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Statistical analysis of LH plasma waves observed by Geotail spacecraft

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In this study, we make analysis on generation conditions of LH plasma waves observed by Electric Field Detector (EFD) onboard Geotail spacecraft. We detected LH plasma waves automatically from EFD data, and made an occurrence frequency distribution of LH plasma waves.

LH plasma waves are observed in Lobe region and PSBL region in the magnetosphere. We studied several plasma parameters at the time when LH waves were observed. We 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 large. These results suggest that strong LH plasma waves are observed in Lobe region close to PSBL. 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: magnetosphere, LH plasma waves, Geotail