



Interaction of interplanetary shocks with foreshock and their response in the Earth's magnetosphere

K. Andreeova (1), L. Prech (1), J. Safrankova (1), Z. Nemecek (1)

Charles University Prague, V Holesovickach 2, CZ-18000 Prague 8, Czech Republic
(deandree@seznam.cz)

The study of the interaction of interplanetary shocks (IPS) with the Earth's magnetosphere is fundamental to improve our understanding of the Sun-Earth system, because of their high geoeffectiveness. IP shocks cause pressure pulses on the magnetopause and its movement, they launch different waves into the magnetosphere and modify plasma flow and magnetic fields in the magnetosphere. The arrival of an IP shock is also reflected in observations from geosynchronous satellites (GOES, LANL) and other satellites situated in the outer magnetosphere.

Foreshock is an important structure in front of Earth's bow shock and influences interplanetary shocks in different ways. In our recent studies we reported a substantial modification of the front of certain interplanetary shocks in strong foreshock upstream of the quasiparallel bow shock resulting in much longer rise times of magnetic field and plasma parameters. The duration of the IP shock front was an order of magnitude longer than observations of the same IP shock in other places in the solar wind or the opposite (non-foreshock) flank. In this contribution we aim to discuss the effect of such asymmetrical action in the dayside magnetosphere response. Analysis of these interactions contain data from simultaneous observations of various fast forward shocks from different satellites in the solar wind, foreshock and Earth's magnetosphere, such as ACE, Wind, IMP-8, SOHO, Interball-1, Geotail, and Cluster, and describe solar wind and magnetosphere plasma parameters and magnetic fields.