EPSC Abstracts,
Vol. 4, EPSC2009-326-1, 2009
European Planetary Science Congress,

Electron Density and Temperature of the Electrons Located in the Inner Magnetosphere of Saturn.

M. E. Gkini (1), M. Moncuquet, N. Meyer-Vernet

Observatoire de Paris, Meudon/LESIA, (1)magda.gkini@obspm.fr

Abstract

On July 2004, the Cassini spacecraft performed its Saturn orbit insertion (SOI). Since then and for 6 years Cassini will orbit the planet more than 134 times with various periapsis (so called perikrones) and inclinations. This work is interested in the closest approaches of Saturn by Cassini, i.e. the trajectory part located around the perikrones, typically between 3.5Rs and 9Rs. Around each of these perikrones, the radio-HF receiver of RPWS observed a peak at the upper-hybrid frequency and weakly banded emissions having well-defined minima at the gyroharmonics. We have studied these spectra by using the technique of Quasi-Thermal Noise spectroscopy (QTN) in magnetized plasmas and we deduced the electron density, the core and the halo temperatures in the inner magnetosphere of Saturn. We present the results for 20 perikrones, which took place during the period 02/2005-02/2008. We show the dependence of those parameters on the distance from the planet and on the inclination related to the ring plane. From the latter we will be able to have a clear view of the large scale structure of the plasma torus in this region of Saturn's magnetosphere (embedded in the dusty ring E), which is badly known, especially because it is very cold (typically a few eV for the core electrons) and thus hardly accessible to particle analyzers.

Figure 1: Europlanet logo