Geophysical Research Abstracts, Vol. 9, 04945, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-04945

On the perturbed charged particle environment of Titan

K. Szego (1), Z. Bebesi (1), C. Bertucci (2), A.J. Coates (3), F. Crary (4), G. Erdos (1), L. Foldy (1), R. Hartle (5), E.C. Sittler (5), D.T. Young (4)

(1) KFKI Research Institue for Particle and Nuclear Physics, Budapest, Hungary (szego@rmki.kfki.hu), (2) Imperial College, London, UK, (3) Mullard Space Sci. Lab,Holmbury St. Mary, UK, (4) Southwest Research Institute, San Antonio, TX, US, (5) Goddard Space Flight Center, Greenbelt, MD, US

The instrument suite of the Cassini mission has explored the plasma environment of Titan more than twenty times since the beginning of the mission. The Cassini Plasma Spectrometer (CAPS) collected charged particles data during most of the flybys. In this study we summarise what we learned about the charged particle environment developed due to the interaction of the ionosphere of Titan with the subsonic, rotating, multicomponent magnetospheric flow. The ionosphere itself was variable since its sources varied during the flybys. In general the magnetic field was not in a pure dipole configuration. Our major findings are that along the near-equatorial orbits the flowside plasma sphere extended to 6-7 R-Titan on both sides of the corotation direction, all ion components of the flow decelerated as we approached Titan. Along the polar orbits we analysed, the deceleration of the heavy and light ion components was significantly different, leading to different bulk speeds for these species. This situation is very much different from the equatorial case; pointing to the kinetic nature of the plasma interaction. Above the ionosphere on all orbits we observed a dense, cold, sharply bounded plasma region, composed dominantly of ionospheric ions; similar to Mars in many respect. Accordingly, this perturbed plasma environment has new features relative to those explored before.