



Energetic particle diffusion and the A ring: Revisiting noise from Cassini's orbital insertion

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Immediately following Cassini's orbital insertion on July 1, 2004 the Cassini spacecraft passed over the Saturn's main rings. In anticipation of the final phase of the Cassini mission, with orbits inside and over the main rings, we have re-examined data from the CAPS instrument taken during the orbital insertion period. One previously-neglected feature is the detector noise in the ELS sensor. This has proven to be a sensitive, relative measure of omni-directional energetic (>5 MeV) electron flux. The data are obtained at 31.25 ms time resolution, corresponding to 0.46 km spatial resolution. Over the A ring, the energetic electron flux was essentially zero (~ 3 counts per sample.) At the edge of the A ring, this dramatically increased to approximately 2500 counts per sample in the space of 17.5 km. We use these results to derive the energetic particle diffusion rate and the absorption (optical depth) of the ring.