



## **Structure and dynamics of Saturn's inner magnetosphere - Cassini RPWS/LP observations**

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The Radio and Plasma Wave Science (RPWS) Langmuir probe (LP) on the Cassini spacecraft has provided cold plasma measurements of the magnetosphere of Saturn since 2004. We use LP data from 130 orbits to map the structure and dynamics of the inner plasma disk of Saturn, from magnetic L shell 2.5 to 12. The focus is on the ion density and velocity. The derived ion densities are used to map the shape of the inner plasma torus of Saturn, showing a maximum along the orbit of Enceladus. The estimated ion velocities are found to be below corotation speed, in a statistical sense. We compare our measurements with other reported Cassini measurements giving further support for that dust-plasma interaction, between the E-ring particles and the surrounding plasma, takes place. Our mapping will be useful for numerical model attempts in the future and can serve as a reference model for the inner plasma disk.