

Results of ionospheric radio sounding from heights in the vicinity of the F2-layer maximum

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Results of ionospheric radio sounding from heights in the vicinity of the F2-layer maximum are presented [1]. New phenomenon of the specific multifrequency trace has been opened in the ionosphere radio sounding from the Mir man space station during those periods when the station was below height of F2 maximum. This trace which never earlier was diagnosed at satellite sounding, has been found out on a 286 ionograms of the middle and low latitudes. It was titled as – related low trace (RLT) - and it has been explained as consecutive inclined reflection of radio waves from the Earth and refraction from strong irregularity of the F2 electronic concentration. Probing with a height of 330-380 km is in front of the "classical" method, which produces a sounding from the heights of 1000 km, and the advantages and disadvantages. The analysis of both based on the consideration of specific examples. The main advantages are a more accurate measurement of the electron density near the height of the main peak of the ionosphere and, consequently, less erroneous calculation of Nh-profiles [2]. And also in the diagnosis of large-scale ionospheric inhomogeneities, relating both to the regular structures of the ionosphere (the equatorial anomaly, etc) and to irregular (macro irregularity of seismic origin, etc). In probing the heterogeneity is an ever deeper penetration of radio waves inside the irregularity and, thus, it becomes possible to study the internal structure of these irregularities [3]. The examples of the internal structure of heterogeneities as a regular character, and irregular are presented. Areas of responsibility RLT experiment is showing in describing of the electron density spatial distribution. Especially emphasized that the sounding man space station has a special meaning, since on the one hand actually provided regular radio sounding, and relatively easy to solve the problem of repairing onboard ionosonde. On the other hand sensing provides the control of the space near the station, - useful for man space stations.

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