

High-Latitude GPS TEC Changes Associated With a Sudden Magnetospheric Compression

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ABSTRACT

Using ionospheric total electron content (TEC) measured by Global Positioning System (GPS) receivers of the Canadian High Arctic Network (CHAIN), we provide clear evidence for a systematic and propagating TEC enhancement produced by the compression of the magnetosphere due to a sudden increase in the solar wind dynamic pressure. The magnetospheric compression is evident in the THEMIS/GOES data. Application of a GPS triangulation technique revealed that the TEC changes propagated with a speed of ~ 6 km/s in the antisunward direction near noon and ~ 7 km/s in the sunward direction in the pre-noon sector. Figure below shows the map propagation velocity of TEC disturbance estimated using GPS triangulation technique. Characteristics of the TEC changes along with riometer absorption measurement seems to indicate that TEC change is due to electron density enhancement in the F region and is possibly due to particle precipitation associated with the sudden magnetospheric compression.

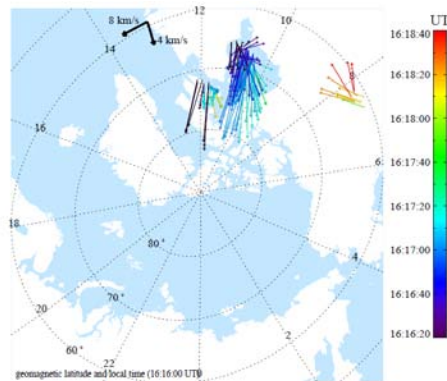


Figure: Map of propagation velocity of the TEC disturbance estimated using GPS triangulation technique.