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electric fields, shielding fields,
and neutral winds and
composition..

Interplanetary-Ionospheric Coupling: The 6 November 2001 Magnetic Storm Event

B. T. Tsurutani, A. Mannucci, B. Iijima (all at Jet
Propulsion Laboratory, California Institute of
Technology, Pasadena, CA 91109;
818-354-7559; e-mail: bruce.tsurutani@jpl.nasa.gov)

M.A. Abdu, J.H.A. Sobral, W.D. Gonzalez, Instituto
Nacional de Pesquisas Espaciais, Sao Jose dos Campos,
Brazil

T. Tsuda, Radio Science Center for Space and Atmosphere,
Kyoto University, Japan

B. Fejer, Utah State University, Logan, UT

T. Fuller Rowell, CIRES Univ. Colorado and NOAA SEC,
Boulder, Co 80905

J.U.O. Kozyra, University of Michigan, Ann Arbor 48109

T. Foster, Heystack Observatory, Millstone Hill, Mass.

The effects of the intense southward interplanetary magnetic fields of the 6 November 2001 event is studied using ground-based GPS receiver data, satellite (vertical) GPS receiver data, satellite altimeter data and Brazilian near-equatorial ionosonde data. Strong dawn-to-dusk directed interplanetary electric fields are generated by shock compression of an upstream slow magnetic cloud southward B_z magnetic fields. The electric field reached an unusually high $\sim 55 \text{ mV m}^{-1}$ intensity. Immediately after shock impingement, there were strong dayside and nightside ionospheric effects. The CHAMP GPS data plus ground based GPS data indicate that the dayside ionosphere was lifted to altitudes above the satellite ($\sim 430 \text{ km}$). The vertical ionospheric TEC increased by 50-100%. Nightside ionosonde data indicate strong decreases in TEC. During the intense interplanetary electric field event, an unusual plasma feature is noted. Enhanced midlatitude densities occur with a sharp drop-off of densities at higher latitudes. The latitude of the drop-off decreased with storm development, similar to plasmaspheric erosion during magnetospheric convection electric field events. Finally large decreases in the dayside TEC are noted ~ 6 hrs after shock passage. This decrease is $\sim 40\%$ below quiet daytime values. These interesting ionospheric features will be discussed in terms of prompt penetration of interplanetary

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3.a) B. T. Tsurutani
Jet Propulsion Laboratory
MS 169-506
4800 Oak Grove Drive
Pasadena, CA 91109

b) Tel. 818 354-7559

c) Fax 818 354-8895

d) bruce.tsurutani@jpl.nasa.gov

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