



A statistical analysis of ionospheric anomalies before 736 $M > 6.0$ earthquakes during 2002-2010

Huijun Le (1,2), Jann-Yenq Liu (2), and Libo Liu (1)

(1) the Geology and Geophysics Institute, Chinese Academy of Sciences, Beijing, China (lehj@mail.iggcas.ac.cn), (2) Institute of Space Science, National Central University, Chung-Li, Taiwan (tigerjyliu@gmail.com)

This paper presents a statistical study on the pre-earthquake ionospheric anomaly by using the TEC data from global ionosphere map (GIM). Total 736 $M \geq 6.0$ earthquakes in the global area during 2002-2010 are selected. The anomaly day is first defined. Then the occurrence rates of abnormal day for both the days within 1-21 days prior to the earthquakes (PE) and the background days (PN) are calculated. The results show that the values of PE depend on the earthquake magnitude, the earthquake source depth, and the length of days prior to the earthquake. The PE is the larger for the earthquakes with the greater magnitude and lower depth and for the closer days to the earthquakes. The results also shows that the occurrence rate of anomaly within several days before the earthquakes is overall larger than that during the background days, especially for the large magnitude and low depth earthquakes. These results indicate that those anomalous behavior of TEC within just few days before the earthquakes are related with the forthcoming earthquakes in high probability.