Statistical investigation of pre-seismic ionospheric disturbance from the in-situ plasma observation of the DEMETER

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We investigate ionospheric disturbance observed by the DEMETER plasma probes, which are ISL (Electron density and temperature) and IAP (Ion density and temperature). Since there are several papers concerning the pre-seismic ionospheric disturbance by using the data of electron/ion densities and temperature, we verify the reported pre-seismic anomalies by means of superposed epoch analysis. From the whole data set of the DEMETER, the superposed epoch analysis showed that the plasma disturbance appeared near the epicenter around 40 hours before the earthquakes. On the other hand, in the case of randomly generated earthquake catalogue, no similar anomalies appeared.

Keywords: Earthquake, DEMETER, Ionosphere

