



Variations of the critical foE-frequency of the ionosphere connected with earthquakes. Evaluation of observations of the vertical sounding station “Tokyo”

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In the present work the critical frequencies foE and foF2 of the ionosphere are considered as possible earthquake precursors. The statistical analysis of the critical frequencies is carried out based on the data of the vertical sounding station (VSS) “Kokubunji” (“Tokyo”) ($\varphi = 35.7^\circ$ N, $\lambda = 139.5^\circ$ E, 1957-1988) obtained every hour. Disturbances are considered on the background of seasonal, geomagnetic as well as 11-years and 27-days Solar variations. Special normalized parameters E and F are introduced, which represent the almost seasonal-independent parts of foE and foF2. Days with high Solar (Wolf number > 100) and geomagnetic ($\Sigma K_p > 25$) activities are excluded from the analysis. For all data (observed every hour) analysed, no correlations of the normalized parameters E and F are found. One day before the seismic shock, a positive correlation is observed. The superimposed epochs method is used to determine the temporal behaviour of E and F. It is found that E and F decrease one day before the earthquakes provided that the seismic shocks occur at distances $600 < R < 1000$ km from the VSS, and that the focus of earthquakes with magnitudes $M > 5.5$ is situated at depths smaller than 60 km. The reliability of the effect is larger than 98 %. Possible physical mechanisms of the phenomenon are discussed.