

## Particle simulations about LH plasma waves observed by Geotail spacecraft

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According to our previous study, LH plasma waves are observed in Lobe and PSBL region in the magnetosphere. We studied several plasma parameters at the time when LH waves were observed, and found that LH waves were observed with the large perpendicular velocity of ion and the earthward ion flow. In addition, the LH plasma waves observed with the earthward ion flow have low frequencies, and the strengths of those LH plasma waves are relatively large. These results suggest that strong LH plasma waves are observed in the boundary region where ion flow usually exist, such as Lobe region close to PSBL. In addition, LH plasma waves are observed when ion velocity perpendicular to the ambient magnetic field is enhanced and earthward ion flows are observed.

On the basis of these results, we are going to perform 2-dimensional particle simulations about LH plasma waves observed by EFD. In these simulations, we examine effects of perpendicular on thermal velocity and parallel ion drift velocity on the generation mechanism of LH plasma waves. We will farther investigate the occurrence conditions of LH plasma waves to clarify the generation mechanism of these waves and their effects on local plasma environment in the magnetosphere.

Keywords: Lower Hybrid plasma wave, magnetosphere, statistical analysis, ion flow, wave-particle interaction