



The variability of mass-loading near Enceladus

K. K. Khurana (1), M.K. Dougherty (2), Y. Jia, (1), C. T. Russell (1) and P. Travnicek (3)

(1) Institute of Geophysics and Planetary Physics, UCLA, Los Angeles, CA, 90095, USA, kkhurana@igpp.ucla.edu (2) Imperial College, Department of Physics, London SW7 2AZ, (3) Institute of Atmospheric Physics, Czech Academy of Sciences, Prague, Czechoslovakia.

The detailed modeling of magnetic field observations from the three upstream flybys executed in 2005 had shown that Enceladus does not possess any internal magnetic field but acts as an obstacle to the corotating plasma of Saturn's magnetosphere. In situ and remote sensing observations from the third flyby (11EN) provided conclusive evidence of a large vent outgassing near the south pole of Enceladus and confirmed the southern offset of the center of draping of the magnetic field. Detailed MHD and Bio-Savart modeling of the magnetic field signatures from the 2005 flybys showed that the effective diameter of the obstacle is at least 6 RE and the obstacle is displaced by > 2 RE south of Enceladus and the mass picked-up by the plasma within 5 RE of Enceladus is < 3 kg/s.

In this presentation we compare and contrast magnetic field observations from the recent close flyby of Enceladus (61EN on March 12, 2008) with those from the three upstream flybys executed in 2005. We present Biot-Savart and MHD modeling results from all four flybys in order to understand the variability and dynamics of plasma pickup near Enceladus.