

## Extreme storm events of October-November 2003 and geomagnetic field variations at the equatorial and low latitude stations in the Indian region

SOBHANA ALEX and SHYAMOLI MUKHERJEE

*Indian Institute of Geomagnetism*

*Plot 5, Sector 18, New Panvel (W) – 410 218, Navi Mumbai.*

The most pronounced space weather events of solar cycle 23 occurred during October – November 2003. A series of X-class flares erupted from the sun emitting a powerful solar flare of magnitude X17/4B flare at 1110UT on 28 October and X10/2B flare at 2049UT on 29 October giving rise to unusually high solar wind speeds. Geoeffective CMEs traveling at  $\sim 2000\text{km/s}$  drove shock fronts at 0600UT on 29 October and 1600UT on 30 October that impacted the earth's magnetic field at 0612UT on 29 October and 1620UT on 30 October respectively, resulting in intense geomagnetic storm activity during 29-31 October. The CMEs traveled at a record transit time of 19 hours thereby making this storm event the third largest in terms of speed. Subsequently another intense storm mainphase occurred on 20 November resulting from the M3.2/2n flare on 18 November that had an associated CME traveling at a speed of  $\sim 1100\text{km/s}$ . Digital ground magnetic field measurements from the equatorial and low latitude locations in the Indian longitude zone are used in the study. Ground magnetic signatures are studied in relation to the solar wind plasma configurations, interplanetary magnetic fields and auroral precipitation patterns. The complex processes of energy dissipation in the magnetosphere during the storm period are discussed in reference to the development of storm main phase and further recovery.

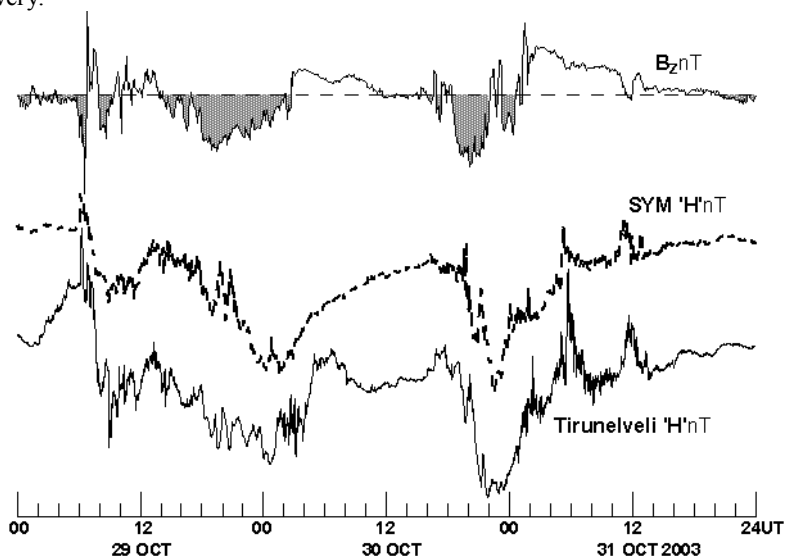


Figure 1. Interplanetary and geomagnetic signatures during the intense storm of October 2003