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Empirical model for the electron density peak height disturbance in response to solar wind conditions

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Geomagnetic storms disturb the quiet behaviour of the ionosphere, its electron density and the electron density peak height, hmF2. Many works have been done to predict the variations of the electron density but few efforts have been dedicated to predict the variations the hmF2 under disturbed helio-geomagnetic conditions. We present the results of the analyses of the F2 layer peak height disturbances occurred during intense geomagnetic storms for one solar cycle. The results systematically show a significant peak height increase about 2 hours after the beginning of the main phase of the geomagnetic storm, independently of both the local time position of the station at the onset of the storm and the intensity of the storm. An additional uplift is observed in the post sunset sector. The duration of the uplift and the height increase are dependent of the intensity of the geomagnetic storm, the season and the local time position of the station at the onset of the storm. An empirical model has been developed to predict the electron density peak height disturbances in response to solar wind conditions and local time which can be used for nowcasting and forecasting the hmF2 disturbances for the middle latitude ionosphere. This being an important output for EURIPOS project operational purposes.