



GPS-based atmospheric sounding with CHAMP: Near real-time provision of occultation data for numerical weather prediction

J. WICKERT (1), T. SCHMIDT (1), G. MICHALAK (1), S. B. HEALY (2), G. BEYERLE (1), C. FALCK (1), R. GALAS (1), S. HEISE (1), W. KÖHLER (1), M. ROTHACHER (1), D. OFFILER (3), and W. WERGEN (4)

(1) GeoForschungsZentrum Potsdam (GFZ), Germany, (2) European Centre for Medium-Range Weather Forecasts (ECMWF), (3) Met Office, United Kingdom, (4) Deutscher Wetterdienst (DWD), (wickert@gfz-potsdam.de / Fax: +49 331 2881732)

The German geoscience satellite CHAMP (CHAllenging Minisatellite Payload) provides up to 200 globally distributed and precise vertical profiles of atmospheric parameters per day since early 2001. A unique long-term set of GPS radio occultation (RO) data is being generated, since the mission is expected to last until 2008. More than 400,000 occultation measurements will have been performed as of April 2006.

We introduce and overview a recent joint research project of GFZ, ECMWF, DWD and MetOffice to stimulate the use of GPS radio occultation data to improve global weather forecasts. Major goals are the continuous provision of near real-time atmospheric data from CHAMP with an average time delay of around 2 hours and their assimilation to global atmospheric analyses for numerical weather prediction.

A first stage of the project was started in December 2005: The continuous provision of occultation data from CHAMP (bending angles and refractivity) with less than 4 hours average delay between the measurements aboard CHAMP and the provision of corresponding analysis results. This can be achieved by using the operational occultation infrastructure from GFZ, which includes a polar receiving antenna at Ny Ålesund, a global network of low-latency GPS ground stations and automated orbit and occultation processing systems.

We overview the interaction of the occultation infrastructure components for the near

real-time data provision and present first results of the first project stage including delay statistics and quality information of the provided near real-time data. We also inform on the status of the project-related assimilation activities and results of the contributing weather centers and give an outlook to further activities and expected results.