Geophysical Research Abstracts
Vol. 13, EGU2011-2190, 2011
EGU General Assembly 2011

Depleted magnetic bottle in 90 degrees pitch angle within magnetic cloud

Katerina Andreeova (1), Emilia Kilpua (1), Liisa Juusola (2), Alexey Isavnin (1), Rami Vainio (1), Hannu Koskinen (1,2)

(1) University of Helsinki, Department of Physics, Helsinki, Finland (andreeova@seznam.cz), (2) Finnish Meteorological Institute, Helsinki, Finland

An interplanetary magnetic cloud (MC) is an important solar-terrestrial event to study relations between space weather and Earth's magnetosphere. We have analyzed a magnetic cloud (MC) observed by ACE, Wind, and Themis B, and later by Themis C in the solar wind on 3 September 2008, lasting until 4 September 2008. An Earth-directed coronal mass ejection (CME) was recorded by coronagraphs onboard SOHO and STEREO B spacecraft on 31 August, 2008. A few days later the north-south oriented MC without the leading interplanetary shock was observed in sequence by all solar wind monitors from the first Lagrangian point L1 into close Earth's vicinity. Minimum variance analysis (MVA) was used to determine the normal direction and the speed of propagation of the leading edge of MC, propagating almost perpendicular to the Sun-Earth line (cone angle of magnetic cloud about 4 degrees), so this event is quite symmetrical and the first contact point occurred practically on the nose of the magnetopause. Depletions in suprathermal electrons at 90 degrees pitch angle, occurs often on closed field lines within CMEs. The halo typically consists of suprathermal electrons that have been scattered from the strahl or that have been accelerated at interplanetary shock. We show that depletion of halo electrons can occur as a result of mirroring of suprathermal electrons associated with connection to magnetic field enhancement beyond the spacecraft.