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## **High-Latitude Topside Ionospheric Vertical Electron-Density-Profile changes in Response to Large Magnetic Storms**

Abstract:

Large magnetic-storm induced changes have been detected in high-latitude topside vertical electron-density profiles  $Ne(h)$ . The investigation was based on the large database of topside  $Ne(h)$  profiles and digital topside ionograms from the International Satellites for Ionospheric Studies (ISIS) program available from the NASA Space Physics Data Facility (SPDF) at <http://spdf.gsfc.nasa.gov/isis/isis-status.html>. This large database enabled  $Ne(h)$  profiles to be obtained when an ISIS satellite passed through a small region of space before, during, and after a major magnetic storm for each storm investigated. A major goal was to relate the magnetic-storm induced  $Ne(h)$  profile changes to solar-wind parameters. Thus an additional data constraint was to consider only storms where solar-wind data were available from the NASA OMNIWeb database. Ten large magnetic storms (with Dst less than -100 nT) were identified that satisfied both the  $Ne(h)$  profile and the solar-wind data constraints. Large  $Ne(h)$  changes were observed during each of these storms. The data coverage was best for the northern-hemisphere winter. Here  $Ne(h)$  profile enhancements were always observed when the magnetic local time (MLT) was within 3 hours of midnight and  $Ne(h)$  profile depletions were always observed when the MLT was within 3 hours of noon. The observed  $Ne(h)$  deviations will also be related to the observed solar-wind parameters with the appropriate time shifts.