688.3	50688.3	1	4
ICRF J125757.2 + 322929	1255 + 327	12 57 57.23184992	32 29 29.3261210	0.00001187	0.0003198	−0.445	50219.8	50219.8	50219.8	1	79
ICRF J125908.4 − 231038	1256 − 229	12 59 08.46203311	−23 10 38.6538333	0.00001082	0.0003721	−0.186	50661.8	50632.3	50688.3	2	154
ICRF J125912.6 − 243605	1256 − 243	12 59 12.62560696	−24 36 05.5035426	0.00003288	0.0010980	0.142	50658.4	50632.3	50688.3	2	90
ICRF J125931.1 + 514056	1257 + 519	12 59 31.17401831	51 40 56.2607603	0.00002792	0.0003986	0.118	53563.0	49577.0	54112.8	2	33
ICRF J130001.9 + 120622	1257 + 123	13 00 01.93884002	12 06 22.1194842	0.00005927	0.0012675	−0.306	49914.7	49914.7	49914.7	1	47
ICRF J130028.5 + 283010	1258 + 287	13 00 28.52995478	28 30 10.1889374	0.00003327	0.0005575	0.254	53126.1	53126.1	53126.1	1	58
ICRF J130036.4 + 082802	1258 + 087	13 00 36.43877573	08 28 02.8631452	0.00003208	0.0010023	−0.390	53503.7	53503.7	53503.7	1	37
ICRF J130041.0 + 141729	1258 + 145	13 00 41.03703841	14 17 29.4138162	0.00017323	0.0035980	−0.245	53560.8	53560.8	53560.8	1	4
ICRF J130041.2 + 502936	1258 + 507	13 00 41.24705877	50 29 36.7651226	0.00003328	0.0006919	−0.212	49909.1	49577.0	50306.3	2	123
ICRF J130132.6 + 463402	1259 + 468	13 01 32.60627648	46 34 02.9397625	0.00004079	0.0007580	0.227	53561.9	53561.9	53561.9	1	56
ICRF J130217.1 + 481917	1300 + 485	13 02 17.19610266	48 19 17.5740056	0.00002902	0.0005339	0.112	50306.3	50306.3	50306.3	1	72
ICRF J130237.9 + 690251	1300 + 693	13 02 37.92476239	69 02 51.6019507	0.00037249	0.0039013	0.484	49827.5	49827.5	49827.5	1	12
ICRF J130313.8 − 105117	1300 − 105	13 03 13.86795252	−10 51 17.1281751	0.00002199	0.0007003	0.246	50576.2	50576.2	50576.2	1	57
ICRF J130443.6 − 034602	1302 − 034	13 04 43.64224057	−03 46 02.5506865	0.00001927	0.0005910	−0.052	50576.2	50576.2	50576.2	1	64
ICRF J130500.0 + 785435	1304 + 791	13 05 00.01422030	78 54 35.7964708	0.00018686	0.0002402	0.181	50404.3	49827.5	50688.3	2	97
ICRF J130508.4 − 285042	1302 − 285	13 05 08.46858935	−28 50 42.0257439	0.00005617	0.0018394	0.367	50688.3	50688.3	50688.3	1	49
ICRF J130603.3 + 552943	1303 + 557	13 06 03.35109918	55 29 43.8597151	0.00029174	0.0022177	0.347	49577.0	49577.0	49577.0	1	11
ICRF J130632.6 − 171858	1303 − 170	13 06 32.66050737	−17 18 58.3883623	0.00002037	0.0007942	−0.063	50632.3	50632.3	50632.3	1	67
ICRF J130807.9 + 495753	1305 + 502	13 08 07.92425420	49 57 53.4696365	0.00005343	0.0007568	0.447	50306.3	50306.3	50306.3	1	52
ICRF J130815.5 + 040109	1305 + 042	13 08 15.55307644	04 01 09.3515738	0.00002789	0.0009826	−0.666	53126.1	53126.1	53126.1	1	61
ICRF J130832.7 − 245832	1305 − 247	13 08 32.72735700	−24 58 32.4086150	0.00007026	0.0025763	−0.822	54112.8	54112.8	54112.8	1	16
ICRF J130909.7 + 555738	1307 + 562	13 09 09.75440663	55 57 38.1962414	0.00004813	0.0010487	−0.159	49577.0	49577.0	49577.0	1	63
ICRF J130948.4 − 394833	1306 − 395	13 09 48.48830855	−39 48 33.0874354	0.00003171	0.0013879	−0.272	53523.9	53523.9	53523.9	1	39
ICRF J131053.5 + 465352	1308 + 471	13 10 53.59158980	46 53 52.2182849	0.00010218	0.0017777	0.383	50306.3	50306.3	50306.3	1	17
ICRF J131107.8 + 141746	1308 + 145	13 11 07.82434054	14 17 46.6481921	0.00007976	0.0016700	−0.446	50136.6	50085.5	50156.3	2	61
ICRF J131123.8 + 165844	1308 + 172	13 11 23.82009922	16 58 44.1904170	0.00015673	0.0050069	−0.872	50134.4	50085.5	50156.3	2	42
ICRF J131214.2 + 253113	1309 + 257	13 12 14.28887967	25 31 13.1751265	0.00012491	0.0023489	−0.385	53134.5	53134.5	53134.5	1	19
ICRF J131243.3 + 482830	1310 + 487	13 12 43.35368902	48 28 30.9408819	0.00005586	0.0007593	−0.011	50306.3	50306.3	50306.3	1	44
ICRF J131250.9 − 042449	1310 − 041	13 12 50.90124457	−04 24 49.8914608	0.00001898	0.0005876	0.054	50576.2	50576.2	50576.2	1	64

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J131301.4 − 272258	1310 − 271	13 13 01.42139924	−27 22 58.8433604	0.00023396	0.0079434	−0.183	50649.8	50632.3	50688.3	2	16
ICRF J131327.9 + 673550	1311 + 678	13 13 27.98631749	67 35 50.3816369	0.00087262	0.0045923	−0.396	52409.7	52409.7	52409.7	1	9
ICRF J131337.8 + 545823	1311 + 552	13 13 37.85316548	54 58 23.8993959	0.00010396	0.0012735	−0.188	53138.4	49577.0	54088.1	2	38
ICRF J131443.8 + 530627	1312 + 533	13 14 43.83056536	53 06 27.7306899	0.00007374	0.0013815	0.091	49577.0	49577.0	49577.0	1	39
ICRF J131501.8 + 122052	1312 + 126	13 15 01.85285439	12 20 52.6387284	0.00007541	0.0023358	−0.809	53561.9	53561.9	53561.9	1	35
ICRF J131513.4 + 284053	1312 + 289	13 15 13.49152475	28 40 53.6692629	0.00002514	0.0005485	0.082	53126.1	53126.1	53126.1	1	61
ICRF J131624.5 + 194704	1313 + 200	13 16 24.56800180	19 47 04.4615452	0.00023138	0.0028228	−0.071	50326.0	50085.5	54482.7	3	23
ICRF J131726.1 − 203138	1314 − 202	13 17 26.14895287	−20 31 38.1315793	0.00013627	0.0062265	−0.817	53134.5	53134.5	53134.5	1	19
ICRF J131736.5 − 134532	1314 − 134	13 17 36.53772316	−13 45 32.6513881	0.00002718	0.0008207	0.480	50576.2	50576.2	50576.2	1	63
ICRF J131739.1 + 411545	1315 + 415	13 17 39.19378543	41 15 45.6178549	0.00022462	0.0035740	0.538	53560.8	53560.8	53560.8	1	17
ICRF J131833.7 − 060723	1315 − 058	13 18 33.70943158	−06 07 23.8209095	0.00001477	0.0005078	−0.190	54112.8	54112.8	54112.8	1	48
ICRF J131912.0 − 121732	1316 − 120	13 19 12.07206631	−12 17 32.1284646	0.00001784	0.0005412	0.276	50576.2	50576.2	50576.2	1	64
ICRF J131931.6 − 123925	1316 − 123	13 19 31.66964077	−12 39 25.0754790	0.00002075	0.0007316	−0.503	53437.4	51449.7	53503.7	2	62
ICRF J131938.7 − 004939	1317 − 005	13 19 38.76617674	−00 49 39.9392130	0.00001976	0.0007666	0.185	53552.8	53552.8	53552.8	1	59
ICRF J132042.2 + 503607	1318 + 508	13 20 42.20809554	50 36 07.7987026	0.00060130	0.0024144	−0.492	51526.5	49577.0	54112.8	3	15
ICRF J132145.6 + 831613	1322 + 835	13 21 45.60966523	83 16 13.4229034	0.00075210	0.0006161	−0.327	50688.3	50688.3	50688.3	1	41
ICRF J132211.4 + 214812	1319 + 220	13 22 11.40359117	21 48 12.2790441	0.00002201	0.0005473	−0.300	54088.1	54088.1	54088.1	1	65
ICRF J132236.9 − 093737	1319 − 093	13 22 36.91264806	−09 37 37.7998687	0.00001205	0.0003974	−0.061	50576.2	50576.2	50576.2	1	64
ICRF J132255.6 + 391207	1320 + 394	13 22 55.66445939	39 12 07.9517199	0.00003961	0.0007870	0.447	53560.8	53560.8	53560.8	1	47
ICRF J132304.1 − 384900	1320 − 385	13 23 04.14839424	−38 49 00.6715446	0.00020299	0.0146840	0.244	53153.2	53153.2	53153.2	1	10
ICRF J132317.1 − 340712	1320 − 338	13 23 17.13884891	−34 07 12.3566227	0.00051273	0.0154133	0.409	53134.5	53134.5	53134.5	1	6
ICRF J132411.8 − 323535	1321 − 323	13 24 11.86076191	−32 35 35.5905735	0.00014640	0.0040955	0.886	52354.8	52306.7	52409.7	2	45
ICRF J132412.0 + 404811	1321 + 410	13 24 12.09560728	40 48 11.7633699	0.00003143	0.0005760	−0.174	50242.8	50242.8	50242.8	1	53
ICRF J132425.7 − 104923	1321 − 105	13 24 25.79313610	−10 49 23.1336086	0.00001728	0.0005713	0.082	50576.2	50576.2	50576.2	1	64
ICRF J132429.3 + 474320	1322 + 479	13 24 29.34245376	47 43 20.6235214	0.00006795	0.0009754	−0.202	50306.3	50306.3	50306.3	1	46
ICRF J132509.6 − 080448	1322 − 078	13 25 09.61552881	−08 04 48.3906732	0.00003785	0.0011677	−0.422	54112.8	54112.8	54112.8	1	30
ICRF J132513.2 − 111739	1322 − 110	13 25 13.21959038	−11 17 39.0815427	0.00002806	0.0012163	−0.402	54088.1	54088.1	54088.1	1	48
ICRF J132650.5 + 571206	1324 + 574	13 26 50.57262349	57 12 06.7491777	0.00048730	0.0055690	−0.641	49577.0	49577.0	49577.0	1	21
ICRF J132720.9 + 432627	1325 + 437	13 27 20.97900094	43 26 27.9892113	0.00002495	0.0004220	0.079	50242.8	50242.8	50242.8	1	74
ICRF J132725.1 + 500849	1325 + 504	13 27 25.12366986	50 08 49.1724957	0.00004672	0.0009258	0.148	50866.7	49577.0	54112.8	3	75
ICRF J132754.6 + 122309	1325 + 126	13 27 54.68300432	12 23 09.1781780	0.00001134	0.0003472	−0.306	53523.9	53523.9	53523.9	1	88
ICRF J133019.0 − 312259	1327 − 311	13 30 19.08405144	−31 22 59.1356190	0.00001846	0.0006462	−0.466	52365.6	52306.7	52409.7	2	119
ICRF J133111.6 − 263909	1328 − 263	13 31 11.69300444	−26 39 09.6166473	0.00011998	0.0051009	−0.688	53503.7	53503.7	53503.7	1	14
ICRF J133129.1 − 034114	1328 − 034	13 31 29.16143198	−03 41 14.1142889	0.00003474	0.0009085	0.031	53552.8	53552.8	53552.8	1	50
ICRF J133153.8 + 060823	1329 + 063	13 31 53.89716261	06 08 23.3919432	0.00004141	0.0008477	0.137	53126.1	53126.1	53126.1	1	42

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J133204.4 − 050943	1329 − 049	13 32 04.46467109	−05 09 43.3056052	0.00001676	0.0005069	0.139	50576.2	50576.2	50576.2	1	63
ICRF J133230.9 − 140213	1329 − 137	13 32 30.92911234	−14 02 13.1845888	0.00101009	0.0170664	0.699	53560.8	53560.8	53560.8	1	3
ICRF J133239.2 − 125615	1329 − 126	13 32 39.25138181	−12 56 15.3439146	0.00008634	0.0024606	0.623	53573.0	53573.0	53573.0	1	25
ICRF J133304.9 + 065231	1330 + 071	13 33 04.99695123	06 52 31.9703055	0.00002291	0.0006190	0.001	53134.5	53134.5	53134.5	1	65
ICRF J133307.4 + 272518	1330 + 276	13 33 07.49071645	27 25 18.3831331	0.00001514	0.0004277	−0.336	50219.8	50219.8	50219.8	1	77
ICRF J133338.9 − 235625	1330 − 236	13 33 38.92591420	−23 56 25.5777845	0.00070646	0.0371724	−0.982	54088.1	54088.1	54088.1	1	11
ICRF J133345.1 − 195042	1331 − 195	13 33 45.17566715	−19 50 42.3444485	0.00005891	0.0019615	−0.185	50661.1	50632.3	50688.3	2	33
ICRF J133404.1 − 115014	1331 − 115	13 34 04.19077328	−11 50 14.2712882	0.00002063	0.0006100	0.299	50576.2	50576.2	50576.2	1	57
ICRF J133511.9 + 025309	1332 + 031	13 35 11.90513258	02 53 09.5131210	0.00095858	0.0124217	−0.555	53126.1	53126.1	53126.1	1	3
ICRF J133521.9 + 454238	1333 + 459	13 35 21.96226191	45 42 38.2313896	0.00002815	0.0004291	−0.026	50306.3	50306.3	50306.3	1	64
ICRF J133525.9 + 584400	1333 + 589	13 35 25.92845073	58 44 00.2914463	0.00004438	0.0004719	−0.436	49577.0	49577.0	49577.0	1	115
ICRF J133556.4 − 051141	1333 − 049	13 35 56.47672928	−05 11 41.6594648	0.00002110	0.0006160	0.288	50576.2	50576.2	50576.2	1	64
ICRF J133608.2 − 082951	1333 − 082	13 36 08.25981435	−08 29 51.7973391	0.00001506	0.0005119	0.122	50576.2	50576.2	50576.2	1	64
ICRF J133634.3 − 185241	1333 − 186	13 36 34.39334121	−18 52 41.6751316	0.00003191	0.0010266	0.259	53560.8	53560.8	53560.8	1	53
ICRF J133901.7 − 240114	1336 − 237	13 39 01.74637183	−24 01 14.0053249	0.00001091	0.0003613	−0.106	50659.4	50632.3	50688.3	2	157
ICRF J133923.7 + 632858	1337 + 637	13 39 23.78306923	63 28 58.4252503	0.00016733	0.0012770	0.408	49827.5	49827.5	49827.5	1	63
ICRF J134004.6 − 013746	1337 − 013	13 40 04.61507053	−01 37 46.5436125	0.00002986	0.0008501	0.523	50576.2	50576.2	50576.2	1	54
ICRF J134036.0 + 360026	1338 + 362	13 40 36.00993900	36 00 26.7374888	0.00023011	0.0035875	0.676	54112.8	54112.8	54112.8	1	14
ICRF J134115.2 + 281605	1338 + 285	13 41 15.28274373	28 16 05.0771727	0.00002236	0.0006437	−0.514	50219.8	50219.8	50219.8	1	41
ICRF J134204.7 − 205129	1339 − 206	13 42 04.73950872	−20 51 29.5405515	0.00001785	0.0005729	−0.153	50659.0	50632.3	50688.3	2	134
ICRF J134208.3 + 270930	1339 + 274	13 42 08.37667394	27 09 30.6174497	0.00001496	0.0003771	−0.160	50219.8	50219.8	50219.8	1	73
ICRF J134300.5 + 685517	1341 + 691	13 43 00.55338324	68 55 17.1618641	0.00036600	0.0056643	0.547	52584.3	49827.5	54088.1	2	17
ICRF J134337.4 − 174755	1340 − 175	13 43 37.41425277	−17 47 55.4447862	0.00003207	0.0009267	0.049	50632.3	50632.3	50632.3	1	51
ICRF J134414.4 − 172340	1341 − 171	13 44 14.40246638	−17 23 40.3954921	0.00002811	0.0009177	−0.058	53573.0	53573.0	53573.0	1	80
ICRF J134533.1 + 445259	1343 + 451	13 45 33.17245371	44 52 59.5730336	0.00002256	0.0004143	0.135	53561.9	53561.9	53561.9	1	82
ICRF J134536.9 + 382312	1343 + 386	13 45 36.94294248	38 23 12.4239845	0.00077129	0.0065278	0.556	54112.8	54112.8	54112.8	1	5
ICRF J134549.3 + 070631	1343 + 073	13 45 49.31478391	07 06 31.1212682	0.00004987	0.0013326	0.224	53560.8	53560.8	53560.8	1	37
ICRF J134551.5 − 301504	1343 − 300	13 45 51.51994433	−30 15 04.5933858	0.00013881	0.0040350	0.565	52306.7	52306.7	52306.7	1	27
ICRF J134723.4 + 183537	1344 + 188	13 47 23.49018528	18 35 37.5736304	0.00001686	0.0005511	−0.161	50130.1	50085.5	50156.3	2	205
ICRF J134731.4 + 055233	1345 + 061	13 47 31.44480279	05 52 33.8042092	0.00022479	0.0057249	−0.246	53134.5	53134.5	53134.5	1	4
ICRF J134740.4 − 375036	1344 − 375	13 47 40.42893711	−37 50 36.6203399	0.00004707	0.0014092	0.017	53153.2	53153.2	53153.2	1	16
ICRF J134931.4 − 113253	1346 − 113	13 49 31.44325188	−11 32 53.8301425	0.00002118	0.0006346	0.277	50576.2	50576.2	50576.2	1	63
ICRF J135014.0 − 220441	1347 − 218	13 50 14.09008064	−22 04 41.0775377	0.00004861	0.0014079	0.244	50660.0	50632.3	50688.3	2	85
ICRF J135022.1 + 094010	1347 + 099	13 50 22.13601733	09 40 10.6554607	0.00010604	0.0016112	0.380	49914.7	49914.7	49914.7	1	47
ICRF J135036.1 − 163449	1347 − 163	13 50 36.14439490	−16 34 49.5063543	0.00103085	0.0132280	0.919	53561.9	53561.9	53561.9	1	4

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J135045.6 + 233145	1348 + 237	13 50 45.65837834	23 31 45.1588921	0.00005306	0.0007923	−0.001	53126.1	53126.1	53126.1	1	42
ICRF J135116.9 + 083039	1348 + 087	13 51 16.91908181	08 30 39.9035510	0.00000961	0.0002931	0.070	53126.1	53126.1	53126.1	1	89
ICRF J135146.8 − 291217	1348 − 289	13 51 46.83880696	−29 12 17.6506481	0.00004542	0.0013417	−0.852	53126.1	53126.1	53126.1	1	43
ICRF J135152.6 − 144914	1349 − 145	13 51 52.64961047	−14 49 14.5557034	0.00001586	0.0006461	−0.206	50632.3	50632.3	50632.3	1	78
ICRF J135228.0 − 274507	1349 − 275	13 52 28.04619309	−27 45 07.1341079	0.00037560	0.0162044	−0.814	53573.0	53573.0	53573.0	1	14
ICRF J135323.1 + 753257	1352 + 757	13 53 23.16806021	75 32 57.7349913	0.00020019	0.0008514	0.526	49827.5	49827.5	49827.5	1	33
ICRF J135351.5 + 015153	1351 + 021	13 53 51.58444580	01 51 53.8913367	0.00015728	0.0042123	0.740	53560.8	53560.8	53560.8	1	19
ICRF J135605.3 − 342110	1353 − 341	13 56 05.38667312	−34 21 10.8602774	0.00006115	0.0018786	−0.578	52306.7	52306.7	52306.7	1	29
ICRF J135606.9 − 172431	1353 − 171	13 56 06.95289699	−17 24 31.8125376	0.00050651	0.0184509	−0.787	53573.0	53573.0	53573.0	1	11
ICRF J135646.8 − 110129	1354 − 107	13 56 46.83215922	−11 01 29.2189235	0.00035802	0.0044180	0.783	53561.9	53561.9	53561.9	1	16
ICRF J135740.5 + 435359	1355 + 441	13 57 40.59226022	43 53 59.7686434	0.00005588	0.0005164	−0.089	52409.7	52409.7	52409.7	1	64
ICRF J135822.4 + 111932	1355 + 115	13 58 22.41967754	11 19 32.9183971	0.00004028	0.0010275	−0.093	53560.8	53560.8	53560.8	1	44
ICRF J135840.6 + 473758	1356 + 478	13 58 40.66635882	47 37 58.3107113	0.00005723	0.0007220	0.055	53561.9	53561.9	53561.9	1	46
ICRF J135938.0 + 401138	1357 + 404	13 59 38.09427387	40 11 38.2505156	0.00001530	0.0003433	−0.248	50242.8	50242.8	50242.8	1	81
ICRF J140003.8 − 185811	1357 − 187	14 00 03.86600400	−18 58 11.0863676	0.00001599	0.0005713	−0.195	53523.9	53523.9	53523.9	1	88
ICRF J140028.6 + 621038	1358 + 624	14 00 28.64868162	62 10 38.5884658	0.00014865	0.0013317	−0.524	52409.7	52409.7	52409.7	1	22
ICRF J140105.3 − 091631	1358 − 090	14 01 05.33183064	−09 16 31.5721888	0.00001973	0.0006762	−0.332	50576.2	50576.2	50576.2	1	72
ICRF J140134.9 − 300436	1358 − 298	14 01 34.93938286	−30 04 36.8696244	0.00009683	0.0030958	0.564	53126.1	53126.1	53126.1	1	17
ICRF J140145.6 + 583542	1400 + 588	14 01 45.69997963	58 35 42.2654807	0.00036098	0.0030547	−0.659	54057.1	53561.9	54088.1	2	17
ICRF J140202.4 − 282225	1359 − 281	14 02 02.40170255	−28 22 25.1441527	0.00002850	0.0010734	−0.192	50688.3	50688.3	50688.3	1	52
ICRF J140248.5 − 184047	1400 − 184	14 02 48.50452666	−18 40 47.4902677	0.00001708	0.0005986	0.103	54112.8	54112.8	54112.8	1	62
ICRF J140405.2 + 655137	1402 + 660	14 04 05.27906154	65 51 37.5833503	0.00012409	0.0010705	−0.362	52409.7	52409.7	52409.7	1	33
ICRF J140412.1 − 001325	1401 + 000	14 04 12.12397300	−00 13 25.0912202	0.00001303	0.0003691	−0.044	50576.2	50576.2	50576.2	1	70
ICRF J140432.9 + 072846	1402 + 077	14 04 32.99234126	07 28 46.9641917	0.00003109	0.0008345	0.514	53560.8	53560.8	53560.8	1	53
ICRF J140507.7 + 405657	1403 + 411	14 05 07.79545804	40 56 57.8308378	0.00001442	0.0002765	−0.148	53126.1	53126.1	53126.1	1	90
ICRF J140532.8 − 144018	1402 − 144	14 05 32.86734195	−14 40 18.2960663	0.00002056	0.0009183	−0.341	50576.2	50576.2	50576.2	1	61
ICRF J140600.7 − 084806	1403 − 085	14 06 00.70184402	−08 48 06.8804610	0.00001595	0.0005027	−0.373	50576.2	50576.2	50576.2	1	66
ICRF J140636.5 + 782810	1406 + 787	14 06 36.56696136	78 28 10.4062200	0.00024116	0.0005023	−0.369	50205.6	49827.5	50688.3	2	107
ICRF J140653.8 + 343337	1404 + 347	14 06 53.84724960	34 33 37.3065549	0.00001830	0.0005202	−0.323	50219.8	50219.8	50219.8	1	76
ICRF J140729.7 − 270104	1404 − 267	14 07 29.76224452	−27 01 04.2931696	0.00010839	0.0029598	0.165	50657.7	50632.3	50688.3	2	55
ICRF J140819.0 + 685450	1407 + 691	14 08 19.07555510	68 54 50.8275993	0.00039042	0.0025073	0.111	49827.5	49827.5	49827.5	1	24
ICRF J140849.6 − 290023	1405 − 287	14 08 49.61370243	−29 00 23.6085268	0.00002017	0.0006603	0.197	50688.3	50688.3	50688.3	1	63
ICRF J140911.9 − 231549	1406 − 230	14 09 11.97617469	−23 15 49.6122223	0.00008445	0.0028654	−0.311	50658.1	50632.3	50688.3	2	50
ICRF J141004.6 + 020306	1407 + 022	14 10 04.65597093	02 03 06.9123127	0.00001083	0.0003603	0.044	53134.5	53134.5	53134.5	1	81
ICRF J141035.0 + 073121	1408 + 077	14 10 35.07534615	07 31 21.4897484	0.00007884	0.0017250	−0.584	49914.7	49914.7	49914.7	1	50

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J141114.5 + 370535	1409 + 373	14 11 14.51611166	37 05 35.6242707	0.00004619	0.0011641	−0.674	53573.0	53573.0	53573.0	1	61
ICRF J141236.3 + 133438	1410 + 138	14 12 36.37264534	13 34 38.1531137	0.00003421	0.0009914	−0.508	50131.9	50085.5	50156.3	2	136
ICRF J141520.8 − 095558	1412 − 097	14 15 20.83448341	−09 55 58.3204503	0.00059153	0.0097031	0.792	53561.9	53561.9	53561.9	1	6
ICRF J141528.4 + 370621	1413 + 373	14 15 28.46679519	37 06 21.1623683	0.00003196	0.0005207	−0.315	50242.8	50242.8	50242.8	1	59
ICRF J141634.3 − 170545	1413 − 168	14 16 34.36981105	−17 05 45.7343549	0.00003487	0.0011585	−0.181	53560.8	53560.8	53560.8	1	47
ICRF J141708.1 + 460705	1415 + 463	14 17 08.16131810	46 07 05.4483392	0.00004022	0.0005603	0.283	50306.3	50306.3	50306.3	1	56
ICRF J141858.9 − 350942	1415 − 349	14 18 58.91692862	−35 09 42.5070788	0.00003194	0.0010289	−0.102	53134.5	53134.5	53134.5	1	24
ICRF J141949.7 − 192825	1417 − 192	14 19 49.73876994	−19 28 25.2672042	0.00001063	0.0003580	−0.043	50661.6	50632.3	50688.3	2	172
ICRF J142000.3 + 372134	1417 + 375	14 20 00.34105735	37 21 34.6596095	0.00002664	0.0004074	0.088	53134.5	53134.5	53134.5	1	69
ICRF J142107.7 − 064356	1418 − 065	14 21 07.75559474	−06 43 56.3556985	0.00004216	0.0010187	0.564	50576.2	50576.2	50576.2	1	53
ICRF J142123.0 + 464547	1419 + 469	14 21 23.07297765	46 45 47.9870029	0.00004581	0.0007114	0.178	50306.3	50306.3	50306.3	1	56
ICRF J142306.1 + 480210	1421 + 482	14 23 06.15677124	48 02 10.8454822	0.00010569	0.0010830	0.036	50306.3	50306.3	50306.3	1	41
ICRF J142314.1 + 505537	1421 + 511	14 23 14.18656237	50 55 37.2829829	0.00016012	0.0025037	−0.570	50306.3	50306.3	50306.3	1	19
ICRF J142340.8 − 221817	1420 − 220	14 23 40.81029268	−22 18 17.5160213	0.00009256	0.0026926	0.203	53503.7	53503.7	53503.7	1	33
ICRF J142416.0 − 140702	1421 − 138	14 24 16.03503689	−14 07 02.9971162	0.00010498	0.0024624	0.167	53560.8	53560.8	53560.8	1	16
ICRF J142437.0 + 470556	1422 + 473	14 24 37.07980441	47 05 56.6982741	0.00007113	0.0013253	−0.062	50306.3	50306.3	50306.3	1	40
ICRF J142523.0 − 251306	1422 − 249	14 25 23.03739624	−25 13 06.9708319	0.00002427	0.0007639	−0.373	53134.5	53134.5	53134.5	1	65
ICRF J142741.3 − 330531	1424 − 328	14 27 41.36105531	−33 05 31.5050843	0.00002568	0.0011957	−0.180	53830.0	53126.1	54088.1	2	41
ICRF J143009.7 + 104326	1427 + 109	14 30 09.73878998	10 43 26.8621725	0.00001219	0.0003631	0.048	49914.7	49914.7	49914.7	1	89
ICRF J143120.5 + 395241	1429 + 400	14 31 20.53840891	39 52 41.5300707	0.00002050	0.0005645	−0.270	50242.8	50242.8	50242.8	1	85
ICRF J143321.4 − 154844	1430 − 155	14 33 21.45931287	−15 48 44.6874624	0.00000880	0.0002732	−0.084	50632.3	50632.3	50632.3	1	90
ICRF J143405.6 + 420315	1432 + 422	14 34 05.69448171	42 03 15.9916072	0.00001711	0.0003670	−0.229	50242.8	50242.8	50242.8	1	90
ICRF J143421.1 − 114619	1431 − 115	14 34 21.13589848	−11 46 19.5117449	0.00003368	0.0012438	−0.677	53503.7	53503.7	53503.7	1	51
ICRF J143539.9 − 041455	1433 − 040	14 35 39.90459637	−04 14 55.2992329	0.00017341	0.0043769	0.328	53153.2	53153.2	53153.2	1	16
ICRF J143547.1 + 760525	1436 + 763	14 35 47.10019981	76 05 25.8310149	0.00094952	0.0052781	0.195	52464.6	49827.5	54112.8	2	13
ICRF J143828.5 + 441812	1436 + 445	14 38 28.50447729	44 18 12.0715105	0.00004957	0.0007953	0.045	50306.3	50306.3	50306.3	1	51
ICRF J143844.7 + 621154	1437 + 624	14 38 44.78300209	62 11 54.4367932	0.00013500	0.0010100	−0.656	52409.7	52409.7	52409.7	1	28
ICRF J143908.9 + 211450	1436 + 214	14 39 08.90236356	21 14 50.8220142	0.00009807	0.0014259	0.302	53560.8	53560.8	53560.8	1	17
ICRF J143946.9 + 495805	1438 + 501	14 39 46.97621664	49 58 05.4553416	0.00002913	0.0004558	0.074	50306.3	50306.3	50306.3	1	71
ICRF J143956.8 − 153150	1437 − 153	14 39 56.87204418	−15 31 50.5552715	0.00001068	0.0003492	−0.051	50632.3	50632.3	50632.3	1	86
ICRF J144022.3 + 382013	1438 + 385	14 40 22.33609876	38 20 13.6163529	0.00001226	0.0002844	−0.201	50242.8	50242.8	50242.8	1	90
ICRF J144033.6 + 012705	1438 + 016	14 40 33.64696189	01 27 05.2099848	0.00004767	0.0012879	−0.309	53523.9	53523.9	53523.9	1	29
ICRF J144059.4 + 015744	1438 + 021	14 40 59.49586979	01 57 44.1524295	0.00002031	0.0006545	−0.014	53561.9	53561.9	53561.9	1	76
ICRF J144119.8 − 330324	1438 − 328	14 41 19.89355847	−33 03 24.3990603	0.00002775	0.0008898	0.134	53134.5	53134.5	53134.5	1	29
ICRF J144123.9 − 345645	1438 − 347	14 41 23.97019735	−34 56 45.9531524	0.00022865	0.0115501	−0.596	53126.1	53126.1	53126.1	1	11

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J144145.4 − 152336	1438 − 151	14 41 45.41726989	−15 23 36.2659097	0.00004342	0.0015641	−0.139	53560.8	53560.8	53560.8	1	35
ICRF J144158.6 + 631833	1440 + 635	14 41 58.66928807	63 18 33.4377902	0.00066459	0.0052869	0.860	49827.5	49827.5	49827.5	1	22
ICRF J144200.1 + 323420	1439 + 327	14 42 00.13898661	32 34 20.3011013	0.00002607	0.0006599	−0.123	50219.8	50219.8	50219.8	1	64
ICRF J144850.3 + 040219	1446 + 042	14 48 50.36110965	04 02 19.8924767	0.00016807	0.0030703	0.644	49914.7	49914.7	49914.7	1	38
ICRF J144851.1 − 112215	1446 − 111	14 48 51.16009993	−11 22 15.7379281	0.00007337	0.0024639	0.703	50576.2	50576.2	50576.2	1	23
ICRF J144916.5 − 004519	1446 − 005	14 49 16.59031366	−00 45 19.2293378	0.00004423	0.0011494	−0.284	53503.7	53503.7	53503.7	1	45
ICRF J145031.1 + 091027	1448 + 093	14 50 31.16895090	09 10 27.9553279	0.00002223	0.0006983	−0.386	49914.7	49914.7	49914.7	1	113
ICRF J145102.5 − 232931	1448 − 232	14 51 02.50956771	−23 29 31.0960889	0.00048506	0.0228236	−0.893	53573.0	53573.0	53573.0	1	13
ICRF J145131.4 + 134324	1449 + 139	14 51 31.49101145	13 43 24.0013881	0.00011304	0.0013353	0.175	52319.1	50085.5	53134.5	3	22
ICRF J145147.4 − 012735	1449 − 012	14 51 47.41230347	−01 27 35.3075747	0.00001513	0.0004939	−0.495	50576.2	50576.2	50576.2	1	68
ICRF J145157.3 + 635719	1450 + 641	14 51 57.36293710	63 57 19.1976817	0.00037290	0.0023303	−0.604	54088.1	54088.1	54088.1	1	10
ICRF J145224.6 + 452223	1450 + 455	14 52 24.67427631	45 22 23.6686631	0.00018125	0.0028354	−0.762	50306.3	50306.3	50306.3	1	12
ICRF J145318.5 + 350539	1451 + 352	14 53 18.54532135	35 05 39.3652358	0.00007236	0.0022189	−0.007	53573.0	53573.0	53573.0	1	24
ICRF J145344.2 − 252247	1450 − 251	14 53 44.21897490	−25 22 47.5037589	0.00003679	0.0011971	−0.290	53560.8	53560.8	53560.8	1	57
ICRF J145344.2 + 102557	1451 + 106	14 53 44.24109282	10 25 57.5645277	0.00003266	0.0008197	0.011	53561.9	53561.9	53561.9	1	56
ICRF J145359.7 + 091543	1451 + 094	14 53 59.73233558	09 15 43.3291041	0.00031167	0.0057919	−0.351	53560.8	53560.8	53560.8	1	5
ICRF J145402.4 − 340057	1450 − 338	14 54 02.47338565	−34 00 57.2128973	0.00010336	0.0042095	0.464	52367.6	52306.7	52409.7	2	44
ICRF J145420.8 + 162424	1452 + 166	14 54 20.85504763	16 24 24.3709727	0.00001495	0.0005039	−0.123	53523.9	53523.9	53523.9	1	76
ICRF J145432.2 + 295558	1452 + 301	14 54 32.29763804	29 55 58.0426584	0.00062348	0.0185408	0.478	53561.9	53561.9	53561.9	1	5
ICRF J145446.6 − 250512	1451 − 248	14 54 46.69899773	−25 05 12.4915384	0.00012290	0.0048549	−0.642	50664.3	50632.3	50688.3	2	28
ICRF J145502.8 − 170013	1452 − 168	14 55 02.81063896	−17 00 13.9532871	0.00009863	0.0024512	0.039	50632.3	50632.3	50632.3	1	38
ICRF J145531.8 + 213139	1453 + 217	14 55 31.84630957	21 31 39.1761759	0.00002072	0.0005150	0.036	53126.1	53126.1	53126.1	1	74
ICRF J145554.1 + 443137	1454 + 447	14 55 54.13576336	44 31 37.6549248	0.00005980	0.0009887	−0.252	50306.3	50306.3	50306.3	1	47
ICRF J145608.1 + 504836	1454 + 510	14 56 08.11965636	50 48 36.3004356	0.00023678	0.0016791	0.379	49703.8	49577.0	50306.3	2	46
ICRF J145738.1 + 074954	1455 + 080	14 57 38.12871198	07 49 54.7151602	0.00001988	0.0005747	−0.049	49914.7	49914.7	49914.7	1	121
ICRF J145752.5 + 093816	1455 + 098	14 57 52.53173310	09 38 16.5469519	0.00042097	0.0115609	−0.823	53573.0	53573.0	53573.0	1	12
ICRF J145844.7 + 372021	1456 + 375	14 58 44.79444036	37 20 21.6227595	0.00002901	0.0006617	−0.273	50242.8	50242.8	50242.8	1	76
ICRF J145915.7 − 365547	1456 − 367	14 59 15.76380563	−36 55 47.9384597	0.00006240	0.0018901	−0.320	52362.2	52306.7	52409.7	2	26
ICRF J145935.4 + 444207	1457 + 449	14 59 35.45806934	44 42 07.9193695	0.00002891	0.0006247	0.327	53560.8	53560.8	53560.8	1	67
ICRF J150034.0 + 083941	1458 + 088	15 00 34.00391712	08 39 41.8112741	0.00043369	0.0128156	0.513	54112.8	54112.8	54112.8	1	3
ICRF J150051.8 − 235820	1457 − 237	15 00 51.88920903	−23 58 20.1878730	0.00027285	0.0137333	−0.661	53573.0	53573.0	53573.0	1	21
ICRF J150134.7 − 391839	1458 − 391	15 01 34.75807184	−39 18 39.4359679	0.00012060	0.0036160	0.821	52371.5	52306.7	52409.7	2	27
ICRF J150225.0 − 150852	1459 − 149	15 02 25.01748119	−15 08 52.5199923	0.00003495	0.0012660	−0.173	53560.8	53560.8	53560.8	1	42
ICRF J150300.8 + 091758	1500 + 094	15 03 00.89950754	09 17 58.9828183	0.00003969	0.0008709	0.111	54088.1	54088.1	54088.1	1	40
ICRF J150328.8 + 041948	1500 + 045	15 03 28.88770857	04 19 48.9920008	0.00002425	0.0007822	−0.361	53561.9	53561.9	53561.9	1	72

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J150407.5 + 324921	1502 + 330	15 04 07.52536068	32 49 21.1822508	0.00006819	0.0010427	0.156	50219.8	50219.8	50219.8	1	39
ICRF J150426.6 + 285430	1502 + 291	15 04 26.69653456	28 54 30.5420493	0.00003740	0.0011268	0.158	50219.8	50219.8	50219.8	1	46
ICRF J150603.0 − 091912	1503 − 091	15 06 03.03499517	−09 19 12.0547285	0.00014592	0.0037156	0.195	50576.2	50576.2	50576.2	1	20
ICRF J150624.7 + 831928	1510 + 835	15 06 24.71517432	83 19 28.0360498	0.00054701	0.0007583	−0.395	50688.3	50688.3	50688.3	1	26
ICRF J150644.1 + 493355	1505 + 497	15 06 44.11436046	49 33 55.8037786	0.00003747	0.0005300	−0.539	50306.3	50306.3	50306.3	1	53
ICRF J150711.6 + 511716	1505 + 514	15 07 11.61558262	51 17 16.8628554	0.00003990	0.0005321	−0.056	51905.8	49577.0	54112.8	3	80
ICRF J150721.7 + 123629	1504 + 127	15 07 21.75813833	12 36 29.0757014	0.00002438	0.0007490	−0.206	53560.8	53560.8	53560.8	1	59
ICRF J150759.7 + 041511	1505 + 044	15 07 59.73243486	04 15 11.9848917	0.00001353	0.0004633	0.092	52306.7	52306.7	52306.7	1	63
ICRF J150835.7 − 154831	1505 − 156	15 08 35.70158345	−15 48 31.5315396	0.00002087	0.0007259	−0.272	53561.9	53561.9	53561.9	1	87
ICRF J150852.9 − 303629	1505 − 304	15 08 52.99311804	−30 36 29.4297787	0.00010065	0.0029806	−0.893	53126.1	53126.1	53126.1	1	22
ICRF J150910.1 + 161127	1506 + 163	15 09 10.11183266	16 11 27.7358392	0.00002315	0.0008167	−0.384	53126.1	53126.1	53126.1	1	57
ICRF J150920.5 − 073548	1506 − 074	15 09 20.55347599	−07 35 48.1766806	0.00012259	0.0024591	0.054	53573.0	53573.0	53573.0	1	31
ICRF J151141.2 + 051809	1509 + 054	15 11 41.26654675	05 18 09.2597600	0.00001546	0.0004449	0.077	52306.7	52306.7	52306.7	1	64
ICRF J151340.1 + 233835	1511 + 238	15 13 40.18557873	23 38 35.2001872	0.00007348	0.0010975	−0.349	50125.6	50085.5	50156.3	2	83
ICRF J151356.9 − 211457	1511 − 210	15 13 56.97012650	−21 14 57.5069126	0.00000764	0.0002652	−0.048	50659.0	50632.3	50688.3	2	170
ICRF J151434.7 + 025248	1512 + 030	15 14 34.73449274	02 52 48.5084503	0.00002325	0.0006903	0.131	53560.8	53560.8	53560.8	1	56
ICRF J151944.7 − 115144	1517 − 116	15 19 44.78405646	−11 51 44.5272013	0.00002468	0.0008436	0.133	53560.8	53560.8	53560.8	1	68
ICRF J152102.7 + 785830	1522 + 791	15 21 02.79811695	78 58 30.2597177	0.00037400	0.0006579	−0.542	50666.8	49827.5	50688.3	2	40
ICRF J152114.4 + 043021	1518 + 046	15 21 14.41938394	04 30 21.6599319	0.00024030	0.0052682	0.553	49914.7	49914.7	49914.7	1	17
ICRF J152117.5 + 175601	1519 + 181	15 21 17.57923190	17 56 01.0684039	0.00062711	0.0035620	−0.150	54112.8	54112.8	54112.8	1	6
ICRF J152122.5 + 042030	1518 + 045	15 21 22.54358418	04 20 30.1332094	0.00021594	0.0073239	0.921	49914.7	49914.7	49914.7	1	8
ICRF J152433.4 − 301221	1521 − 300	15 24 33.41448621	−30 12 21.3405910	0.00015162	0.0049809	0.948	53134.5	53134.5	53134.5	1	17
ICRF J152502.9 + 110744	1522 + 113	15 25 02.93402258	11 07 44.0603393	0.00013683	0.0037991	−0.174	49914.7	49914.7	49914.7	1	13
ICRF J152615.0 − 042510	1523 − 042	15 26 15.01469930	−04 25 10.0592097	0.00008673	0.0021365	0.535	53561.9	53561.9	53561.9	1	30
ICRF J152659.4 − 135100	1524 − 136	15 26 59.44069997	−13 51 00.1637585	0.00016093	0.0038587	−0.332	50576.2	50576.2	50576.2	1	17
ICRF J152718.7 + 311524	1525 + 314	15 27 18.73704374	31 15 24.3861629	0.00007115	0.0010323	0.130	50219.8	50219.8	50219.8	1	37
ICRF J153016.2 + 375831	1528 + 381	15 30 16.25221108	37 58 31.1652711	0.00007034	0.0013800	−0.639	54112.8	54112.8	54112.8	1	24
ICRF J153133.5 + 720641	1531 + 722	15 31 33.57848153	72 06 41.2271401	0.00012359	0.0005219	0.413	49827.5	49827.5	49827.5	1	94
ICRF J153202.5 − 271637	1529 − 271	15 32 02.57169258	−27 16 37.9188587	0.00002903	0.0010004	−0.413	53560.8	53560.8	53560.8	1	50
ICRF J153243.3 + 675514	1532 + 680	15 32 43.34219784	67 55 14.0099165	0.00080312	0.0065434	0.946	53662.0	49827.5	54088.1	2	20
ICRF J153245.3 − 131910	1529 − 131	15 32 45.37476882	−13 19 10.0862059	0.00002875	0.0008574	0.028	53573.0	53573.0	53573.0	1	67
ICRF J153246.3 + 234405	1530 + 239	15 32 46.34520969	23 44 05.2682470	0.00001155	0.0002854	0.040	53126.1	53126.1	53126.1	1	90
ICRF J153314.2 − 042116	1530 − 041	15 33 14.20533366	−04 21 16.6287101	0.00004003	0.0014707	0.106	53523.9	53523.9	53523.9	1	28
ICRF J153423.5 − 221854	1531 − 221	15 34 23.52795100	−22 18 54.3415506	0.00009042	0.0030718	−0.362	53554.8	53552.8	53561.9	2	36
ICRF J153514.6 + 483659	1533 + 487	15 35 14.65336322	48 36 59.6948622	0.00020569	0.0012190	−0.466	50306.3	50306.3	50306.3	1	26

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J153516.5 + 195450	1533 + 200	15 35 16.53387405	19 54 50.9050393	0.00014698	0.0022817	0.045	53134.5	53134.5	53134.5	1	19
ICRF J153552.0 + 495739	1534 + 501	15 35 52.03896163	49 57 39.0795183	0.00006149	0.0008663	−0.642	50306.3	50306.3	50306.3	1	46
ICRF J153556.1 + 832615	1541 + 835	15 35 56.12668366	83 26 15.2467937	0.00038981	0.0007616	−0.612	53560.8	53560.8	53560.8	1	49
ICRF J153613.8 + 383328	1534 + 387	15 36 13.84617958	38 33 28.6059502	0.00002707	0.0005189	−0.127	53523.9	53523.9	53523.9	1	69
ICRF J153654.4 − 315115	1533 − 316	15 36 54.49825639	−31 51 15.1354577	0.00009361	0.0033832	−0.765	53465.0	53126.1	53503.7	2	39
ICRF J153741.5 − 152712	1534 − 152	15 37 41.57313350	−15 27 12.4998620	0.00001286	0.0004530	−0.292	53540.4	53523.9	53560.8	2	159
ICRF J153820.3 − 034614	1535 − 036	15 38 20.35160307	−03 46 14.3129100	0.00031362	0.0059739	0.704	53153.2	53153.2	53153.2	1	9
ICRF J153905.2 + 053438	1536 + 057	15 39 05.20652735	05 34 38.4381182	0.00033516	0.0068668	0.828	53561.9	53561.9	53561.9	1	10
ICRF J153910.1 + 043051	1536 + 046	15 39 10.10497763	04 30 51.2298671	0.00001652	0.0005081	−0.068	53126.1	53126.1	53126.1	1	63
ICRF J153916.1 + 310407	1537 + 312	15 39 16.17446096	31 04 07.6741353	0.00006748	0.0009767	−0.287	53573.0	53573.0	53573.0	1	52
ICRF J153925.0 + 160400	1537 + 162	15 39 25.09904504	16 04 00.3404309	0.00003034	0.0008450	−0.138	50139.3	50085.5	50156.3	2	104
ICRF J153939.1 + 274438	1537 + 279	15 39 39.13710673	27 44 38.2143684	0.00004015	0.0012217	−0.303	50219.8	50219.8	50219.8	1	46
ICRF J154003.1 − 082325	1537 − 082	15 40 03.15245985	−08 23 25.5029217	0.00016210	0.0031485	0.085	53560.8	53560.8	53560.8	1	15
ICRF J154034.5 − 390617	1537 − 389	15 40 34.55079295	−39 06 17.7494970	0.00100271	0.0431424	−0.256	53552.8	53552.8	53552.8	1	4
ICRF J154200.0 − 111852	1539 − 111	15 42 00.03426169	−11 18 52.9044996	0.00010289	0.0024854	0.013	53561.9	53561.9	53561.9	1	30
ICRF J154256.9 + 612955	1542 + 616	15 42 56.94376405	61 29 55.3456743	0.00040846	0.0020561	−0.740	53503.7	53503.7	53503.7	1	18
ICRF J154301.6 − 075706	1540 − 077	15 43 01.68756006	−07 57 06.6299321	0.00014446	0.0023468	0.756	50576.2	50576.2	50576.2	1	21
ICRF J154405.6 + 324048	1542 + 328	15 44 05.65663413	32 40 48.3209937	0.00002781	0.0005852	−0.499	50219.8	50219.8	50219.8	1	77
ICRF J154414.1 − 231201	1541 − 230	15 44 14.17803774	−23 12 01.3471102	0.00020543	0.0074476	0.869	53573.0	53573.0	53573.0	1	20
ICRF J154459.4 + 040746	1542 + 042	15 44 59.42730546	04 07 46.3564973	0.00008977	0.0022718	−0.275	49914.7	49914.7	49914.7	1	35
ICRF J154502.8 + 513500	1543 + 517	15 45 02.82368175	51 35 00.8731988	0.00001862	0.0003416	−0.298	49828.0	49577.0	50306.3	2	186
ICRF J154508.5 + 475154	1543 + 480	15 45 08.52982479	47 51 54.6640193	0.00004029	0.0006147	−0.435	50306.3	50306.3	50306.3	1	47
ICRF J154543.8 + 540042	1544 + 541	15 45 43.82575612	54 00 42.7596859	0.00009542	0.0014579	−0.107	53560.8	53560.8	53560.8	1	28
ICRF J154609.5 + 002624	1543 + 005	15 46 09.53145924	00 26 24.6139961	0.00001544	0.0004965	0.008	49914.7	49914.7	49914.7	1	117
ICRF J154741.2 − 094333	1544 − 095	15 47 41.28571021	−09 43 33.0007368	0.00007415	0.0019588	−0.297	53561.9	53561.9	53561.9	1	32
ICRF J154812.9 − 121331	1545 − 120	15 48 12.93930469	−12 13 31.3230637	0.00014382	0.0025521	0.658	50576.2	50576.2	50576.2	1	26
ICRF J155029.8 − 053811	1547 − 054	15 50 29.84754924	−05 38 11.0150884	0.00019836	0.0046067	−0.367	53573.0	53573.0	53573.0	1	29
ICRF J155043.5 + 112047	1548 + 114	15 50 43.59477275	11 20 47.4553029	0.00003112	0.0009932	−0.413	53134.5	53134.5	53134.5	1	65
ICRF J155114.5 − 175502	1548 − 177	15 51 14.59824793	−17 55 02.3270908	0.00017075	0.0052376	−0.349	53153.2	53153.2	53153.2	1	15
ICRF J155158.2 + 580644	1550 + 582	15 51 58.20783817	58 06 44.4537409	0.00010316	0.0016226	−0.211	49577.0	49577.0	49577.0	1	43
ICRF J155203.2 + 085047	1549 + 089	15 52 03.26163998	08 50 47.3353877	0.00003630	0.0009838	−0.334	53560.8	53560.8	53560.8	1	43
ICRF J155331.6 − 242206	1550 − 242	15 53 31.62781211	−24 22 06.0354224	0.00000804	0.0002595	−0.047	50713.3	50632.3	54907.7	4	155
ICRF J155530.7 − 032649	1552 − 033	15 55 30.74815106	−03 26 49.5199764	0.00001626	0.0005407	0.031	50576.2	50576.2	50576.2	1	72
ICRF J155543.0 + 111124	1553 + 113	15 55 43.04401221	11 11 24.3658424	0.00002472	0.0007461	−0.037	49914.7	49914.7	49914.7	1	100
ICRF J155654.8 + 182513	1554 + 185	15 56 54.81670401	18 25 13.5763950	0.00040271	0.0041075	0.072	53573.0	53573.0	53573.0	1	9

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J155752.7 + 025327	1555 + 030	15 57 52.76342406	02 53 27.8785806	0.00011552	0.0046242	−0.471	53560.8	53560.8	53560.8	1	17
ICRF J155848.2 + 562514	1557 + 565	15 58 48.28890536	56 25 14.1196523	0.00004029	0.0004055	−0.023	53126.1	53126.1	53126.1	1	67
ICRF J155901.7 + 592421	1558 + 595	15 59 01.70337503	59 24 21.8420484	0.00214595	0.0114536	0.729	53561.9	53561.9	53561.9	1	6
ICRF J155949.6 − 053122	1557 − 053	15 59 49.64212220	−05 31 22.5611231	0.00098871	0.0370818	0.479	53573.0	53573.0	53573.0	1	3
ICRF J160056.4 − 072205	1558 − 072	16 00 56.47654913	−07 22 05.2243854	0.00006220	0.0022938	0.751	53153.2	53153.2	53153.2	1	26
ICRF J160154.5 + 135710	1559 + 140	16 01 54.53723151	13 57 10.7632128	0.00011036	0.0026477	0.015	53560.8	53560.8	53560.8	1	20
ICRF J160213.8 + 241837	1600 + 244	16 02 13.83831433	24 18 37.7947394	0.00007186	0.0012495	−0.343	54088.1	54088.1	54088.1	1	23
ICRF J160318.7 − 100721	1600 − 099	16 03 18.77828831	−10 07 21.2956103	0.00002033	0.0007189	−0.420	53153.2	53153.2	53153.2	1	62
ICRF J160338.0 + 155402	1601 + 160	16 03 38.06194126	15 54 02.3552149	0.00076810	0.0110326	0.830	50156.3	50156.3	50156.3	1	5
ICRF J160355.9 + 573054	1602 + 576	16 03 55.93158778	57 30 54.4119609	0.00019814	0.0018387	−0.646	49577.0	49577.0	49577.0	1	35
ICRF J160401.4 − 222340	1601 − 222	16 04 01.47173481	−22 23 40.9869997	0.00003467	0.0011744	0.515	50656.5	50632.3	50688.3	2	97
ICRF J160449.9 + 192620	1602 + 195	16 04 49.99376647	19 26 20.9415503	0.00006064	0.0012822	0.131	53561.9	53561.9	53561.9	1	35
ICRF J160533.0 + 300129	1603 + 301	16 05 33.04803954	30 01 29.7021840	0.00004225	0.0008048	−0.650	50219.8	50219.8	50219.8	1	59
ICRF J160608.5 + 312446	1604 + 315	16 06 08.51839276	31 24 46.4578362	0.00001606	0.0003650	−0.461	50219.8	50219.8	50219.8	1	87
ICRF J160616.0 + 181459	1604 + 183	16 06 16.02782509	18 14 59.8193827	0.00004904	0.0018612	−0.795	53573.0	53573.0	53573.0	1	57
ICRF J160658.3 + 271705	1604 + 274	16 06 58.30034561	27 17 05.5829762	0.00003234	0.0007356	−0.757	50219.8	50219.8	50219.8	1	58
ICRF J160706.4 + 155134	1604 + 159	16 07 06.43043506	15 51 34.4849749	0.00002523	0.0007153	−0.258	50122.2	50085.5	50156.3	2	139
ICRF J160807.0 − 162500	1605 − 162	16 08 07.02100957	−16 25 00.0601008	0.00023795	0.0123700	−0.732	54088.1	54088.1	54088.1	1	13
ICRF J160820.7 + 561356	1607 + 563	16 08 20.75223761	56 13 56.3691102	0.00026679	0.0044253	−0.817	49577.0	49577.0	49577.0	1	24
ICRF J160822.1 + 401217	1606 + 403	16 08 22.15769751	40 12 17.8327063	0.00004096	0.0007130	−0.438	53503.7	53503.7	53503.7	1	31
ICRF J160934.9 − 220546	1606 − 219	16 09 34.93271244	−22 05 46.6082576	0.00023124	0.0065002	−0.488	53561.9	53561.9	53561.9	1	14
ICRF J160938.7 − 054724	1606 − 056	16 09 38.75001785	−05 47 24.5776085	0.00033576	0.0098755	−0.335	53560.8	53560.8	53560.8	1	5
ICRF J161149.0 + 185638	1609 + 190	16 11 49.04753945	18 56 38.1070618	0.00002001	0.0005867	−0.362	50126.2	50085.5	50156.3	2	181
ICRF J161531.0 + 213011	1613 + 216	16 15 31.09386726	21 30 11.0942118	0.00061487	0.0082384	0.759	50146.9	50085.5	50156.3	2	15
ICRF J161603.7 + 463225	1614 + 466	16 16 03.76672587	46 32 25.2392997	0.00003208	0.0005741	0.149	53560.8	53560.8	53560.8	1	65
ICRF J161655.5 + 362134	1615 + 364	16 16 55.58003522	36 21 34.5010340	0.00010049	0.0009559	0.266	50242.8	50242.8	50242.8	1	42
ICRF J161705.9 − 112238	1614 − 112	16 17 05.99474530	−11 22 38.6166936	0.00022470	0.0046233	0.166	53573.0	53573.0	53573.0	1	14
ICRF J161713.5 + 040841	1614 + 042	16 17 13.58878279	04 08 41.7005079	0.00052771	0.0087992	−0.501	53561.9	53561.9	53561.9	1	5
ICRF J161727.0 − 194132	1614 − 195	16 17 27.09321970	−19 41 32.0187641	0.00009123	0.0035875	−0.643	53153.2	53153.2	53153.2	1	16
ICRF J161916.6 − 181721	1616 − 181	16 19 16.68117658	−18 17 21.7017623	0.00004211	0.0014167	−0.538	53560.8	53560.8	53560.8	1	45
ICRF J162233.9 + 142620	1620 + 145	16 22 33.99578015	14 26 20.5974830	0.00002146	0.0004830	0.273	53134.5	53134.5	53134.5	1	61
ICRF J162304.5 + 662401	1622 + 665	16 23 04.52163425	66 24 01.0789046	0.00009061	0.0008876	0.244	49827.5	49827.5	49827.5	1	66
ICRF J162307.6 + 390932	1621 + 392	16 23 07.62237305	39 09 32.4112706	0.00001828	0.0003998	−0.099	50242.8	50242.8	50242.8	1	78
ICRF J162358.2 + 074130	1621 + 078	16 23 58.25175795	07 41 30.5447583	0.00060668	0.0160926	0.816	49914.7	49914.7	49914.7	1	5
ICRF J162407.7 + 054324	1621 + 058	16 24 07.73388883	05 43 24.2447773	0.00001325	0.0004276	0.033	53126.1	53126.1	53126.1	1	79

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J162432.1 + 565228	1623 + 569	16 24 32.17956980	56 52 28.0011704	0.00007805	0.0017567	0.121	49577.0	49577.0	49577.0	1	57
ICRF J162432.9 − 064949	1621 − 067	16 24 32.92654459	−06 49 49.6297514	0.00021663	0.0037595	0.863	50576.2	50576.2	50576.2	1	24
ICRF J162637.2 + 580917	1625 + 582	16 26 37.23652420	58 09 17.6672508	0.00005855	0.0009500	−0.507	53891.9	49577.0	54088.1	2	46
ICRF J162815.2 + 224757	1626 + 229	16 28 15.23991079	22 47 57.3127500	0.00043673	0.0141512	−0.871	50129.8	50085.5	50156.3	2	8
ICRF J162846.6 − 141541	1625 − 141	16 28 46.61977569	−14 15 41.8878841	0.00004107	0.0012173	−0.408	50576.2	50576.2	50576.2	1	47
ICRF J162848.4 − 004139	1626 − 005	16 28 48.46771317	−00 41 39.7046224	0.00006796	0.0018397	0.007	53523.9	53523.9	53523.9	1	37
ICRF J162951.8 + 675714	1629 + 680	16 29 51.83809698	67 57 14.9787584	0.00020822	0.0043515	−0.133	52585.9	49827.5	54112.8	3	24
ICRF J163041.8 + 070109	1628 + 071	16 30 41.81713882	07 01 09.1066693	0.00013414	0.0021088	0.072	53561.9	53561.9	53561.9	1	16
ICRF J163116.5 + 492739	1629 + 495	16 31 16.53990059	49 27 39.5156732	0.00002902	0.0004902	−0.289	50306.3	50306.3	50306.3	1	64
ICRF J163250.1 − 105231	1630 − 107	16 32 50.10968617	−10 52 31.9955920	0.00019794	0.0048962	−0.606	53561.9	53561.9	53561.9	1	16
ICRF J163257.6 − 003321	1630 − 004	16 32 57.68136714	−00 33 21.0767455	0.00006268	0.0025748	−0.296	53560.8	53560.8	53560.8	1	28
ICRF J163328.8 − 255735	1630 − 258	16 33 28.89063445	−25 57 35.4775335	0.00019028	0.0056974	0.122	53573.0	53573.0	53573.0	1	32
ICRF J163412.7 + 320335	1632 + 321	16 34 12.78980694	32 03 35.4247510	0.00001821	0.0005116	0.171	53126.1	53126.1	53126.1	1	72
ICRF J163430.3 − 205825	1631 − 208	16 34 30.32375315	−20 58 25.9379479	0.00004265	0.0014008	0.618	53552.8	53552.8	53552.8	1	53
ICRF J163537.6 + 595515	1634 + 600	16 35 37.64870719	59 55 15.0774898	0.00005255	0.0006654	−0.017	54112.8	54112.8	54112.8	1	53
ICRF J163537.6 + 601956	1634 + 604	16 35 37.65472878	60 19 56.7469890	0.00026527	0.0040458	0.800	53394.1	49577.0	54088.1	2	26
ICRF J163615.8 − 131532	1633 − 131	16 36 15.86098120	−13 15 32.6945375	0.00007611	0.0018451	0.160	53560.8	53560.8	53560.8	1	37
ICRF J163736.5 − 330904	1634 − 330	16 37 36.53587585	−33 09 04.8359473	0.00014579	0.0075709	−0.302	53153.2	53153.2	53153.2	1	19
ICRF J163819.2 − 034005	1635 − 035	16 38 19.25195693	−03 40 05.0874017	0.00002527	0.0007250	0.300	50576.2	50576.2	50576.2	1	70
ICRF J163845.2 − 141550	1635 − 141	16 38 45.28496140	−14 15 50.2376395	0.00004740	0.0013629	−0.581	50576.2	50576.2	50576.2	1	35
ICRF J163925.0 + 863153	1654 + 866	16 39 25.02119433	86 31 53.1256876	0.00507387	0.0039574	−0.724	52409.7	52409.7	52409.7	1	13
ICRF J163939.8 + 535747	1638 + 540	16 39 39.84292727	53 57 47.1189716	0.00013296	0.0017319	0.552	49577.0	49577.0	49577.0	1	51
ICRF J164010.5 − 001147	1637 − 001	16 40 10.58619882	−00 11 47.5448382	0.00004243	0.0010960	0.003	53560.8	53560.8	53560.8	1	43
ICRF J164047.9 + 122002	1638 + 124	16 40 47.93884092	12 20 02.0791715	0.00002411	0.0006117	−0.309	49914.7	49914.7	49914.7	1	104
ICRF J164240.4 + 252307	1640 + 254	16 42 40.41183851	25 23 07.6819503	0.00001654	0.0003877	−0.388	50219.8	50219.8	50219.8	1	82
ICRF J164259.3 − 284957	1639 − 287	16 42 59.37159823	−28 49 57.9467400	0.00174644	0.0203990	0.732	53561.9	53561.9	53561.9	1	5
ICRF J164416.3 + 072033	1641 + 074	16 44 16.32970415	07 20 33.7593057	0.00012403	0.0047306	−0.686	49914.7	49914.7	49914.7	1	27
ICRF J164435.7 − 180432	1641 − 179	16 44 35.74680889	−18 04 32.4597205	0.00015403	0.0052460	−0.327	53153.2	53153.2	53153.2	1	15
ICRF J164452.4 + 181317	1642 + 183	16 44 52.43240828	18 13 17.2384601	0.00005451	0.0019261	−0.768	50138.4	50085.5	50156.3	2	75
ICRF J164459.0 + 253630	1642 + 256	16 44 59.06085245	25 36 30.5878753	0.00005347	0.0008057	−0.529	50219.8	50219.8	50219.8	1	47
ICRF J164558.5 + 633010	1645 + 635	16 45 58.55270351	63 30 10.9226198	0.00009872	0.0009595	0.417	49827.5	49827.5	49827.5	1	48
ICRF J164615.1 + 741910	1647 + 744	16 46 15.16446332	74 19 10.9403717	0.00525458	0.0832785	0.892	53523.9	53523.9	53523.9	1	3
ICRF J164656.8 + 405917	1645 + 410	16 46 56.85870412	40 59 17.1720544	0.00000999	0.0002113	0.071	50242.8	50242.8	50242.8	1	90
ICRF J164734.9 + 495000	1646 + 499	16 47 34.91196443	49 50 00.5869743	0.00010081	0.0012611	−0.535	50306.3	50306.3	50306.3	1	36
ICRF J164829.2 + 410405	1646 + 411	16 48 29.25796892	41 04 05.5536134	0.00003326	0.0004643	−0.661	50242.8	50242.8	50242.8	1	68

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J164904.3 − 262008	1645 − 262	16 49 04.31529011	−26 20 08.6258920	0.00046465	0.0252591	0.341	53560.8	53560.8	53560.8	1	4
ICRF J164927.6 + 041203	1646 + 042	16 49 27.67946320	04 12 03.9874696	0.00004703	0.0013305	−0.712	49914.7	49914.7	49914.7	1	80
ICRF J164940.9 + 744244	1651 + 747	16 49 40.95338742	74 42 44.6206507	0.00028187	0.0013040	0.306	53552.8	53552.8	53552.8	1	23
ICRF J164950.4 + 062653	1647 + 065	16 49 50.49139557	06 26 53.4491930	0.00009940	0.0013130	0.331	49914.7	49914.7	49914.7	1	56
ICRF J165103.6 + 012923	1648 + 015	16 51 03.66237140	01 29 23.4588952	0.00001552	0.0005455	−0.492	49914.7	49914.7	49914.7	1	112
ICRF J165137.8 + 213524	1649 + 216	16 51 37.84392232	21 35 24.6555159	0.00053570	0.0045578	0.615	53561.9	53561.9	53561.9	1	6
ICRF J165201.4 + 061855	1649 + 063	16 52 01.40010059	06 18 55.3538804	0.00004602	0.0013522	−0.442	49914.7	49914.7	49914.7	1	39
ICRF J165329.9 + 310756	1651 + 312	16 53 29.91065562	31 07 56.8725490	0.00001564	0.0003481	−0.345	50219.8	50219.8	50219.8	1	86
ICRF J165518.7 + 423339	1653 + 426	16 55 18.79497316	42 33 39.8238334	0.00003111	0.0007891	−0.402	53573.0	53573.0	53573.0	1	80
ICRF J165634.0 + 182626	1654 + 185	16 56 34.08910319	18 26 26.3473990	0.00006579	0.0013792	0.132	50139.9	50085.5	50156.3	2	56
ICRF J165639.6 + 532148	1655 + 534	16 56 39.62417209	53 21 48.7714141	0.00004212	0.0006100	−0.374	54088.1	54088.1	54088.1	1	50
ICRF J165648.2 + 601216	1656 + 602	16 56 48.24498123	60 12 16.4345575	0.00003514	0.0004014	−0.020	53560.8	53560.8	53560.8	1	80
ICRF J165656.1 − 020649	1654 − 020	16 56 56.11813772	−02 06 49.5201001	0.00003022	0.0008507	−0.111	50576.2	50576.2	50576.2	1	48
ICRF J165720.7 + 570553	1656 + 571	16 57 20.70892983	57 05 53.5037054	0.00006569	0.0006879	0.005	49577.0	49577.0	49577.0	1	95
ICRF J165733.3 − 200434	1654 − 199	16 57 33.33472791	−20 04 34.9825374	0.00004102	0.0012447	−0.147	53529.1	53503.7	53561.9	2	64
ICRF J165746.8 + 480833	1656 + 482	16 57 46.87895357	48 08 33.0409718	0.00001682	0.0002891	−0.238	50306.3	50306.3	50306.3	1	64
ICRF J165924.1 + 262936	1657 + 265	16 59 24.14944383	26 29 36.9432564	0.00001909	0.0004153	−0.303	50219.8	50219.8	50219.8	1	77
ICRF J165944.9 + 021307	1657 + 022	16 59 44.99717792	02 13 07.0453770	0.00012082	0.0052658	−0.904	53573.0	53573.0	53573.0	1	42
ICRF J170009.2 + 683006	1700 + 685	17 00 09.29279221	68 30 06.9597512	0.00009115	0.0005125	0.384	53849.1	49827.5	54112.8	2	65
ICRF J170023.9 + 052244	1657 + 054	17 00 23.95599113	05 22 44.0948468	0.00001263	0.0003831	0.024	53134.5	53134.5	53134.5	1	81
ICRF J170121.3 + 033851	1658 + 037	17 01 21.37818104	03 38 51.1748407	0.00003321	0.0012178	−0.531	54088.1	54088.1	54088.1	1	40
ICRF J170126.8 − 190331	1658 − 189	17 01 26.89428073	−19 03 31.5755360	0.00005189	0.0019581	−0.063	53560.8	53560.8	53560.8	1	29
ICRF J170221.7 + 150206	1700 + 151	17 02 21.71814581	15 02 06.0816239	0.00016277	0.0030990	0.397	50145.7	50085.5	50156.3	2	20
ICRF J170405.0 − 131634	1701 − 132	17 04 05.08687561	−13 16 34.2342658	0.00023586	0.0033932	0.301	53153.2	53153.2	53153.2	1	12
ICRF J170407.4 + 013408	1701 + 016	17 04 07.48910458	01 34 08.4740833	0.00008229	0.0014473	−0.004	53561.9	53561.9	53561.9	1	32
ICRF J170526.4 + 510935	1704 + 512	17 05 26.41352013	51 09 35.3994634	0.00007822	0.0020512	−0.035	52209.6	50306.3	54112.8	2	22
ICRF J170620.4 + 120859	1704 + 122	17 06 20.49749552	12 08 59.7941906	0.00004761	0.0009250	0.292	53560.8	53560.8	53560.8	1	43
ICRF J170636.7 + 095359	1704 + 099	17 06 36.72730342	09 53 59.6387808	0.00005001	0.0013860	−0.230	53573.0	53573.0	53573.0	1	45
ICRF J170720.3 − 141523	1704 − 141	17 07 20.39055920	−14 15 23.1280739	0.00002566	0.0007574	−0.446	53503.7	53503.7	53503.7	1	72
ICRF J170753.7 + 184639	1705 + 188	17 07 53.74751547	18 46 39.0207375	0.00003463	0.0009309	−0.637	53561.9	53561.9	53561.9	1	51
ICRF J170801.2 + 334646	1706 + 338	17 08 01.25145362	33 46 46.3767458	0.00003166	0.0007992	−0.038	54088.1	54088.1	54088.1	1	46
ICRF J170844.6 + 003509	1706 + 006	17 08 44.64748645	00 35 09.5137617	0.00013810	0.0042318	−0.804	49914.7	49914.7	49914.7	1	31
ICRF J171017.2 − 035550	1707 − 038	17 10 17.20538013	−03 55 50.1287054	0.00001499	0.0004905	0.225	50576.2	50576.2	50576.2	1	71
ICRF J171140.5 + 541145	1710 + 542	17 11 40.50477589	54 11 45.1346369	0.00003288	0.0006816	−0.350	53573.0	53573.0	53573.0	1	82
ICRF J171148.9 − 333841	1708 − 335	17 11 48.99476875	−33 38 41.0227795	0.00087331	0.0314066	0.609	53552.8	53552.8	53552.8	1	3

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J171231.6 − 182002	1709 − 182	17 12 31.69728636	−18 20 02.7668100	0.00007660	0.0037688	−0.239	53561.9	53561.9	53561.9	1	25
ICRF J171331.2 − 265852	1710 − 269	17 13 31.27558558	−26 58 52.5264855	0.00000981	0.0003064	−0.161	50658.5	50632.3	50688.3	2	122
ICRF J171335.1 + 491632	1712 + 493	17 13 35.14761746	49 16 32.5365947	0.00003991	0.0005772	−0.209	50306.3	50306.3	50306.3	1	51
ICRF J171432.5 − 205354	1711 − 208	17 14 32.51298637	−20 53 54.2901567	0.00008498	0.0030657	−0.161	53523.9	53523.9	53523.9	1	27
ICRF J171456.5 − 055820	1712 − 059	17 14 56.57371568	−05 58 20.5947055	0.00002062	0.0006362	−0.406	53503.7	53503.7	53503.7	1	71
ICRF J171611.1 + 215213	1714 + 219	17 16 11.19074067	21 52 13.6667685	0.00011258	0.0015442	−0.436	50129.0	50085.5	50156.3	2	57
ICRF J171613.9 + 683638	1716 + 686	17 16 13.93800856	68 36 38.7446662	0.00004108	0.0003901	0.296	49827.5	49827.5	49827.5	1	118
ICRF J171626.4 − 045211	1713 − 048	17 16 26.48807577	−04 52 11.9451060	0.00001611	0.0005707	−0.193	53552.8	53552.8	53552.8	1	81
ICRF J171701.1 + 191740	1714 + 193	17 17 01.16594491	19 17 40.6558299	0.00001939	0.0005623	−0.335	53561.9	53561.9	53561.9	1	86
ICRF J171736.0 − 334208	1714 − 336	17 17 36.02909328	−33 42 08.8248676	0.00021238	0.0054556	0.005	53371.9	53134.5	53503.7	2	14
ICRF J171814.9 − 112044	1715 − 112	17 18 14.94816715	−11 20 44.9699071	0.00018975	0.0058375	0.086	53153.2	53153.2	53153.2	1	16
ICRF J171849.3 − 285041	1715 − 287	17 18 49.37959933	−28 50 41.0995402	0.00018322	0.0046290	0.716	53573.0	53573.0	53573.0	1	34
ICRF J171902.0 − 142019	1716 − 142	17 19 02.01996194	−14 20 19.0101893	0.00001905	0.0006561	−0.321	53552.8	53552.8	53552.8	1	72
ICRF J171910.9 + 065815	1716 + 070	17 19 10.93337300	06 58 15.7465825	0.00001079	0.0003360	−0.057	53126.1	53126.1	53126.1	1	89
ICRF J171938.2 + 480412	1718 + 481	17 19 38.24956879	48 04 12.2484004	0.00009175	0.0011223	−0.008	53560.8	53560.8	53560.8	1	30
ICRF J171952.2 + 081703	1717 + 083	17 19 52.20621337	08 17 03.5540032	0.00001042	0.0003546	0.013	49914.7	49914.7	49914.7	1	129
ICRF J172010.3 + 382556	1718 + 384	17 20 10.33481001	38 25 56.1637663	0.00003322	0.0007015	0.219	54112.8	54112.8	54112.8	1	53
ICRF J172059.6 − 083217	1718 − 084	17 20 59.68638280	−08 32 17.3311175	0.00038873	0.0171899	−0.748	53153.2	53153.2	53153.2	1	5
ICRF J172109.4 + 354216	1719 + 357	17 21 09.49103232	35 42 16.0635358	0.00002480	0.0006653	−0.370	50242.8	50242.8	50242.8	1	77
ICRF J172203.5 − 050325	1719 − 050	17 22 03.53850887	−05 03 25.0067978	0.00002317	0.0006525	−0.265	53503.7	53503.7	53503.7	1	67
ICRF J172240.0 + 610559	1722 + 611	17 22 40.05936155	61 05 59.7874250	0.00002400	0.0002307	−0.451	53267.2	49577.0	54088.1	4	116
ICRF J172242.1 + 281500	1720 + 282	17 22 42.16157802	28 15 00.0765911	0.00001788	0.0004731	−0.233	50219.8	50219.8	50219.8	1	78
ICRF J172244.5 + 101335	1720 + 102	17 22 44.58279344	10 13 35.7731179	0.00001585	0.0004035	0.098	53134.5	53134.5	53134.5	1	83
ICRF J172252.9 + 245834	1720 + 250	17 22 52.98989075	24 58 34.6912082	0.00010083	0.0034931	0.252	50219.8	50219.8	50219.8	1	22
ICRF J172314.1 + 654746	1723 + 658	17 23 14.13815121	65 47 46.1779329	0.00014365	0.0014296	−0.363	53560.8	53560.8	53560.8	1	33
ICRF J172359.4 + 765311	1726 + 769	17 23 59.44510137	76 53 11.5516479	0.00007955	0.0003912	0.519	49827.5	49827.5	49827.5	1	110
ICRF J172405.4 + 400436	1722 + 401	17 24 05.42883756	40 04 36.4568820	0.00001830	0.0003038	−0.587	50290.5	50242.8	54482.7	2	89
ICRF J172441.4 + 605555	1724 + 609	17 24 41.41504777	60 55 55.7276820	0.00016562	0.0011311	−0.518	52861.5	49577.0	54112.8	2	29
ICRF J172446.9 − 144359	1721 − 146	17 24 46.96655575	−14 43 59.7611892	0.00001443	0.0004560	0.090	53552.8	53552.8	53552.8	1	90
ICRF J172624.7 + 050442	1723 + 051	17 26 24.78346195	05 04 42.6743981	0.00008472	0.0018351	0.145	53560.8	53560.8	53560.8	1	25
ICRF J172635.1 + 321323	1724 + 322	17 26 35.12469032	32 13 23.0221116	0.00002291	0.0006449	−0.220	53573.0	53573.0	53573.0	1	72
ICRF J172644.9 + 063918	1724 + 066	17 26 44.94529013	06 39 18.5096202	0.00001453	0.0004827	−0.136	53561.9	53561.9	53561.9	1	90
ICRF J172658.9 − 225801	1723 − 229	17 26 58.90450573	−22 58 01.5489316	0.00004313	0.0014151	0.038	53503.7	53503.7	53503.7	1	47
ICRF J172723.4 + 551053	1726 + 552	17 27 23.46923269	55 10 53.5369812	0.00008389	0.0012080	−0.519	49577.0	49577.0	49577.0	1	72
ICRF J172850.2 − 035050	1726 − 038	17 28 50.23511108	−03 50 50.4355771	0.00003725	0.0009363	0.643	50576.2	50576.2	50576.2	1	46

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J172859.1 + 383826	1727 + 386	17 28 59.14138874	38 38 26.4479337	0.00002357	0.0004382	0.287	53134.5	53134.5	53134.5	1	67
ICRF J172908.2 − 265750	1726 − 269	17 29 08.21657043	−26 57 50.7419960	0.00014968	0.0048785	−0.124	54088.1	54088.1	54088.1	1	22
ICRF J173033.0 − 051508	1727 − 052	17 30 33.07601869	−05 15 08.0750594	0.00018899	0.0046356	0.340	54112.8	54112.8	54112.8	1	17
ICRF J173034.9 + 002438	1728 + 004	17 30 34.99945638	00 24 38.6919875	0.00005360	0.0023136	−0.537	53126.1	53126.1	53126.1	1	32
ICRF J173315.1 − 372232	1729 − 373	17 33 15.19301090	−37 22 32.3959728	0.00006105	0.0021536	0.263	52169.7	49650.8	52409.7	3	29
ICRF J173458.3 + 092658	1732 + 094	17 34 58.37698621	09 26 58.2601461	0.00003115	0.0007081	−0.194	49914.7	49914.7	49914.7	1	71
ICRF J173510.4 + 080831	1732 + 081	17 35 10.44551078	08 08 31.0633280	0.00002673	0.0007587	0.298	53560.8	53560.8	53560.8	1	55
ICRF J173526.7 − 055950	1732 − 059	17 35 26.78452413	−05 59 50.2163195	0.00008709	0.0025826	−0.170	53561.9	53561.9	53561.9	1	24
ICRF J173702.0 − 225155	1734 − 228	17 37 02.03341110	−22 51 55.3895477	0.00034861	0.0090578	0.641	54112.8	54112.8	54112.8	1	11
ICRF J173811.6 − 150300	1735 − 150	17 38 11.63558216	−15 03 00.5974122	0.00005290	0.0015878	−0.664	53573.0	53573.0	53573.0	1	59
ICRF J173935.3 + 335808	1737 + 339	17 39 35.36252553	33 58 08.1940592	0.00002271	0.0004838	−0.434	50219.8	50219.8	50219.8	1	119
ICRF J174001.5 − 081114	1737 − 081	17 40 01.56622041	−08 11 14.7820580	0.00003528	0.0013020	−0.728	53523.9	53523.9	53523.9	1	40
ICRF J174005.8 + 221100	1737 + 222	17 40 05.86287581	22 11 00.9735897	0.00003641	0.0012085	−0.264	50136.0	50085.5	50156.3	2	87
ICRF J174006.3 + 450650	1738 + 451	17 40 06.37261029	45 06 50.3710270	0.00001845	0.0003259	−0.545	50306.3	50306.3	50306.3	1	67
ICRF J174026.9 + 194319	1738 + 197	17 40 26.97051918	19 43 19.6798499	0.00006154	0.0012269	−0.043	54088.1	54088.1	54088.1	1	26
ICRF J174037.1 + 031147	1738 + 032	17 40 37.19900343	03 11 47.8383535	0.00011046	0.0014578	−0.153	53528.7	53503.7	53560.8	2	32
ICRF J174048.9 + 434816	1739 + 438	17 40 48.95053865	43 48 16.1508122	0.00003391	0.0005368	−0.552	50242.8	50242.8	50242.8	1	72
ICRF J174134.8 + 475132	1740 + 478	17 41 34.82194177	47 51 32.5365686	0.00005916	0.0007196	−0.432	50306.3	50306.3	50306.3	1	51
ICRF J174211.6 − 151729	1739 − 152	17 42 11.66286776	−15 17 29.1596431	0.00002869	0.0011734	−0.165	53554.6	53552.8	53561.9	2	44
ICRF J174259.5 − 190308	1740 − 190	17 42 59.54975940	−19 03 08.5408103	0.00092258	0.0157760	0.486	53503.7	53503.7	53503.7	1	4
ICRF J174347.6 + 374753	1742 + 378	17 43 47.64631987	37 47 53.8301440	0.00002294	0.0004385	−0.552	50242.8	50242.8	50242.8	1	72
ICRF J174357.8 + 193509	1741 + 196	17 43 57.83270386	19 35 09.0175767	0.00020109	0.0018006	0.116	53573.0	53573.0	53573.0	1	28
ICRF J174425.0 + 401448	1742 + 402	17 44 25.09585938	40 14 48.1410625	0.00025334	0.0019875	−0.035	50242.8	50242.8	50242.8	1	21
ICRF J174447.6 − 084914	1742 − 088	17 44 47.60189563	−08 49 14.3300769	0.00022344	0.0058317	−0.070	54112.8	54112.8	54112.8	1	8
ICRF J174504.6 + 225248	1742 + 228	17 45 04.66885042	22 52 48.0772880	0.00003063	0.0008944	0.064	50133.1	50085.5	50156.3	2	116
ICRF J174555.9 + 181450	1743 + 182	17 45 55.92743283	18 14 50.4202098	0.00004385	0.0016298	−0.092	50130.5	50085.5	50156.3	2	52
ICRF J174648.2 + 260320	1744 + 260	17 46 48.27890022	26 03 20.3541884	0.00002127	0.0005654	−0.250	53560.8	53560.8	53560.8	1	65
ICRF J174805.8 + 340401	1746 + 340	17 48 05.81967874	34 04 01.1806379	0.00001830	0.0005457	−0.339	50219.8	50219.8	50219.8	1	120
ICRF J174806.2 + 083219	1745 + 085	17 48 06.26040885	08 32 19.2853684	0.00003912	0.0015646	−0.629	54088.1	54088.1	54088.1	1	28
ICRF J174900.3 + 432151	1747 + 433	17 49 00.36039631	43 21 51.2869533	0.00001964	0.0003445	−0.447	50242.8	50242.8	50242.8	1	82
ICRF J174905.4 + 194408	1746 + 197	17 49 05.47374100	19 44 08.8396457	0.00005692	0.0014731	0.259	50145.6	50085.5	50156.3	2	53
ICRF J175142.6 + 292050	1749 + 293	17 51 42.68393999	29 20 50.2021485	0.00001884	0.0004059	−0.031	53126.1	53126.1	53126.1	1	65
ICRF J175211.6 + 731120	1753 + 731	17 52 11.69252675	73 11 20.5448741	0.00013455	0.0007595	0.321	53560.8	53560.8	53560.8	1	48
ICRF J175214.6 + 061148	1749 + 062	17 52 14.66875807	06 11 48.1552267	0.00002107	0.0007301	0.041	53573.0	53573.0	53573.0	1	75
ICRF J175233.1 − 295644	1749 − 299	17 52 33.10692495	−29 56 44.8974049	0.00081485	0.0193091	−0.112	53552.8	53552.8	53552.8	1	6

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J175236.9 − 101144	1749 − 101	17 52 36.97411880	−10 11 44.7316252	0.00006357	0.0016985	−0.291	50576.2	50576.2	50576.2	1	45
ICRF J175246.0 + 173420	1750 + 175	17 52 46.00290187	17 34 20.3498184	0.00002013	0.0007051	−0.227	50130.6	50085.5	50156.3	2	157
ICRF J175309.0 − 184338	1750 − 187	17 53 09.08867831	−18 43 38.5272339	0.00011252	0.0034751	0.533	53759.1	53503.7	54112.8	2	31
ICRF J175407.5 + 645202	1753 + 648	17 54 07.58976854	64 52 02.6311668	0.00028841	0.0033683	−0.171	49827.5	49827.5	49827.5	1	28
ICRF J175526.2 − 223210	1752 − 225	17 55 26.28477177	−22 32 10.6166169	0.00017740	0.0036245	−0.087	53134.5	53134.5	53134.5	1	13
ICRF J175625.8 − 142709	1753 − 144	17 56 25.86234331	−14 27 09.5530763	0.00135056	0.0630105	−0.977	54088.1	54088.1	54088.1	1	10
ICRF J175758.8 + 053148	1755 + 055	17 57 58.82500070	05 31 48.0234394	0.00013527	0.0056784	0.035	53126.1	53126.1	53126.1	1	11
ICRF J175834.1 + 061032	1756 + 061	17 58 34.11763141	06 10 32.9709231	0.00008433	0.0032665	−0.846	53573.0	53573.0	53573.0	1	43
ICRF J180104.2 + 043818	1758 + 046	18 01 04.24178382	04 38 18.2043423	0.00002748	0.0008652	0.024	53134.5	53134.5	53134.5	1	50
ICRF J180225.1 + 455734	1801 + 459	18 02 25.14267573	45 57 34.6353098	0.00014536	0.0015349	0.186	50306.3	50306.3	50306.3	1	27
ICRF J180309.4 − 043302	1800 − 045	18 03 09.42713760	−04 33 02.8135814	0.00061919	0.0206082	0.259	53503.7	53503.7	53503.7	1	3
ICRF J180415.9 + 010132	1801 + 010	18 04 15.98458653	01 01 32.4072284	0.00005757	0.0012857	−0.050	50027.3	49914.7	54643.7	2	42
ICRF J180531.1 − 043809	1802 − 046	18 05 31.11612529	−04 38 09.6957441	0.00125250	0.0143882	0.420	53126.1	53126.1	53126.1	1	3
ICRF J180547.4 + 171455	1803 + 172	18 05 47.43634050	17 14 55.9214451	0.00002731	0.0007052	−0.033	53560.8	53560.8	53560.8	1	74
ICRF J180619.9 + 614118	1805 + 616	18 06 19.94589150	61 41 18.3296786	0.00020804	0.0011158	−0.006	49702.2	49577.0	49827.5	2	30
ICRF J180731.7 + 310621	1805 + 310	18 07 31.75809668	31 06 21.5794019	0.00011580	0.0027319	−0.673	53573.0	53573.0	53573.0	1	10
ICRF J180738.8 + 220456	1805 + 220	18 07 38.80615451	22 04 56.4109735	0.00002618	0.0006090	−0.226	53561.9	53561.9	53561.9	1	75
ICRF J180740.6 − 250625	1804 − 251	18 07 40.68769551	−25 06 25.9440556	0.00014653	0.0037271	0.058	53134.5	53134.5	53134.5	1	18
ICRF J180911.9 + 275811	1807 + 279	18 09 11.97859851	27 58 11.7998462	0.00001208	0.0003512	−0.162	50219.8	50219.8	50219.8	1	135
ICRF J181003.3 + 564922	1809 + 568	18 10 03.31918230	56 49 22.9683088	0.00009397	0.0011779	−0.645	49577.0	49577.0	49577.0	1	60
ICRF J181143.1 + 170457	1809 + 170	18 11 43.18347313	17 04 57.2573737	0.00001216	0.0003144	0.102	53136.6	53134.5	53306.8	2	82
ICRF J181240.1 − 283626	1809 − 286	18 12 40.19229677	−28 36 26.9421007	0.00008522	0.0036820	0.248	53503.7	53503.7	53503.7	1	46
ICRF J181257.6 + 560349	1812 + 560	18 12 57.66948319	56 03 49.2002134	0.00002190	0.0002532	−0.117	54088.1	54088.1	54088.1	1	68
ICRF J181314.6 + 430415	1811 + 430	18 13 14.68940809	43 04 15.6765187	0.00002334	0.0003524	−0.354	50242.8	50242.8	50242.8	1	81
ICRF J181333.4 + 061542	1811 + 062	18 13 33.41164190	06 15 42.0337231	0.00005434	0.0016389	−0.578	49914.7	49914.7	49914.7	1	48
ICRF J181337.2 + 295237	1811 + 298	18 13 37.26679767	29 52 37.8711932	0.00001875	0.0004766	−0.439	50219.8	50219.8	50219.8	1	120
ICRF J181536.7 + 612711	1815 + 614	18 15 36.79195261	61 27 11.6479650	0.00066488	0.0033896	0.441	49669.8	49577.0	49827.5	2	27
ICRF J181623.9 + 345745	1814 + 349	18 16 23.90081352	34 57 45.7487759	0.00027384	0.0040058	−0.091	50219.8	50219.8	50219.8	1	17
ICRF J181819.3 − 110848	1815 − 111	18 18 19.31353245	−11 08 48.3084858	0.00029289	0.0060195	−0.443	53126.1	53126.1	53126.1	1	6
ICRF J181830.5 + 501719	1817 + 502	18 18 30.51925226	50 17 19.7438458	0.00004028	0.0005380	−0.275	49945.0	49577.0	50306.3	2	109
ICRF J181917.4 − 025807	1816 − 029	18 19 17.40870716	−02 58 07.8698877	0.00012603	0.0019723	0.729	50576.2	50576.2	50576.2	1	31
ICRF J181926.5 + 384501	1817 + 387	18 19 26.54737811	38 45 01.7863328	0.00001613	0.0003788	−0.143	53134.5	53134.5	53134.5	1	81
ICRF J181938.2 + 154344	1817 + 157	18 19 38.28983570	15 43 44.7234879	0.00390396	0.0350477	−0.991	54088.1	54088.1	54088.1	1	4
ICRF J182111.8 − 050220	1818 − 050	18 21 11.80954336	−05 02 20.0864656	0.00007928	0.0019927	0.098	53503.7	53503.7	53503.7	1	42
ICRF J182159.4 + 681843	1822 + 682	18 21 59.49177810	68 18 43.0093873	0.00010317	0.0005906	0.656	53709.3	49827.5	54088.1	2	45

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J182159.7 + 394559	1820 + 397	18 21 59.70063426	39 45 59.6567118	0.00013609	0.0021766	−0.539	50242.8	50242.8	50242.8	1	36
ICRF J182209.9 + 160014	1819 + 159	18 22 09.96898304	16 00 14.8439931	0.00003596	0.0010082	0.126	50134.1	50085.5	50156.3	2	102
ICRF J182319.6 − 272626	1820 − 274	18 23 19.65968116	−27 26 26.6745555	0.00558866	0.1753559	−0.978	50632.3	50632.3	50632.3	1	3
ICRF J182403.9 + 112737	1821 + 114	18 24 03.94800122	11 27 37.7012822	0.00018433	0.0059025	−0.847	53573.0	53573.0	53573.0	1	28
ICRF J182448.1 + 011934	1822 + 012	18 24 48.14343153	01 19 34.2021136	0.00001075	0.0003281	−0.186	53134.5	53134.5	53134.5	1	86
ICRF J182537.6 − 073730	1822 − 076	18 25 37.60955203	−07 37 30.0129436	0.00007434	0.0016400	0.616	52359.3	52306.7	52409.7	2	45
ICRF J182541.5 + 575305	1824 + 578	18 25 41.59866083	57 53 05.9574212	0.00016439	0.0014149	0.333	53560.8	53560.8	53560.8	1	28
ICRF J182608.1 − 365049	1822 − 368	18 26 08.13486718	−36 50 49.7259656	0.00004665	0.0016482	−0.062	53153.2	53153.2	53153.2	1	22
ICRF J182617.7 + 183152	1824 + 185	18 26 17.71100186	18 31 52.8884242	0.00036030	0.0065890	−0.428	50141.4	50085.5	50156.3	2	19
ICRF J182620.5 − 292424	1823 − 294	18 26 20.59910539	−29 24 24.9519186	0.00003092	0.0009595	0.370	53533.0	53503.7	53561.9	2	115
ICRF J182625.0 + 014940	1823 + 017	18 26 25.06116954	01 49 40.1191973	0.00001481	0.0004525	−0.029	53552.8	53552.8	53552.8	1	90
ICRF J182659.9 + 343114	1825 + 344	18 26 59.98285205	34 31 14.1198898	0.00002092	0.0004761	−0.383	50219.8	50219.8	50219.8	1	103
ICRF J182710.2 − 453309	1823 − 455	18 27 10.23808726	−45 33 09.9626391	0.00006991	0.0022364	0.168	52306.7	52306.7	52306.7	1	18
ICRF J182720.1 + 263824	1825 + 266	18 27 20.13455553	26 38 24.1515108	0.00005146	0.0011370	0.156	54112.8	54112.8	54112.8	1	37
ICRF J182745.0 − 040544	1825 − 041	18 27 45.04056428	−04 05 44.5763583	0.00021683	0.0030324	0.177	50576.2	50576.2	50576.2	1	22
ICRF J182755.4 + 265805	1825 + 269	18 27 55.42496052	26 58 05.9178690	0.00004045	0.0010675	−0.732	50219.8	50219.8	50219.8	1	75
ICRF J182809.8 + 643416	1827 + 645	18 28 09.85758595	64 34 16.0335221	0.00021919	0.0016634	0.519	49827.5	49827.5	49827.5	1	31
ICRF J182931.7 + 484446	1828 + 487	18 29 31.78093439	48 44 46.1613921	0.00001764	0.0003317	−0.492	53552.8	53552.8	53552.8	1	80
ICRF J182956.5 + 395734	1828 + 399	18 29 56.52020563	39 57 34.7031713	0.00002911	0.0004752	−0.490	50242.8	50242.8	50242.8	1	120
ICRF J183005.9 + 061915	1827 + 062	18 30 05.93987008	06 19 15.9522754	0.00002510	0.0008156	−0.582	49914.7	49914.7	49914.7	1	82
ICRF J183114.8 + 290710	1829 + 290	18 31 14.85923409	29 07 10.2936371	0.00022048	0.0028192	−0.045	50219.8	50219.8	50219.8	1	15
ICRF J183118.8 + 220012	1829 + 219	18 31 18.89183617	22 00 12.3350150	0.00042851	0.0035410	−0.815	52069.1	50156.3	53503.7	2	21
ICRF J183240.0 + 011816	1830 + 012	18 32 40.09376297	01 18 16.4737465	0.00006373	0.0020930	−0.323	53126.1	53126.1	53126.1	1	20
ICRF J183241.9 + 073155	1830 + 074	18 32 41.98910191	07 31 55.1241981	0.00004273	0.0018462	−0.783	49914.7	49914.7	49914.7	1	79
ICRF J183307.7 + 011535	1830 + 011	18 33 07.76086623	01 15 35.3009664	0.00004264	0.0012495	−0.610	53523.9	53523.9	53523.9	1	38
ICRF J183414.0 − 030119	1831 − 030	18 34 14.07456938	−03 01 19.6270469	0.00007103	0.0012504	0.248	53134.5	53134.5	53134.5	1	30
ICRF J183427.3 + 050603	1831 + 050	18 34 27.31151004	05 06 03.9650366	0.00014302	0.0022646	−0.042	53560.8	53560.8	53560.8	1	22
ICRF J183503.3 + 324146	1833 + 326	18 35 03.38963121	32 41 46.8566903	0.00004483	0.0006215	0.003	50219.8	50219.8	50219.8	1	79
ICRF J183519.6 + 611940	1834 + 612	18 35 19.67526762	61 19 40.0142571	0.00006620	0.0008649	−0.139	49577.0	49577.0	49577.0	1	67
ICRF J183546.2 + 240750	1833 + 240	18 35 46.27247972	24 07 50.8301629	0.00001676	0.0004740	−0.290	53555.6	53552.8	53561.9	2	118
ICRF J183822.9 + 062808	1835 + 064	18 38 22.91200344	06 28 08.7094565	0.00016391	0.0066265	−0.174	49914.7	49914.7	49914.7	1	24
ICRF J183828.4 − 342741	1835 − 345	18 38 28.49688919	−34 27 41.7518321	0.00008610	0.0036619	−0.659	53523.9	53523.9	53523.9	1	25
ICRF J183848.8 + 040424	1836 + 040	18 38 48.82903678	04 04 24.6694078	0.00018408	0.0027055	−0.337	49914.7	49914.7	49914.7	1	30
ICRF J183854.8 + 092727	1836 + 094	18 38 54.83523926	09 27 27.8968033	0.00002793	0.0011948	−0.574	53126.1	53126.1	53126.1	1	52
ICRF J183905.8 + 410059	1837 + 409	18 39 05.80333657	41 00 59.0928119	0.00031352	0.0055978	0.204	54112.8	54112.8	54112.8	1	10

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J184057.3 + 545215	1839 + 548	18 40 57.37668481	54 52 15.9101301	0.00004633	0.0005826	−0.112	53422.2	49577.0	54088.1	3	76
ICRF J184307.9 + 444951	1841 + 447	18 43 07.91745863	44 49 51.5228863	0.00015276	0.0013444	−0.179	53126.1	53126.1	53126.1	1	25
ICRF J184407.2 + 131228	1841 + 131	18 44 07.26258782	13 12 28.0391409	0.00013743	0.0030436	−0.762	50137.3	50085.5	50156.3	2	41
ICRF J184535.1 + 354116	1843 + 356	18 45 35.10885925	35 41 16.7265084	0.00002296	0.0004340	−0.096	50242.8	50242.8	50242.8	1	87
ICRF J184539.9 − 220036	1842 − 220	18 45 39.90294845	−22 00 36.5735207	0.00032805	0.0149801	−0.809	53552.8	53552.8	53552.8	1	3
ICRF J184551.3 − 285240	1842 − 289	18 45 51.36828419	−28 52 40.2763162	0.00001871	0.0007240	−0.261	53153.2	53153.2	53153.2	1	86
ICRF J184606.3 − 065127	1843 − 069	18 46 06.30026275	−06 51 27.7461010	0.00027859	0.0031693	−0.098	53134.5	53134.5	53134.5	1	13
ICRF J184712.6 + 081035	1844 + 081	18 47 12.66039471	08 10 35.3880170	0.00002884	0.0007545	0.220	49914.7	49914.7	49914.7	1	66
ICRF J184834.3 + 324400	1846 + 326	18 48 34.36117619	32 44 00.1394707	0.00001942	0.0004017	−0.372	50219.8	50219.8	50219.8	1	111
ICRF J184920.1 + 302414	1847 + 303	18 49 20.10341772	30 24 14.2371640	0.00001742	0.0005605	−0.215	50219.8	50219.8	50219.8	1	92
ICRF J185152.3 + 610038	1851 + 609	18 51 52.36093807	61 00 38.7797439	0.00047201	0.0020983	0.513	53494.3	49577.0	54112.8	2	22
ICRF J185230.3 + 401906	1850 + 402	18 52 30.37253179	40 19 06.6083559	0.00001872	0.0003424	−0.219	50242.8	50242.8	50242.8	1	111
ICRF J185250.5 + 142639	1850 + 143	18 52 50.58049382	14 26 39.6995824	0.00006328	0.0023370	−0.863	54088.1	54088.1	54088.1	1	31
ICRF J185317.9 − 362842	1849 − 365	18 53 17.92023201	−36 28 42.1644472	0.00010039	0.0066342	−0.150	52740.3	52306.7	53134.5	3	26
ICRF J185326.7 + 331056	1851 + 331	18 53 26.78723828	33 10 56.1329878	0.00004773	0.0010578	−0.509	53561.9	53561.9	53561.9	1	39
ICRF J185327.6 + 234435	1851 + 236	18 53 27.62798494	23 44 35.5308246	0.00004682	0.0016892	−0.606	53523.9	53523.9	53523.9	1	35
ICRF J185404.3 − 153913	1851 − 157	18 54 04.33205098	−15 39 13.1998100	0.00002840	0.0009070	0.292	53561.1	53552.8	53573.0	2	97
ICRF J185527.7 + 374256	1853 + 376	18 55 27.70680460	37 42 56.9665264	0.00003695	0.0009982	−0.726	50242.8	50242.8	50242.8	1	83
ICRF J185535.4 + 025119	1853 + 027	18 55 35.43649798	02 51 19.5692704	0.00051442	0.0075666	−0.180	52389.1	52306.7	52409.7	2	5
ICRF J185554.4 − 120957	1853 − 122	18 55 54.44538414	−12 09 57.9645725	0.00012639	0.0042833	0.416	53503.7	53503.7	53503.7	1	12
ICRF J185556.3 − 175442	1853 − 179	18 55 56.37874360	−17 54 42.9172053	0.00083084	0.0189717	0.233	53153.2	53153.2	53153.2	1	4
ICRF J185631.8 + 061016	1854 + 061	18 56 31.83887710	06 10 16.7646823	0.00018077	0.0037478	0.543	52386.8	52306.7	52409.7	2	9
ICRF J185725.5 + 162455	1855 + 163	18 57 25.59555110	16 24 55.8393637	0.00007546	0.0026887	0.683	54112.8	54112.8	54112.8	1	25
ICRF J185819.0 − 251050	1855 − 252	18 58 19.07771704	−25 10 50.6904405	0.00041955	0.0266514	0.489	53153.2	53153.2	53153.2	1	4
ICRF J190034.6 + 272230	1858 + 273	19 00 34.67745471	27 22 30.9173474	0.00010570	0.0022154	0.057	50219.8	50219.8	50219.8	1	18
ICRF J190048.5 + 270157	1858 + 269	19 00 48.51396009	27 01 57.5711051	0.00004502	0.0010544	−0.563	50219.8	50219.8	50219.8	1	32
ICRF J190132.1 − 252814	1858 − 255	19 01 32.12657758	−25 28 14.2323954	0.00055319	0.0200162	0.760	53503.7	53503.7	53503.7	1	7
ICRF J190311.6 + 554038	1902 + 556	19 03 11.60940049	55 40 38.4644916	0.00274124	0.0277563	0.671	52960.3	49577.0	54088.1	2	8
ICRF J190528.5 − 115332	1902 − 119	19 05 28.58783975	−11 53 32.4159017	0.00008976	0.0019206	0.768	53791.0	53503.7	54112.8	2	53
ICRF J190536.4 + 194308	1903 + 196	19 05 36.47207857	19 43 08.0454964	0.00001797	0.0005286	−0.311	53552.8	53552.8	53552.8	1	81
ICRF J190711.9 + 012708	1904 + 013	19 07 11.99626174	01 27 08.9631558	0.00007287	0.0013599	0.354	52111.9	49914.7	53126.1	2	38
ICRF J190806.2 + 222234	1905 + 222	19 08 06.21080437	22 22 34.1483981	0.00002198	0.0005819	−0.135	53561.9	53561.9	53561.9	1	80
ICRF J190945.1 − 213935	1906 − 217	19 09 45.15488861	−21 39 35.3982673	0.00340772	0.1077714	−0.558	54088.1	54088.1	54088.1	1	7
ICRF J191045.1 + 230558	1908 + 230	19 10 45.12719150	23 05 58.6112017	0.00004220	0.0012410	−0.263	52370.9	50156.3	53134.5	2	39
ICRF J191135.0 + 265813	1909 + 268	19 11 35.07736405	26 58 13.7630801	0.00002696	0.0006058	−0.499	50219.8	50219.8	50219.8	1	38

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J191153.9 − 210243	1908 − 211	19 11 53.93739371	−21 02 43.8017931	0.00003697	0.0013287	−0.727	53126.1	53126.1	53126.1	1	55
ICRF J191156.5 − 192150	1909 − 194	19 11 56.51918830	−19 21 50.9624471	0.00018676	0.0041385	0.195	53573.0	53573.0	53573.0	1	26
ICRF J191207.1 − 080421	1909 − 081	19 12 07.12882577	−08 04 21.9020986	0.00002963	0.0008920	0.077	53153.2	53153.2	53153.2	1	47
ICRF J191211.9 − 150457	1909 − 151	19 12 11.93965826	−15 04 57.5426935	0.00001743	0.0005409	−0.156	53523.9	53523.9	53523.9	1	78
ICRF J191225.1 + 374036	1910 + 375	19 12 25.12360141	37 40 36.6451302	0.00001774	0.0003788	−0.412	50242.8	50242.8	50242.8	1	134
ICRF J191523.8 + 654846	1915 + 657	19 15 23.81910628	65 48 46.3851721	0.00018160	0.0020081	−0.060	49827.5	49827.5	49827.5	1	32
ICRF J191652.5 − 151900	1914 − 154	19 16 52.51099580	−15 19 00.0712632	0.00001286	0.0004612	−0.265	53536.5	53503.7	53561.9	2	147
ICRF J191708.6 − 211030	1914 − 212	19 17 08.64451434	−21 10 30.7801849	0.00037069	0.0113882	0.162	53560.8	53560.8	53560.8	1	8
ICRF J191744.8 − 192131	1914 − 194	19 17 44.81932675	−19 21 31.6096438	0.00003064	0.0011176	−0.368	53573.0	53573.0	53573.0	1	69
ICRF J191810.7 + 552038	1917 + 552	19 18 10.75008721	55 20 38.6094432	0.00005201	0.0005701	−0.563	49577.0	49577.0	49577.0	1	116
ICRF J191845.5 + 493756	1917 + 495	19 18 45.57960057	49 37 56.0341134	0.00003744	0.0006235	−0.330	53561.9	53561.9	53561.9	1	66
ICRF J192014.4 − 244505	1917 − 248	19 20 14.43061532	−24 45 05.8013267	0.00063410	0.0212499	−0.445	53573.0	53573.0	53573.0	1	7
ICRF J192029.1 + 265148	1918 + 267	19 20 29.10814393	26 51 48.0027013	0.00004455	0.0017304	−0.162	54112.8	54112.8	54112.8	1	32
ICRF J192043.0 − 383106	1917 − 386	19 20 43.00890313	−38 31 06.0717265	0.00119033	0.0315740	0.617	53503.7	53503.7	53503.7	1	4
ICRF J192043.2 − 023611	1918 − 026	19 20 43.26218826	−02 36 11.6059978	0.00001907	0.0006157	−0.030	53552.8	53552.8	53552.8	1	64
ICRF J192109.9 + 433341	1919 + 434	19 21 09.93472639	43 33 41.8375736	0.00013061	0.0013209	−0.402	54088.1	54088.1	54088.1	1	17
ICRF J192154.2 + 450626	1920 + 450	19 21 54.20530839	45 06 26.8880402	0.00060124	0.0033955	−0.349	50306.3	50306.3	50306.3	1	10
ICRF J192234.6 + 153010	1920 + 154	19 22 34.69927882	15 30 10.0322171	0.00027090	0.0034405	−0.327	50126.0	50085.5	50156.3	2	21
ICRF J192327.2 + 475416	1922 + 478	19 23 27.22983014	47 54 16.8171626	0.00003451	0.0007662	0.306	50306.3	50306.3	50306.3	1	50
ICRF J192417.4 + 332929	1922 + 333	19 24 17.48222566	33 29 29.7455995	0.00036810	0.0028626	0.302	52306.7	52306.7	52306.7	1	9
ICRF J192517.0 − 340101	1922 − 341	19 25 17.02026653	−34 01 01.5368370	0.00003643	0.0012315	−0.067	53126.1	53126.1	53126.1	1	32
ICRF J192540.8 + 122738	1923 + 123	19 25 40.81707928	12 27 38.0871052	0.00002706	0.0008081	0.158	53134.5	53134.5	53134.5	1	51
ICRF J192606.3 + 505257	1924 + 507	19 26 06.32170291	50 52 57.0177669	0.00002413	0.0004778	0.143	49876.4	49577.0	50306.3	2	134
ICRF J192626.9 − 100551	1923 − 101	19 26 26.96692497	−10 05 51.9606756	0.00020070	0.0049593	0.714	53560.8	53560.8	53560.8	1	18
ICRF J192631.1 + 770631	1928 + 770	19 26 31.19130499	77 06 31.4970063	0.00058077	0.0021712	−0.067	53573.0	53573.0	53573.0	1	32
ICRF J192730.4 + 611732	1926 + 611	19 27 30.44262139	61 17 32.8792112	0.00004570	0.0004122	−0.453	49577.0	49577.0	49577.0	1	130
ICRF J192821.3 + 441201	1926 + 440	19 28 21.35155805	44 12 01.8536031	0.00014091	0.0029926	0.411	52223.8	50306.3	53126.1	2	25
ICRF J192904.5 + 232529	1926 + 233	19 29 04.57595064	23 25 29.2787313	0.00008354	0.0011668	−0.152	50135.1	50085.5	50156.3	2	70
ICRF J192919.9 + 050757	1926 + 050	19 29 19.94804781	05 07 57.5912745	0.00014468	0.0039514	−0.385	49914.7	49914.7	49914.7	1	17
ICRF J192944.9 + 254316	1927 + 256	19 29 44.91814096	25 43 16.2462392	0.00003162	0.0008432	0.022	50219.8	50219.8	50219.8	1	38
ICRF J192947.8 + 091003	1927 + 090	19 29 47.86284104	09 10 03.6241778	0.00060953	0.0170933	−0.484	53561.9	53561.9	53561.9	1	5
ICRF J193108.6 + 312233	1929 + 312	19 31 08.67387746	31 22 33.3966176	0.00010878	0.0016523	−0.389	50219.8	50219.8	50219.8	1	22
ICRF J193235.4 − 292842	1929 − 295	19 32 35.45376300	−29 28 42.0480778	0.00002631	0.0010017	−0.088	53552.8	53552.8	53552.8	1	73
ICRF J193321.8 + 150446	1931 + 149	19 33 21.80498373	15 04 46.4000927	0.00006014	0.0019830	−0.099	52306.7	52306.7	52306.7	1	20
ICRF J193357.3 + 654016	1933 + 655	19 33 57.33721123	65 40 16.8283745	0.00003925	0.0004885	0.210	49827.5	49827.5	49827.5	1	94

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J193440.6 + 613841	1934 + 615	19 34 40.68337591	61 38 41.6228436	0.00006485	0.0006518	−0.177	53573.0	53573.0	53573.0	1	63
ICRF J193452.8 − 241624	1931 − 243	19 34 52.84872060	−24 16 24.3574464	0.00007798	0.0027429	−0.061	53153.2	53153.2	53153.2	1	37
ICRF J193522.7 + 813014	1939 + 813	19 35 22.72236600	81 30 14.5542587	0.00032962	0.0004304	−0.552	50688.3	50688.3	50688.3	1	64
ICRF J193535.7 − 160232	1932 − 161	19 35 35.79528554	−16 02 32.3721605	0.00004799	0.0015755	−0.136	54112.8	54112.8	54112.8	1	25
ICRF J193627.8 + 364234	1934 + 365	19 36 27.81664640	36 42 34.9809629	0.00006339	0.0008237	0.045	50242.8	50242.8	50242.8	1	52
ICRF J193629.3 + 224625	1934 + 226	19 36 29.30618727	22 46 25.8607877	0.00128766	0.0188801	0.895	52306.7	52306.7	52306.7	1	3
ICRF J193719.9 − 062728	1934 − 065	19 37 19.99270265	−06 27 28.0708810	0.00062851	0.0197202	0.734	53503.7	53503.7	53503.7	1	4
ICRF J193731.4 + 360735	1935 + 360	19 37 31.43661029	36 07 35.8413362	0.00001898	0.0003929	0.149	53134.5	53134.5	53134.5	1	77
ICRF J193804.9 − 174920	1935 − 179	19 38 04.95829989	−17 49 20.3870698	0.00002831	0.0010065	−0.483	53560.8	53560.8	53560.8	1	58
ICRF J193830.6 + 044811	1936 + 046	19 38 30.66960578	04 48 11.6115132	0.00004839	0.0015002	−0.746	49914.7	49914.7	49914.7	1	66
ICRF J193843.6 + 094219	1936 + 095	19 38 43.64956229	09 42 19.2011885	0.00790694	0.0208583	−0.883	54088.1	54088.1	54088.1	1	3
ICRF J193933.5 + 381735	1937 + 381	19 39 33.56692623	38 17 35.3890297	0.00009748	0.0008814	0.417	53126.1	53126.1	53126.1	1	23
ICRF J193951.8 + 371330	1938 + 371	19 39 51.80640900	37 13 30.4873927	0.00005896	0.0007007	−0.280	50242.8	50242.8	50242.8	1	66
ICRF J194049.3 + 430424	1939 + 429	19 40 49.32001123	43 04 24.6575383	0.00012476	0.0012767	0.347	53573.0	53573.0	53573.0	1	39
ICRF J194110.2 − 300720	1938 − 302	19 41 10.24283710	−30 07 20.4284603	0.00041581	0.0106265	0.863	53503.7	53503.7	53503.7	1	11
ICRF J194126.9 + 722142	1942 + 722	19 41 26.98411365	72 21 42.2173037	0.00056585	0.0056218	0.306	53560.8	53560.8	53560.8	1	10
ICRF J194147.0 − 051132	1939 − 053	19 41 47.00858206	−05 11 32.3830438	0.00002479	0.0008456	−0.629	53523.9	53523.9	53523.9	1	59
ICRF J194240.9 − 313014	1939 − 316	19 42 40.91402840	−31 30 14.6092276	0.00003389	0.0012236	−0.527	53523.9	53523.9	53523.9	1	56
ICRF J194258.6 + 412923	1941 + 413	19 42 58.63811385	41 29 23.0599385	0.00001467	0.0002979	0.102	53134.5	53134.5	53134.5	1	90
ICRF J194431.5 + 544807	1943 + 546	19 44 31.51263486	54 48 07.0629378	0.00016186	0.0010241	0.218	49577.0	49577.0	49577.0	1	47
ICRF J194515.9 + 095259	1942 + 097	19 45 15.92278574	09 52 59.5631657	0.00002973	0.0012519	0.111	49914.7	49914.7	49914.7	1	65
ICRF J194522.8 − 015321	1942 − 020	19 45 22.82077592	−01 53 21.8309624	0.00001423	0.0004884	−0.203	53556.9	53552.8	53561.9	2	155
ICRF J194553.5 + 705548	1946 + 708	19 45 53.51992731	70 55 48.7321708	0.00034931	0.0018436	0.349	49827.5	49827.5	49827.5	1	30
ICRF J194719.5 + 124855	1944 + 126	19 47 19.52672088	12 48 55.4213224	0.00007578	0.0014176	−0.078	50138.0	50085.5	50156.3	2	54
ICRF J194743.7 − 010324	1945 − 011	19 47 43.78371850	−01 03 24.5276170	0.00002951	0.0009770	−0.590	53503.7	53503.7	53503.7	1	64
ICRF J194804.5 + 355620	1946 + 358	19 48 04.52010941	35 56 20.6713609	0.00008474	0.0012474	−0.033	50242.8	50242.8	50242.8	1	36
ICRF J194835.7 + 394352	1946 + 396	19 48 35.77007627	39 43 52.0678756	0.00023149	0.0020822	−0.198	54088.1	54088.1	54088.1	1	11
ICRF J194933.1 + 242118	1947 + 242	19 49 33.14259482	24 21 18.2447392	0.00039912	0.0038027	0.642	52306.7	52306.7	52306.7	1	9
ICRF J194935.2 + 725242	1950 + 727	19 49 35.23118271	72 52 42.9679297	0.00036379	0.0036460	−0.191	49827.5	49827.5	49827.5	1	17
ICRF J194953.4 − 195713	1946 − 200	19 49 53.42018023	−19 57 13.3304014	0.00000683	0.0002302	0.099	50658.5	50632.3	50688.3	2	152
ICRF J195044.0 − 043611	1948 − 047	19 50 44.05505426	−04 36 11.8396763	0.00011594	0.0022354	−0.220	50576.2	50576.2	50576.2	1	26
ICRF J195106.9 + 572717	1950 + 573	19 51 06.98253921	57 27 17.1762923	0.00032389	0.0022621	0.503	49577.0	49577.0	49577.0	1	29
ICRF J195136.0 + 013442	1949 + 014	19 51 36.01846344	01 34 42.7142452	0.00001292	0.0003731	0.083	53126.1	53126.1	53126.1	1	90
ICRF J195147.4 − 050943	1949 − 052	19 51 47.46847704	−05 09 43.9624016	0.00001635	0.0005469	−0.061	53523.9	53523.9	53523.9	1	81
ICRF J195248.2 + 252653	1950 + 253	19 52 48.29396254	25 26 53.4844057	0.00001580	0.0003704	0.074	52409.7	52409.7	52409.7	1	77

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J195441.1 − 112322	1951 − 115	19 54 41.15573549	−11 23 22.6418249	0.00001329	0.0004468	−0.181	53523.9	53523.9	53523.9	1	90
ICRF J195659.4 − 322546	1953 − 325	19 56 59.45527684	−32 25 46.0071304	0.00001606	0.0004854	−0.155	52306.7	52306.7	52306.7	1	47
ICRF J195922.0 + 384654	1957 + 386	19 59 22.03928791	38 46 54.1653905	0.00010930	0.0012614	0.125	53573.0	53573.0	53573.0	1	35
ICRF J195959.8 + 650854	1959 + 650	19 59 59.85208598	65 08 54.6526793	0.00020470	0.0020767	0.193	49827.5	49827.5	49827.5	1	29
ICRF J200042.1 − 132533	1957 − 135	20 00 42.14510115	−13 25 33.5329541	0.00001649	0.0005721	−0.109	53552.8	53552.8	53552.8	1	90
ICRF J200110.6 + 102758	1958 + 103	20 01 10.64344087	10 27 58.1171566	0.00014011	0.0021097	−0.492	49914.7	49914.7	49914.7	1	35
ICRF J200112.8 + 435252	1959 + 437	20 01 12.87374891	43 52 52.8394196	0.00064299	0.0072000	0.259	50242.8	50242.8	50242.8	1	14
ICRF J200153.7 + 241639	1959 + 241	20 01 53.77796558	24 16 39.9902336	0.00003583	0.0008733	0.238	53561.9	53561.9	53561.9	1	57
ICRF J200209.5 + 065115	1959 + 067	20 02 09.57486477	06 51 15.3921540	0.00008394	0.0017967	0.449	54112.8	54112.8	54112.8	1	27
ICRF J200243.0 − 164922	1959 − 169	20 02 43.08833372	−16 49 22.7102802	0.00013927	0.0044726	−0.758	54088.1	54088.1	54088.1	1	17
ICRF J200252.0 + 450608	2001 + 449	20 02 52.09615195	45 06 08.3275309	0.00001716	0.0002592	−0.118	51774.6	50306.3	53523.9	2	103
ICRF J200324.9 − 042138	2000 − 045	20 03 24.97541613	−04 21 38.4278278	0.00016078	0.0066184	0.191	53560.8	53560.8	53560.8	1	7
ICRF J200330.2 + 303430	2001 + 304	20 03 30.24405768	30 34 30.7888626	0.00001085	0.0003132	0.050	52409.7	52409.7	52409.7	1	82
ICRF J200354.5 + 662556	2003 + 662	20 03 54.50945834	66 25 56.3758459	0.00036908	0.0017133	0.200	53528.4	49827.5	54112.8	2	22
ICRF J200517.2 − 182203	2002 − 185	20 05 17.29315622	−18 22 03.3229745	0.00001477	0.0007317	−0.213	50657.6	50632.3	50688.3	2	106
ICRF J200552.0 + 442855	2004 + 443	20 05 52.08824444	44 28 55.1231204	0.00057703	0.0066897	0.261	51659.0	50306.3	53552.8	2	12
ICRF J200556.5 − 231027	2002 − 233	20 05 56.59555038	−23 10 27.0099872	0.00002923	0.0009482	−0.211	53153.2	53153.2	53153.2	1	57
ICRF J200648.3 − 122255	2004 − 125	20 06 48.34320195	−12 22 55.2966359	0.00016450	0.0066165	0.653	53561.9	53561.9	53561.9	1	17
ICRF J200704.3 + 745225	2007 + 747	20 07 04.38465889	74 52 25.3987092	0.00886166	0.0015701	0.643	54088.1	54088.1	54088.1	1	9
ICRF J200711.9 + 063644	2004 + 064	20 07 11.91531996	06 36 44.5962259	0.00008097	0.0018694	0.233	49914.7	49914.7	49914.7	1	49
ICRF J200728.7 + 660722	2007 + 659	20 07 28.77103584	66 07 22.5356176	0.00004864	0.0005051	0.464	49827.5	49827.5	49827.5	1	106
ICRF J200745.4 + 372202	2005 + 372	20 07 45.40147424	37 22 02.2494922	0.00302682	0.0516429	−0.979	52409.7	52409.7	52409.7	1	3
ICRF J200755.1 − 443444	2004 − 447	20 07 55.18441192	−44 34 44.2789130	0.00004882	0.0013603	−0.082	52395.0	52306.7	52409.7	2	21
ICRF J200952.3 + 722919	2010 + 723	20 09 52.30378881	72 29 19.3510233	0.00004717	0.0003102	0.246	49827.5	49827.5	49827.5	1	114
ICRF J201049.2 + 611615	2009 + 611	20 10 49.28861439	61 16 15.1570541	0.00005510	0.0006199	−0.348	49577.0	49577.0	49577.0	1	103
ICRF J201049.7 + 332213	2008 + 332	20 10 49.72330194	33 22 13.8106809	0.00009232	0.0012310	0.016	52409.7	52409.7	52409.7	1	16
ICRF J201205.6 + 462855	2010 + 463	20 12 05.63741861	46 28 55.7771296	0.00009687	0.0010695	−0.737	50306.3	50306.3	50306.3	1	17
ICRF J201515.1 − 013732	2012 − 017	20 15 15.15797697	−01 37 32.5598307	0.00001631	0.0005199	−0.015	50576.2	50576.2	50576.2	1	81
ICRF J201519.1 + 525359	2013 + 527	20 15 19.16837543	52 53 59.7197970	0.00016912	0.0016064	0.615	49577.0	49577.0	49577.0	1	54
ICRF J201528.7 + 371059	2013 + 370	20 15 28.72976962	37 10 59.5148505	0.00001629	0.0003470	−0.034	52306.7	52306.7	52306.7	1	59
ICRF J201528.8 + 341039	2013 + 340	20 15 28.83188025	34 10 39.4098650	0.00005919	0.0007662	−0.234	50219.8	50219.8	50219.8	1	19
ICRF J201555.3 + 655452	2015 + 657	20 15 55.36867333	65 54 52.6592583	0.00004546	0.0003809	0.406	49827.5	49827.5	49827.5	1	109
ICRF J201645.6 + 360033	2014 + 358	20 16 45.61879053	36 00 33.3747318	0.00010529	0.0017609	0.495	52409.7	52409.7	52409.7	1	19
ICRF J201646.4 − 270848	2013 − 273	20 16 46.41586118	−27 08 48.1688946	0.00042732	0.0214844	0.563	53561.9	53561.9	53561.9	1	8
ICRF J201753.0 − 251450	2014 − 254	20 17 53.00196376	−25 14 50.0824575	0.00010801	0.0034004	−0.429	53153.2	53153.2	53153.2	1	25

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J201811.3 + 083154	2015 + 083	20 18 11.31194827	08 31 54.5474318	0.00001306	0.0004600	−0.348	49914.7	49914.7	49914.7	1	132
ICRF J201828.0 − 110955	2015 − 113	20 18 28.01425146	−11 09 55.4978315	0.00002372	0.0007783	−0.122	53153.2	53153.2	53153.2	1	70
ICRF J202006.5 + 294214	2018 + 295	20 20 06.56359314	29 42 14.1503012	0.00013803	0.0042011	−0.207	52409.7	52409.7	52409.7	1	9
ICRF J202135.2 + 051504	2019 + 050	20 21 35.28120311	05 15 04.7785042	0.00001617	0.0005506	−0.350	49914.7	49914.7	49914.7	1	123
ICRF J202235.5 + 761126	2023 + 760	20 22 35.57587137	76 11 26.1716017	0.00015408	0.0008591	0.733	49827.5	49827.5	49827.5	1	62
ICRF J202255.1 − 120404	2020 − 122	20 22 55.15456851	−12 04 04.7460789	0.00028444	0.0087680	0.391	53561.9	53561.9	53561.9	1	4
ICRF J202323.1 + 222352	2021 + 222	20 23 23.16021042	22 23 52.5263190	0.00003736	0.0013554	−0.620	50142.9	50085.5	50156.3	2	79
ICRF J202332.8 − 012342	2020 − 015	20 23 32.81638962	−01 23 42.1539875	0.00006330	0.0016661	−0.319	53560.8	53560.8	53560.8	1	14
ICRF J202422.7 + 002753	2021 + 003	20 24 22.71502013	00 27 53.1016590	0.00002989	0.0009318	−0.223	53561.9	53561.9	53561.9	1	60
ICRF J202435.5 − 325335	2021 − 330	20 24 35.57648522	−32 53 35.9126266	0.00004064	0.0013600	0.396	53126.1	53126.1	53126.1	1	30
ICRF J202524.9 + 502839	2023 + 503	20 25 24.97250098	50 28 39.5365596	0.00006058	0.0004560	−0.628	49938.7	49577.0	50306.3	2	121
ICRF J202540.6 − 073552	2022 − 077	20 25 40.66040914	−07 35 52.6885754	0.00001046	0.0003485	−0.265	50576.2	50576.2	50576.2	1	81
ICRF J202553.6 − 284548	2022 − 289	20 25 53.61284797	−28 45 48.6970384	0.00001420	0.0004754	0.015	53542.0	53523.9	53560.8	2	145
ICRF J202752.6 − 083155	2025 − 086	20 27 52.60104565	−08 31 55.8769496	0.00001633	0.0005383	−0.246	53552.8	53552.8	53552.8	1	80
ICRF J202918.9 + 463602	2027 + 464	20 29 18.93662938	46 36 02.2500981	0.00039591	0.0060024	−0.278	50306.3	50306.3	50306.3	1	12
ICRF J203015.1 − 062214	2027 − 065	20 30 15.13901161	−06 22 14.9337788	0.00001673	0.0005558	0.014	54088.1	54088.1	54088.1	1	61
ICRF J203022.4 − 050312	2027 − 052	20 30 22.42838311	−05 03 12.7753927	0.00003369	0.0009554	−0.537	53560.8	53560.8	53560.8	1	41
ICRF J203057.9 − 303924	2027 − 308	20 30 57.93370972	−30 39 24.3469204	0.00038586	0.0149369	0.100	53134.5	53134.5	53134.5	1	9
ICRF J203332.0 + 214622	2031 + 216	20 33 32.03143001	21 46 22.4101011	0.00012834	0.0014561	−0.118	50151.1	50085.5	50156.3	2	41
ICRF J203428.2 + 282039	2032 + 281	20 34 28.28376914	28 20 39.9882561	0.00022832	0.0031402	−0.696	53523.9	53523.9	53523.9	1	11
ICRF J203437.1 + 115431	2032 + 117	20 34 37.10982977	11 54 31.3837109	0.00011015	0.0016326	0.055	49914.7	49914.7	49914.7	1	43
ICRF J203454.4 − 164026	2032 − 168	20 34 54.46447988	−16 40 26.6114549	0.00007631	0.0022907	−0.102	53503.7	53503.7	53503.7	1	19
ICRF J203522.3 + 105606	2032 + 107	20 35 22.33330321	10 56 06.7885863	0.00000768	0.0002389	−0.088	49914.7	49914.7	49914.7	1	135
ICRF J203523.7 + 582118	2034 + 581	20 35 23.75213836	58 21 18.7456115	0.00025160	0.0016070	−0.141	49577.0	49577.0	49577.0	1	39
ICRF J203533.9 + 185705	2033 + 187	20 35 33.98337975	18 57 05.4666934	0.00085160	0.0129404	0.512	52306.7	52306.7	52306.7	1	3
ICRF J203640.7 − 062903	2034 − 066	20 36 40.70896282	−06 29 03.8475358	0.00001225	0.0003947	−0.176	53523.9	53523.9	53523.9	1	88
ICRF J203651.1 − 214636	2033 − 219	20 36 51.17270637	−21 46 36.7492557	0.00001878	0.0006578	−0.152	53552.8	53552.8	53552.8	1	76
ICRF J203727.9 − 152200	2034 − 155	20 37 27.93734840	−15 22 00.4984195	0.00030651	0.0070471	−0.211	53573.0	53573.0	53573.0	1	14
ICRF J203756.6 − 243832	2034 − 248	20 37 56.67495433	−24 38 32.5603154	0.00002634	0.0008891	−0.167	53560.8	53560.8	53560.8	1	60
ICRF J203909.9 − 031714	2036 − 034	20 39 09.98520077	−03 17 14.4118962	0.00034965	0.0070696	0.636	53561.9	53561.9	53561.9	1	6
ICRF J203934.8 + 215209	2037 + 216	20 39 34.80819998	21 52 09.6863762	0.00015192	0.0054820	−0.759	50135.3	50085.5	50156.3	2	27
ICRF J204027.7 − 170703	2037 − 172	20 40 27.73358680	−17 07 03.1051052	0.00005980	0.0017660	−0.239	53560.8	53560.8	53560.8	1	34
ICRF J204214.5 + 035613	2039 + 037	20 42 14.50252437	03 56 13.9370345	0.00300518	0.0152098	0.789	54088.1	54088.1	54088.1	1	4
ICRF J204254.2 − 225559	2039 − 231	20 42 54.25405267	−22 55 59.9007204	0.00002434	0.0007544	0.365	53552.8	53552.8	53552.8	1	71
ICRF J204257.2 − 222326	2040 − 225	20 42 57.27636743	−22 23 26.9166588	0.00024566	0.0066195	0.144	53573.0	53573.0	53573.0	1	12

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J204310.2 + 125513	2040 + 127	20 43 10.20912289	12 55 13.5711204	0.00005566	0.0019149	−0.691	50144.2	50085.5	50156.3	2	64
ICRF J204334.4 + 342316	2041 + 342	20 43 34.45316495	34 23 16.9949448	0.00040557	0.0041538	−0.142	53560.8	53560.8	53560.8	1	9
ICRF J204442.6 − 094038	2042 − 098	20 44 42.67520635	−09 40 38.7227720	0.00005620	0.0024155	−0.441	53153.2	53153.2	53153.2	1	38
ICRF J204545.4 + 154727	2043 + 156	20 45 45.49403463	15 47 27.3395226	0.00004827	0.0010843	0.274	53561.9	53561.9	53561.9	1	45
ICRF J204710.3 − 023622	2044 − 027	20 47 10.36654513	−02 36 22.1467270	0.00011450	0.0035702	−0.123	52306.7	52306.7	52306.7	1	12
ICRF J204737.6 − 184141	2044 − 188	20 47 37.65527503	−18 41 41.3520981	0.00002694	0.0012852	0.252	54112.8	54112.8	54112.8	1	45
ICRF J204753.7 + 534332	2046 + 535	20 47 53.79597573	53 43 32.3978362	0.00026933	0.0018780	0.227	49577.0	49577.0	49577.0	1	29
ICRF J204945.8 + 100314	2047 + 098	20 49 45.86498059	10 03 14.3982668	0.00001607	0.0005001	−0.258	49914.7	49914.7	49914.7	1	131
ICRF J205002.2 + 361952	2048 + 361	20 50 02.28437425	36 19 52.5020217	0.00014180	0.0019720	0.132	50242.8	50242.8	50242.8	1	20
ICRF J205006.2 + 040748	2047 + 039	20 50 06.24059175	04 07 48.8898223	0.00001786	0.0005775	−0.522	49914.7	49914.7	49914.7	1	105
ICRF J205024.6 − 262818	2047 − 266	20 50 24.69383597	−26 28 18.0565571	0.00002471	0.0008893	0.044	53561.9	53561.9	53561.9	1	72
ICRF J205135.5 + 174336	2049 + 175	20 51 35.58292147	17 43 36.9007714	0.00002823	0.0007292	−0.186	50130.1	50085.5	50156.3	2	124
ICRF J205243.6 + 161948	2050 + 161	20 52 43.61987407	16 19 48.8282844	0.00002620	0.0008029	−0.066	50139.8	50085.5	50156.3	2	116
ICRF J205252.0 + 363535	2050 + 364	20 52 52.05498177	36 35 35.3005039	0.00001284	0.0003400	−0.162	50242.8	50242.8	50242.8	1	65
ICRF J205302.5 + 351521	2051 + 350	20 53 02.54766618	35 15 21.9274165	0.00023653	0.0075342	−0.355	53560.8	53560.8	53560.8	1	7
ICRF J205309.3 + 224801	2050 + 226	20 53 09.36400676	22 48 01.4864229	0.00003311	0.0006187	0.429	53129.7	53126.1	53134.5	2	56
ICRF J205422.0 − 201616	2051 − 204	20 54 22.07246291	−20 16 16.8192628	0.00001680	0.0005653	−0.021	53153.2	53153.2	53153.2	1	89
ICRF J205538.8 + 612200	2054 + 611	20 55 38.83832280	61 22 00.6388498	0.00007983	0.0010684	−0.323	49692.6	49577.0	49827.5	2	78
ICRF J205550.2 − 041647	2053 − 044	20 55 50.25801430	−04 16 47.0809132	0.00002321	0.0006498	−0.089	50576.2	50576.2	50576.2	1	63
ICRF J205551.1 − 123444	2053 − 127	20 55 51.19935842	−12 34 44.2369591	0.00013503	0.0026474	0.527	53153.2	53153.2	53153.2	1	18
ICRF J205625.0 − 320847	2053 − 323	20 56 25.07022819	−32 08 47.8009689	0.00003024	0.0010583	−0.324	53126.1	53126.1	53126.1	1	26
ICRF J210039.1 + 261537	2058 + 260	21 00 39.10013322	26 15 37.0250605	0.00017079	0.0018172	−0.195	53134.5	53134.5	53134.5	1	22
ICRF J210240.2 + 601509	2101 + 600	21 02 40.21918875	60 15 09.8365852	0.00013779	0.0006420	−0.165	53793.9	49577.0	54088.1	2	46
ICRF J210245.8 − 331316	2059 − 334	21 02 45.88598335	−33 13 16.1822255	0.00014979	0.0075876	0.180	53134.5	53134.5	53134.5	1	16
ICRF J210507.7 + 003325	2102 + 003	21 05 07.71547628	00 33 25.0088936	0.00007361	0.0016587	0.262	53560.8	53560.8	53560.8	1	32
ICRF J210610.8 + 213535	2103 + 213	21 06 10.81819001	21 35 35.9965477	0.00001047	0.0003163	−0.225	52722.8	50085.5	53134.5	3	88
ICRF J210628.1 + 023137	2103 + 023	21 06 28.14880633	02 31 37.8003742	0.00002977	0.0009829	−0.082	53561.9	53561.9	53561.9	1	57
ICRF J210727.0 − 170810	2104 − 173	21 07 27.02171176	−17 08 10.3569134	0.00006000	0.0024582	−0.021	53523.9	53523.9	53523.9	1	35
ICRF J210812.3 − 245233	2105 − 250	21 08 12.32010938	−24 52 33.3215779	0.00014327	0.0043259	0.311	53153.2	53153.2	53153.2	1	16
ICRF J210931.8 + 353257	2107 + 353	21 09 31.87872044	35 32 57.5976419	0.00001002	0.0002223	−0.181	50242.8	50242.8	50242.8	1	135
ICRF J211000.9 − 102057	2107 − 105	21 10 00.97899686	−10 20 57.3189618	0.00001427	0.0003922	−0.200	50576.2	50576.2	50576.2	1	71
ICRF J211022.6 − 012658	2107 − 016	21 10 22.61909344	−01 26 58.2423212	0.00003309	0.0008917	0.071	53153.2	53153.2	53153.2	1	56
ICRF J211329.4 + 401251	2111 + 400	21 13 29.48630999	40 12 51.3882780	0.00008227	0.0010749	−0.307	53153.2	53153.2	53153.2	1	35
ICRF J211458.3 + 283257	2112 + 283	21 14 58.33362879	28 32 57.1970597	0.00001391	0.0004394	−0.317	50219.8	50219.8	50219.8	1	45
ICRF J211518.4 − 141643	2112 − 144	21 15 18.43555282	−14 16 43.3718159	0.00001600	0.0005295	−0.125	53552.8	53552.8	53552.8	1	78

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J211636.6 + 053617	2114 + 053	21 16 36.63486938	05 36 17.0451203	0.00001481	0.0005196	−0.052	54112.8	54112.8	54112.8	1	61
ICRF J211720.7 + 050304	2114 + 048	21 17 20.75708729	05 03 04.1129306	0.00002107	0.0007244	−0.390	49914.7	49914.7	49914.7	1	111
ICRF J211756.4 + 543132	2116 + 543	21 17 56.48450029	54 31 32.5083826	0.00057188	0.0094687	−0.334	53573.0	53573.0	53573.0	1	14
ICRF J211843.2 − 063617	2116 − 068	21 18 43.24228274	−06 36 17.9958743	0.00012019	0.0030663	0.584	53503.7	53503.7	53503.7	1	17
ICRF J211954.1 + 711036	2119 + 709	21 19 54.16438071	71 10 36.1071763	0.00073115	0.0048419	0.413	49827.5	49827.5	49827.5	1	11
ICRF J212031.7 + 443434	2118 + 443	21 20 31.77356155	44 34 34.2605485	0.00129712	0.0073950	−0.841	50306.3	50306.3	50306.3	1	6
ICRF J212041.1 + 053345	2118 + 053	21 20 41.18232607	05 33 45.0080521	0.00001652	0.0004908	−0.059	53134.5	53134.5	53134.5	1	74
ICRF J212046.2 + 664220	2119 + 664	21 20 46.20170454	66 42 20.2310179	0.00050904	0.0028815	0.655	52970.0	49827.5	54112.8	2	15
ICRF J212048.4 − 033028	2118 − 037	21 20 48.47358426	−03 30 28.9299433	0.00006400	0.0017187	0.104	53561.9	53561.9	53561.9	1	34
ICRF J212100.6 + 190128	2118 + 188	21 21 00.60657910	19 01 28.2814144	0.00009696	0.0022244	−0.658	50140.4	50085.5	50156.3	2	49
ICRF J212113.1 − 370308	2118 − 372	21 21 13.19378632	−37 03 08.9020809	0.00001722	0.0005316	−0.249	53126.1	53126.1	53126.1	1	26
ICRF J212305.3 + 550027	2121 + 547	21 23 05.31348090	55 00 27.3253234	0.00002583	0.0003098	−0.709	52739.4	49577.0	53134.5	3	91
ICRF J212331.8 + 461422	2121 + 460	21 23 31.82846389	46 14 22.9610929	0.00010560	0.0011777	−0.095	50306.3	50306.3	50306.3	1	41
ICRF J212455.3 − 143813	2122 − 148	21 24 55.34972261	−14 38 13.3188654	0.00016268	0.0033191	0.686	53561.9	53561.9	53561.9	1	26
ICRF J212526.1 + 244203	2123 + 244	21 25 26.17042529	24 42 03.5791223	0.00017701	0.0054537	0.311	53130.3	53126.1	53134.5	2	8
ICRF J212527.4 + 642339	2124 + 641	21 25 27.44706934	64 23 39.3542177	0.00005157	0.0006825	−0.304	49827.5	49827.5	49827.5	1	74
ICRF J212529.2 + 044135	2122 + 044	21 25 29.25542900	04 41 35.5215946	0.00001460	0.0005014	−0.158	49914.7	49914.7	49914.7	1	108
ICRF J212632.7 − 011932	2123 − 015	21 26 32.75746002	−01 19 32.4052349	0.00002083	0.0007202	−0.399	50576.2	50576.2	50576.2	1	67
ICRF J212921.4 − 182122	2126 − 185	21 29 21.41910347	−18 21 22.7904338	0.00001249	0.0004213	−0.057	50656.9	50632.3	50688.3	2	125
ICRF J213016.2 + 084355	2127 + 085	21 30 16.24974872	08 43 55.9278638	0.00000852	0.0002669	−0.013	52409.7	52409.7	52409.7	1	134
ICRF J213401.1 − 421843	2130 − 425	21 34 01.17258802	−42 18 43.2433963	0.00029774	0.0219002	0.388	53134.5	53134.5	53134.5	1	9
ICRF J213624.0 + 430142	2134 + 428	21 36 24.00639415	43 01 42.4725196	0.00026224	0.0024530	−0.298	53573.0	53573.0	53573.0	1	28
ICRF J213700.9 + 510136	2135 + 508	21 37 00.98622604	51 01 36.1289517	0.00002687	0.0001621	−0.159	52306.7	52306.7	52306.7	1	64
ICRF J213744.1 + 345542	2135 + 347	21 37 44.10284603	34 55 42.0948005	0.00013621	0.0065776	−0.104	53134.5	53134.5	53134.5	1	10
ICRF J213750.0 − 204231	2135 − 209	21 37 50.00785746	−20 42 31.6696123	0.00027528	0.0054174	0.417	52306.7	52306.7	52306.7	1	11
ICRF J213837.1 − 243954	2135 − 248	21 38 37.18110637	−24 39 54.4663412	0.00001515	0.0005020	−0.081	50657.0	50632.3	50688.3	2	127
ICRF J213847.4 − 184930	2136 − 190	21 38 47.44911398	−18 49 30.6704006	0.00020823	0.0053261	0.117	53560.8	53560.8	53560.8	1	17
ICRF J213938.1 + 131613	2137 + 130	21 39 38.14037353	13 16 13.0518760	0.00012853	0.0023258	0.149	53561.9	53561.9	53561.9	1	23
ICRF J213942.5 + 012227	2137 + 011	21 39 42.50890764	01 22 27.1672646	0.00008079	0.0017630	−0.182	49914.7	49914.7	49914.7	1	50
ICRF J214016.9 + 391144	2138 + 389	21 40 16.94709807	39 11 44.8554780	0.00008370	0.0015502	−0.077	50242.8	50242.8	50242.8	1	23
ICRF J214046.8 − 192356	2137 − 196	21 40 46.86020045	−19 23 56.0421844	0.00032698	0.0105257	−0.955	53573.0	53573.0	53573.0	1	23
ICRF J214056.5 − 280459	2138 − 283	21 40 56.52497614	−28 04 59.9556919	0.00025602	0.0091373	0.715	53503.7	53503.7	53503.7	1	17
ICRF J214215.9 − 255126	2139 − 260	21 42 15.92606536	−25 51 26.5927705	0.00040452	0.0116300	0.119	53523.9	53523.9	53523.9	1	9
ICRF J214230.9 − 244438	2139 − 249	21 42 30.95907213	−24 44 38.8326468	0.00002057	0.0007009	0.025	54112.8	54112.8	54112.8	1	71
ICRF J214236.9 − 043743	2140 − 048	21 42 36.90167606	−04 37 43.5126970	0.00003202	0.0008684	−0.503	50576.2	50576.2	50576.2	1	60

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J214241.9 − 230338	2139 − 232	21 42 41.94580187	−23 03 38.4844206	0.00021471	0.0075328	0.862	53560.8	53560.8	53560.8	1	14
ICRF J214350.1 + 333710	2141 + 333	21 43 50.13577529	33 37 10.8163439	0.00015212	0.0014576	0.220	53561.9	53561.9	53561.9	1	17
ICRF J214451.1 − 331255	2141 − 334	21 44 51.18569679	−33 12 55.0987604	0.00001707	0.0005164	−0.003	53134.5	53134.5	53134.5	1	36
ICRF J214655.1 + 042725	2144 + 042	21 46 55.19199900	04 27 25.4779601	0.00002026	0.0006552	−0.177	53560.8	53560.8	53560.8	1	72
ICRF J214731.1 − 360151	2144 − 362	21 47 31.12552006	−36 01 51.2868533	0.00033467	0.0147778	0.414	53126.1	53126.1	53126.1	1	5
ICRF J214816.0 + 610705	2146 + 608	21 48 16.04229735	61 07 05.7944158	0.00003706	0.0004192	0.336	52409.7	52409.7	52409.7	1	80
ICRF J214836.8 − 172344	2145 − 176	21 48 36.80084790	−17 23 44.0148349	0.00000858	0.0002896	−0.099	50632.3	50632.3	50632.3	1	71
ICRF J215023.6 + 144947	2147 + 145	21 50 23.60710592	14 49 47.8954533	0.00019781	0.0048212	−0.284	52409.7	52409.7	52409.7	1	10
ICRF J215053.0 − 281241	2147 − 284	21 50 53.08799485	−28 12 41.8152205	0.00002709	0.0009602	0.023	54112.8	54112.8	54112.8	1	45
ICRF J215121.9 − 274223	2148 − 279	21 51 21.90509173	−27 42 23.0089538	0.00001408	0.0004861	0.209	54088.1	54088.1	54088.1	1	62
ICRF J215131.4 + 070926	2149 + 069	21 51 31.42929846	07 09 26.7834302	0.00001583	0.0004031	−0.164	49914.7	49914.7	49914.7	1	102
ICRF J215350.9 + 432254	2151 + 431	21 53 50.95912929	43 22 54.5010828	0.00003009	0.0004170	−0.184	53134.5	53134.5	53134.5	1	54
ICRF J215407.4 − 150131	2151 − 152	21 54 07.43870777	−15 01 31.4693650	0.00006763	0.0021500	0.683	53561.9	53561.9	53561.9	1	38
ICRF J215440.9 + 172750	2152 + 172	21 54 40.90045215	17 27 50.7933669	0.00004310	0.0010539	0.387	50130.4	50085.5	50156.3	2	82
ICRF J215534.4 + 191448	2153 + 190	21 55 34.43680467	19 14 48.4883006	0.00017773	0.0032687	−0.646	53573.0	53573.0	53573.0	1	20
ICRF J215550.7 − 113947	2153 − 119	21 55 50.71837937	−11 39 47.9788311	0.00023946	0.0039118	−0.221	53560.8	53560.8	53560.8	1	14
ICRF J215614.7 − 003704	2153 − 008	21 56 14.75791251	−00 37 04.5943965	0.00000924	0.0002976	−0.078	50576.2	50576.2	50576.2	1	81
ICRF J215657.3 + 833714	2159 + 833	21 56 57.31597720	83 37 14.7226639	0.00123680	0.0012927	−0.790	50688.3	50688.3	50688.3	1	29
ICRF J215712.8 + 101424	2154 + 100	21 57 12.86045160	10 14 24.7982551	0.00002745	0.0007818	−0.116	49914.7	49914.7	49914.7	1	75
ICRF J215729.1 − 180702	2154 − 183	21 57 29.12379175	−18 07 02.8660088	0.00010553	0.0025647	0.120	50632.3	50632.3	50632.3	1	29
ICRF J215934.2 − 010554	2156 − 013	21 59 34.27575198	−01 05 54.8913664	0.00022278	0.0032737	0.362	53561.9	53561.9	53561.9	1	15
ICRF J220014.1 + 213757	2157 + 213	22 00 14.19762462	21 37 57.0410978	0.00034500	0.0041345	0.704	50152.8	50085.5	50156.3	2	20
ICRF J220016.9 − 371657	2157 − 375	22 00 16.96659486	−37 16 57.0514540	0.00022324	0.0084847	−0.765	53503.7	53503.7	53503.7	1	4
ICRF J220054.8 − 163232	2158 − 167	22 00 54.87887425	−16 32 32.7012203	0.00006237	0.0020741	−0.778	53126.1	53126.1	53126.1	1	32
ICRF J220127.5 + 031215	2158 + 029	22 01 27.50872648	03 12 15.1629664	0.00002087	0.0006215	−0.148	49914.7	49914.7	49914.7	1	118
ICRF J220255.9 − 233510	2200 − 238	22 02 55.99949471	−23 35 10.2462175	0.00001309	0.0004023	−0.307	50655.3	50632.3	50688.3	2	124
ICRF J220312.6 + 675047	2201 + 676	22 03 12.62275205	67 50 47.6737213	0.00006912	0.0004465	−0.508	53829.8	49827.5	54088.1	2	66
ICRF J220330.9 + 100742	2201 + 098	22 03 30.95265516	10 07 42.5859399	0.00027564	0.0024095	−0.034	49914.7	49914.7	49914.7	1	18
ICRF J220421.1 + 363237	2202 + 363	22 04 21.10048271	36 32 37.0916492	0.00011447	0.0015770	−0.589	50242.8	50242.8	50242.8	1	20
ICRF J220546.5 + 292655	2203 + 292	22 05 46.50641817	29 26 55.1313309	0.00008713	0.0011696	0.160	53561.9	53561.9	53561.9	1	36
ICRF J220641.3 − 211940	2203 − 215	22 06 41.38228809	−21 19 40.5140518	0.00004759	0.0012551	0.697	53134.5	53134.5	53134.5	1	39
ICRF J220823.9 + 742338	2207 + 741	22 08 23.95452050	74 23 38.3422096	0.00043750	0.0033286	−0.035	53560.8	53560.8	53560.8	1	17
ICRF J220921.4 + 515801	2207 + 517	22 09 21.48687555	51 58 01.8337836	0.00017089	0.0016859	0.472	49577.0	49577.0	49577.0	1	53
ICRF J221006.0 + 085729	2207 + 087	22 10 06.05031280	08 57 29.5635342	0.00010721	0.0024006	0.512	54112.8	54112.8	54112.8	1	23
ICRF J221051.6 + 201324	2208 + 199	22 10 51.65233513	20 13 24.0532580	0.00023168	0.0032315	0.714	53561.9	53561.9	53561.9	1	6

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J221150.5 − 370704	2208 − 373	22 11 50.52608835	−37 07 04.9821134	0.00033047	0.0210525	−0.039	53153.2	53153.2	53153.2	1	10
ICRF J221153.8 + 184149	2209 + 184	22 11 53.88888932	18 41 49.8611414	0.00004373	0.0010752	0.078	53573.0	53573.0	53573.0	1	58
ICRF J221201.5 + 081916	2209 + 080	22 12 01.58933762	08 19 16.5102234	0.00003520	0.0014960	−0.079	53523.9	53523.9	53523.9	1	29
ICRF J221207.9 + 330834	2209 + 328	22 12 07.97727648	33 08 34.5189774	0.00005981	0.0009364	−0.036	50219.8	50219.8	50219.8	1	46
ICRF J221239.1 + 275938	2210 + 277	22 12 39.10339642	27 59 38.4545949	0.00022935	0.0051717	0.547	54112.8	54112.8	54112.8	1	14
ICRF J221250.8 + 064608	2210 + 065	22 12 50.83928693	06 46 08.7410283	0.00001913	0.0006325	0.022	49914.7	49914.7	49914.7	1	122
ICRF J221310.2 + 362355	2210 + 361	22 13 10.22291461	36 23 55.1740410	0.00066587	0.0090005	−0.892	53561.9	53561.9	53561.9	1	5
ICRF J221408.8 + 071142	2211 + 069	22 14 08.86159951	07 11 42.3933442	0.00002336	0.0008284	−0.396	49914.7	49914.7	49914.7	1	62
ICRF J221446.4 − 252116	2211 − 256	22 14 46.40175918	−25 21 16.0952596	0.00109638	0.0372035	−0.767	53573.0	53573.0	53573.0	1	6
ICRF J221516.0 − 294423	2212 − 299	22 15 16.03453501	−29 44 23.3333871	0.00003845	0.0016871	0.594	50820.9	50688.3	54664.7	2	30
ICRF J221642.7 + 310235	2214 + 307	22 16 42.71044038	31 02 35.3641074	0.00002615	0.0004697	−0.220	50219.8	50219.8	50219.8	1	59
ICRF J221702.1 − 190203	2214 − 192	22 17 02.16573346	−19 02 03.8246037	0.00002580	0.0008054	−0.051	53134.5	53134.5	53134.5	1	60
ICRF J221717.5 + 315649	2215 + 316	22 17 17.57636899	31 56 49.9950565	0.00001718	0.0004095	−0.293	50219.8	50219.8	50219.8	1	80
ICRF J221935.3 − 271903	2216 − 275	22 19 35.32091243	−27 19 03.2904220	0.00139340	0.0106954	0.629	54088.1	54088.1	54088.1	1	11
ICRF J221938.5 + 214112	2217 + 214	22 19 38.52140145	21 41 12.5583974	0.00059723	0.0180507	0.056	53573.0	53573.0	53573.0	1	7
ICRF J221947.2 − 005132	2217 − 011	22 19 47.28245196	−00 51 32.5552262	0.00003276	0.0012251	−0.492	54112.8	54112.8	54112.8	1	42
ICRF J221949.7 + 261327	2217 + 259	22 19 49.74111932	26 13 27.9438546	0.00011113	0.0048054	−0.035	50219.8	50219.8	50219.8	1	20
ICRF J222245.1 + 134454	2220 + 134	22 22 45.16318131	13 44 54.4483801	0.00002727	0.0008368	−0.015	53560.8	53560.8	53560.8	1	61
ICRF J222252.9 + 121349	2220 + 119	22 22 52.98900804	12 13 49.8087244	0.00004949	0.0010577	−0.340	49914.7	49914.7	49914.7	1	71
ICRF J222256.0 − 114426	2220 − 119	22 22 56.00537445	−11 44 26.3679922	0.00035982	0.0090109	0.615	53503.7	53503.7	53503.7	1	9
ICRF J222318.0 + 624933	2221 + 625	22 23 18.09659524	62 49 33.8054934	0.00017134	0.0022052	0.146	53688.2	53134.5	54088.1	2	31
ICRF J222407.9 − 112621	2221 − 116	22 24 07.96268719	−11 26 21.1065780	0.00001437	0.0004355	0.046	50576.2	50576.2	50576.2	1	87
ICRF J222543.7 − 111340	2223 − 114	22 25 43.71839674	−11 13 40.6978039	0.00001162	0.0004050	−0.216	50576.2	50576.2	50576.2	1	90
ICRF J222646.5 + 005211	2224 + 006	22 26 46.53701754	00 52 11.3315498	0.00001462	0.0005211	−0.325	49914.7	49914.7	49914.7	1	125
ICRF J222850.4 + 441908	2226 + 440	22 28 50.46312433	44 19 08.4433599	0.00019586	0.0016091	−0.541	50306.3	50306.3	50306.3	1	25
ICRF J222951.8 + 011456	2227 + 009	22 29 51.80191804	01 14 56.7227921	0.00006279	0.0011461	0.234	53126.1	53126.1	53126.1	1	40
ICRF J223015.3 − 132542	2227 − 136	22 30 15.30602336	−13 25 42.9007954	0.00003138	0.0011202	−0.377	53560.8	53560.8	53560.8	1	32
ICRF J223139.6 − 142222	2228 − 146	22 31 39.62622857	−14 22 22.9712715	0.00005633	0.0020479	0.339	53561.9	53561.9	53561.9	1	42
ICRF J223332.4 + 424539	2231 + 425	22 33 32.40650870	42 45 39.9246436	0.00004416	0.0008332	0.138	50242.8	50242.8	50242.8	1	36
ICRF J223358.4 + 100852	2231 + 098	22 33 58.45034203	10 08 52.1150672	0.00010253	0.0018433	−0.078	49914.7	49914.7	49914.7	1	22
ICRF J223457.4 − 205503	2232 − 211	22 34 57.44033739	−20 55 03.2381764	0.00006687	0.0016854	−0.712	50648.3	50632.3	50688.3	2	56
ICRF J223556.1 − 182612	2233 − 186	22 35 56.17105474	−18 26 12.5854256	0.00176691	0.0817404	−0.996	54088.1	54088.1	54088.1	1	5
ICRF J223609.5 − 170621	2233 − 173	22 36 09.52276252	−17 06 21.9731876	0.00001345	0.0004572	−0.171	50632.3	50632.3	50632.3	1	73
ICRF J223626.2 − 230926	2233 − 234	22 36 26.23864741	−23 09 26.5966450	0.00003576	0.0012800	−0.274	53573.0	53573.0	53573.0	1	63
ICRF J223704.2 + 421648	2234 + 420	22 37 04.20978321	42 16 48.2620193	0.00003824	0.0006500	0.090	54112.8	54112.8	54112.8	1	57

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J223718.3 − 250632	2234 − 253	22 37 18.35540261	−25 06 32.5182192	0.00021436	0.0066529	0.404	53560.8	53560.8	53560.8	1	11
ICRF J223810.3 + 072413	2235 + 071	22 38 10.39572454	07 24 13.9857143	0.00001388	0.0004446	−0.010	53561.9	53561.9	53561.9	1	81
ICRF J223812.8 + 274952	2235 + 275	22 38 12.87361920	27 49 52.7730335	0.00003788	0.0008039	−0.307	53573.0	53573.0	53573.0	1	67
ICRF J223815.0 + 680459	2236 + 678	22 38 15.02952486	68 04 59.7601288	0.00513122	0.0366245	−0.992	54088.1	54088.1	54088.1	1	9
ICRF J223834.6 + 124250	2236 + 124	22 38 34.60484999	12 42 50.7822946	0.00003458	0.0010626	−0.554	50135.7	50085.5	50156.3	2	86
ICRF J223923.7 − 215315	2236 − 221	22 39 23.71697071	−21 53 15.4358879	0.00053396	0.0232833	0.451	53560.8	53560.8	53560.8	1	3
ICRF J224019.8 + 513311	2238 + 512	22 40 19.87840855	51 33 11.7962667	0.00006638	0.0007419	−0.529	50024.0	49577.0	50306.3	2	93
ICRF J224107.2 + 412011	2238 + 410	22 41 07.20523281	41 20 11.6183276	0.00002303	0.0006629	−0.172	50242.8	50242.8	50242.8	1	45
ICRF J224326.4 − 254430	2240 − 260	22 43 26.40878862	−25 44 30.6877978	0.00001623	0.0004827	−0.412	50652.4	50632.3	50688.3	2	103
ICRF J224412.7 + 405713	2241 + 406	22 44 12.73111025	40 57 13.6209885	0.00004160	0.0007786	−0.360	50242.8	50242.8	50242.8	1	32
ICRF J224435.1 + 260020	2242 + 257	22 44 35.14739442	26 00 20.7015673	0.00017455	0.0018421	−0.731	53573.0	53573.0	53573.0	1	28
ICRF J224528.2 + 032408	2242 + 031	22 45 28.28473529	03 24 08.8639719	0.00001384	0.0004335	−0.025	49914.7	49914.7	49914.7	1	118
ICRF J224549.0 − 075519	2243 − 081	22 45 49.00380227	−07 55 19.3813292	0.00002533	0.0008173	−0.364	53560.8	53560.8	53560.8	1	53
ICRF J224730.1 + 000006	2244 − 002	22 47 30.19597903	00 00 06.4629016	0.00001008	0.0003364	−0.263	50576.2	50576.2	50576.2	1	87
ICRF J224751.8 + 472307	2245 + 471	22 47 51.81696421	47 23 07.7688432	0.00021472	0.0030927	0.367	53134.5	53134.5	53134.5	1	12
ICRF J224752.1 − 085022	2245 − 091	22 47 52.19294778	−08 50 22.0808738	0.00015622	0.0043782	0.237	53561.9	53561.9	53561.9	1	13
ICRF J224752.6 − 123719	2245 − 128	22 47 52.64105485	−12 37 19.7214328	0.00002636	0.0008717	−0.105	50576.2	50576.2	50576.2	1	21
ICRF J224758.6 + 031042	2245 + 029	22 47 58.68206698	03 10 42.3534877	0.00002101	0.0006184	−0.083	49914.7	49914.7	49914.7	1	119
ICRF J224800.0 − 054118	2245 − 059	22 48 00.08053532	−05 41 18.2182939	0.00003779	0.0013182	−0.731	50576.2	50576.2	50576.2	1	66
ICRF J224837.9 + 371812	2246 + 370	22 48 37.91049719	37 18 12.4630616	0.00002116	0.0005941	−0.173	50242.8	50242.8	50242.8	1	45
ICRF J224919.0 − 303912	2246 − 309	22 49 19.04185351	−30 39 12.6319986	0.00002835	0.0008128	−0.680	53126.1	53126.1	53126.1	1	37
ICRF J224944.9 + 133109	2247 + 132	22 49 44.94687220	13 31 09.4792649	0.00040021	0.0057090	−0.550	50140.6	50085.5	50156.3	2	18
ICRF J224954.5 + 113630	2247 + 113	22 49 54.58597467	11 36 30.8467145	0.00008695	0.0017007	0.160	52409.7	52409.7	52409.7	1	16
ICRF J224959.6 − 125116	2247 − 131	22 49 59.61249957	−12 51 16.8250335	0.00007953	0.0038956	−0.565	50576.2	50576.2	50576.2	1	34
ICRF J225042.8 + 555014	2248 + 555	22 50 42.85101651	55 50 14.5808958	0.00004934	0.0006163	−0.253	49577.0	49577.0	49577.0	1	101
ICRF J225044.4 − 280639	2247 − 283	22 50 44.49238610	−28 06 39.3302221	0.00001886	0.0006879	−0.053	54088.1	54088.1	54088.1	1	71
ICRF J225228.6 − 204731	2249 − 210	22 52 28.68050002	−20 47 31.5385805	0.00010035	0.0035780	−0.052	53560.8	53560.8	53560.8	1	26
ICRF J225248.1 + 704315	2251 + 704	22 52 48.16047530	70 43 15.8246038	0.00130676	0.0021227	0.335	49827.5	49827.5	49827.5	1	14
ICRF J225312.4 + 323604	2250 + 323	22 53 12.49978628	32 36 04.3264982	0.00003291	0.0006829	−0.236	53561.9	53561.9	53561.9	1	52
ICRF J225321.1 + 023613	2250 + 023	22 53 21.10446562	02 36 13.0414577	0.00010028	0.0021836	0.019	53560.8	53560.8	53560.8	1	17
ICRF J225404.4 + 005420	2251 + 006	22 54 04.40616009	00 54 20.9527108	0.00004716	0.0011441	−0.329	49914.7	49914.7	49914.7	1	57
ICRF J225409.3 + 244523	2251 + 244	22 54 09.34189749	24 45 23.4226569	0.00001799	0.0005356	−0.199	50219.8	50219.8	50219.8	1	65
ICRF J225421.0 + 134148	2251 + 134	22 54 21.01621626	13 41 48.6756717	0.00000947	0.0003007	−0.146	53134.5	53134.5	53134.5	1	73
ICRF J225425.2 + 620938	2252 + 618	22 54 25.29332945	62 09 38.7424357	0.00199412	0.0355617	−0.233	52409.7	52409.7	52409.7	1	4
ICRF J225600.1 − 273556	2253 − 278	22 56 00.15574757	−27 35 56.1194876	0.00004024	0.0015634	0.508	50650.6	50632.3	50688.3	2	58

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J225610.6 + 230145	2253 + 227	22 56 10.67501265	23 01 45.1751301	0.00121515	0.0077356	−0.673	54112.8	54112.8	54112.8	1	4
ICRF J225641.2 − 201140	2254 − 204	22 56 41.20771748	−20 11 40.5098346	0.00001302	0.0004289	−0.139	50653.4	50632.3	50688.3	2	106
ICRF J225722.0 + 572030	2255 + 570	22 57 22.04602737	57 20 30.1949082	0.00027168	0.0051345	−0.457	52409.7	52409.7	52409.7	1	11
ICRF J225722.0 + 415416	2255 + 416	22 57 22.07289310	41 54 16.5308113	0.00003211	0.0010056	−0.385	50242.8	50242.8	50242.8	1	39
ICRF J225857.7 + 020342	2256 + 017	22 58 57.75251090	02 03 42.2894346	0.00016021	0.0033346	−0.771	49914.7	49914.7	49914.7	1	31
ICRF J225857.9 + 571906	2256 + 570	22 58 57.94119091	57 19 06.4630701	0.00005866	0.0003965	0.275	53126.1	53126.1	53126.1	1	59
ICRF J225900.6 − 081103	2256 − 084	22 59 00.68881424	−08 11 03.0433498	0.00004034	0.0014885	−0.531	53573.0	53573.0	53573.0	1	53
ICRF J225929.9 − 292043	2256 − 296	22 59 29.93350222	−29 20 43.7991278	0.00002138	0.0006588	−0.001	52409.7	52409.7	52409.7	1	58
ICRF J230018.3 + 103754	2257 + 103	23 00 18.31253543	10 37 54.0834194	0.00002696	0.0009046	−0.438	53560.8	53560.8	53560.8	1	60
ICRF J230025.5 − 264422	2257 − 270	23 00 25.50072573	−26 44 22.7809499	0.00002599	0.0009324	−0.343	50647.1	50632.3	50688.3	2	68
ICRF J230040.8 + 033710	2258 + 033	23 00 40.88576651	03 37 10.8391916	0.00004042	0.0011560	0.153	49914.7	49914.7	49914.7	1	63
ICRF J230107.9 − 015804	2258 − 022	23 01 07.97846578	−01 58 04.5859425	0.00001069	0.0003454	−0.056	50576.2	50576.2	50576.2	1	90
ICRF J230126.6 + 570625	2259 + 568	23 01 26.62691622	57 06 25.5088924	0.00049339	0.0035947	−0.051	49827.5	49827.5	49827.5	1	11
ICRF J230127.7 + 372649	2259 + 371	23 01 27.73738998	37 26 49.2431188	0.00002139	0.0007204	−0.246	50242.8	50242.8	50242.8	1	45
ICRF J230223.8 − 371806	2259 − 375	23 02 23.88789758	−37 18 06.8388446	0.00092321	0.0099298	−0.178	51600.8	48162.4	53503.7	3	5
ICRF J230241.3 + 640552	2300 + 638	23 02 41.31499697	64 05 52.8488544	0.00002963	0.0003114	−0.040	53408.3	49827.5	54088.1	3	133
ICRF J230302.9 − 184125	2300 − 189	23 03 02.97600040	−18 41 25.8226415	0.00001596	0.0005720	0.381	50650.7	50632.3	50688.3	2	76
ICRF J230304.0 + 385348	2300 + 386	23 03 04.06583124	38 53 48.3659717	0.00002442	0.0007258	−0.295	50242.8	50242.8	50242.8	1	43
ICRF J230309.9 + 143141	2300 + 142	23 03 09.95279304	14 31 41.3544596	0.00002650	0.0007316	0.074	54112.8	54112.8	54112.8	1	49
ICRF J230357.9 − 100219	2301 − 103	23 03 57.91964462	−10 02 19.2072201	0.00046373	0.0190368	0.735	53561.9	53561.9	53561.9	1	6
ICRF J230517.5 + 824249	2304 + 824	23 05 17.53977228	82 42 49.1562882	0.00023693	0.0009419	0.110	53560.8	53560.8	53560.8	1	26
ICRF J230615.3 − 045948	2303 − 052	23 06 15.31708917	−04 59 48.2849740	0.00002034	0.0006483	−0.176	50576.2	50576.2	50576.2	1	83
ICRF J230715.9 + 323031	2304 + 322	23 07 15.91256323	32 30 31.9366321	0.00002182	0.0004159	−0.495	50219.8	50219.8	50219.8	1	72
ICRF J230738.6 − 224752	2304 − 230	23 07 38.65485318	−22 47 52.9948760	0.00001644	0.0004954	−0.026	50648.7	50632.3	50688.3	2	75
ICRF J230811.6 + 200842	2305 + 198	23 08 11.63647969	20 08 42.1950305	0.00006762	0.0013516	−0.156	50123.7	50085.5	50156.3	2	50
ICRF J230844.1 + 094626	2306 + 095	23 08 44.17161506	09 46 26.1111683	0.00001317	0.0004253	0.050	53126.1	53126.1	53126.1	1	45
ICRF J230926.6 + 682010	2307 + 680	23 09 26.66609088	68 20 10.7564109	0.00006909	0.0003628	−0.099	53705.7	49827.5	54088.1	2	78
ICRF J231105.3 + 342510	2308 + 341	23 11 05.32880057	34 25 10.9049783	0.00001166	0.0002583	−0.129	52409.7	52409.7	52409.7	1	73
ICRF J231219.6 + 724126	2310 + 724	23 12 19.69785092	72 41 26.9175447	0.00007513	0.0005410	0.078	49827.5	49827.5	49827.5	1	59
ICRF J231258.7 + 384742	2310 + 385	23 12 58.79404477	38 47 42.6603069	0.00006290	0.0008760	0.370	50242.8	50242.8	50242.8	1	25
ICRF J231549.8 + 863143	2316 + 862	23 15 49.81987387	86 31 43.5956512	0.00086723	0.0007268	0.326	53560.8	53560.8	53560.8	1	48
ICRF J231621.0 − 433746	2313 − 439	23 16 21.09981165	−43 37 46.9020343	0.00020381	0.0134765	0.265	52363.9	52306.7	52409.7	2	18
ICRF J231741.5 + 290222	2315 + 287	23 17 41.56199865	29 02 22.7699755	0.00008020	0.0009524	−0.438	53561.9	53561.9	53561.9	1	40
ICRF J231806.8 − 401006	2315 − 404	23 18 06.86207699	−40 10 06.2217757	0.00014400	0.0069652	−0.910	53503.7	53503.7	53503.7	1	15
ICRF J231811.3 − 165929	2315 − 172	23 18 11.36140447	−16 59 29.1878280	0.00001956	0.0006801	0.010	53558.7	53552.8	53573.0	2	96

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(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J231833.9 + 240439	2316 + 238	23 18 33.96786857	24 04 39.7496509	0.00001915	0.0005054	−0.104	54112.8	54112.8	54112.8	1	62
ICRF J232046.7 + 182925	2318 + 182	23 20 46.77596767	18 29 25.7753376	0.00003128	0.0008822	0.248	53560.8	53560.8	53560.8	1	55
ICRF J232118.2 − 082721	2318 − 087	23 21 18.25023346	−08 27 21.5214626	0.00002308	0.0007046	0.157	50576.2	50576.2	50576.2	1	80
ICRF J232209.0 + 691103	2320 + 689	23 22 09.04522965	69 11 03.4168253	0.00006795	0.0004731	−0.123	53130.1	53126.1	53134.5	2	65
ICRF J232228.5 + 184324	2319 + 184	23 22 28.56882681	18 43 24.8985802	0.00003589	0.0008362	0.219	50135.8	50085.5	50156.3	2	107
ICRF J232236.0 + 081201	2320 + 079	23 22 36.08942498	08 12 01.5923398	0.00003583	0.0007908	−0.301	49914.7	49914.7	49914.7	1	62
ICRF J232304.6 − 015048	2320 − 021	23 23 04.62987469	−01 50 48.1134088	0.00004090	0.0009286	0.222	50576.2	50576.2	50576.2	1	60
ICRF J232339.1 − 061759	2321 − 065	23 23 39.11373346	−06 17 59.2388099	0.00002500	0.0007484	0.357	53561.9	53561.9	53561.9	1	64
ICRF J232344.6 − 161252	2321 − 164	23 23 44.63142774	−16 12 52.1234322	0.00013405	0.0030736	0.102	53573.0	53573.0	53573.0	1	28
ICRF J232428.0 − 211900	2321 − 215	23 24 28.05630658	−21 19 00.5051171	0.00038218	0.0156818	0.675	53560.8	53560.8	53560.8	1	6
ICRF J232503.3 − 405130	2322 − 411	23 25 03.38032023	−40 51 30.0682835	0.00190832	0.0492654	0.717	52409.7	52409.7	52409.7	1	3
ICRF J232544.9 + 480625	2323 + 478	23 25 44.91236773	48 06 25.2877337	0.00057348	0.0036077	−0.830	50306.3	50306.3	50306.3	1	11
ICRF J232625.6 + 011208	2323 + 009	23 26 25.64376927	01 12 08.6922260	0.00025855	0.0057489	−0.826	49914.7	49914.7	49914.7	1	14
ICRF J232706.4 + 801258	2325 + 799	23 27 06.42561810	80 12 58.9351668	0.00016161	0.0006557	−0.425	53573.0	53573.0	53573.0	1	76
ICRF J232721.9 + 152437	2324 + 151	23 27 21.96597427	15 24 37.3104136	0.00007055	0.0014029	−0.260	50136.2	50085.5	50156.3	2	67
ICRF J232735.9 + 153309	2325 + 152	23 27 35.98489116	15 33 09.5751778	0.00003338	0.0008144	−0.140	53561.9	53561.9	53561.9	1	46
ICRF J232752.8 + 764308	2325 + 764	23 27 52.82258463	76 43 08.6439520	0.00031082	0.0019681	0.302	53523.9	53523.9	53523.9	1	21
ICRF J232824.8 + 192958	2325 + 192	23 28 24.87477433	19 29 58.0301003	0.00019504	0.0023709	0.608	53560.8	53560.8	53560.8	1	18
ICRF J232905.7 + 083415	2326 + 082	23 29 05.78674237	08 34 15.8538762	0.00003701	0.0012756	−0.421	49914.7	49914.7	49914.7	1	50
ICRF J233013.7 + 334836	2327 + 335	23 30 13.73765215	33 48 36.4715643	0.00001229	0.0002887	−0.346	50219.8	50219.8	50219.8	1	81
ICRF J233037.6 − 453958	2327 − 459	23 30 37.68043323	−45 39 58.1056336	0.00032134	0.0099469	0.826	52306.7	52306.7	52306.7	1	9
ICRF J233046.1 + 315533	2328 + 316	23 30 46.15996711	31 55 33.5074587	0.00002258	0.0005651	−0.210	50219.8	50219.8	50219.8	1	68
ICRF J233257.5 + 083810	2330 + 083	23 32 57.59623954	08 38 10.4268290	0.00004878	0.0009448	−0.175	49914.7	49914.7	49914.7	1	66
ICRF J233302.5 + 390112	2330 + 387	23 33 02.53339768	39 01 12.0489037	0.00003748	0.0008690	−0.071	50242.8	50242.8	50242.8	1	58
ICRF J233316.6 − 013107	2330 − 017	23 33 16.68836814	−01 31 07.3865852	0.00002272	0.0007255	0.241	50576.2	50576.2	50576.2	1	76
ICRF J233412.8 + 073627	2331 + 073	23 34 12.82815798	07 36 27.5514563	0.00000759	0.0002195	0.024	51343.9	49914.7	54112.8	3	205
ICRF J233518.7 − 290716	2332 − 293	23 35 18.72720689	−29 07 16.6096579	0.00006555	0.0032867	0.247	50688.3	50688.3	50688.3	1	14
ICRF J233520.4 − 013109	2332 − 017	23 35 20.41206807	−01 31 09.5916342	0.00002607	0.0005813	0.280	50576.2	50576.2	50576.2	1	72
ICRF J233921.1 + 601011	2336 + 598	23 39 21.12520569	60 10 11.8492190	0.00003891	0.0004459	−0.462	52409.7	52409.7	52409.7	1	64
ICRF J233929.7 + 024405	2336 + 024	23 39 29.71056446	02 44 05.3555909	0.00016190	0.0057535	−0.578	53153.2	53153.2	53153.2	1	12
ICRF J233953.5 − 231039	2337 − 234	23 39 53.57725066	−23 10 39.2240269	0.00021701	0.0081469	0.654	53561.9	53561.9	53561.9	1	18
ICRF J233954.5 − 331016	2337 − 334	23 39 54.53521077	−33 10 16.8817618	0.00005453	0.0018958	−0.692	52306.7	52306.7	52306.7	1	33
ICRF J234023.6 − 005326	2337 − 011	23 40 23.67018764	−00 53 26.9990491	0.00042872	0.0061513	0.707	53573.0	53573.0	53573.0	1	10
ICRF J234057.2 + 331902	2338 + 330	23 40 57.29949032	33 19 02.6213911	0.00002028	0.0003591	0.192	53134.5	53134.5	53134.5	1	81
ICRF J234106.9 + 001833	2338 + 000	23 41 06.90894668	00 18 33.3490768	0.00083649	0.0155242	−0.264	49914.7	49914.7	49914.7	1	3

(continued on next page)

(Table 20: continued)

Designation[a]	Source[b]	α	δ	σ_α (s)	σ_δ ($''$)	$C_{\alpha-\delta}$	Epoch of Observation Mean	First	Last	$N_{\rm exp}$	$N_{\rm obs}$
ICRF J234247.9 − 222340	2340 − 226	23 42 47.98369526	−22 23 40.1987941	0.00017926	0.0056629	0.061	53561.9	53561.9	53561.9	1	18
ICRF J234342.7 + 154302	2341 + 154	23 43 42.74913992	15 43 02.9782405	0.00006342	0.0018972	−0.253	53523.2	53503.7	53573.0	2	32
ICRF J234343.7 + 700319	2341 + 697	23 43 43.73435070	70 03 19.4067541	0.00010091	0.0008940	−0.616	53761.3	53560.8	54088.1	2	71
ICRF J234403.7 + 822640	2342 + 821	23 44 03.76951137	82 26 40.4018962	0.00258296	0.0033275	−0.086	52409.7	52409.7	52409.7	1	9
ICRF J234422.5 + 295220	2341 + 295	23 44 22.55242258	29 52 20.7009948	0.00063880	0.0043110	0.074	53523.9	53523.9	53523.9	1	7
ICRF J234512.4 − 155507	2342 − 161	23 45 12.46232090	−15 55 07.8343000	0.00001230	0.0004191	−0.162	53552.8	53552.8	53552.8	1	90
ICRF J234639.9 + 070506	2344 + 068	23 46 39.93323868	07 05 06.8460024	0.00061819	0.0044840	−0.189	49914.7	49914.7	49914.7	1	10
ICRF J234646.2 + 301159	2344 + 299	23 46 46.25078350	30 11 59.2492984	0.00008082	0.0015739	−0.445	53503.7	53503.7	53503.7	1	19
ICRF J234704.8 + 514217	2344 + 514	23 47 04.83670343	51 42 17.8816190	0.00013295	0.0012194	−0.572	53992.8	53573.0	54112.8	2	36
ICRF J234708.6 − 185618	2344 − 192	23 47 08.62672125	−18 56 18.8579352	0.00004413	0.0012728	0.032	50647.5	50632.3	50688.3	2	44
ICRF J234735.1 + 271901	2345 + 270	23 47 35.17486513	27 19 01.4938879	0.00002069	0.0005267	−0.323	53561.9	53561.9	53561.9	1	71
ICRF J234811.7 − 042556	2345 − 047	23 48 11.75774170	−04 25 56.3816594	0.00001259	0.0004116	−0.072	53539.3	53523.9	53560.8	2	149
ICRF J234920.8 + 384917	2346 + 385	23 49 20.82652500	38 49 17.5585063	0.00001327	0.0002595	−0.467	50242.8	50242.8	50242.8	1	89
ICRF J234921.0 + 053439	2346 + 052	23 49 21.05151098	05 34 39.8727098	0.00001370	0.0004344	0.016	52916.3	49914.7	53153.2	2	82
ICRF J235002.0 + 110636	2347 + 108	23 50 02.03087598	11 06 36.7043725	0.00007688	0.0018919	0.141	49914.7	49914.7	49914.7	1	28
ICRF J235010.0 + 081255	2347 + 079	23 50 10.07936990	08 12 55.2779967	0.00018564	0.0028047	−0.029	53561.9	53561.9	53561.9	1	16
ICRF J235146.0 − 220309	2349 − 223	23 51 46.00684076	−22 03 09.6593321	0.00003858	0.0012085	0.096	53573.0	53573.0	53573.0	1	52
ICRF J235248.9 + 394756	2350 + 395	23 52 48.90728832	39 47 56.2240709	0.00002739	0.0006362	−0.184	53560.8	53560.8	53560.8	1	66
ICRF J235252.8 + 704448	2350 + 704	23 52 52.85433083	70 44 48.3275403	0.00078511	0.0050130	0.828	49827.5	49827.5	49827.5	1	11
ICRF J235342.2 + 551840	2351 + 550	23 53 42.29978135	55 18 40.6675165	0.00005262	0.0007349	0.008	49827.5	49827.5	49827.5	1	54
ICRF J235409.1 − 001947	2351 − 006	23 54 09.17590087	−00 19 47.9556899	0.00001611	0.0004788	0.294	50576.2	50576.2	50576.2	1	82
ICRF J235502.1 − 212536	2352 − 217	23 55 02.14661532	−21 25 36.7808339	0.00004355	0.0013668	0.560	53552.8	53552.8	53552.8	1	47
ICRF J235723.8 − 245103	2354 − 251	23 57 23.85097341	−24 51 03.1631831	0.00014461	0.0047262	0.607	53561.9	53561.9	53561.9	1	26
ICRF J235725.1 − 015215	2354 − 021	23 57 25.13795231	−01 52 15.5093179	0.00001102	0.0003609	−0.051	50576.2	50576.2	50576.2	1	89
ICRF J235731.1 − 112539	2354 − 117	23 57 31.19756717	−11 25 39.1764446	0.00000630	0.0002070	−0.044	50576.2	50576.2	50576.2	1	86
ICRF J235828.8 + 043024	2355 + 042	23 58 28.84694245	04 30 24.8352840	0.00003968	0.0013163	0.361	53573.0	53573.0	53573.0	1	51
ICRF J235859.8 + 392228	2356 + 390	23 58 59.85518328	39 22 28.3057145	0.00002380	0.0004591	−0.265	50242.8	50242.8	50242.8	1	72

[a] ICRF Designations, constructed from the source coordinates
with the format ICRF JHHMMSS.s+DDMMSS or ICRF JHHMMSS.s-DDMMSS;
they follow the recommendations of the IAU Task Group on Designations.
[b] IERS Designations, previously constructed from B1950
coordinates; the complete format, including acronym and epoch in addition
to the coordinates, is IERS BHHMM+DDd or IERS BHHMM-DDd.

Table 21: Physical characteristics of ICRF2 defining sources

Designation[1]	Source name [2]	T[3]	z	Flux (Jy) 8.4GHz	Flux (Jy) 2.3GHz	Spec ind.[4]	mv	class sp.[5]	not[6]
ICRF J000435.6 − 473619	0002 − 478	A					19.0		
ICRF J001031.0 + 105829	0007 + 106	G	0.089	0.38	0.18	0.50	14.2	S1.2	v
ICRF J001101.2 − 261233	0008 − 264	Q	1.096	0.44	0.30	0.50	19.0		
ICRF J001331.1 + 405137	0010 + 405	G	0.256	0.56	0.48	−0.62	18.2	S1.9	
ICRF J001611.0 − 001512	0013 − 005	Q	1.574	0.35	0.88	−0.24	20.8		
ICRF J001945.7 + 732730	0016 + 731	Q	1.781	0.77	1.56	0.07	18.0		
ICRF J002232.4 + 060804	0019 + 058	L		0.17	0.25	0.03	19.2		
ICRF J003824.8 + 413706	0035 + 413	Q	1.353	0.35	0.65	0.20	19.9		
ICRF J005041.3 − 092905	0048 − 097	L	0.537	1.24	0.84	0.20	16.3	HP	v
ICRF J005109.5 − 422633	0048 − 427	Q	1.749	0.39	0.85		18.8		
ICRF J010245.7 + 582411	0059 + 581	A	0.644	1.68	1.38		16.1		
ICRF J010645.1 − 403419	0104 − 408	Q	0.584	3.34	1.16		19.0		
ICRF J010915.4 − 604948	0107 − 610	G					21.4		
ICRF J011205.8 + 224438	0109 + 224	L		0.67	0.42	0.12	16.4	HP	
ICRF J011327.0 + 494824	0110 + 495	G	0.389	0.60	0.53	−0.14	19.3	S1.2	
ICRF J011857.2 − 214130	0116 − 219	Q	1.161	0.50	0.59	0.09	19.0		
ICRF J012141.5 + 114950	0119 + 115	Q	0.570	0.18	0.10	0.33∗	19.0	HP	
ICRF J013305.7 − 520003	0131 − 522	G	0.020				20.3	S1	
ICRF J013658.5 + 475129	0133 + 476	Q	0.859	2.00	1.86	0.19	17.7	HP	
ICRF J013708.7 + 312235	0134 + 311	V		0.34	0.59	0.03	21.6		
ICRF J014125.8 − 092843	0138 − 097	L	0.733	0.53	0.62	−0.12	17.5	HP	
ICRF J015456.2 + 474326	0151 + 474	Q	1.026	0.61	0.38	0.50			
ICRF J020333.3 + 723253	0159 + 723	L		0.22	0.22	0.09	19.2		
ICRF J020504.9 + 321230	0202 + 319	Q	1.466	0.89	0.49	0.07	18.2		
ICRF J021748.9 + 014449	0215 + 015	Q	1.715	1.06	0.69		18.3	HP	
ICRF J022428.4 + 065923	0221 + 067	G	0.511	0.41	0.32	0.04	19.0	HP	
ICRF J022934.9 − 784745	0230 − 790	Q	1.070				18.6		
ICRF J023145.8 + 132254	0229 + 131	Q	2.060	1.04	1.34	0.06	17.7		
ICRF J023631.1 − 295355	0234 − 301	Q	2.103	0.48	0.20		18.0		
ICRF J023653.2 − 613615	0235 − 618	A					17.8		
ICRF J023752.4 + 284808	0234 + 285	Q	1.210	1.18	1.90	0.13	17.1	HP	
ICRF J023945.4 − 023440	0237 − 027	Q	1.116	0.51	0.37	0.49	21.0		
ICRF J030335.2 + 471616	0300 + 470	L		0.78	1.22		17.2		
ICRF J030350.6 − 621125	0302 − 623	A					19.1		
ICRF J030642.6 + 624302	0302 + 625	R		0.25	0.38				
ICRF J030903.6 + 102916	0306 + 102	Q	0.862	0.57	0.62	0.44	17.0		
ICRF J030956.0 − 605839	0308 − 611	A					18.6		
ICRF J031049.8 + 381453	0307 + 380	Q	0.816	0.66	0.48	0.36	17.6		
ICRF J031301.9 + 412001	0309 + 411	G	0.134	0.44	0.29	0.33	16.5	S1	
ICRF J032536.8 + 222400	0322 + 222	Q	2.060	1.69	0.99	−0.01	19.1		
ICRF J033413.6 − 400825	0332 − 403	L	1.445	2.15	0.57	−0.04	18.5	HP	
ICRF J033553.9 − 543025	0334 − 546	A					20.4		
ICRF J034506.4 + 145349	0342 + 147	A	1.556	0.28	0.44	0.42			
ICRF J034838.1 − 274913	0346 − 279	Q	0.990	1.21	1.11		19.4		
ICRF J040145.1 + 211028	0358 + 210	A	0.834	0.41	0.61		17.9		
ICRF J040353.7 − 360501	0402 − 362	Q	1.417	1.50	1.15	0.43	17.2		
ICRF J040534.0 − 130813	0403 − 132	Q	0.571	0.72	0.38	−0.37	17.2	HP	
ICRF J040659.0 − 382628	0405 − 385	Q	1.285	1.26	1.00	0.19	17.5		
ICRF J041636.5 − 185108	0414 − 189	Q	1.536	0.77	1.12	−0.09	18.5		
ICRF J042315.8 − 012033	0420 − 014	Q	0.915	2.67	2.68	−0.08	17.8	HP	
ICRF J042446.8 + 003606	0422 + 004	L	0.310	0.41	0.43	−0.33	16.1	HP	v
ICRF J042952.9 + 272437	0426 + 273	V		0.40	0.49	−0.42	18.6		
ICRF J043337.8 + 290555	0430 + 289	L		0.42	0.48	0.02	18.8		
ICRF J043900.8 − 452222	0437 − 454	V		1.00			20.5		
ICRF J044331.6 + 344106	0440 + 345	R		0.58	0.98				

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(Table 21: continued)

Designation[1]	Source name [2]	T[3]	z	Flux (Jy) 8.4GHz	Flux (Jy) 2.3GHz	Spec ind.[4]	mv	class sp.[5]	not[6]
ICRF J044907.6 + 112128	0446 + 112	L?	1.207	0.55	0.76	0.38	20.0		
ICRF J045005.4 − 810102	0454 − 810	G	0.444			0.29∗	19.6	S1.5	
ICRF J045703.1 − 232452	0454 − 234	Q	1.003	1.62	1.43	−0.07	16.6	HP	
ICRF J050112.8 − 015914	0458 − 020	Q	2.286	1.47	1.84	−0.09	18.4	HP	
ICRF J050145.2 + 135607	0458 + 138	R		0.38	0.60	0.16			
ICRF J050643.9 − 610940	0506 − 612	Q	1.093				16.9		
ICRF J050842.3 + 843204	0454 + 844	L		0.23	0.33	0.24	16.5	HP	
ICRF J050927.4 + 101144	0506 + 101	A		0.54	0.41	−0.30	17.8		
ICRF J051002.3 + 180041	0507 + 179	G	0.416	0.65	0.75	0.00	20.0		
ICRF J051644.9 − 620705	0516 − 621	A					21.0		
ICRF J051803.8 + 205452	0515 + 208	A	2.579	0.32	0.43				
ICRF J052234.4 − 610757	0522 − 611	Q	1.400			−0.18	18.1		
ICRF J052531.4 − 455754	0524 − 460	Q	1.479			0.14∗	17.3		
ICRF J052616.6 − 483036	0524 − 485	V		0.10	0.10				
ICRF J052732.7 + 033131	0524 + 034	L		0.39	0.46		18.6		
ICRF J053315.8 + 482252	0529 + 483	Q	1.162	0.53	0.64		18.8		
ICRF J053435.7 − 610607	0534 − 611	A					18.8		
ICRF J053628.4 − 340111	0534 − 340	-	0.683	0.33	0.49				
ICRF J053850.3 − 440508	0537 − 441	Q	0.894	4.79	4.03		15.5	HP	
ICRF J053942.3 + 143345	0536 + 145	A	2.690	0.47	0.54				
ICRF J053954.2 − 283955	0537 − 286	Q	3.100	0.53	0.65	0.24	20.0		
ICRF J054734.1 + 272156	0544 + 273	R		0.51	0.36				
ICRF J055009.5 − 573224	0549 − 575	A					19.5		
ICRF J055530.8 + 394849	0552 + 398	Q	2.365	5.28	3.99		18.0		
ICRF J055932.0 + 235353	0556 + 238	R		0.49	0.64				
ICRF J060309.1 + 174216	0600 + 177	A	1.738	0.42	0.58				
ICRF J064632.0 + 445116	0642 + 449	Q	3.400	3.86	1.07	0.88	18.4		
ICRF J064814.0 − 304419	0646 − 306	Q	1.153	0.95	0.90	0.06	18.6		
ICRF J065024.5 − 163739	0648 − 165	R		0.95	1.37				
ICRF J065917.9 + 081330	0656 + 082	V		0.51	0.68				
ICRF J070001.5 + 170921	0657 + 172	V		0.83	0.75				
ICRF J071046.1 + 473211	0707 + 476	Q	1.292	0.49	0.88	−0.28	18.2		
ICRF J072153.4 + 712036	0716 + 714	L	0.300	0.41	0.26	−0.13	15.5	HP	
ICRF J072516.8 + 142513	0722 + 145	A		0.45	0.93	0.03	17.8		
ICRF J072611.7 + 791131	0718 + 792	R		0.62	0.77	0.19			
ICRF J073019.1 − 114112	0727 − 115	Q	1.591	2.02	2.90		22.5		
ICRF J073918.0 + 013704	0736 + 017	Q	0.191	1.20	2.00	−0.09	16.1	HP	v
ICRF J074202.7 + 490015	0738 + 491	A	2.318	0.45	0.47	0.11			
ICRF J074554.0 − 004417	0743 − 006	Q	0.994	1.53	1.24	0.67	17.1		
ICRF J074625.8 + 254902	0743 + 259	Q	2.979	0.15	0.49		19.1		
ICRF J074836.1 + 240024	0745 + 241	G	0.409	0.54	0.74	0.25	19.0	HP	
ICRF J075052.0 + 123104	0748 + 126	Q	0.889	1.80	1.35	0.15	17.8		
ICRF J080248.0 + 180949	0759 + 183	A		0.47	0.57	0.12	18.5		
ICRF J080518.1 + 614423	0800 + 618	A	3.033	1.00	1.07	−0.08			
ICRF J080757.5 + 043234	0805 + 046	Q	2.880	0.20	0.34	−0.38	18.4		
ICRF J080839.6 + 495036	0804 + 499	Q	1.436	0.81	1.08	−0.14	17.5	HP	
ICRF J080856.6 + 405244	0805 + 410	Q	1.418	0.93	0.77	0.38	19.0		
ICRF J081126.7 + 014652	0808 + 019	L	1.148	0.58	0.57	0.43	17.5		
ICRF J081525.9 + 363515	0812 + 367	Q	1.028	0.75	0.75	−0.08	18.0		
ICRF J081815.9 + 422245	0814 + 425	L		1.05	1.08	−0.04	18.5	HP	1
ICRF J082550.3 + 030924	0823 + 033	L	0.506	1.13	1.45	0.14	18.0	HP	
ICRF J083052.0 + 241059	0827 + 243	Q	0.940	0.85	0.89	0.03	17.3		
ICRF J083639.2 − 201659	0834 − 201	Q	2.752	3.40	2.46		19.4		
ICRF J085448.8 + 200630	0851 + 202	L	0.306	1.31	1.24	0.11∗	14.0	HP	

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(Table 21: continued)

Designation[1]	Source name [2]	T[3]	z	Flux (Jy) 8.4GHz	Flux (Jy) 2.3GHz	Spec ind.[4]	mv	class sp.[5]	not[6]
ICRF J085641.8 − 110514	0854 − 108	R		1.10	0.63	0.04			
ICRF J091437.9 + 024559	0912 + 029	G	0.427	0.48	0.58		18.0	S1	
ICRF J092246.4 − 395935	0920 − 397	Q	0.591	1.39	1.19		18.8		
ICRF J092314.4 + 384939	0920 + 390	V		0.37	0.36	−0.01	21.7		
ICRF J092751.8 − 203451	0925 − 203	Q	0.348	0.45	0.31	−0.20	16.4	S1.0	
ICRF J095232.0 + 351252	0949 + 354	Q	1.876	0.34	0.29	−0.04	19.0		
ICRF J095819.6 + 472507	0955 + 476	Q	1.882	1.89	1.30	0.20	18.0		
ICRF J095820.9 + 322402	0955 + 326	Q	0.530	0.68	0.43	−0.33	15.8	S1.8	
ICRF J095847.2 + 653354	0954 + 658	L	0.368	0.56	0.67	0.29	15.4	HP	
ICRF J100614.0 − 501813	1004 − 500	R							
ICRF J101447.0 + 230116	1012 + 232	Q	0.565	0.77	0.69	−0.05	17.5	S1.5	
ICRF J101603.1 + 051302	1013 + 054	Q	1.713	0.52	0.54	−0.18	19.9		
ICRF J101725.8 + 611627	1014 + 615	Q	2.805	0.50	0.58	0.19	18.3		
ICRF J101810.9 + 354239	1015 + 359	Q	1.228	0.63	0.61	0.00	19.0		
ICRF J102343.5 − 664648	1022 − 665	R							
ICRF J102444.8 + 191220	1022 + 194	Q	0.828	0.47	0.39	−0.05	17.5		
ICRF J103303.7 + 411606	1030 + 415	Q	1.117	0.37	0.19	−0.14	18.2	HP	
ICRF J103334.0 + 071126	1030 + 074	A	1.535	0.19	0.20	0.18	19.0		
ICRF J103653.4 − 374415	1034 − 374	Q	1.821	0.50	0.22	0.29	19.5	HP	
ICRF J103716.0 − 293402	1034 − 293	Q	0.312	1.49	1.21	0.14	16.5	HP	
ICRF J104146.7 + 523328	1038 + 528	Q	0.678	0.53	0.44	−0.10	17.4		
ICRF J104423.0 + 805439	1039 + 811	Q	1.260	0.76	0.71	0.10	16.5		
ICRF J104455.9 + 065538	1042 + 071	Q	0.690	0.24	0.35	−0.25	20.5		
ICRF J104806.6 − 190935	1045 − 188	Q	0.595	1.19	0.85	−0.11	18.8	S1.8	
ICRF J105148.7 + 211952	1049 + 215	Q	1.300	0.91	1.27	−0.06	17.9		v
ICRF J105811.5 + 811432	1053 + 815	Q	0.706	0.78	0.54	0.47	18.5		
ICRF J105829.6 + 013358	1055 + 018	Q	0.890	3.75			18.3	HP	
ICRF J110352.2 − 535700	1101 − 536	A					16.2		
ICRF J110427.3 + 381231	1101 + 384	L	0.030	0.32	0.36	−0.11	13.8	HP	
ICRF J111358.6 + 144226	1111 + 149	Q	0.866	0.23	0.55		18.0		
ICRF J112553.7 + 261019	1123 + 264	Q	2.341	0.76	1.17	0.04	17.5		
ICRF J112704.3 − 185717	1124 − 186	Q	1.050	1.51	0.97	0.53	19.0		
ICRF J113053.2 + 381518	1128 + 385	Q	1.741	1.15	0.80	0.14	19.1		
ICRF J113320.0 + 004052	1130 + 009	Q	1.640	0.22	0.29	−0.09	19.0		
ICRF J113624.5 − 033029	1133 − 032	Q	1.648	0.53	0.36		19.5		
ICRF J114553.6 − 695401	1143 − 696	A					17.7		
ICRF J114658.2 + 395834	1144 + 402	Q	1.088	0.73	0.48	0.30	18.1		
ICRF J114701.3 − 381211	1144 − 379	Q	1.048	2.72	1.08	0.22	16.2	HP	
ICRF J114751.5 − 072441	1145 − 071	Q	1.342	0.53	0.78	0.08	17.5		
ICRF J115019.2 + 241753	1147 + 245	L	0.200	0.50	0.52	−0.05	16.7	HP	v
ICRF J115217.2 − 084103	1149 − 084	Q	2.370	1.05	0.97		18.5		
ICRF J115918.3 − 663539	1156 − 663	R							
ICRF J115931.8 + 291443	1156 + 295	Q	0.730	1.28	1.52	−0.29	17.0	HP	
ICRF J121546.7 − 173145	1213 − 172	G		1.62	1.23	−0.16	21.4		
ICRF J121752.0 + 300700	1215 + 303	L	0.130	0.25	0.28	−0.30	15.7	HP	v
ICRF J122222.5 + 041315	1219 + 044	Q	0.965	0.67	0.54	0.12	18.0		
ICRF J122340.4 + 804004	1221 + 809	L		0.47	0.36	−0.28	18.0		
ICRF J122847.4 + 370612	1226 + 373	Q	1.510	0.25	0.46	0.44	18.2		
ICRF J123924.5 + 073017	1236 + 077	G	0.400	0.70	0.70	0.11	20.1		
ICRF J124251.3 + 375100	1240 + 381	Q	1.318	0.51	0.68	0.05	19.0		
ICRF J124604.2 − 073046	1243 − 072	Q	1.286	0.78	0.69		18.0		
ICRF J124646.8 − 254749	1244 − 255	Q	0.630	1.52	0.73	0.25	17.4	HP	
ICRF J125438.2 + 114105	1252 + 119	Q	0.873	0.40	0.70	−0.14	16.2		
ICRF J125459.9 − 713818	1251 − 713	A					20.5		

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(Table 21: continued)

Designation[1]	Source name [2]	T[3]	z	Flux (Jy) 8.4GHz	Flux (Jy) 2.3GHz	Spec ind.[4]	mv	class sp.[5]	not[6]
ICRF J130252.4 + 574837	1300 + 580	V		0.28	0.25	0.54	18.9		
ICRF J131059.4 + 323334	1308 + 328	Q	1.650	0.45	0.49	0.26	19.1		
ICRF J131607.9 − 333859	1313 − 333	Q	1.210	0.87	0.77	−0.07	20.0		
ICRF J132700.8 + 221050	1324 + 224	Q	1.400	1.79	1.98	0.07	18.2		
ICRF J132901.1 − 560802	1325 − 558	R							
ICRF J133739.7 − 125724	1334 − 127	Q	0.540	4.88	3.21	0.34	17.2	HP	
ICRF J134345.9 + 660225	1342 + 662	Q	0.766	0.23	0.26	0.55	20.0		
ICRF J134408.6 + 660611	1342 + 663	Q	1.350	0.51		−0.16	20.0		
ICRF J135256.5 − 441240	1349 − 439	L	0.050	0.06	0.06		18.0	HP	
ICRF J135406.8 − 020603	1351 − 018	Q	3.710	0.77	0.80		20.9		
ICRF J135711.2 − 152728	1354 − 152	Q	1.890	1.34	0.69		19.0		
ICRF J135755.3 + 764321	1357 + 769	A		0.80	0.68	0.05	19.0		
ICRF J140856.4 − 075226	1406 − 076	Q	1.494	0.73	0.63		18.4		
ICRF J141946.5 + 542314	1418 + 546	L	0.153	0.50	0.60	0.57	15.9	HP	
ICRF J141946.6 + 382148	1417 + 385	Q	1.831	0.59	0.50		19.3		
ICRF J142455.5 − 680758	1420 − 679	A					22.2		
ICRF J142549.0 + 142456	1423 + 146	Q	0.780	0.35	0.45	0.09	19.0		
ICRF J142756.2 − 420619	1424 − 418	Q	1.522	1.33	1.49	0.28∗	17.7	HP	
ICRF J143439.7 + 195200	1432 + 200	A	1.382	0.40	0.50		18.3		
ICRF J144553.3 − 162901	1443 − 162	A		0.28	0.45		19.5		
ICRF J145239.6 − 650203	1448 − 648	G					22.0		
ICRF J145432.9 − 401232	1451 − 400	Q	1.810	0.33	0.70		18.5		
ICRF J145859.3 + 041613	1456 + 044	G	0.391	0.53	0.44	−0.33	18.3		
ICRF J150048.6 + 475115	1459 + 480	A		0.61	0.40	0.24	19.4		
ICRF J150424.9 + 102939	1502 + 106	Q	1.839	1.00	1.50	−0.03	18.6	HP	
ICRF J150506.4 + 032630	1502 + 036	G	0.409	0.98	0.83	0.41	18.1		
ICRF J150609.5 + 373051	1504 + 377	G	0.672	0.86	0.66	−0.01	21.2	S2	
ICRF J151002.9 + 570243	1508 + 572	Q	4.309	0.38	0.22	−0.18	21.4		
ICRF J151250.5 − 090559	1510 − 089	Q	0.361	1.23	2.20		16.7	HP	v
ICRF J151344.8 − 101200	1511 − 100	Q	1.513	0.82	0.80	0.03	14.7		
ICRF J151656.7 + 193212	1514 + 197	L	1.070	0.48	0.60	0.14	18.5		
ICRF J152149.6 + 433639	1520 + 437	Q	2.171	0.50	0.38	0.48			
ICRF J152237.6 − 273010	1519 − 273	L	1.294	1.68	1.34	0.17	18.5	HP	
ICRF J154929.4 + 023701	1546 + 027	Q	0.414	1.23	1.25	0.05	16.8	HP	
ICRF J155035.2 + 052710	1548 + 056	Q	1.422	2.10	2.35	−0.21	17.7	HP	
ICRF J155751.4 − 000150	1555 + 001	Q	1.770	0.96	0.78		19.3		
ICRF J155850.2 − 643229	1554 − 643	G	0.080				17.0		
ICRF J155930.9 + 030448	1557 + 032	Q	3.891	0.35	0.35		19.8		
ICRF J160734.7 − 333108	1604 − 333	V		0.17	0.26				
ICRF J160846.2 + 102907	1606 + 106	Q	1.226	1.20	1.69	0.12	18.2		
ICRF J161630.6 − 710831	1611 − 710	A					20.7		
ICRF J161637.5 + 045932	1614 + 051	Q	3.210	0.55	0.67	0.39	19.5		
ICRF J161914.8 + 224747	1617 + 229	A	1.987	0.68	0.57		20.9		
ICRF J162418.4 − 680912	1619 − 680	Q	1.354				18.0		
ICRF J162546.8 − 252738	1622 − 253	Q	0.786	2.24	2.18	−0.04	21.9		
ICRF J162854.6 − 615236	1624 − 617	R							
ICRF J163813.4 + 572023	1637 + 574	Q	0.751	0.91	1.28	0.05	16.7	S1.2	
ICRF J164029.6 + 394646	1638 + 398	Q	1.700	0.86	0.98	0.28	18.5	HP	
ICRF J164125.2 + 225704	1639 + 230	Q	2.063	0.42	0.37	0.12	19.3		
ICRF J164207.8 + 685639	1642 + 690	Q	0.751	1.10	1.48	−0.22	19.2	HP	
ICRF J164257.3 − 810835	1633 − 810	A					18.0		
ICRF J170053.1 − 261051	1657 − 261	R		0.45	0.23				
ICRF J170144.8 − 562155	1657 − 562	R							
ICRF J170336.5 − 621240	1659 − 621	V							

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(Table 21: continued)

Designation[1]	Source name [2]	T[3]	z	Flux (Jy) 8.4GHz	Flux (Jy) 2.3GHz	Spec ind.[4]	mv	class sp.[5]	not[6]
ICRF J170734.4 + 014845	1705 + 018	Q	2.570	0.51	0.76		18.9		
ICRF J170934.3 − 172853	1706 − 174	R		0.33	0.52				
ICRF J171913.0 + 174506	1717 + 178	L	0.137	0.54	0.68	0.03	18.5	HP	
ICRF J172727.6 + 453039	1726 + 455	Q	0.710	1.02	1.14	0.21	17.8	S1.2	
ICRF J173302.7 − 130449	1730 − 130	Q	0.902	8.31	4.67	−0.08	18.5		
ICRF J173340.7 − 793555	1725 − 795	A					19.7		
ICRF J173420.5 + 385751	1732 + 389	Q	0.970	1.12	1.25	0.19	19.0	HP	
ICRF J173927.3 + 495503	1738 + 499	Q	1.545	0.35	0.43		19.0		
ICRF J173957.1 + 473758	1738 + 476	L		0.60	1.01	0.04	18.5		
ICRF J174358.8 − 035004	1741 − 038	Q	1.054	3.59	2.18	0.78	18.6	HP	
ICRF J174535.2 + 172001	1743 + 173	Q	1.702	0.70	1.20	−0.14	18.7		
ICRF J174614.0 + 622654	1745 + 624	Q	3.900	0.48	0.35	−0.29	19.5		
ICRF J175132.8 + 093900	1749 + 096	Q	0.322	4.30	1.59	0.64	17.9	HP	v
ICRF J175342.4 + 284804	1751 + 288	V		0.33	0.41		19.6		
ICRF J175653.1 + 153520	1754 + 155	V		0.45	0.31				
ICRF J180024.7 + 384830	1758 + 388	Q	2.092	1.07	0.42	0.72	18.0		
ICRF J180045.6 + 782804	1803 + 784	Q	0.680	2.07	2.23	0.13	17.0	HP	
ICRF J180132.3 + 440421	1800 + 440	Q	0.663	0.95	0.37	−0.20	17.5		
ICRF J180323.4 − 650736	1758 − 651	V					20.6		
ICRF J180957.8 − 455241	1806 − 458	G	0.070				15.7		
ICRF J181945.3 − 552120	1815 − 553	A					18.9		
ICRF J182332.8 + 685752	1823 + 689	R		0.20	0.35	−0.04			
ICRF J182407.0 + 565101	1823 + 568	Q	0.664	0.98	0.95	−0.11	18.4	HP	
ICRF J182912.4 − 581355	1824 − 582	R							
ICRF J183728.7 − 710843	1831 − 711	Q	1.356			0.14	17.5		
ICRF J184233.6 + 680925	1842 + 681	Q	0.470	0.80	0.65	0.02	17.9		
ICRF J184822.0 + 321902	1846 + 322	A	0.798	0.52	0.55				
ICRF J184916.0 + 670541	1849 + 670	Q	0.657	0.85	0.67	−0.06	18.7	S1.2	
ICRF J191109.6 − 200655	1908 − 201	Q	1.119	1.78	1.84	0.06			
ICRF J192332.1 − 210433	1920 − 211	Q	0.874	2.60	2.30	−0.09			
ICRF J192451.0 − 291430	1921 − 293	Q	0.352	12.03	13.93	0.05	16.8	HP	v
ICRF J193006.1 − 605609	1925 − 610	A					20.3		
ICRF J193124.9 + 224331	1929 + 226	R		0.60	0.59				
ICRF J193716.2 − 395801	1933 − 400	Q	0.965	0.96		−0.10	18.0		
ICRF J193926.6 − 152543	1936 − 155	Q	1.657	0.75	0.67	0.53	19.4	HP	
ICRF J194025.5 − 690756	1935 − 692	Q	3.100				17.3		
ICRF J195542.7 + 513148	1954 + 513	Q	1.220	1.29	1.21		18.5		
ICRF J195759.8 − 384506	1954 − 388	Q	0.630	3.15	2.45	0.35	17.1	HP	
ICRF J200057.0 − 174857	1958 − 179	Q	0.650	1.06	0.70	0.75	17.5	HP	
ICRF J200210.4 + 472528	2000 + 472	V		1.12	1.07				
ICRF J200555.0 − 372341	2002 − 375	R		0.32	0.45	0.41			
ICRF J201115.7 − 154640	2008 − 159	Q	1.180	1.10	0.93	0.59	17.2		
ICRF J203154.9 + 121941	2029 + 121	Q	1.215	0.82	1.00	0.74∗	18.5		
ICRF J205616.3 − 471447	2052 − 474	Q	1.489	0.10	0.10		19.1		
ICRF J210138.8 + 034131	2059 + 034	Q	1.013	0.94	0.87		18.1		
ICRF J210841.0 + 143027	2106 + 143	A	2.017	0.39	0.46	−0.06	20.0		
ICRF J210933.1 − 411020	2106 − 413	Q	1.060	1.59	1.50		21.0		
ICRF J211529.4 + 293338	2113 + 293	Q	1.514	0.66	0.48	0.62∗	18.5		
ICRF J212630.7 − 460547	2123 − 463	Q	1.670	0.10	0.10		18.0		
ICRF J212912.1 − 153841	2126 − 158	Q	3.270	0.84	1.06	0.38	17.3		
ICRF J213410.3 − 015317	2131 − 021	Q	1.285	1.26	1.54	0.01	18.7	HP	2
ICRF J213901.3 + 142335	2136 + 141	Q	2.427	2.84	1.50	0.38	18.5		
ICRF J214712.7 − 753613	2142 − 758	Q	1.139				17.3		
ICRF J215224.8 + 173437	2150 + 173	L		0.55	0.50	−0.06	21.0	HP	

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(Table 21: continued)

Designation[1]	Source name [2]	T[3]	z	Flux (Jy) 8.4GHz	Flux (Jy) 2.3GHz	Spec ind.[4]	mv	class sp.[5]	not[6]
ICRF J220743.7 − 534633	2204 − 540	Q	1.206				18.0		
ICRF J221205.9 + 235540	2209 + 236	Q	1.125	0.93	0.82	0.13	19.0		
ICRF J222305.9 − 345547	2220 − 351	G	0.298	0.32	0.27	−0.51		S1	
ICRF J222547.2 − 045701	2223 − 052	Q	1.404	2.37	1.67	−0.31	17.2	HP	
ICRF J222940.0 − 083254	2227 − 088	Q	1.560	2.76	1.25	0.13	17.5	HP	
ICRF J223036.4 + 694628	2229 + 695	G		0.24	0.52	0.24	19.6		
ICRF J223513.2 − 483558	2232 − 488	Q	0.510	0.10	0.10	−0.15	17.2		
ICRF J223912.0 − 570100	2236 − 572	V					18.5		
ICRF J224703.9 − 365746	2244 − 372	Q	2.252	0.62	0.57	−0.33	19.0		
ICRF J224838.6 − 323552	2245 − 328	Q	2.268	0.35	0.34	−0.12	18.6		
ICRF J225307.3 + 194234	2250 + 190	Q	0.284	0.32	0.34	0.17	16.7	S1	
ICRF J225717.3 + 074312	2254 + 074	L	0.190	0.51	0.36		17.0	HP	v
ICRF J225805.9 − 275821	2255 − 282	Q	0.926	3.83	1.38	0.57	16.8	S1	
ICRF J230343.5 − 680737	2300 − 683	Q	0.510				16.4	S1.5	
ICRF J232044.8 + 051349	2318 + 049	Q	0.622	0.65	0.70		19.0		
ICRF J232917.7 − 473019	2326 − 477	Q	1.299	0.10	0.10		16.8		
ICRF J233633.9 − 411521	2333 − 415	A	1.406	0.10	0.10	−0.05	20.0		
ICRF J234719.8 − 511036	2344 − 514	A	2.670				20.1		
ICRF J235430.1 − 151311	2351 − 154	Q		0.58	0.98		17.0		
ICRF J235600.6 − 682003	2353 − 686	A	1.716				17.0		
ICRF J235753.2 − 531113	2355 − 534	Q	1.006				17.8		
ICRF J235810.8 − 102008	2355 − 106	Q	1.639	0.55	0.61	−0.07	17.7		
ICRF J235933.1 + 385042	2356 + 385	Q	2.704	0.51	0.37	−0.29	19.0		
ICRF J235935.4 − 313343	2357 − 318	Q	0.990	0.76	0.54		17.6		

[1]ICRF Designations, constructed from the source coordinates with the format ICRF JHHMMSS.s+DDMMSS or ICRF JHHMMSS.s-DDMMSS; they follow the recommendations of the IAU Task Group on Designations.

[2]IERS Designations, previously constructed from B1950 coordinates; the complete format, including acronym and epoch in addition to the coordinates, is IERS BHHMM+DDd or IERS BHHMM-DDd.

[3]Type of Object: Q = quasar, G = galaxie, L = BL Lac, L? = BL Lac candidate, A = active galactic nuclei or quasar, V = optical source, R = radio source

[4]Spectral index from Healey *et al.* 2007, asterisk indicates that the reported value is from Stickel *et al.*

[5]Classification of Spectrum: S1 = Seyfert 1 spectrum, S1.0, S1.2, S1.5, S1.8, S1.9 = intermediate Seyfert galaxies, S2 = Seyfert 2 spectrum, HP = high optical polarization (sup 3%)

[6]Notes: v = variable in optical, 1 = no redshift is listed because the values given in literature are only speculative, 2 = uncertain redshift