



Assessment of regional ionosphere model supporting precise positioning for ASG-EUPOS network

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Since 2008 the Head Office of Geodesy and Cartography in Poland operates a dense active GNSS network – ASG-EUPOS – consisting of over 100 stations. Currently over 60 stations are equipped with GPS+GLONASS receivers, including almost 30 stations with Galileo capability. This greatly improves IPP coverage over Poland and neighboring areas and offers excellent opportunity of providing high resolution and accurate ionosphere model for positioning purposes.

In this paper we show performance assessment of a multi-GNSS ionospheric TEC model derived from precise carrier phase GNSS data. The model is based on processing of 170 GNSS stations located in Poland and neighboring countries. In the first step, carrier phase biases are estimated for each satellite arc. In the second step, these biases are used together with multi-frequency, multi-GNSS carrier phase observations to calculate TEC at IPP locations. Then, the least squares collocation method is applied to provide vertical TEC grid – the TEC model.

The TEC grid is used to calculate ionospheric delay corrections. The corrections are then verified by comparison to double differences ionospheric residual derived from GNSS data at selected test baselines. Our results show that the multi-GNSS regional ionospheric TEC model is capable of providing ionospheric corrections that may satisfy precise GNSS positioning requirements.