Geophysical Research Abstracts
Vol. 14, EGU2012-10859, 2012
EGU General Assembly 2012

Processing and application of GPS radio occultation data from TerraSAR-X and TanDEM-X

S. Heise, G. Beyerle, L. Grunwaldt, G. Michalak, T. Schmidt, J. Wickert, and F. Zus

GFZ German Research Centre for Geosciences, Dep. 1, Geodesy and Remote Sensing, Potsdam, Germany
(stefan.heise@gfz-potsdam.de)

The GPS radio occultation (RO) technique exploits atmospheric refraction and delay of GPS signals observed aboard Low Earth Orbiting satellites. Vertical profiles of bending angle, refractivity, temperature and humidity are derived with high vertical resolution. Measurements of the calibration-free RO technique are meanwhile well-established for applications in numerical weather prediction and climatological studies. Currently, the GPS RO technique is applied aboard the satellite missions COSMIC, Metop, TerraSAR-X, TanDEM-X, GRACE-A and SAC-C.

At present, RO observations from TerraSAR-X and GRACE-A are operationally processed at GFZ. These data are provided for numerical weather prediction and continue GFZ's long-term set of RO data starting with CHAMP in 2001. Additionally, RO measurements aboard TanDEM-X have been activated for a 7-week period (Nov. 24, 2011 – Jan. 12, 2012) in order to collect synchronous observations with its twin satellite TerraSAR-X. Both satellites fly in a very close formation which enables parallel RO observations under nearly identical atmospheric conditions. We present a statistical profile to profile comparison between both satellites and discuss differences especially with respect to different open-loop settings applied onboard TanDEM-X. Furthermore we overview recent results from the climatological application of GPS RO data with focus on tropopause and temperature trends in the upper troposphere and lower stratosphere region.