



Comparison of numerical weather models in the area of the Antarctic Peninsula

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The Earth's neutral atmosphere with its dry and wet component affects the radio waves emitted by GPS satellites or extragalactic radio sources. Thus, modelling the effect of the neutral atmosphere is a limiting factor for GNSS applications (e.g. GPS) and VLBI, respectively. In the related literature this phenomenon is usually called tropospheric refraction. For satellite-based precise point positioning applications, one has to model and estimate the tropospheric refraction in order to guarantee results of highest quality. In the opposite, tropospheric effects can also be used to derive the important meteorological parameter water vapour.

In the framework of a case study carried out at the Geodetic Institute of the University of Karlsruhe (TH) (Germany), GPS data collected at several sites of the Antarctic Peninsula were used to evaluate a realistic measure for the precision and the accuracy of GPS-based integrated precipitable water vapour estimates. As external references NCEP (National Center for Environmental Prediction) Reanalysis data were used. The results of this NCEP-dependent case study were presented e.g. at the EGU 2005.

At the Institute of Geodesy and Geophysics of the Vienna University of Technology (Austria) detailed and numerous investigations based on VLBI and GPS data have been carried out to derive accurate mapping functions based on data from the numerical weather model provided by the European Centre for Medium-Range Weather Forecasts (ECMWF).

The poster will present a comparison of the two numerical weather models ECMWF and NCEP based on different parameters (e.g. precipitable water vapour or troposphere mapping functions) in the area of the Antarctic Peninsula. The meteorological data base of this area is affected by the small quantity of meteorological observations.

Therefore the quality of the numerical weather models has to be investigated. Furthermore, the effort of obtaining reliable estimations of precipitable water will be an additional source to improve the knowledge about climate variability in the area of the Antarctic Peninsula.