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Impact of the April 5, 2010 Geomagnetic Storm on GPS Positioning Accuracy at Yamoussoukro

Abstract:

On April 5th, 2010, a severe magnetic storm was observed with a magnitude of about – 100 nT as indicated by the Dst index. The diurnal variation of the ionospheric Total Electron Content (TEC) has shown a peculiar diurnal variation exhibiting a prominent depletion of the TEC in the course of the day. Since the ionosphere plays a major role on the accuracy of the GPS positioning solution, we have use the GPS data collected from the IGS station of Yamoussoukro (Latitude 6,87 , Longitude -5,24, dip= -12,91) in Côte-d'Ivoire to investigation the effect of this major geomagnetic storm on the positioning accuracy. The position was estimated using the program of Raquet (2012). We have adopted the elevation cutoff value to 30 degree following the criteria of Otsuka et al., (2006). The result show that the error due to the ionosphere is minimized due to the decreasing of the electron density.