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Experiences from six years of PWV monitoring using the permanent GPS observations in Slovakia

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The continuous determination of Precipitable Water Vapor (PWV) based on the GPS analysis and meteorological observations in Slovakia in the time span from 2002 to 2007 is evaluated. The station time series of Zenith Total Delays (ZTD) are obtained from the analysis of network of 6 permanent GPS sites in Slovakia and 14 sites situated in neighbors. The network solution is performed on the weekly basis at the Slovak University of Technology (SUT) in Bratislava. The data which are resulting from solution using two versions - 4.2 and 5.0 of the Bernese GPS software are compared with ZTD outcoming from processing of EUREF permanent GPS network and from the PPP station solutions. The reliability of ZTD from SUT network solution is evaluated on the basis of results at some selected sites and the detected biases are discussed. The GPS derived PWV time series are examined in relationship with the long-term rainfall records at meteorological stations. The space-temporal variation of PWV over the territory Slovakia is modeled and the methods suitable for visualization of PWV are discussed. The possibilities of using these models for indication of the risk areas with oversized concentration of atmospheric moisture are outlined.