

Precursor effects of earthquake on the ionosphere

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Abstract

We report two precursor phenomena associated with earthquake. Source data are Ne and Te obtained by Japanese satellite HINOTORI and American satellite DE-2, which were in orbit in 1981-1982. HINOTORI was a low inclination satellite at the height of 600km, while DE-2 was polar orbiting satellite with sun synchronous fixed at local time of about 9 AM/PM with eccentric orbit. Te obtained with HINOTORI satellite shows that Te of the afternoon overshoots, which usually starts to appear around 15 local time and disappears around 20 local time in the low-mid latitude, starts to decrease or the afternoon overshoot totally disappears about 5 days prior to the earthquake and recovers after 5 days. Ne observed by DE-2 shows the following. Over epicentre Ne reduces. Ne behaves as if equator ionisation trough moves to the epicentre. Irregularities is also recognized in Ne. This feature also starts to appear about 5 days prior to earthquake and disappears after 5 days. The result shows that combination of two satellites makes us identify the location of the epicentre. It seems that ionosphere is not sensitive to the earthquake which occurs in the ocean far from land. Ionosphere is less sensitive to the earthquakes which occur in high latitude. To get thorough ionospheric features associated with earthquake, constellation of the mini/small satellite is urgently needed.