

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 in preceding years was maintained principally in two different, and more or less independent, directions. In one approach we combined some of the Earth Orientation Parameters using the ‘combined smoothing’ algorithm that we recently proposed, without changing the underlying reference frames (terrestrial, celestial). In the other one, we followed the direction of combining non-SINEX particular solutions of different techniques to determine the Earth orientation parameters simultaneously with station coordinates. In 2007, we continued our activities by merging these two approaches together. Our PhD student, Vojtech Štefka, is responsible for solving this problem.

Combination of EOP and station coordinates

We started to use constraints similar to the ones used to define ‘smoothness’ of the resulting curve in Vondrák smoothing method, in order to ensure the continuity and smoothness of Earth Orientation Parameters of our non-rigorous combination. To this end, a transfer function, corresponding to appropriate value of the weight for these constraints, was empirically estimated and used to compute three-year solution. Our numerical solutions of the combination were so far based on solving full normal equation matrix, which was a rather time consuming task. Therefore, the more effective algorithm for sparse systems from the GNU Gama package (<http://www.gnu.org/software/gama>) has been recently implemented. This decreased the necessary computation time by about one order.

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

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