



Is Saturn's Magnetosphere Turbulent?

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On February 12, 2008 the Cassini spacecraft passed through Saturn's dayside bow shock and spent 16 hours in the solar wind. The interval in the solar wind was characterized by a series of dynamic pressure pulses and a rotation of the interplanetary magnetic field from southward to northward. We have used these Cassini solar observations to drive our global magnetohydrodynamic simulation of the interaction of solar wind with Saturn's magnetosphere and ionosphere. We found that large amplitude waves formed at the magnetopause in response to the changes in the dynamic pressure. The vorticity (both parallel and perpendicular) increased within the outer magnetosphere. The vorticity was mostly driven by pressure variations and not reconnection. The vortices frequently were nested with smaller vortices within the large scale vortices. This cascade in vorticity is suggestive of turbulent flows. In this presentation we will evaluate vorticity in our Saturn simulation to determine if the flows are turbulent. With Cassini in the solar wind there were no simultaneous observations within Saturn's magnetosphere. However we will examine the Cassini observations at other times to look for evidence of turbulence.