



Ionospheric effects of geomagnetic storm in different sectors: observation and modeling

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There are presented the results of investigation into the manifestations of the large geomagnetic storm on April, 2000 in the high- and mid-latitude ionosphere, based on using the data from a network of ionospheric stations located within the longitude sectors 90-150°E and 250-310°. Analysis of the ionospheric response to geomagnetic storm in different hemispheres suggests that the longitude variations of ionospheric disturbances are determined primarily by the local time of sudden storm commencement. The fact that the geographic and magnetic coordinates do not coincide also leads to a longitude dependence of ionospheric effects of geomagnetic storms. An interpretation of the measurements involves comparing them with results of calculations in terms of a numerical model of the ionosphere and plasmasphere. Calculations are corrected according to the data of ionospheric stations. Measured and modeled values of foF2 considerable agree at both high and middle latitudes in the daytime when the ionospheric response to the magnetic storm is controlled mainly by the disturbance in the composition of the neutral atmosphere. The main differences are found in the evening and night hours of local time at high latitudes because the variations of ionization are caused by the combined effect of convection and energetic electron precipitation. It determined a discrepancy between the observed and calculated values of foF2.