



The structure of mid- and high-latitude ionosphere during November 2004 storm event obtained from GPS observations

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In this report the response of the ionospheric total electron content over Europe to the severe November 7-12, 2004 storm is presented. This event consists of two sequences of geomagnetic disturbances, with maximal Dst value of 370 nT and 290 nT, respectively. The character of the development of the geomagnetic storm caused corresponding storm-time TEC behaviour. The spatial and temporal changes of TEC were analyzed on the base of TEC maps. While creating these maps, the GPS measurements of 70 - 90 stations of IGS/EPN network were used. Our estimation technique provided TEC maps with 5 min interval and with spatial resolution of 150 - 300 km. During the main phase of the November 7 storm the positive disturbances took place over Europe after 06.00 UT. The maximal effect was observed in the evening and night hours on 7-8 November at latitudes between 55N and 70N. The TEC enhancement exceeded 100% relative to a quiet day. During the recovery phase of the storm the negative effect took place. The depression of TEC reached 70 %. The strong enhancement of TEC was registered in night hours also on 8-9 November in subauroral and auroral ionosphere. It can be attributed to a particle precipitation. The strong short-time TEC enhancement was observed in day time on 9, 10 and 12 November. The effect probably caused the occurrence of large scale TID. The negative effect prevailed in night time on 10-11 November 2004. The TEC maps were used for the analysis of the dynamics of the latitude profiles. The latitude dependence of TEC is essentially modified during the storm. The latitude profiles represent the dynamics of ionospheric trough very well. During the storm the trough was displayed at latitude of about 50N. The behavior of the ionosphere in this period was complex and we attributed it to the individual features of the development of magnetic storm.