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Analysis of inter - calibrated electron observations in Saturn's inner magnetosphere

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Abstract. The Cassini instrumental suite dedicated to Magnetosphere and Plasma Science at Saturn allows measurement of ion and electron plasma distribution functions over a broad range of energies. Based on a careful intercalibration of the Cassini Plasma Spectrometer (CAPS) and of the Magnetospheric Imaging Instrument (MIMI) we present a study that combines all the available electron plasma observations for selected orbits. The CAPS electron spectrometer (ELS) measures the velocity distribution function of the thermal and suprathermal components (0.6 eV to 26.040 keV) of the magnetospheric plasma. The Low Energy Magnetospheric Measurement System (LEMMS) of the MIMI instrument covers data at a higher energy range (0.015 MeV to 0.884 MeV), and overlaps the ELS at its lower energy range. We first compute composite particle energy spectra in order to produce an empirical model of the elec-

tron populations observed in Saturn's inner magnetosphere ($<$ 15 Rs). We then derive a comprehensive set of electron macroscopic parameters, constraining it with RPWS total electron density. The whole set of plasma components fluid moments will then be expanded from an orbit leg to a full meridional plane, using a maxwellian distribution model in a dipolar magnetic geometry with magnetic-field-aligned polarization electric field.

We also present preliminary results on the local time dependence of the inner magnetospheric regions defined from a multi-intruments data analysis.