

The spectral-temporary analysis of electron density variations obtained over Irkutsk during September 2005 World Day campaign

A.G. Kim, A.V. Medvedev, K.G. Ratovsky

Institute of solar-terrestrial physics SB RAS, Irkutsk, Russia (kim_anton@mail.ru / Fax: +7-3952-511675 / Phone: +7-3952-564559)

For the first time parameters of ionosphere have been obtained in September 2005 during such long-term continuous ionospheric observations conducted by radio physical complex of Institute of Solar-Terrestrial Physics in Irkutsk. Incoherent Scatter Coordinated Observation Days passed in this time all over the world. In the complex ionospheric observations over Irkutsk (52N, 104E) were used the Irkutsk incoherent scatter radar, the chirp-sounder and the digisonde DPS-4. The features of time variations of electron density with altitude were investigated. Different levels of solar and geomagnetic activities occurred during this observation period.

The feature of Irkutsk incoherent scatter radar is that the height electron density profile is measured by Faraday fading method and does not need calibration by ionosounder that gives unique opportunity for verification of electron content density measured by two independent methods. "SAO-Explorer" was used for electron content profile calculation obtained by the digisonde and the chirp-sounder (operated in weakly oblique sounding mode).

For the first time such spectral-temporary analysis of month variations of electron density over Irkutsk (diameter of observed region is ~ 100 km) has been conducted on the basis of data of three independent near situated tools which continuously operated in September 2005. Results of data analysis made it possible to trace the dynamics of regular variations evolution with period from 10 minutes to 30 days. Variations of critical frequency f_0F_2 and total electron density profile which was divided into height intervals corresponded to E-, F1-, F2-layers and to layer above hmF2 were analyzed. The dependence of fluctuations' spectrum variation in geophysical parameters data versus the duration of sampling interval was investigated also, it allowed us to select traveling ionospheric disturbances observed during as quiet as disturbed days (the most disturbed day was on 11-th September when the daily Kp reached 50 and the Dst index reached a minimum value of -123 nT).

The work was supported by Russian Foundation for Basic Research (grant No 05-07-90212) and Leading Scientific School of Russian Federation (grant No. NSh-5071.2006.5).