



Comparison of atmospheric water vapor from GPS and WVR

Ming Shangguan (1), Michael Bender (1), Jens Wickert (1), Ulrich Löhnert (2), and Susanne Crewel (2)

(1) Helmholtz Centre Potsdam, German Research Centre for Geosciences (GFZ), Department 1.1, Potsdam, Germany (sgming@gfz-potsdam.de), (2) Institute for Geophysics and Meteorology, University of Köln, Köln, Germany

Zenith Total Delays (ZTDs), the integrated water vapor (IWV) and the Slant Total Delays (STDs) derived from GNSS observations are commonly accepted atmospheric observations for meteorological applications. The IWV can be derived from GNSS observations or directly measured by water vapor radiometers (WVRs). WVRs measure the IWV and the integrated liquid water (ILW) along a given line of sight. On the other hand the GPS-STDs must be converted into moisture information for the comparison. Several strategies to derive the IWV from the GPS data will be compared.

To validate the quality of GPS-STDs, the GPS derived IWV is compared with WVR observations. Tomographic 3D moisture fields can be reconstructed based on the GPS-STDs. As input data we use GPS-slants-data as well as WVR-data observed in Murg valley from October to December 2007. Several possible influential factors such as elevation, the absolute water vapor, atmospheric anisotropy and the integrated liquid water content will be analyzed and discussed. The results show that the estimated IWV from GPS has comparable accuracy as the corresponding data from WVR.