



A study of ionospheric response to magnetic superstorms

O. M. Pirog (1), N. M. Polekh (1), E. B. Romanova (1), G. A. Zhrebtsov (1),
Jiankui Shi (2), Xiao Wang (2)

(1) Institute of Solar-Terrestrial Physics, Irkutsk, Russian Academy of Sciences, Russia, (2)
Center for Space Science and Applied Research, Chinese Academy of Sciences, Beijing,
China (pir@iszf.irk.ru / Fax: +7 3952 511675 Phone: +7 3952 428265)

There are presented the investigation of ionosphere during magnetic storms with the values of index $Dst < (-200 \div -300 \text{ nT})$ observed during the period of two last cycles of solar activity. There are used the data from a network of ionospheric stations located at different latitudes in the longitudinal sector of $90\text{-}150^\circ\text{E}$. There is revealed that response of ionosphere to superstorm is dictated by both the time of sudden storm commencement (ssc) and the temporal variation of index Dst . When a storm has pronounced commencement, one minimum and not extended, the ionosphere recovers to the undisturbed level during the next day after storm. When a storm has not one minimum, complicate form and extended, the ionosphere is restored to its original condition slowly and is completed to third-four day after storm. Theoretic model is used for interpretation of observations. Calculations are carried out with correction of the corresponding empirical models according to the available data of ground observations. Results show a good agreement between the measured and modeled values of foF2. The zone of the magnetospheric convection expands to mid latitude during the storm with two minima of Dst on October – November, 2003 and defines the prolonged restoration of ionosphere to quiet level.