

Interaction between energetic electrons and neutral particles in Saturn's inner magnetosphere

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Neutral particles in Saturn's inner magnetosphere play the dominant role in loss of energetic electrons and ions because of abundance of neutral particles (e.g., Paranicas et al., 2007). The estimation of interaction between energetic and neutral particles gives a clue to understand particle acceleration and loss processes. These interactions produce the butterfly type pitch angle distribution which is dominant distribution in Saturn's inner magnetosphere (e.g., Roussos et al., 2005).

In order to understand loss processes of energetic electrons, we have estimated pitch angle diffusion coefficients by interaction between energetic electrons and neutral particles. A result showed that diffusion coefficients by neutral are greater than those by electron-ion interactions around Enceladus ($L \sim 3.94$). We have further estimated these diffusion coefficients in Saturn's inner magnetosphere by using a water molecule distribution model. In this presentation, we will show the importance of energetic electron loss process by interaction between energetic electrons and neutral particles.