

Saturn's magnetosheath transition layer

A. Masters (1), H. Hasegawa (1), T. D. Phan (2), S. V. Badman (1), M. Fujimoto (1), A. J. Coates (3,4), M. K. Dougherty (5)

(1) ISAS/JAXA, Japan, (2) University of California, USA, (3) Center for Planetary Sciences at UCL/Birkbeck, UK, (4) MSSL/UCL, UK, (5) Imperial College London, UK (a.masters@stp.isas.jaxa.jp)

Abstract

The interaction between the solar wind and a magnetised planet produces a cavity around the planet known as a magnetosphere. Although this cavity effectively shields near-planet space from the solar wind, the occurrence of magnetic reconnection at the magnetopause boundary of the magnetosphere allows solar wind energy to enter the system. In the case of Earth's magnetosphere a region of reduced plasma pressure and enhanced magnetic pressure can form in the solar wind immediately adjacent to the magnetopause (which also can form around other planetary magnetospheres). This layer is often referred to as the Magnetosheath Transition Layer (MTL), and Earth's MTL responds strongly to magnetopause reconnection. The nature of magnetopause reconnection at Saturn is unclear. We study Saturn's MTL using data taken by the Cassini spacecraft. We examine the response of the layer to local magnetised plasma conditions, compare this response to that of Earth's MTL, and assess whether our results are in agreement with current, limited understanding of magnetopause reconnection at Saturn.