Loss process due to elastic collisions between magnetospheric keV electrons and neutral H2O molecules in the Enceladus torus

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Water group neutrals (H_2O, OH, and O) in Saturn's inner magnetosphere play the dominant role in loss of energetic electrons and ions because of abundance of the neutrals [e.g., Paranicas et al., 2007,2008; Sittler et al., 2008]. The previous studies suggested that the neutral cloud originated from Enceladus contributes to loss processes of plasma in the inner magnetosphere. However, little has been reported on a quantitative study of the electron loss process due to electron-neutral collisions. Tadokoro et al., [2014] examined the variation of 1keV electron pitch angle distribution due to elastic collisions with the dense region of H_2O originated from Enceladus using one-dimensional test-particle simulation. The result showed that the electrons of ˜11.4% to the total number of equatoriall electrons at the initial condition are lost in ˜380sec, corresponding to the co-rotating electron flux tube passes the dense H_2O region in the vicinity of Enceladus. Next remaining issue is a calculation of energy dependent electron loss rate. We show the loss rate of electrons with 500eV-50keV and the comparison of the loss rate between the high (in the vicinity of Enceladus) and low (in the Enceladus torus) H_2O density regions.