

Loss processes in Saturn's inner magnetosphere ~interaction between energetic electrons and neutral particles~

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Neutral particles in Saturn's inner magnetosphere play a dominant role in loss of energetic electrons and ions because of abundance of neutral particles (e.g., Paranicas et al., 2007; Sittler et al., 2008). The estimation of interaction between energetic and neutral particles gives a clue to understand particle acceleration and loss processes.

In order to understand loss processes of energetic electrons, we have estimated pitch angle diffusion coefficients by interaction between energetic electrons (more than keV) and neutral particles. The neutral particle distribution has been constructed by a Monte-Carlo simulation which follows gravity fields of Saturn and each inner moon (Enceladus, Tethys, Dione, and Rhea) after neutral particles are ejected from the satellites and the south pole of Enceladus into the magnetosphere due to sputtering and a plume. Results showed that diffusion coefficients by neutral particles are greater than those by electron-ion interactions around Enceladus ($L \sim 3.94$). We have further estimated pitch angle and energy diffusion coefficients in Saturn's inner magnetosphere. In this presentation, we will show the importance of energetic electron loss process by interaction between energetic electrons and neutral particles.