



## **Propagation of an interplanetary shock through the bow shock and magnetosheath**

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Propagation of an interplanetary (IP) shock through the bow shock and magnetosheath is studied using numerical results of a three-dimensional MHD model of the magnetosheath. It has been found that the interaction between the IP shock and the bow shock generates a new discontinuity identified as a combination of a slow expansion wave, a contact discontinuity, and a slow reversed shock. The bow shock begins its inward motion immediately after encounter with the IP shock. Three versions of the MHD model corresponding to a different magnetopause reaction on the IP shock arrival have been tested. Comparison of these runs reveals that the magnetopause reaction defines the mode of reflected waves. A most probable scenario predicts propagation of a weak reversed fast shock from the magnetopause towards the bow shock. The speed of the IP shock propagation does not depend on the magnetopause response and all three model runs confirm a deceleration and deformation of the IP shock front in the magnetosheath in course of its motion from the subsolar region to the magnetosheath flanks.