

Space Studies of the Earth-Moon System, Planets, and Small Bodies of the Solar System (B)
Mercury: Visiting an Elusive Planet (B07)

MESSENGER OBSERVATIONS OF THE RESPONSE OF MERCURY'S MAGNETOSPHERE TO NORTHWARD AND SOUTHWARD INTERPLANETARY MAGNETIC FIELDS

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MESSENGER's 14 January 2008 encounter with Mercury has provided new observations of the solar wind interaction with this planet. Here we report initial results concerning this miniature magnetosphere's response to the north-south component of the interplanetary magnetic field (IMF). This is the component of the IMF that is expected to exert the greatest influence over the structure of the magnetopause and the processes responsible for energy transfer into the magnetosphere. The IMF was northward immediately prior to and following the passage of the MESSENGER spacecraft through this small magnetosphere. However, several-minute episodes of southward IMF were observed in the magnetosheath during the inbound portion of the encounter. Evidence for reconnection at the dayside magnetopause in the form of well-developed flux transfer events (FTEs) was observed in the magnetosheath following some of these southward-Bz intervals. The inbound magnetopause crossing in the magnetic field measurements is consistent with a transition from the magnetosheath into the plasma sheet. Immediately following MESSENGER's entry into the magnetosphere, rotational perturbations in the magnetic field similar to those seen at the Earth in association with large-scale plasma sheet vortices driven by Kelvin-Helmholtz waves along the magnetotail boundary at the Earth are observed. The outbound magnetopause occurred during northward IMF Bz and had the char-

acteristics of a tangential discontinuity. These new observations have important implications for our understanding of energy transfer into Mercury's magnetosphere.