

Solar wind observation during the super-storm in October-November 2003

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We study the solar wind properties in very fast interplanetary shock events observed during the super-storm period in the October-November 2003 season, especially the one on 29 October 2003. During this event the intensity of high energy solar energetic particles (higher than several to several tens of MeV) was quite high, causing a serious background problem for plasma particle measurements on GEOTAIL as well as on the other spacecraft. The magnetic and electric field measurements, as well as the plasma wave measurement aboard GEOTAIL, on the other hand, were free from such a background problem, and provided a reliable estimate for the local plasma parameters including the plasma density. From these measurements, our best estimation for the local shock velocity is ~ 2000 km/s in the observer's rest frame, or ~ 1400 km/s in the upstream plasma rest frame. The corresponding Alfvén Mach number is ~ 12 . We will also discuss implications from these studies on the space weather environment around the earth.