



Influence of ionospheric disturbances onto long-baseline relative positioning in kinematic mode

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Ionospheric disturbances are fast and random variabilities in the ionosphere and they are difficult to detect and model. Some strong disturbances can cause, among others, interruption of GNSS signal or even lead to loss of signal lock. These phenomena are especially harmful for kinematic real-time applications, where the system availability is one of the most important parameters influencing positioning reliability.

Our investigations were conducted using long time series of GNSS observations gathered at high latitude, where ionospheric disturbances more frequently occur. Selected processing strategy was used to monitor ionospheric signatures in time series of the coordinates. Quality of the data of input and of the processing results were examined and described by a set of proposed parameters. Variations in the coordinates were compared with available information about the state of ionosphere derived from Neustrelitz TEC Model (NTCM) and with the time series of raw observations. Some selected parameters were also calculated with the “iono-tools” module of the TUB-NavSolutions software developed by the Precise Navigation and Positioning Group at Technische Universitaet Berlin.

The paper presents very first results of evaluation of the robustness of positioning algorithms with respect to ionospheric anomalies using the NTCM model and our calculated ionospheric parameters.