Geophysical Research Abstracts
Vol. 18, EGU2016-17056, 2016
EGU General Assembly 2016

Evaluating the robustness of real-time PWV estimates

Andre Sa (1,2,3), Hugo Valentim (1), Rui Fernandes (1), and Machiel Bos (1)

(1) SEGAL (UBI/IDL), C4G, Covilhã, Portugal (rui@segal.ubi.pt), (2) IPG, Guarda, Portugal (andregvsa@gmail.com), (3) TU Delft, Delft, The Netherlands

In the recent years, the Global Navigation Satellite Systems (GNSS), in particular the Global Positioning Systems (GPS), have proved their capacity to monitor/sense atmospheric water vapor with an accuracy that is comparable to the accuracy of other conventional meteorological sensors. As a result, the provision of Zenith Total Delays (ZTDs) and derived Precipitable Water Vapor (PWV) was established as a standard sounding technique. However, the accuracy of the near real-time estimates of ZTDs/PWVs based on ultra rapid GPS orbits aimed at contributing for nowcasting are still under research. In 2015 a near real-time processing scheme was implemented at SEGAL (Space and Earth Analysis Laboratory) and tested using the two permanent Portuguese GNSS networks: RENEP and SERVIR. The first one, RENEP, is supervised by General Directorate of Territory (DGT), and the second, is under supervision of the Army Geographic Institute of Portugal (IGeoE). These networks consist of 55 GNSS stations that cover homogeneously continental Portugal with a mean interstation distance of 40 km, which is a good horizontal resolution for meteorological purposes.
In this research, and using the implemented scheme, various near real-time ZTDs and PWVs estimations are computed with a delay of 2 to 30 hours, each time increasing the delay by 1 hour. These solutions are compared with reference solutions, based on final GPS orbits, and the convergence of the near real time solutions towards the reference solution is investigated. The increase of relevant information for weather prediction as GNSS-PWV estimates in the weather nowcast is important especially in the decision process of warning dissemination of severe weather situations.