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# Energetic Particle Injection Events in the Saturnian Magnetosphere

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One of the special features of the Saturnian magnetosphere is about the frequent injection events of energetic ions and electrons observed by the plasma instruments (i.e. MIMI./LEMMS) onboard the Cassini spacecraft. Such injection events could be triggered by the so-called interchange instability due to the mass-loading effect of the ions originated from the icy satellite, Enceladus. Following the work of Mauk et al. (Geophys. Res. Lett., 32, L14S05, doi:10.1029/2005GL022485) and Mueller et al. (JGR, 115, A08203, doi:101029'2009JA015122, 2010), we have initiated a project to study the interrelation between the injection process (such as the distributions of the strength and duration of the injection events) and the orbital phase of Saturn around the Sun from Solstice to Equinox, possibly covering a solar cycle. Because of temporal variations of the Saturnian ionospheric conductivity and the ionization rates of Enceladus neutral cloud as a result of the changing sun-lit angle and shadow effect of the ring system, there might be corresponding changes in the co-rotation lag of the magnetospheric plasma and the frequency of interchange instability. The long-term measurements of Cassini from 2004 to 2017 are best suited for this investigation. In this presentation, a few snapshots of the observed injection events will be shown to explore the viability of this approach.