A Morphological Study of GPS-TEC and Its Variation Related to Wenchuan Earthquake (M=7.9) of 12 May 2008

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Daily variation of vertical TEC data recorded at Bichpuri Agra station (Geographic Lat. 27.2^0N, Geographic Long. 78^0E, Geomagnetic Lat. 17.10^0N) employing a GPS receiver has been studied for a period of three years from 01 August, 2006 to 31 March, 2009. The results show that the mean TEC varies from a minimum at 0500 hrs LT (LT=UT+5.5 hrs) to a peak value at about 1400 hrs LT and then decreases. The lowest values of TEC are observed in winter whereas higher values are observed in equinox and summer. Abnormal variation in TEC over the regular feature is seen following two magnetic storms occurred on 10 November 2006 (ΣKp=34) and 01 April 2007 (ΣKp=33). Further, we have studied the TEC variation in relation to Wenchuan earthquake (M=7.9) of 12 May 2008. A significant enhancement has been observed in TEC 22 days before this earthquake. This result is interpreted in terms of E×B drift mechanism, where E is electric field of seismic origin. These results are not influenced by magnetic storms and are attributed strongly to earthquake.

Keywords: TEC, Magnetic Storms, Earthquake