# STRUCTURAL UNCERTAINTY OF THE CHAMP CLIMATE RECORD FROM DIFFERENT DATA CENTERS

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GPS radio occultation (RO) provides independent and high quality observations of the Earths atmosphere. Characteristics including global coverage, essentially all-weather capability, good vertical resolution, long-term stability, and homogeneity make it well suited for climate monitoring, outperforming conventional observation methods. RO atmospheric parameters are valuable indicators of climate change in the upper troposphere and lower stratosphere (UTLS). Errors of RO data, observational errors of single profiles and sampling errors of climatologies, are well characterized so far. A remaining gap for the establishment of an RO climate record is the quantification of structural uncertainty arising from different processing schemes. In this context an international collaboration on the intercomparison of RO multi-year data records has been started in 2007 aiming at a systematic assessment of the accuracy and quality of data from different RO processing centers. A first comparison by Ho et al. (2009) showed low structural uncertainty for 5-year CHAMP refractivity climatologies provided by four centers. We extent the intercomparison to data provided by all six international RO processing centers, DMI Copenhagen, EUM Darmstadt, GFZ Potsdam, JPL Pasadena, UCAR Boulder, WEGC Graz, for the CHAMP record September 2001 to September 2008. We analyze bending angle, refractivity, dry pressure, dry geopotential height, and dry temperature of commonly defined monthly 5 deg-zonal mean climatologies at a 200 m altitude grid up to 40 km. Intercomparison is performed for tropical, mid-, and high latitude bands. After subtraction of the sampling error, anomaly time series and anomaly differences are calculated. Statistical analysis of the respective time series allows quantifying the structural uncertainty of RO data stemming from different processing schemes in order to complete our knowledge on RO errors in current data sets. Preliminary results reveal lowest structural uncertainty in the tropics at 8 to 25 km height for all inspected RO parameters. The assessment of the overall quality, consistency, and reproducibility will help to establish an RO climate record with full error characterization, which can be regarded as benchmark-quality UTLS climate reference dataset for (future) long-term climate observations.