Geophysical Research Abstracts
Vol. 13, EGU2011-1649-1, 2011
EGU General Assembly 2011

Performance of OPUS-RS in the presence of large height differences: A User Assessment

D. Ugur Sanli (1) and Fatih K. Kurumahmut (2)

(1) Bogazici University, Kandilli Observatory and Earthquake Research Institute, Geodesy Department, Istanbul, Turkey (ugur.sanli@boun.edu.tr, +90 216 3320241), (2) Istanbul Technical University, Civil Engineering Faculty, Department of Civil Engineering, Istanbul, Turkey (fatihkurumahmut@yahoo.com)

The effect of inter-station height differences on GPS solutions has been reported in detail in previous studies. Recent developments in the area indicate that the effect appears to be software specific usually depending on the survey method and processing strategy used. Therefore, studying the effect on various GPS software solutions is essential from the point of view of generalizing the ideas. In this manner, this time we assess solutions from OPUS Rapid Static (RS) developed by the National Geodetic Survey (NGS) and available on the web to world-wide users. We used special GPS data sets that the software allows and the data of US permanent GPS stations from the archives of Scripps Orbit and Permanent Array Center (SOPAC). One data set included GPS baselines that have large height differences between a rover point and Continuously Operating Reference Stations (CORS). The other set included GPS baselines in which the large height difference between the same rover point and the reference stations was eliminated (i.e. the group of reference stations was changed using the options of the software). Our initial results indicate that the correlation between the RMS of the rapid static solutions regarding the vertical component and the average height difference between a rover station and the reference stations is 0.61. The initial examination also reveals that the reported vertical RMS by the manufacturer grows about a factor of 2-3 when the average height difference between a rover station and reference stations becomes as large as 700 m. When the large height differences between the rover point and the reference stations are removed, i.e. a different set of reference stations are used, the correlation is reduced down to 0.39. In other words, the effect of the inter-station distance becomes more apparent as indicated by the manufacturer, and the RMS level drops down to the expected level. In the presentation, we discuss our methodology and the limitations that the user faces when attempting such evaluations. The presentation concludes with the recommendations that might be useful to obtain statistically more satisfying results in the future.