Geophysical Research Abstracts, Vol. 9, 06363, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-06363

Long time-series of GPS- and VLBI-derived EOP consistently combined including the TRF

D. Thaller (1), M. Krügel (2), B. Meisel (2), T. Artz (3), P. Steigenberger (1), V. Tesmer (2), J. Wünsch (1), M. Rothacher (1)

(1) GeoForschungsZentrum Potsdam (GFZ), Potsdam, Germany, (2) Deutsches Geodätisches Forschungsinstitut (DGFI), Munich, Germany, (3) Institute for Geodesy and Geomatics (IGG), University of Bonn, Bonn, Germany

We generated daily technique-specific normal equations for the time-span 1984-2006 for VLBI and 1994-2006 for GPS. In order to get homogeneous time-series for the estimated parameters, the entire time spans were reprocessed with the latest analysis standards. In order to obtain homogeneous time-series, a reprocessing is indispensable, as it is well-known that changes in the analysis strategy split the time-series of parameters into sub-intervals with different properties. In the case of comparing or combining independent solutions, the homogeneity between the individual solutions is as important as the homogeneity within one time-series. Therefore, a detailed harmonization of the processing standards and parameterization was performed although different software packages were used to process the space-geodetic observations. Based on the datum-free normal equations, Earth orientation parameters (EOP), station coordinates and velocities are estimated together and can be consistently combined. The combination encloses all five Earth rotation angles including their time-derivatives, i.e., polar motion, universal time (UT) and nutation. It will be studied to what extent a combined terrestrial reference frame can stabilize the VLBI-derived time-series of UT and the nutation angles. And, going one step further, the question will be answered whether the contribution of length of day (LOD) and the nutation rates by GPS improves the results. The validation of the estimated time-series will be done by comparisons with other time-series of EOP officially available, by spectral analysis in view of tidal amplitudes, and by comparisons with atmospheric and oceanic angular momentum data.