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The Mapping of high-latitude TEC fluctuations during the last extended solar minimum

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During the last few years the number of the GPS permanent stations have been increasing systematically. Currently it is possible to use phase GPS observations for detecting of the ionospheric disturbances with high spatial and temporal resolution. In this study 30 second GPS measurements were used to investigate the occureance of the TEC fluctuations at high and mid latitudes during the extended solar minimum period (2008-2011). Based on observations from more than 100 permanent stations the 2-hour maps of the TEC variability and daily map of the ionospheric fluctuations as a function geomagnetic local time were created. In order to determine the variability of the ionosphere ROT (Rate of TEC) and ROTI (Rate of TEC index) were used. The diurnal, seasonal, and storm-time variations of TEC fluctuation activity were estimated. The most intensive TEC fluctuations at considered period were observed during several weak and moderate geomagnetic disturbances at November 2008, July 2009 and May 2010. The statistical characteristics of fluctuation intensity and TEC fluctuations maps as well as data processing technique are presented.