

Ring- and Moon-Associated Energetic Particle dropouts observed by MIMI-LEMMS during Cassini's Ring-Grazing Orbits

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Abstract

During December 2016-April 2017, the Cassini spacecraft performed 19 orbits with periapses just outside Saturn's main rings. These ring plane crossings allowed magnetic field lines threading the outer regions of the main ring system to be sampled close to the equatorial plane. Trapped energetic particles have been previously shown to provide valuable information on the presence of moons, rings, and incomplete ring arcs that complements the data provided by remote sensing instruments. We report on observations of this region by the LEMMS sensor of Cassini's Magnetospheric Imaging System, MIMI. We concentrate on results relevant to the region surrounding the moons Janus and Epimetheus at 2.4 to 2.8 Saturn radii from the planet's centre. We present the inferences that can be drawn about this region from absorption signatures due to those moons plus the ring material that orbits near to them, slightly complicated by the northward offset of Saturn's magnetic equator.

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