Geophysical Research Abstracts, Vol. 9, 01965, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-01965

Interplanetary shock waves in the Earth's magnetosheath: Cluster observations

G. Pallocchia (1), M. B. Cattaneo (1), I. Dandouras (2), L. M. Kistler (3), B. Klecker (4), C. W. Carlson (5), A. Korth (6), M. McCarthy (7), R. Lundin (8), A. Balogh (9)

(1) Istituto di Fisica dello Spazio Interplanetario - Istituto Nazionale di Astrofisica, Rome, Italy, (2) Centre d' Etude Spatiale des Rayonnements, Toulose, France, (3) Space Science Center, Center for Earth, Oceans and Space, University of New Hampshire, Durham, New Hampshire, USA, (4) Max Planck Institut fur Extraterrestrische Phisick, Garching, Germany, (5) Space Sciences Laboratory, University of California, Berkeley, California, USA, (6) Max Planck Institut fur Sonnensystemforschung, Katlenburg - Lindau, Germany, (7) Geophysics Program, University of Washington, Seattle, Washington, USA, (8) Swedish Institute of Space Physics, Kiruna, Sweden, (9) Space and Atmospheric Physics, Blackett Laboratory, Imperial College, London, UK

The interaction of two shock waves is a basic problem in plasma physics playing an important role in many processes occurring in space. In the past years, despite their importance, shock waves collisions have been subject of very few observational studies. Here we present some events, seen by the Cluster satellites, concerning interplanetary shock waves going through the magnetosheath after the impact with the Earth's bow-shock. These observations show the complex and non-linear nature of the phenomenon. Actually the associated variations in plasma parameters and in the magnetic field are due, besides the transmitted interplanetary shocks, to other secondary (i.e. produced in the impact) discontinuities and waves. To this regard, we briefly compare our observations with the MHD theory predictions and some results coming from recent 3D simulations.