



Modeling of ionospheric response to the great magnetic storm using the SuperDARN data

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Usually for numerical modeling of ionospheric storms corresponding empirical models specify parameters of neutral atmosphere and magnetosphere. Statistical kind of these models renders them impractical for simulation of the individual storm. Therefore one has to correct the empirical models using various additional speculations. Recently we investigated the influence of magnetospheric inputs such as distributions of electric potential, number and energy fluxes of the precipitating electrons on the results of the ionospheric storm simulations (Tashchilin and Romanova, 2007).

In this paper we have compared the maps of electric fields according to empirical model (Sojka et al., 1986), with maps obtained by the magnetogram inversion technique (Mishin, 1990) and the SuperDARN data during the storm on September 25-27, 1998. Ionospheric parameters (electron densities, ion and electron temperature) are simulated using SuperDARN data. The obtained results are compared with the previous results (Pirog et al., 2006; Tashchilin and Romanova, 2007) and data of measurements at the network of ionospheric stations.

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References

Sojka J.J., Rasmussen C.E., Schunk R.W. J. Geophys. Res., 91, 11281-11290, 1986
Tashchilin A.V. and Romanova E.B. Proceedings of the 30th Annual Seminar Apatity 27 February – 2 March 2007, Apatity, 189-192, 2007.
Mishin, V. M. Space Sci. Rev., 53, 83-163, 1990.
Pirog O.M., Polekh N.M., Tashchilin A.V., et al, Advances Space Res., 37, 1081-1087, 2006