



## **Troposphere Parameters Derived from Multi-GNSS Data Processing at GFZ**

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**Abstract** Usually, the processing of Global Navigation Satellite System (GNSS) observations requires a thorough consideration of atmospheric parameters for precise applications. Accordingly, GPS meteorology has become a tool which uses measurements from ground-based GPS receivers for atmospheric water vapor sounding. Zenith total delay (ZTD) products derived from GNSS complement different other meteorological observing systems. GPS-based ZTD estimates have also been assimilated into numerical weather prediction (NWP) models.

In addition to GPS and GLONASS, the new and emerging satellite navigation systems BeiDou and Galileo provide the potential for extended and more precise GNSS applications. Accordingly, the International GNSS Service (IGS) has initiated the Multi-GNSS Experiment (MGEX) to acquire and analyze data from all four constellations. In view of the increased number of actively transmitting satellites, the ZTD parameter estimation will particularly benefit from an improved spatial distribution of observations tracked by the ground-based receivers.

In this contribution, we report on the status of our multi-system (GPS, GLONASS, BeiDou, Galileo) data processing at GFZ. Based on data from the MGEX network we produce multi-GNSS solutions including parameter estimates for satellite orbits, clock, station coordinates and site-specific ZTDs. Our presentation focusses on the validation of ZTDs from the multi-GNSS processing and a comparison with single-system ZTD solutions and GFZ's operational near real-time troposphere products.