EMS Annual Meeting Abstracts
Vol. 13, EMS2016-705, 2016
16th EMS / 11th ECAC

Achievements of GNSS4SWEC Working Group 1: Advanced GNSS Processing Techniques

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The COST Action ES1206 (GNSS4SWEC project) addresses new exploitations of the synergy between developments in GNSS and meteorological communities. The Working Group 1 (Advanced GNSS processing techniques) deals with implementing and assessing new methods for GNSS tropospheric monitoring and precise positioning exploiting all modern GNSS constellations, signals, products etc. Besides other goals, WG1 coordinates development of advanced tropospheric products in support of weather numerical and non-numerical nowcasting.These are ultra-fast and high-resolution tropospheric products available in real time or in a sub-hourly fashion and parameters in support of monitoring an anisotropy of the troposphere, e.g. horizontal gradients and tropospheric slant path delays.

The poster presents an overview of WG1 activities and, particularly, achievements in two activities, Benchmark and Real-time Demonstration campaigns. For the Benchmark a comprehensive data set of GNSS observations and various meteorological data were collected in support of the WG1 developments. The campaign covered the two-month period in 2013 (May-June) which included severe weather events in the central Europe. The derived GNSS and Numerical Weather Precision models (NWM) reference tropospheric products already showed interesting results, especially regarding the horizontal tropospheric gradients from GNSS processing. Benchmark data set is also being used for an extensive validation of slant total delays from GNSS, NWM-raytracing and Water Vapour Radiometer (WVR) solutions. The Real-time Demonstration campaign aims at enhancing and assessing ultra-fast GNSS tropospheric products for severe weather and NWM nowcasting. Results are showed from real-time demonstrations as well as offline production simulating real-time processing within the Benchmark campaign.