

## Hybrid Simulation of Electromagnetic Ion Cyclotron Waves Generated by Loss Cone Distribution in Ganymede's Polar Cap Region

# Masafumi Shoji[1]; Tomoki Kimura[2]

[1] ISAS, JAXA; [2] JAXA/ISAS

Galileo spacecraft observation has shown that low frequency coherent L-mode electromagnetic ion cyclotron (EMIC) waves have been observed near the polar cap region of Ganymede satellite. The observation results and linear wave growth analyses suggested that the waves are generated by the loss cone distribution function of energetic ions (~a few hundreds of keV). In this study, we perform one-dimensional hybrid simulations to investigate the generation process of the EMIC wave spectra with multiple peaks and the effect on the ion plasma distribution. We introduce nonuniform ambient magnetic field assuming Ganymede's polar cap region interacting with Jovian magnetic field. We reproduce the continuous generation of the loss cone distribution of the energetic S<sup>+</sup> ions and the EMIC waves propagating toward Ganymede. The EMIC wave spectra show a good agreement with the Galileo observation. We also analyze the pitch angle scattering of the hot S<sup>+</sup> ions.