

3.6.2.2 Astronomical Institute, Academy of Sciences of the Czech Republic, and Department of Geodesy, Czech Technical University, Prague

Introduction The CRC is an integral part of the Center for Earth Dynamics Research (CEDR) that joins five Czech institutions active in astronomy and geosciences research. The combination research is maintained principally in two different directions. On the one hand, we combine some of the Earth Orientation Parameters using the ‘combined smoothing’ algorithm that we recently proposed, without changing the underlying reference frames (terrestrial, celestial). On the other hand, we follow the direction of combining non-SINEX particular solutions of different techniques to determine the Earth Orientation Parameters simultaneously with station coordinates. In 2006, we started to consider a possibility of merging these two approaches together (see below).

Combination of EOP and station coordinates

As a response to a call for producing weekly combinations, the method of non-rigorous combination was slightly modified. The tests proved that it is suitable to produce such very short-term solutions. To avoid lack of data and stabilize the solution though, it is necessary to use a longer data interval. Namely, 13-daily data was used for weekly solutions, with further overlap of VLBI data to assure time corrections over the whole interval.

The ilrsb and ign-wd04 intra-techniques solutions were used for SLR and Doris, respectively. CPP data was used for GPS, and for VLBI, the data was recovered from CPP singular normal equations using vtrf2005 station coordinates.

Rms errors of the weekly combinations decreased during the three years of solutions from 6 mm to 4 mm, indicating improved quality of the data. Effect of combinations on EOP did not exceed 0.26 mas, 0.45 mas and 0.18 ms, for pole coordinates x , y and time corrections, respectively (Pešek & Kostecký, 2006).

The possibility of using constraints similar to the ones used to define ‘smoothness’ of the resulting curve in Vondrák smoothing method started to be investigated to ensure the continuity of Earth Orientation Parameters of our non-rigorous combination. To this end, PhD student Vojtech Štefka was hired whose task is to consider this problem.

Staff *Astronomical Institute:*
Dr. Jan Vondrák (Primary Scientist)
Dr. Cyril Ron
Vojtech Štefka

Department of Geodesy:
Prof. Jan Kostecký (Head of CEDR)

Dr. Ivan Pešek

Prof. Aleš Cepek

References

Pešek I., Kostecký J.: 2006, Generating weekly combinations of Earth orientation parameters and station coordinates from results of space geodesy techniques, in: GPS+GLONASS+Galileo: nové obzory geodézie, eds. L. Gerháťová, J. Hefty, STU Bratislava, p. 51-57 (in Czech).

Pešek I., Kostecký J.: 2006, Simultaneous determination of Earth orientation parameters and station coordinates from combination of results of different observation techniques, *Studia Geoph. et Geod.*, 50 (2006), 537-548.

Jan Vondrák, Ivan Pešek