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On spatial scales of seismo-ionospheric effects

Elena V. Liperovskaya (1), Claudia-Veronika Meister (2), Dieter H.H. Hoffmann (2), and Alexandra S. Silina (1)

(1) Institute of Physics of the Earth of the Russian Academy, Bolshaya Gruzinskaya 10, 123995 Moscow, Russia (liper@ifz.ru), (2) Technische Universität Darmstadt, Institut für Kenphysik, 64289 Darmstadt, Germany (c.v.meister@skmail.ikp.physik.tu-darmstadt.de,)

In the present work disturbances of the ionisation intensity in the E- and F-layers of the ionosphere a few days before earthquakes are investigated using data observed by ionospheric sounding stations in Japan, on Kamchatka, and of Middle Asia. Earthquakes with magnitudes $M > 5$ and depths $H < 80$ km are considered. The seismo-ionospheric effects are distinguished from seasonal, geomagnetic, 11-years, and 27-days Solar variations of the ionosphere. Days with high Solar and geomagnetic disturbances are excluded from the analysis. To reveal the statistical seismo-ionospheric effects, the superimposed epoches method is applied.

It is shown that an earthquake precursor may be observed for seismic shocks with magnitudes $M > 5$, when the ionospheric station is situated at a distance from the seismic event not larger than the Dobrovolsky radius $R = \exp(M)$ km. It seems that the seismo-ionospheric effects are caused by the Earth crust near the station, and not by processes in the epicenter of the upcoming earthquake.