



GPS radio occultation at GFZ: Status and recent results from TerraSAR-X and TanDEM-X

Stefan Heise, Georg Beyerle, Grzegorz Michalak, Torsten Schmidt, Jens Wickert, and Florian Zus
GFZ German Research Centre for Geosciences, Dep. 1, Geodesy and Remote Sensing, Potsdam, Germany
(stefan.heise@gfz-potsdam.de, ++49 331 288 1759)

The innovative GPS radio occultation (RO) remote sensing technique exploits atmospheric refraction and delay of GPS signals observed aboard Low Earth Orbiting (LEO) satellites. Observed phase path delays can be inverted to vertical profiles of bending angle, refractivity, temperature and humidity. Main properties of the calibration-free RO technique are insensitivity to clouds and rain, global coverage and high vertical resolution. The GPS RO technique is currently applied aboard several satellite missions (Metop, COSMIC, TerraSAR-X, GRACE-A, SAC-C). Since 2006, GPS RO data are operationally used in numerical weather prediction, significantly improving the forecast quality of the world-leading weather centres.

The operational GFZ orbit and occultation analysis system is currently in use for processing of GRACE-A and TerraSAR-X RO observations. Daily about 350 occultation events are analyzed and provided with average latency of less than 2 hours between measurement aboard the satellites and data provision via the GTS (Global Telecommunication Service) to the weather services (e.g., UK MetOffice, ECMWF, NCEP, DWD).

We overview the status of the operational RO analysis including tropospheric water vapor results and validation with ECMWF analyses and radiosonde observations. We also present initial GPS RO results from the TanDEM-X mission, which are based on initial measurements in late August 2010.