

Ionosphere modified prior to large earthquakes - Possible role of earthquake related electric field -

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We report two evidences of the existence of the precursor effects of large earthquakes (Magnitude: larger than 6.5) on the ionosphere. One is obtained from well-established Electro temperature probe onboard Japanese scientific satellite (HINOTRI), which was in orbit during the period of February 1981 to June 1982. We found that electron temperature (T_e) in the afternoon overshoot reduced about 5 days prior to earthquake, and recovered about 5 days after the earthquake. This paper describes three cases of big earthquakes, which occurred in November 1981 and in January 1982 around Philippine.

The second evidence is found in the O^+ density, which was measured by Dynamic Explorer 2 (DE-2) launched by USA. The perigee and apogee heights were roughly 309 km and 1012 km with high inclination of sun synchronous orbit. We found that O^+ density over epicenters reduce. In most beautiful case, O^+ along satellite orbit shows that as if equatorial ionization trough (minimum) shifts over epicenter. This movement starts to appear more than 5 days before earthquake. As the satellite longitude becomes closer to the epicenters, the feature becomes clearer. Very often O^+ shows about 1-2 % fluctuation. It is noted, however, that ionosphere shows different features depending on the latitudes of the epicenter.