



## The enigma of a large tilt in Saturn's current sheet

**K. K. Khurana** (1), C. S. Arridge (2), M.K. Dougherty (3), C. T. Russell (1)

(1) Institute of Geophysics and Planetary Physics, UCLA, Los Angeles, CA, 90095, USA, (2) Planetary Science Group, Mullard Space Science Laboratory, (3) Imperial College, Department of Physics, London SW7 2AZ.

Data from orbits in the near tail region traversed by Cassini in late 2006, show a puzzling behavior. In a magnetosphere known for its almost axisymmetric magnetic dipole, the spacecraft is observed to cross the current sheet periodically. In these crossings, the radial and azimuthal components of the magnetic field reverse sign twice during a spin period of Saturn in a manner similar to the dipole tilt induced motions of the Jovian current sheet. Detailed modeling shows that the tilt of the current sheet required to explain the observations is  $10^\circ$ , not the  $< 1^\circ$  expected from measurements of the internal field made at low latitude close to the planet.

In this presentation, we examine all of the data so far collected by Cassini to catalogue all of the periodic current sheet crossings in the data. We examine parameters like the radial distance, latitude, longitude and local time of the spacecraft to understand under what conditions the current sheet crossings are observed. We explore models of Saturn's current sheet that can explain the periodicities of the observed magnetic field. Finally, we speculate on various mechanism(s) and phenomena that could cause this large tilt in Saturn's current sheet.