

STUDY OF THE IRREGULAR STRUCTURE OF THE LOWER POLAR IONOSPHERE

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A method of the ionosphere pulse sounding by the MF or HF radio waves together with a reflected signal spaced receiving is a most convenient for the research of the D-region electron density irregular structure. The correlation analysis of the partial reflected ordinary wave which was received with the three spaced sensors of the observatory Tumanny (69.0°N; 35.7°E) revealed time-altitude regions of the small-scale irregularities (transversal character size more than 100 m) grouping. The correlation analysis consists in the time-altitude diagram of the cross-correlation function maxima reconstruction.

An analysis of such diagrams for the data of 1999 august revealed a regular stratified structure of the lower ionosphere. The layers are the space areas with a vertical size about some kilometers. Furthermore, they contain the electron density irregularities with a transversal scale more than 100 m. A configuration and resolution of the measuring facility defines this scale. Further, it was determined that the layer at 85 km is typical for a first half of day from 0 to 8 - 12 UT and then it is parted on the two strata which are located at 87 - 91 and 77 - 83 km.

The share analysis of the three cross-correlation functions allows excluding an uncertain information as well as to obtain more specific information about a height and time interval of the ionospheric processes. This method of the irregular lower ionosphere research can be used for an exploration of Polar Mesosphere Summer Echo (PMSE) phenomenon.