

# Monitoring of atmospheric water vapour variability in multi-GNSS constellation

## Abstract

The monitoring of atmospheric water vapour variability from estimation of tropospheric parameters from the Global Navigational Satellite System (GNSS) measurements is discussed in this thesis. The key parameter is the zenith total delay (ZTD), estimated from near real time processing of GNSS measurements at the Department of Theoretical Geodesy at the Faculty of Civil Engineering at the Slovak University of Technology in Bratislava. Validation of estimated zenith total delays with respect to ZTD from other sources (E-GVAP, IGS) is carried out to verify the correctness of the processing method. The monitoring of water vapour variability with time series of ZTD, time series of precipitable water vapour (PWV), ZTD and PWV maps and water vapour tomography of Slovakia is performed. The ZTD data were assimilated with the Three-Dimensional variational method into the numerical weather prediction system ALADIN.

Keywords: zenith total delay, near real time processing, data assimilation, AROME, ALADIN