

A METHOD TO DETERMINE THE STORM MOVEMENT USING SINGLE GPS STATION - A CASE STUDY OF OCTOBER 2003 GEOMAGNETIC STORM

Zainol Abidin Abdul Rashid, Mohammad Awad Momani, Mohd Alauddin Mohd ali, Baharudin Yatim

Universiti Kebangsaan Malaysia, Bandar Baru Bangi, Selangor, Malaysia

Knowledge of the storm movement is very important for space weather prediction. Currently, the worldwide GPS grid-based systems are used to monitor the storm movement. This method although is practical, but it is based on the measurement of surface intensity of the plasma and therefore lacks the detail information on the storm vector. By examining the temporal and spatial variations of VTEC obtained from the individual GPS satellites and their differences (PRN TEC enhancement-depletion events) over the sky at a particular station, it is possible to determine the storm direction and speed. In this paper we test the method for the determination of storm vector during the October 2003 geomagnetic storm at Scott Base station, Antarctica. Results show that at Scott Base station during the event, the ionospheric plasma tends to rotate in counter clockwise direction with a velocity ranging from 75 to 200 m/s. By extending the method to the worldwide GPS grid-based system, it would further enhance the prediction of the geomagnetic storm and hence the space weather predictions.