Geophysical Research Abstracts,
Vol. 11, EGU2009-8256-1, 2009
EGU General Assembly 2009

Retrieving tropospheric delay using GPS single frequency receivers

Z. Deng, M. Bender, G. Dick, M. Ge, and J. Wickert

Helmholtz Centre Potsdam, German Research Centre for Geosciences GFZ, Telegrafenberg, Potsdam, Germany (deng@gfz-potsdam.de)

Retrieving tropospheric delays from GPS measurements of regional networks provides important input for regional weather forecasts. To get data with higher spatial resolution existing GPS ground networks can be densified with average station distance up to few kilometers. To minimize the costs the densification can be realized with cost effective GPS single frequency receivers, but a proper handling of the ionosphere delay is required. We developed an approach for ionosphere correction of single-frequency GPS data, where satellite-specific corrections are calculated based on dual-frequency data from nearby GPS stations. The approach is implemented into the EPOS software at GFZ for testing and validation.

The efficiency of the approach has been tested using data from an experimental GPS network with mixed single- and dual-frequency receivers set up in 2008 at Meteorological Observatory Lindenberg for atmospheric studies in cooperation with the German Weather Service. The impacts of the availability of dual-frequency data and the geometrical distribution of the stations are analyzed. The results show that the estimated Zenith Total Delay (ZTD) from single frequency data using Precise Point Positioning strategy has the same accuracy as that from dual-frequency data for near real-time applications.