

# The Bonn Geodetic VLBI Operation Center

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## Abstract

The IGGB Operation Center has continued to organize and schedule the IVS-T2, IVS-OHIG, IVS-INT3, and EUROPE sessions.

## 1. Center Activities

The IGGB VLBI Operation Center is located at the Institute of Geodesy und 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 2009 are the same as in 2008.

- **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, Madrid (DSS65A), Medicina, Matera, Noto, and Yebes 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 other month (7 sessions in 2009) 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 planned 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, 12 to 15 stations have been scheduled in each session requiring multiple passes on the IVS correlators. The scheduling of these sessions has to make sure that a sufficient number of observations is 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)**

Seven sessions of the Southern Hemisphere and Antarctica Series with the Antarctic stations Syowa (Japanese) and O'Higgins (German) plus Fortaleza, Hobart, Kokee, and DSS45 have been organized for maintenance of the VLBI TRF and for Earth rotation monitoring. These sessions are clustered in time at periods when O'Higgins is manned depending on logistical circumstances and available manpower. 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 determination with rapid processing time. Since August 2007 these sessions have been scheduled to start every Monday morning at 7:00 a.m. UT.

In order to speed up delivery of the results, the raw VLBI observation data of the three sites is transferred to the Bonn Correlator by Internet connections. 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 Mb/s from Tsukuba and Wettzell. For compatibility reasons, the data of Tsukuba initially recorded in K4 format has to be converted to Mark 5 format after transmission. 16 channels with 8 MHz/channel are recorded resulting in 256 Mb/s. With close to 30 minutes effective observing and recording time, each station has to transfer about 460 Gb or 58 GB per session. Due to copying procedures and current network capacities, the threshold for completion of delivery of the raw VLBI data to the correlator is currently about seven hours after the final observation. In 2009, 49 sessions have been observed and transmitted successfully. 80% of the sessions have been correlated and delivered within the first 8 hours after the end of the observations. A further 15% have been completed within 10 hours. The rest have taken between 10 and 24 hours due to difficulties with networking hardware.

## 2. Staff

Table 1. Personnel at IGGB Operation Center

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