3.6.2.6 Geodetic Institute of the University of Bonn (GIUB)

The Geodetic Institute of the University of Bonn has been operating an IERS Combination Research Centre since 2001. In 2005, most of the investigations concentrated on the generation of the input files for ITRF2005 since the VLBI Group of the Geodetic Institute is responsible for generating the official input series of the International VLBI Service for Geodesy and Astrometry (IVS).

In this process, contributions of the IVS Analysis Centres in the form of individual SINEX files for each 24-hour session have been combined to the official IVS series of SINEX files. For this purpose, the IVS had decided that it will carry out its official combination activities purely on the basis of datum-free normal equations. So, combinations of output from software packages using least-squares algorithms based on the solution of normal equations did not pose any basic difficulties. However, software packages using Kalman Filter or Square Root Information Filter techniques are not able to generate normal equations directly. Possible ways of reconstructing normal equations from covariance matrices have been investigated but a satisfying solution has not been reached yet due to a deficit in transferring necessary statistical information. For this reason, the official IVS VLBI series has been combined only on the basis of contributions of analysis centres which were able to produce genuine datum-free normal equations (Vennebusch et al. 2006). In connection with the combination of EOP results on the basis of EOP time series, it was found out that the IVS Analysis Centres use slightly different realisations of the terrestrial reference frame (TRF) in their data analysis for EOP determinations. This introduces an extra noise component which can be eliminated through the use of a single TRF realisation to be applied after the combination process. For this reason, the IVS will change to carry out combinations of datum-free normal equations in SINEX format exclusively from January 1, 2007.

Reference

Vennebusch M., S. Böckmann, A. Nothnagel (2006): The contribution of Very Long Baseline Interferometry to the 2005 realisation of the International Terrestrial Reference Frame; submitted to Journal of Geodesy

Axel Nothnagel, Sarah Böckmann, Markus Vennebusch