Assessment of new tropospheric real time product at GOP

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A benchmark campaign was started in February 2013 at the Geodetic observatory Pecny (GOP) for the assessing of Zenith Total Delay (ZTD) estimated from GNSS data in real time in order to support nowcasting or severe weather events monitoring. For this purpose, we developed the Tefnut application which is derived from the G-Nut software library. Our solution is based on the Precise Point Positioning technique (PPP) exploiting the real time precise orbits and clocks provided by the International GNSS Service (IGS). Since February 2013, real time ZTDs have been continuously derived for 36 stations selected worldwide for the benchmark campaign. Resulted ZTDs can be characterized by the standard deviation of 6-9 mm when compared to the EUREF and IGS final tropospheric products. The precision requirement for the nowcasting, initially defined during the EU TOUGH project, has been thus already accomplished. Site-specific biases of up to 15 mm (from a monthly statistics) are however still observed being caused by incomplete precise models in the software. These biases are stable enough to be effectively reduced before a usage of real time ZTDs in meteorological applications. The benchmark campaign included both static and kinematic coordinate solutions. The latter resulted in a slightly worse ZTD precision only, which might be encouraging to develop a system for exploiting also receivers on moving platforms for this type of applications. The G-Nut/Tefnut software is being enhanced steadily and we will focus on further improvements towards higher accuracy of estimated tropospheric parameters as well as an for extensions towards multi-GNSS and advanced tropospheric products monitoring the atmospheric asymmetry too.