



Advanced tropospheric products from Multi-GNSS at AUTH

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The last 8 years, International GNSS Service (IGS) develops and supports the Multi-GNSS Experiment (MGEX) which offers the opportunity for a more accurate navigation, positioning and therefore better monitoring of severe weather event. In the current study, we retrieve atmospheric parameters as Zenith Total Delay (ZTD), Precipitable Water (PW) and Gradients from multi-constellation Global Navigation Satellite Systems (GNSS) (e.g., GPS, Galileo, and BeiDou) in 15 GNSS sites in the European region. The whole GNSS data processing was carried out using GAMIT (release 10.61), including Vienna Mapping Function 1 (VMF1) and Global Pressure Temperature 2 (GPT2).

One of the scope of the present work is the validation of our results with BeRTISS (Balkan-Mediterranean Real Time Severe weather Service) project, which recently implemented under the frame of the European Territorial Cooperation Programme "Interreg V-B Balkan-Mediterranean 2014-2020".

Secondly, we compare the estimated tropospheric products from Galileo and Beidou with GPS satellite systems in an hourly timespan for five months in 2017.

According to the results, the mean differences between GPS - Galileo is less than 1 mm in ZTD values, on the other hand the differences between GPS – Beidou is three times larger respectively. The tropospheric products estimation is absolutely related with the ambiguity resolution, which is less successful for Beidou, due to the small number of the operated satellites in orbit.

Especially for GPS the phase ambiguities are resolved in 97.6% for wide lane and 90.7% for narrow lane, also for Galileo the percentage of phase ambiguities resolution was 95.9%, 85.8%. Finally, for Beidou the percentages of resolving phase ambiguities were less successful with 87.3%, 60.1% of wide and narrow lane respectively.