



Fast estimation of tropospheric water vapour content based on earth-fixed GNSS data and its potential contribution to weather forecasting

A. Karabatic (1), R. Weber (1), S. Leroch (2)

(1) Institute of Geodesy and Geophysics, Vienna, Austria, (2) Central Institute for Meteorology and Geodynamics, Austria

(anna@mars.hg.tuwien.ac.at / FAX: +43 1 58801-12896)

The importance of high resolution meteorological analysis of the alpine atmosphere due to local and regional extreme precipitation events increased over the past years. A detailed analysis of the humidity field is an important precondition for a better monitoring of these events and for forecasts with improved spatial resolution. Errors in the analysis occur mainly in alpine areas where the predicted models do not reproduce the mountain atmosphere correctly.

While the hydrostatic zenith delay of GNSS microwave signals is usually well sizeable, the wet component, describing the rapid variable water vapour content of the troposphere (one of the limiting error sources in GNSS precise point positioning) has to be estimated from the observation data. Due to the interest of meteorologists in the wet component of the troposphere as an additional data source for Numerical Weather Prediction, several regional projects were initiated in Europe and abroad to derive the zenith wet delay from ground based GNSS observation data.

In this presentation we present the project GNSS-MET which makes use of continuous measurements of a regional network consisting of 8 GPS/GLONASS reference stations, located in Carinthia, Austria. The network has been extended with surrounding stations of the IGS and EUREF-network. The aim of the project is to provide GNSS based measurements of the tropospheric water vapour content with a temporal delay of less than one hour to use them within the INCA system, operated by the Austrian Meteorological Service (ZAMG).