Geophysical Research Abstracts, Vol. 8, 05483, 2006
SRef-ID: 1607-7962/gra/EGU06-A-05483

The mass-loading of plasma near Enceladus

K. K. Khurana (1), M.K. Dougherty (2), P. Travnicek (3), F.M. Neubauer (4), J. Saur (4), and C. T. Russell (1)

(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, (4) Institut fĺur Geophysik und Meteorologie, University of Cologne, Germany

We present an analysis of the magnetic field data obtained from the three close flybys of Enceladus in 2005 by Cassini. All three Enceladus encounters occurred on the upstream side of Enceladus at closest approach distances of 5.8, 3.0 and 1.7 Enceladus radii (R_E) respectively. These flybys show that the tiny icy moon (radius 250 km) presents itself as a large obstacle slowing down the plasma flow.

A detailed modeling of the data show that the effective obstacle is not co-located with Enceladus but is displaced at least one R_E south of Enceladus and its size is at least 2 R_E in radius. The characteristics (size, conductivity and location) of the obstacle show variations between passes. The magnetic field signatures are consistent with a plume generated dynamic atmosphere which is confined mainly to the southern hemisphere of Enceladus.