

# Improved troposphere modeling for near real-time and post-processing GPS applications at swisstopo

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For several years, swisstopo has been involved in data analysis of GPS permanent networks. One main activity concentrates on the computation of troposphere parameters in near real-time. Zenith total delay estimates are delivered every hour with a time delay of about 45 minutes to various partners, such as the European project E-GVAP (EUMETNET GPS Water Vapour Programme) and the Federal Office of Meteorology and Climatology (MeteoSwiss), with the goal to use the data for numerical weather prediction.

At present, a network of 75 permanent sites is processed on a routine basis. In line with the switch from Bernese GPS Software Version 4.2 to 5.0, a number of new features related to troposphere parameter determination became relevant. The modelling of the troposphere delay is now done using a continuous, piece-wise linear parameter representation, and the dry-Niell in conjunction with the wet-Niell mapping function are applied. Furthermore the impact of the network size, the usage of relative constraints and the application of ambiguity resolution strategies is studied. The influence of these effects on the resulting troposphere products, and comparisons with solutions coming from a real real-time positioning software (GPSNET) are presented in this paper.