

S001-26

A 会場 : 11/5 AM2 (10:45-12:30)

12:05~12:20

#小谷 翼<sup>1)</sup>, 樋田 美栄子<sup>2)</sup>, 森高 外征雄<sup>2)</sup>, 田口 聡<sup>1)</sup>

(<sup>1</sup> 京大理, <sup>2</sup> 核融合研)

## **Simulation study of the harmonic structure of lower hybrid wave driven by energetic ions: comparison with observation**

#Tsubasa Kotani<sup>1)</sup>, Mieko Toida<sup>2)</sup>, Toseo Moritaka<sup>2)</sup>, Satoshi Taguchi<sup>1)</sup>

(<sup>1</sup> Graduate school of Science, Kyoto Univ., <sup>2</sup> NIFS)

In the cold plasma approximation, there are no perpendicularly propagating waves above the lower hybrid resonance frequency. However, unusual waves with an integer multiple of the lower hybrid resonance frequency have been recently observed in the Earth's magnetosphere [Huang et al., 2020, JGR]. These unusual waves propagate perpendicular to the magnetic field with linear polarization. Hereafter, we call these waves the harmonic lower hybrid waves. The excitation mechanism of the harmonic lower hybrid waves has not been fully understood because energetic ions, which can excite the lower hybrid wave, have not been found in the observation.

Using one-dimensional, electromagnetic, particle-in-cell simulations, we report the excitation mechanism and development of the harmonic lower hybrid waves driven by energetic ions. We investigate the parameter dependence, such as the ratio of the electron plasma frequency to the electron cyclotron frequency, on the development of the harmonic lower hybrid waves. We also compare the simulation results with the observation to discuss the condition where the harmonic lower hybrid waves are excited.