INFLUENCE OF STATION REFERENCING ON THE QUALITY OF EOP TIME SERIES

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ABSTRACT

EOP series (at a daily sampling) are computed together with (weekly) station positions. The definition of the terrestrial frames (TF) underlying these position series affects the accuracy of the estimated EOP series. The goal of this work is to evidence this influence for Satellite Laser Ranging (SLR) network, from two points of view.

In the first case study, the station referencing is realized through minimum constraints which align the orientation of the weekly TF with respect to a given Terrestrial Reference Frame (TRF). The weekly station networks over which these constraints are applied have a significant influence on the stability of the EOP series. To get the best stability, we thus search for weekly core networks with optimization methods. The WRMS of the so-computed EOP series shows a 25 μas improvement compared to the standard approach recommended by the analysis working group of the International Laser Ranging Service (ILRS).

In the second approach, the station referencing with respect to a given TRF is realized through the computation of weekly Helmert transformations. The EOP series consistent with the so-obtained station position series are directly computed by adding the estimated rotations. The results provided by an optimization (on the basis of a stochastic algorithm) of this approach will be compared to the results above.