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IPW and ZTD from numerical weather prediction model in the context of GNSS tropospheric products

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Paper describes extensive experiences in dealing with operational numerical prediction models treated as a source of IPW and ZTD needed for GNSS tropospheric products quality assessment. Authors use operational numerical prediction model COSMO-LM (maintained by Polish Institute of Meteorology and Water Management) in two different resolution versions: 14 km and 2.8 km and global model GFS (operated by NCEP). Both input fields and first prognosis steps of operational numerical prediction model were processed as IPW source for comparisons and analyses. We discuss diversity of questions concerning precise derivation of IPW and ZTD from model grid e. g.: interpolation of data in space, numerical integration in zenith direction, correction for model topography, physical equations chosen for humidity parameters conversions etc.
Results from NWP model are neatly collated with various GNSS tropospheric solutions: WUT EPN LAC solutions, EPN combined product and IGS solutions. Also meteorological water vapour data sources (radiosoundings and sun photometer CIMEL-318) were utilized for independent verification.
Presented results of many comparisons lead to some clues about key factors in such calculations. We get also valuable information about GNSS tropospheric solutions quality.