The quasi-27-day solar flux variations influence on the ionosphere parameters at Irkutsk in 2003-2005

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Day-to-day variations of the ionosphere parameters are caused by influence of the different factors. We can note such factors like solar activity, geomagnetic activity and meteorological conditions. Under different conditions one of these factors can play the major or secondary role. The analyses of the day-to-day critical frequencies variations obtained at Irkutsk (52.5N, 104.3E) showed that there was a good correlation between the observed daily mean critical frequencies and daily F10.7 index values for winter months. This fact has initiated the research of the quasi-27-day solar flux variations influence on the ionosphere parameters.

The observed critical frequencies and total electron content (TEC) values at Irkutsk in 2003-2005 have been selected for the analysis. The TEC values were obtained both by the DPS-4 sounder and from the global ionosphere maps of the vertical TEC (http://www.cx.unibe.ch/aiub/ionosphere.html).

The research is carried out on the base of correlation analysis between the ionosphere parameters and the different indices that characterize the solar activity level. The correlation analysis allows us to estimate the degree of the 27-day solar flux variations influence and time delay between the solar flux and the ionosphere parameters variations.

Also the possibility of use of the alternative solar activity indices as an input to the IRI model for critical frequency and TEC prediction is discussed in the report.