

3.6.2.6 GeoForschungsZentrum Potsdam (GFZ)

Research activities

GFZ has investigated the error sources which may cause systematic differences in the reference frames realized by different techniques and/or computed by various Analysing Centres. A few related papers have been published.

IERS SINEX Combination Campaign

A new software has been developed at GFZ to combine the SINEX files of different ACs from various space-geodesy techniques. Its functions are:

- 1) validation;
- 2) de-constraining (remove the a priori constraints);
- 3) adjust the weighting factors for different SINEX files;
- 4) combine SINEX normal equations, including TRF and EOP parameters;
- 5) using local tie data;
- 6) add systematic parameters for per technique, per AC, or per SINEX file;
- 7) datum definition, add the global constraint into the combined normal equation;
- 8) solution, residual check, statistical information.

Final results will be presented at the EGS (2003) meeting.

Study the possible impact of LEO missions on IERS basic products

For some years now quite a number of low altitude satellites have been launched, which are equipped with instruments of more than one technique. Examples are: ENVISAT (SLR + DORIS); Jason and T/P (GPS receiver + SLR + DORIS); CHAMP and GRACE (GPS receiver + SLR). Firstly, they provide a kind of 'collocation (of multi-techniques) on board satellites', which, in addition to the ground collocations, can be used to strengthen the link between the terrestrial reference frames of the related techniques. Secondly, if one uses the on-board GPS data together with the ground GPS data to determine simultaneously LEO orbits, GPS orbits, ground station positions and EOP, the geocentre and scale of the GPS reference frames could be more stable due to the contribution of the LEO. Geocentre and scale are actually the two weak points of the GPS reference frame.

In order to fully exploit the usefulness of LEOs for the IERS basic products, the method of combination at the observation level is necessary. This requires more complicated software and larger CPU time. The EPOSOC software at GFZ is therefore revised in order to meet this requirement. The tests results which will be published in the forthcoming IERS Technical Note No. 30 has shown encouraging potential.

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