



## **GPS radio occultation with CHAMP: Derivation and validation of atmospheric excess phase data**

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Atmospheric excess phase data are derived from GPS occultation measurements of the German CHAMP (CHALLENGING Minisatellite Payload) satellite. A GPS analysis software from Shanghai Astronomical Observatory is used for the investigations. The excess phases are computed using a space-based single differencing technique without direct use of GPS ground station data.

About 1,400 excess phases, recorded from December 1 – 7, 2005, are compared with analysis results from the operational CHAMP processing at GFZ, retrieved by the double and single difference technique. The corresponding atmosphere/refractivity profiles, retrieved from the different phase delay sets, are also compared with co-located data from meteorological analyses of the ECMWF (European Centre for Medium-Range Forecasts).

The influence of different factors on the excess phase retrieval is analyzed in more detail, e.g., the effect of satellite clock errors, antenna phase center correction or the type of ionosphere correction of the reference GPS satellite link.