Geophysical Research Abstracts,
Vol. 11, EGU2009-8519, 2009
EGU General Assembly 2009

The impact of tropospheric models on coordinate repeatabilities in regional GPS network determination

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Troposphere effect is considered as one of the major source error limiting the quality of GPS positioning. When baseline lengths grow longer, the troposphere bias becomes decorrelated and therefore, the use of tropospheric correction models is necessary. In this paper, we investigate the effect of troposphere modelling and mapping functions on the repeatability of regional GPS network determination. Results, obtained from different dates, with or without standard tropospheric correction models, show temporal fluctuations due to the variability of meteorological conditions. This makes it difficult to identify small crustal deformation signals in GPS time series. Data from the ALGEONET (ALgerian GEOdynamical NETwork) network and Bernese GPS Software were used in this study. The first results show that the use of Neil mapping function improves significantly the repeatability of horizontal component. The changes are relatively important on station heights where several millimetres are observed.