

3.6.2.5 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. During 2004, the IVS combination process of EOP time series has been improved further. Here, a procedure for considering correlations between the different IVS Analysis Centres has been developed and further refined (Steinforth and Nothnagel 2004).

The second activity concerns the combination of EOP and station coordinates of VLBI solutions using SINEX V2.0 output files (Vennebusch 2004). Here, the output of solutions in the form of datum-free normal equation matrices is used as input for the combination. The output is again a datum-free normal equation system containing all the information of the input solutions. This can then be used for further combination with the other space geodetic techniques. In previous years, input solutions were only provided by IVS Analysis Centres using the Calc/Solve VLBI analysis software. This fact facilitated the first steps of SINEX-based combinations in the past since the identical software guaranteed a consistent handling of certain geophysical effects. In 2004, input has also been provided on the basis of the OCCAM and the SteelBreeze software. The new challenge now is that the nutation models used as apriori information as well as the paradigms, old (IAU1976/1980) and new (IAU2000), may be quite different for the input series. The pre-processing of the combination is, thus, not only necessary for a transformation to an identical reference epoch but also for the nutation model as such. Since this is quite a complex task which will not be necessary any more when all analysis centres use the IAU2000 paradigm, it was decided to spare the development of the necessary routines for the time being. The input normal equations are, thus, first being processed individually in order to eliminate the elements of the two nutation parameters through further steps of de-composition. Through this procedure the elements for the nutation parameters are automatically excluded in the subsequent combination process and the output SINEX files contain only elements for polar motion, UT1–UTC with their rates and for the station coordinates. This procedure has been used for the IVS contribution to the IERS Combination Pilot Project and will also be used for the IVS submissions to the ITRF2004 initiative.

References

Steinforth, C., Nothnagel, A. (2004): Considering a Priori Correlations in the IVS Combined EOP Series; N.R. Vandenberg, K.D. Baver (eds.), IVS 2004 General Meeting Proceedings, NASA-CP-2004-212255, Greenbelt MD, 413–417

Vennebusch, M.(2004): First Results of SINEX Combinations; N.R. Vandenberg, K.D. Baver (eds.), IVS 2004 General Meeting Proceedings, NASA-CP-2004-212255, Greenbelt MD, 423–426

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