

## TEC over Japan during seismically active period in May - August 2008

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Using data of Japanese dense array of GPS receivers(GEONET), we performed a detailed analysis of the ionosphere TEC above Japan during seismically active period in May - August 2008, when 22 earthquakes with  $M$  is greater than 5.0 (including three large events of  $M=6.8-7.0$ ) occurred around the Tohoku area of Japan. This study allows us to make a step forward in the issue of seismo-ionosphere relations and of earthquake precursors in the ionosphere TEC. It is known that the decisive role in the ionosphere state is played by space weather effects. Besides, apart from the natural ionospheric variability by diurnal, seasonal or latitudinal fluctuations, enhance of pre-seismic processes a few days before an earthquake in the area of future epicenter can produce alterations of the ionosphere parameters as well. It should be noted that the considered period falls on the minimum of solar activity, so that the space weather influence was minimum at this time. However, in order to distinguish TEC variations caused by pre-seismic effects from those of solar and geomagnetic origin, we compared the estimated TEC values with time series of the interplanetary magnetic field component  $B_z$ , F10.7 solar flux, index of geomagnetic activity Dst and planetary index  $K_p$ . Besides, due to local TEC anomalies were reported to reflect global variations of TEC (Afraimovich and Astafyeva, 2008, *Earth, Planets and Space*, 60, 961), we bring out data of global TEC as well. At the same time, the analyzed period of 101 day is long enough to exclude planetary waves appearance in the ionosphere TEC which are known to have a period of  $\sim 2, 5, 10, 16$  days (e.g., Shalimov, *Cosmic Research*, 2001, 39, 6, 559) and which can be taken by mistake as precursory signals. The occurred earthquakes differ by mechanisms (on-land and underwater) and by the hypocenter depth (from 8 km to 111 km). This provides us an opportunity to compare effects of possible precursors in the ionosphere TEC not only concerning their appearance but also by distinctiparation of different types of earthquakes.