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The Real-Time Ionospheric Service for ASG-EUPOS Network

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ASG-EUPOS Network is the Polish part of the European Position Determination System consisting of more than 100 permanently working in Poland GNSS receivers. The main goal of the established ionospheric service is supporting positioning and navigation with high accuracy both in real-time and postprocessing. The primary products of the system are the daily variations of the TEC over stations and the daily maps of the TEC created using carrier phase leveled to code observations and spherical harmonic expansion as a mapping function. The maps are characterized by high temporal (0.5 hour) and spatial resolution (0.5 x 0.5 degree). In order to make possible taking into account observations with low elevation angles during the processing GNSS data, the final maps are extended using about 100 European GNSS stations belong to the IGS/EPN network. The final products are written in modified ionex file covering the area from -10 to 40 degree for longitude and from 35 to 60 degree for latitude. For the real-time application of the ionospheric TEC map in the GNSS positioning the predicted map using autocovariance and ARMA methods is created. The second part of the presented service is connected with monitoring of the different scale ionospheric irregularities. The detecting of the small-scale disturbances is done with two kind of high-rate GNSS receivers (50Hz): Septentrio POLARXS and JAVAD SIGMA. The scintillation indices for amplitude and phase are calculated in near real-time for each scintillation GNSS receiver. In order to monitor medium and large scale ionospheric irregularities the ROT (rate of TEC) time series for all ASG-EUPOS receivers are determined.