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1 Modeling of season effects in storm time variations of ionospheric parameters in East Asia

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The investigations of ionospheric response to geomagnetic storms along meridian were continued in the frames of collaborate Russian-Chinese project. In this study the bulk attention is focused to modeling of ionospheric disturbances in different seasons. The morphological analysis was performed according to the data of ionosheric stations located in the longitudinal sector of 90-130˚E at latitudes from auroral zone to equator. There is received the considerable differences in the variations of ionospheric parameters during the geomagnetic storms depending on latitude and season. In the **winter** at high latitudes the disturbances were positive at night and negative in day. In contrast at middle latitudes the disturbances are negative at night and positive in the day. In the **summer** the disturbances are mainly negative. In the **equinox** the disturbance pattern is similar to the winter one, but with smaller amplitude.

The numerical model for ionosphere-plasmasphere coupling developed at the ISTP SB RAS was used to interpret the observational data. Presented model calculations have been obtained owing to correction of the MSIS-86 thermospheric model according to the available data of ionospheric ground observations. A theoretical analysis of the processes controlling the ionospheric response to the geomagnetic storm showed the crucial role of the neutral composition variations. There is good agreement of measurements and modeling results in the daytime both at high and middle latitudes. The

main distinction is marked in the evening and night hours LT. At middle latitudes this was associated with the fact that the model results were consistent with the situation when plasmasphere was practically filled and capable to maintain the sufficiently high values of Ne after sunset during the storm whereas the actual plasmasphere was not all filled. The discrepancy between the model and measured values in the evening and night hours at high latitudes was caused by the variations in the auroral fluxes, which were not described with the use of statistical model, and the processes associated with formation and moving of the main ionospheric trough. According to results of analysis of the ionospheric plasma convection trajectories, this variability of ionosheric storm parameters is caused by the combined effect of convection and energetic electron precipitation. At low latitudes the results of calculation for the weak storms also showed a satisfactory agreement with observation.

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