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Operational processing of TerraSAR-X radio occultation at GFZ: Status and initial results

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GPS radio occultation (RO) measurements onboard the TerraSAR-X satellite (launch 15 June, 2007) are continuously activated since February 2009. The occultation instrumentation consists of two occultation antennas (forward- and aft-looking) and the Integrated Geodetic and Occultation Receiver (IGOR) providing dual frequency GPS RO observations (50 Hz sampling rate) for atmospheric remote sensing. For the first half of 2010 the launch of the TerraSAR twin TanDEM-X is scheduled carrying the same RO instrumentation.
The operational GFZ orbit and occultation analysis system has very successfully been used for near real-time processing of CHAMP RO data and is currently in use for processing of GRACE RO observations. In contrast to the BlackJack RO receivers aboard CHAMP and GRACE, the IGOR receiver applies the open-loop tracking technique to improve GPS signal tracking (L1 carrier phase) in the lower troposphere. The operational GFZ RO analysis system is upgraded for processing of open-loop RO data. This also includes the handling of navigation bit data (needed for open-loop data correction) which are collected by GFZ's "NavBit" monitoring network. In this presentation we overview the status of the operational RO analysis system and describe first results of operational TerraSAR-X RO processing including validation with independent meteorological data (ECMWF analyses and radiosonde observations).