



Day-time dependence of foF2 variations connected with earthquakes

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In the present work, the day-time variation of the characteristic frequency foF2 of the ionosphere is studied with regard to changes of the seismic activity of the Earth. Used are observations of the vertical ionospheric sounding station “Tokyo” registered in the years 1957-1990. In the analysis, data of the ionospheric parameter $\Delta F = (\text{foF2} - \text{median}(\text{foF2}))/\text{median}(\text{foF2})$ are used. Smoothed median data, measured between seven days before the earthquakes and seven days after the seismic shocks, i.e. in the time interval (-7,7), are taken into account. The choice of the parameter ΔF allows to compare time intervals of different seasons. Further, the day-time behavior of the ΔF -changes on the days (-1,0) are compared with background times. Days with magnetic disturbances described by an index $\Sigma Kp > 25$ are excluded from the analysis. Within the frame of the method of superposition of epochs with a reliability of $P > 95\%$, one may conclude, that at day-time and before midnight a decrease of the foF2-frequency is observed for earthquakes with magnitudes $M > 5.5$ at distances $R > R_D + 100$ km, where $R_D = \exp(M)$ designates the dimension of the earthquake preparation region. In the analysis, some tenths of earthquakes are taken into account. It is shown that the 11-years solar activity cycle does not influence the obtained effect. Several times, scientists already mentioned a considerable increase (or decrease) of the foF2-frequency during a time interval from a few days before strong earthquakes to some days after them. In the present work, it is statistically shown, that such a tendency exists at distances not farther than 100 km from the earthquake preparation region, but this phenomenon is not so important statistically.