

LONG-TERM VARIATIONS IN TEMPERATURE IN MESOPAUSE REGION AND F2-REGION PEAK ELECTRON DENSITY OVER EASTERN SIBERIA

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We present the results of the analysis of year-to-year variations in the temperature of the mesopause region (T_m) and the peak electron density (N_mF2) from spectrometric and radiophysical measurements with the equipment of the Institute of Solar-Terrestrial Physics SB RAS in 2008–2020. Data on the temperature of the mesopause region were obtained from spectrometric measurements of the OH emission ((6-2), 834 nm, Tory (51.8°N, 103.1°E)). The peak electron density was derived from the Irkutsk DPS-4 measurements (52.3°N, 104.3°E). We analyzed the annual mean T_m and N_mF2 , as well as yearly average values of day-to-day and intradiurnal variability in T_m and N_mF2 . The analysis involved data on solar and geomagnetic activity, as well as on variations in the Southern Oscillation Index (SOI). For the analysis, we used simple and multiple linear regression methods. It was found, that variations in the yearly average N_mF2 are dominantly controlled by changes in the solar flux, whereas year-to-year variations in N_mF2 variability are caused by changes in both solar and geomagnetic activity. The yearly average values of T_m variability correlate with changes in the SOI-index: the day-to-day variability shows a positive correlation with the SOI, while the intradiurnal variability demonstrates a negative correlation with the SOI. A significant relationship between the year-to-year variations in the N_mF2 variability and T_m variability was not revealed.

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