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The high resolution Water Vapour model on the area of Poland

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Global Navigation Satellite Systems (GNSS) are designed for positioning, navigation and amongst other possible applications it can also be used to derive information about the state of the atmosphere. Continuous observations from GNSS receivers provide an excellent tool for studying the neutral atmosphere, currently in near real time.
The Near Real Time neutral atmosphere and water vapour distribution models are currently obtained with high resolution from Ground Base Augmentation Systems (GBAS), where reference stations are equipped with GNSS and meteorological sensors. The Poland territory is covered by dense network of GNSS stations in the frame of GBAS system called ASG-EUPOS (www.asgeupos.pl). This system were established in year 2008 by Head Office of Geodesy and Cartography in the frame of EUPOS project (www.eupos.org) for providing positioning services. The GNSS data are available from 130 reference stations located in Poland and neighbour countries.
The ground meteorological observations in the area of Poland and neighbour countries are available from ASG-EUPOS stations included in EUREF Permanent Network (EPN) stations, airports meteorological stations (METAR messages stations), and stations managed by national Institute of Meteorology and Water Management (SYNOP messages stations).
The first part of the paper present the methodology of NRT GNSS data processing for ASG-EUPOS stations for Zenith Total Delay (ZTD) estimation. The second part is covering analysis of meteorological parameters interpolation methods for determination of Zenith Hydrostatic Delay (ZHD). The last part concerns the modelling of water vapour distribution over the area of Poland.