

Magnetospheric Current Systems and their Influence on Ionospheric TEC

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The Earth's magnetosphere is a dynamic region shaped by its interaction with the solar wind and Interplanetary Magnetic Field (IMF). Various magnetospheric current systems such as Magnetopause current, Tail current, Ring current and Region 1 and Region 2 Field Aligned currents (FAC) play a crucial role in maintaining the global magnetic balance and in mediating energy transfer between the solar wind, magnetosphere and ionosphere. This is an overview of these current systems and their coupling processes with the Ionosphere, emphasizing how variations in magnetospheric currents can significantly influence ionospheric parameters, particularly the Total Electron Content (TEC). We will also see the geomagnetic storm event highlighting storm time variations in TEC due to magnetospheric currents and associated electric fields during storm phases observed at an equatorial station and a low latitude station. This analysis underscores the importance of understanding magnetosphere ionosphere coupling process for accessing the ionospheric response to space weather disturbances.