

Spin-Periodic Oscillations of Low-Energy Electrons in the Inner Saturnian Magnetosphere

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The inner Saturnian magnetosphere is a complicated multiphase environment. Its structure depends both on several independent spatial coordinates (radial distance, latitude, longitude, local time, and the orbital phase of Enceladus, the principal plasma source) and on the time variability of the Enceladus dust, neutral and plasma torus.

We will explore the hypothesis that a centrifugally driven instability of the torus results in a two-cell rotating convection pattern, as proposed by Gurnett et al. [Science, 2007] and Goldreich and Farmer [JGR, in press, 2007], by detailing low-energy electron plasma observations inside the inner Saturnian magnetosphere. We will take advantage of particular Cassini orbits with similar radial, latitudinal, local time coverage in order to examine the time repeatability of electron properties and the possible existence of an azimuthally-restricted sector of plasma outflow.