3.4.3 International VLBI Service (IVS)

IVS Organization and Activities

IVS in 2001 held its first biennial Technical Operations Workshop (TOW) at Haystack Observatory, with about 80 participants representing Network Stations, Correlators, and Operation Centers. Two IVS Directing Board meetings were held, one in February at NASA's Goddard Space Flight Center in Greenbelt, MD, USA, and the other in September at the Spanish Research Council in Barcelona, Spain. The second IVS Working Group, called WG2, was established at the February board meeting and charged with reviewing the IVS product specifications and observing programs. The WG2 report was completed and delivered to the board by the end of 2001. The IVS Directing Board received an award from the Japanese Ministry of Public Management, Home Affairs, Post and Telecommunications on June 1, 2001. The award was given for the VSI (VLBI Standard Interface) developed under the auspices of IVS. IVS published the first issue of a newsletter which is intended to keep the community informed about IVS activities.

Network Stations

A total of 909 station days were used in 159 geodetic sessions during the year, for an average of 3.0 days per week observing coordinated by IVS. Observing was increased compared to 2000 due to the increased efficiency of the Mark IV correlators. The major observing programs during 2001 were:

NEOS-A Weekly 24-hour measurements of EOP were continued by the U.S. National Earth Orientation Service (NEOS), a joint effort of USNO and NASA. Daily 1.5-hour UT1 Intensive measurements continued on the other four days of the week.

CORE The CORE (Continuous Observations of the Rotation of the Earth) program, coordinated by NASA, observed bi-weekly CORE-3 sessions on the day following NEOS for the first half of the year and then moved to weekly CORE-3 sessions. The CORE-1 (Monday) sessions were monthly. CORE-1 was recorded at 128 Mb/s, double the standard bandwidth, and CORE-3 at 256 Mb/s, quadruple the standard. These modes can only be processed by the Mark IV correlators.

VLBA The Very Long Baseline Array (VLBA), operated by the National Radio Astronomy Observatory (NRAO), continued to allocate six observing days for astrometry/geodesy. These sessions included the 10 VLBA stations plus up to 10 geodetic stations, providing state-of-the-art astrometry as well as information for mapping ICRF sources.

CRF Five sessions were scheduled for maintenance of the ICRF in the southern hemisphere.

IRIS-S Monthly sessions were coordinated by the Geodetic Institute of the University of Bonn, observed monthly for EOP and TRF determinations.

Europe The European geodetic network, coordinated by the Geodetic Institute of the University of Bonn, continued with three sessions in 2001 due to the termination of EU funding.

APSG The Asia-Pacific Space Geodesy (APSG) program operated two sessions.

JADE The Japanese Domestic Experiments (JADE) had seven sessions. These sessions included the dedicated 32-m dish at Tsukuba and are designed to monitor the domestic network within the ITRF.

Syowa The National Institute for Polar Research (NIPR) continued its sessions that included the Syowa station in Antarctica. The data were recorded with K4 and S2 and processed at the Mitaka (Japan) correlator.

Network Performance

The Network Coordinator's data base of station performance showed data loss of about 12%. The most significant problem in 2001 was RFI (radio frequency interference), which occurs mostly at S-band and is expected to become more severe and widespread in future years.

Correlators

The Mark IV correlators at Haystack Observatory (USA), the U.S. Naval Observatory (USA), and at Max-Planck Institute for Radioastronomy (Germany) became fully operational during 2001. Significant software enhancements and operational improvements were made during 2001, with the final result being 2–3 days processing for each 24-hour session.

Data Centers

The IVS Data Centers continued to receive new data bases throughout the year. Almost all of the historical data bases had been submitted to the Data Centers as of the end of 2001.

Analysis Centers

At the second IVS Analysis Workshop, held at Goddard Space Flight Center in February, participants discussed matters of operational and scientific data analysis. Results of the first IVS Analysis Pilot Project included comparisons of 13 different EOP solutions from 10 Analysis Centers, giving a good indication of the status of the different analysis packages. Outlier detection was

added to the combination done by the IVS Analysis Coordinator, increasing the reliability of the results. A call for participation in a second Pilot Project was made in the second half of the year.

Technology Development Centers

The VSI-S (software) specification was nearly completed in 2001. This interface will be the software half of the complete VSI specification. Progress was made toward doing a demonstration experiment for “e-VLBI” in which the raw VLBI data will be transmitted electronically from the stations to the Mark 4 correlator. Participating stations will be Westford (at Haystack Observatory) and the Goddard Geophysical and Astronomical Observatory in Greenbelt, MD. At the Japanese Communications Research Laboratory achievements in high data rate VLBI were made in 2001. They obtained the first real-time fringes at 1 Gbps, and the first tape-based fringes at 2 Gbps.

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