



Correcting the Precipitable Water Vapour model using the Digital Terrain Model

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Processing of permanent GNSS observations gives information about the actual Zenith Total Delay (ZTD). By using the ground meteorological data the Precipitable Water Vapour (PWV) can be evaluated. The locally adjusted PWV values are afterwards interpolated over the area of interest for various applications. Any common interpolation methods lead to incorrect results because of the altitude differences among the interpolated and the observed points. Digital Terrain Model (DTM) provides information about altitudes of used grid points and therefore it can be used for terrain correction of the interpolated PWV values. The presented paper brings mathematical background for terrain correction and shows examples of original and corrected model of PWV over the territory of Slovakia and its vicinity. Afterwards the model can be introduced in routine coordinate estimation. We validate our improved model by comparing the computed coordinates of test stations not included in the PVW modeling with the observed coordinates. Positions are computed using various types of troposphere modeling (no model, Dry Niell model, interpolated PWV values from corrected model plus Saastamoinen model for dry component of ZTD, etc.). Also the case when the ZTD is estimated as an unknown parameter during the processing procedure is included for comparison.