



Sensitivity analysis of tropospheric parameter estimates with regard to frame realization strategies in GNSS networks

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The aim of this paper is to present some preliminary results on the sensitivity of tropospheric parameter estimates which are obtained from different datum definition strategies during the processing of daily GNSS observations in a continental-wide geodetic network. The test network consists of approximately 30 permanent reference stations of the EUREF Permanent GNSS Network (EPN) and the GNSS data that was used in our study cover a total period of three years (2011-2014). Twelve tropospheric parameters and three Cartesian coordinates were estimated at each station using the Bernese software for the daily GNSS data processing. Two different options were selected for the daily datum definition in the underlying network, that is (i) minimal constraints over a number of high quality reference stations and (ii) heavy constraints over all (or some of the) network stations. Both types of datum constraints were implemented by using different sets of daily reference coordinates which were obtained either from the IGB08 solution or from other epoch-based solutions in the particular network. The sensitivity analysis was performed on the magnitude (and its temporal variations) of the estimated tropospheric parameters over all stations, and their associated accuracy level, as derived from each of the aforementioned daily solutions. Statistical and spectrum analyses were also applied on the differences of the estimated tropospheric parameters in order to investigate any spurious signals generated by the different choice of datum constraints in the daily GNSS network adjustments.