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The induced magnetosphere of Titan: 4 years of Cassini observations.

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The absence of an intrinsic magnetic field at Titan results in the direct interaction between its atmosphere and Saturn's rotating magnetosphere. The obstacle to the external plasma flow represented by the moon's collisional ionosphere and the exospheric heavy ions that mass load the external plasma flow leads to the formation of an induced magnetosphere characterized by magnetic field pileup in the sub flow sector and strong draping in the flanks and downstream sector.
We use Cassini Magnetometer (MAG), Plasma Spectrometer (CAPS) and Plasma Wave / Langmuir Probe (RPWS/LP) observations obtained during the first 4 years of the mission to characterize the spatial extent and shape of Titan's induced magnetosphere above 950 km altitude. The role of parameters such as Saturn Local Time (SLT), total upstream pressure, and convective electric field is studied. When possible, we also use Cassini's Magnetospheric Imaging Instrument (MIMI) in order to compare the magnitudes of the dynamic, magnetic and plasma pressures at different altitudes. Finally, we discuss the constraints that these results set for current theoretical models and future observations.