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Interplanatary shock interaction with the magnetosphere: Observation vs MHD model

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In this presentation, 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. 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.