



## **Ionospheric response to HILDCAA events over low latitude Indian region using GPS**

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Total electron content (TEC) has been studied widely due to its importance in space weather and satellite communication. It has been an important factor in determining the behavior of the ionosphere for different types of geomagnetic storms at various low and high latitudinal regions. TEC, measured in TEC Units, is a path dependent value which can be obtained by integrating electron density of a region over the path of the ionosphere.

In this paper, TEC response to High Intensity Long Duration Continuous Activities(HILDCAAs) has been studied for one event where extreme contraction in magnetopause distance occurred in the near earth environment. These events were chosen based on the criterias of being highly-intense, occurring for a period of minimum 2 days; having continuous AE activity; where AE can be greater than or equal to 1000 nT. Also, AE values should never occur inside the main phase of geomagnetic storms. The definition of these events is somewhat loose in which events may occur even if one or more of these criteria are not followed.

The HILDCAA events that have been chosen for the study are in such a way that they coincide with geomagnetic storms during the period. The ever varying disturbance storm time (DST) values in earth's environment has been the nominating factor for a day to be a geomagnetic storm. The DST value below -50nT is categorized to be a storm.

The paper presents a comparative variation of total electron content(TEC) and vertical total electron content (VTEC) during such events and nonHILDCAA events over the Indian region which will lead to the broader understanding of ionospheric behavior during such events at equatorial and low latitude regions.

1.de Siqueira Negreti, P. M., de Paula, E. R., and Candido, C. M. N., "Total electron content responses to HILDCAAs and geomagnetic storms over South America," *Ann. Geophys.*, 35, 1309–1326, doi: 10.5194/angeo-35-1309-2017, 2017

2. Adhikari, Binod & Mishra, Roshan & Chapagain, N. & Baral, Rabin & Das, Priyanka & Klausner, Virginia & Sharma, Manisha "Variation of Solar Wind Parameters and Total Electron Content from Indian, Australian, Brazilian and South African Sectors during the Intense Geomagnetic Storms," doi: 10.1002/essoar.10503097.1.