

R006-37

Zoom meeting B : 11/2 PM1 (13:45-15:30)
14:30-14:45

プラズマ圏磁気赤道付近におけるホイッスラーモード・ヒス放射の非線形生成機構

#大村 善治¹⁾, 疋島 充²⁾, サマーズ ダニー³⁾

¹⁾京大・生存圏, ²⁾宇宙科学研究所, ³⁾ニューファンドランド・メモリアル大学

Nonlinear generation mechanism of whistler-mode hiss emissions near the equatorial plasmasphere

#Yoshiharu Omura¹⁾, Mitsuru Hikishima²⁾, Danny Summers³⁾

¹⁾RISH, Kyoto Univ., ²⁾ISAS/JAXA, ³⁾Memorial University of Newfoundland

We have conducted a one-dimensional electromagnetic particle simulation with a parabolic magnetic field to reproduce whistler-mode hiss emissions in the plasmasphere [1]. We assume a bi-Maxwellian distribution with temperature anisotropy for energetic electrons injected into the plasmasphere, and find that hiss emissions are generated locally as an absolute instability with spectrum characteristics typical of those observed by spacecraft near the magnetic equator. The hiss emissions contain fine structures involving rising tone and falling tone elements with variation in frequencies. The amplitude profile of the spectra agrees with the optimum wave amplitude derived from the nonlinear wave growth theory [2]. The simulation demonstrates that hiss emissions are generated locally near the magnetic equator through linear and nonlinear interactions with energetic electrons with temperature anisotropy. The coherent hiss emissions efficiently scatter resonant electrons of 2.5keV - 80keV into the loss cone.

References:

[1] Hikishima, M., Omura, Y., & Summers, D. (2020). Particle simulation of the generation of plasmaspheric hiss. *J. Geophys. Res. Space Physics*, 125, e2020JA027973, doi:10.1029/2020JA027973

[2] Omura, Y., S. Nakamura, C. A. Kletzing, D. Summers, and M. Hikishima (2015), Nonlinear wave growth theory of coherent hiss emissions in the plasmasphere, *J. Geophys. Res. Space Physics*, 120, 7642-7657, doi:10.1002/2015JA021520.