



Response of the ionosphere to severe geomagnetic storm on October 2003

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In this paper the response of the ionospheric total electron content over Europe to the severe October 29, 2003 storm ($\dot{O} K_p = 58$) is presented. We analyse the spatial and temporal changes of TEC on the base of TEC maps. During creating these maps, the GPS measurements of 70 - 90 stations of IGS/EPN network were used. Our estimation technique provided TEC maps with 15 min interval and with spatial resolution of 150 - 300 km. The feature of the development of the winter storm over Europe was positive effect which was observed in the afternoon. More pronounced positive effect took place at lower latitudes. The TEC enhancements exceeded 150% relative to a quiet day. The long lasting negative perturbation was registered in day-time on October 30, 31 and November 1, 2003. The depression of TEC reached 70%. The TEC maps showed, that the spatial distribution of TEC undergoes dramatic variations. In the ionosphere the large and medium scale structures, including both increases and decreases of TEC, develop during the storm. Behavior of the ionosphere in this time was more complex which we attributed to the individual features of development of magnetic storm. The TEC maps were used for 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 mean ionospheric trough (MIT) very well. During the storm the trough was displayed at latitude of about 50N.