

The Bonn Geodetic VLBI Operation Center

A. Nothnagel, A. Miskens

Abstract

In 2012, the IGGB Operation Center has continued to carry out tasks for organizing and scheduling the observing sessions of the IVS-T2, IVS-OHIG, IVS-INT3, and EUROPE series.

1. Center Activities

The IGGB VLBI Operation Center is located at the Institute of Geodesy and Geoinformation of the University of Bonn, Nussallee 17, D-53115 Bonn, Germany. It has been organizing and scheduling VLBI observing sessions for more than twenty years. The observing series organized and scheduled in 2012 are very similar to those in 2011.

- **Measurement of Vertical Crustal Motion in Europe by VLBI (EUROPE)**

In Europe, a series of special sessions has been scheduled for the determination of precise station coordinates and for long term stability tests. This year, six sessions with Ny-Ålesund, Onsala, Metsahovi, Svetloe, Zelenchukskaya, Badary, Effelsberg, Wettzell, Simeiz, Medicina, Matera, Noto, and Yebes (YEBES40M) were scheduled employing the frequency setup of 16 channels and 4 MHz bandwidth in fan-out mode (identical to the setup of the IVS-T2 sessions).

- **IVS-T2 Series**

This series has been observed roughly every second month (seven sessions in 2012) primarily for maintenance and stabilization of the VLBI terrestrial reference frame as well as for Earth rotation monitoring as a by-product. Each station of the global geodetic VLBI network is scheduled to participate at least once per year in the T2 sessions. In view of the limitations in station days, priority was given to stronger and more robust networks with many sites over more observing sessions. Therefore, generally 15 to 20 stations have been scheduled in each session. The processing is carried out with the DiFX software correlator. The scheduling of these sessions has to take into account that a sufficient number of observations should be planned for each baseline of these global networks. The recording frequency setup is 16 channels and 4 MHz channel bandwidth.

- **Southern Hemisphere and Antarctica Series (OHIG):**

In February 2012, three sessions of the Southern Hemisphere and Antarctica Series with the Antarctic stations Syowa (Japanese) and O'Higgins (German) plus Fortaleza, Hobart, HartRAO, and Kokee have been organized. Furthermore, OHIGGINS was also included successfully in the T2081 session. The (southern) winter O'Higgins burst was scheduled and observed but without the stations of O'Higgins and Warkworth for various reasons. The purpose of these sessions is the maintenance of the VLBI TRF and the monitoring of Earth rotation as a by-product. The recording frequency setup is 16 channels and 4 MHz channel bandwidth. Due to the fact that Syowa is not able to deliver the recorded data for nearly one year after the observations, the correlation and the generation of the databases is delayed considerably.

- **UT1 Determination with Near-real-time e-VLBI (INT3):**

The so-called INT3 sessions included the telescopes of Ny-Ålesund, Tsukuba and Wettzell for weekly UT1 determinations with rapid processing time. Since August 2007, these sessions have been scheduled to start every Monday morning at 7:00 a.m. UT.

The operations of the INT3 series are directly linked to data transmission and correlation since the raw VLBI observation data of the three sites is directly transferred to the Bonn Correlator by Internet connections to speed up delivery of the results. The transmission rate is about 100 Mb/s for Ny-Ålesund (limited due to the use of a radio link for the first part of the distance) and 400-600 Mb/s from Tsukuba and Wettzell. The correlation is solely carried out with the DiFX software correlator.

In 2012, 45 sessions were observed and transmitted successfully. 90% of the sessions were correlated and the databases were delivered within the first five hours after the end of the observations. A further 5% were completed within 10 hours. The rest took between 10 and 48 hours due to difficulties with networking hardware and/or station and processor problems. In March and April, Seshan participated in some INT3 sessions replacing Tsukuba, which could not observe due to maintenance activities. Since then Seshan has taken part in INT3 sessions periodically.

2. Staff

Table 1. Personnel at IGGB Operation Center.

Arno Müskens	+49-228-525264	mueskens@mpifr.de
Axel Nothnagel	+49-228-733574	nothnagel@uni-bonn.de