Polar ionosphere variability from Norilsk ionosonde and SuperDARN Ekaterinburg and Hokkaido HF radars

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Variability of the polar ionosphere is studied using Norilsk ionosonde (69.4N, 88.1E), SuperDARN Hokkaido (43.53N, 143.61E) and Ekaterinburg HF radar (56.4N, 58.5E) data. As characteristics we select the peak electron density (NmF2) measured with the ionosonde and the ground backscatter range corresponding to the skip distance (Rsd) from SuperDARN radar measurements. The disturbances of characteristics are the deviations of characteristics from their 27-day running median values (under assumption that 27-day running medians are associated with climatological specifics of the diurnal, seasonal, and long-term solar activity variations). The variability is considered as the root mean square of disturbances. For different tasks we used different types of averaging. Annual averaging was used for studying year-to-year changes in the variability (solar cycle variations). To study the difference between the day- and nighttime variability we made separate averaging for the day- and nighttime using ground terminator as a day-night boundary. To obtain the diurnal-seasonal pattern of the variability we performed averaging over years for each local time and day of year. In the paper we discuss similarities and differences between the selected characteristics and between the polar and midlatitude ionospheric variability.

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