



Quasi thermal noise spectroscopy in the inner magnetosphere of Saturn with Cassini/RPWS

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On July 2004, the Cassini spacecraft performed its Saturn orbit insertion (SOI). Since then and for 4 years Cassini will orbit the planet nearly 80 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 studied these spectra by using the technique of the quasi-thermal noise spectroscopy in magnetized plasmas and from that we deduced the electron density, the core and the halo temperatures in the inner magnetosphere of Saturn. The aim of this work is to obtain a clear view of the large scale structure of the plasma torus in this region of the Saturn's magnetosphere (embedded in the dusty ring E), which is not well known, especially because it is rather cold (typically a few eV for the electron core) and thus hardly accessible to particle analyzers.