INTERACTION OF INTERPLANATARY SHOCKS WITH THE MAGNETOSPHERE IN OBSERVATIONS AND MHD MODELS

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We try to find a method to classify the different discontinuities that are created as a result of the interaction of an IP shock with the bow shock and to observe a temporal evolution of the magnetopause and bow shock location in response to the IP shock arrival.. The literature suggests that a fast forward shock passing through the bow shock would generate a train of new discontinuities that differ along the Sun-Earth line. We show one example where data measured by Wind is used as input to a global BATS-R-US MHD model. Since discontinuities reflected from the magnetopause and/or from some internal boundary (plasmapause) or even from the ionosphere can play an important role in the interaction process, we use two BATS-R-US runs – with an artificial inner boundary at 6 RE and with the RICE ionospheric model embedded into BATSR-U-S. The comparison of results with the Geotail observations shows a good qualitative agreement but we conclude that an identification of different discontinuities is possible only with MHD model support. Another important result is that the flank magnetopause starts its inward motion earlier than the pressure enhancement arrives to a particular location.

IP shock, bow shock, magnetopause

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