

## Ionospheric total electron content anomaly possibly associated with the 2008 Wenchuan earthquake

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Many anomalous electromagnetic phenomena possibly associated with large earthquakes have been reported. TEC (Total Electron Contents) anomaly is one of the most promising phenomena preceding large earthquakes. Liu et al. [2001] found apparent reductions in the ionospheric total electron content (TEC) within 1 - 5 days prior to M 5.0- earthquakes in Taiwan, as exemplified by the 1999 Chi-Chi earthquake (Mw7.6). For further understating of TEC anomaly associated with large earthquakes, it is important to investigate the anomalous TEC variation related to earthquakes occurred in other region.

In this study, TEC anomaly variation in time and space is investigated at the time of the 2008 Wenchuan earthquake (Mw7.9). We use the GIM (Global Ionosphere Maps) derived from Center for Orbit Determination in Europe (CODE) to detect anomalies in various locations throughout the globe. In order to remove daily variation of TEC, 15 days backward running average  $\langle \text{GIM-TEC}(t) \rangle$  and standard deviation  $\text{SD}(t)$  at specific times are computed. The normalized GIM-TEC\*(t) is defined as follows:  $\text{GIM-TEC}^*(t) = (\text{GIM-TEC}(t) - \langle \text{GIM-TEC}(t) \rangle) / \text{SD}(t)$

In order to evaluate the result of this case study, we perform superposed epoch analysis (SEA) for statistical analysis of TEC anomalies associated with earthquakes (M>6.0, Depth<40km) during 1998-2008. The result indicates that negative TEC anomalies appear 4-6 days before the earthquakes.

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