

TerraSAR-X Radio Occultation processing at the GFZ: center-to-center comparison and validation

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Refractivity profiles derived from the GPS Radio Occultation (RO) remote sensing technique prove to be highly accurate. Nevertheless uncertainties of RO retrievals due to e.g. different processing strategies must be quantified. In fact several studies show that in the upper troposphere and lower stratosphere the agreement between RO retrievals from different processing centers is excellent. A more complex processing software package is required to obtain accurate RO retrievals in the lower troposphere. We present a statistical comparison of retrievals derived from TerraSAR-X data by the German Research Centre for Geosciences Potsdam (GFZ) and the University Corporation for Atmospheric Research (UCAR). The comparison of GFZ and UCAR retrievals for a period of 21 days in 2008 shows good agreement; in the altitude range 8-25km the standard deviation is below 0.34% and the mean deviation does not exceed 0.08%, in the altitude range 0-8km the standard deviation is below 0.88% and the mean deviation does not exceed 0.16%. For comparison and validation purposes we also present a statistical comparison between TerraSAR-X RO retrievals and co-located European Centre for Medium-Range Weather Forecasts profiles; we find that deviations w.r.t. the meteorological analysis are equivalent to those from other satellite missions (e.g. COSMIC).