



Joint analysis of short-period variations of ionospheric parameters in Siberia and the Far East and processes of the tropical cyclogenesis

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In this work a possibility of manifestation of strong meteorological disturbances in the Earth lower atmosphere in variations of ionospheric parameters in the zone remote from the disturbance source has been studied.

The spectral analysis of short-period variations (about ten minutes, hours) in maximum observed frequencies (MOF) of one-skip signals of oblique sounding has been carried out. These variations were induced by changes in the upper atmosphere parameters along the Magadan-Irkutsk oblique-incidence sounding path on the background of diurnal variations in the parameter under study. Data on MOF measurements with off-duty factor approximately 5 min in equinoxes (September, March) of 2005–2007 were used. The analysis was made using the improved ISTP-developed technique of determining periodicities in time series. The increase of signal spectrum energy at certain frequencies is interpreted as manifestation of traveling ionospheric disturbances (TID) associated with propagation of internal gravity waves in the atmosphere. The analysis revealed TIDs of temporal scales under consideration. The question concerning localization of possible sources of revealed disturbances is discussed. Troposphere meteorological disturbances giant in their energy (tropical cyclones, typhoon) are considered as potential sources of observable TIDs. The needed information on tropical cyclones that occurred in the north area of the Indian Ocean, south-west and central areas of the Pacific Ocean in 2005–2007 is taken from the electron base of satellite data on the global tropical cyclogenesis “Global-TC” (ISR RAS). In order to effectively separate disturbances associated with the magnetospheric-ionospheric interaction and disturbances induced by the lower atmosphere influence on the upper atmosphere, we analyze the tropical cyclogenesis events that occurred in quiet helio-geomagnetic conditions.

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