

Attributes of the ICRF

Chopo Ma
Goddard Space Flight Center

The ICRF (International Celestial Reference Frame) realizes the ICRS (International Celestial Reference System) formally through 212 defining radio sources along with more than 2000 other sources with good measured VLBI positions. The observations and analysis underlying the ICRF were completed more than a decade ago. The currently available data set and analysis represent a great improvement, and an effort to establish the next ICRF is underway. The ICRF has several areas of applicability with different attributes. The largest set of sources is available for astronomical phase referencing observations, where the requirement for accuracy is relatively weak. On the other hand, only a small subset, the so-called geodetic catalogue, is used for regular VLBI measurements of the ITRF and Earth orientation without which the ITRF and the ICRF would be uncoupled. This geodetic catalogue has not been astrometrically optimal as it must also consider the practical sensitivity of the available IVS network. In the near and intermediate future, improved VLBI observations from higher bandwidth and new systems and better use of information about the sources should improve the geodetic catalogue and the resulting measurements. For spacecraft navigation and planetary ephemerides sources are needed in particular places along the ecliptic. In addition, the catalogue observing frequency must match the spacecraft telemetry signal used for differential VLBI. Observations and analysis for this purpose are in progress.