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ポスター 1 ：9/24　PM1/PM2 （13:45-18:15）

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Estimation of low-energy electron temperature using Arase satellite interferometry observations

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Electron Cyclotron Harmonic (ECH) waves are a type of plasma waves observed in the magnetosphere. They are characterized by a harmonic structure with peaks occurring at integer multiples of the electron cyclotron frequency. ECH waves have a wave vector direction close to the perpendicular direction of the background magnetic field, with electric field oscillations perpendicular to the background magnetic field. In this study, we attempt to estimate the dispersion relation by calculating the phase velocity of ECH waves.

We analyzed the phase velocity of ECH waves using the interferometric observations from the Arase satellite. The Plasma Wave Experiment (PWE) on the Arase satellite consists of four antennas, of which two are considered as monopole antennas for the interferometric observations. Specifically, the differential measurements between antenna V1 and V2, and the satellite ground are performed. Antennas V1 and V2 rotate every 8 seconds due to the satellite spin.

We calculated the phase difference of ECH waves and obtained their spin dependence. From the numerical calculations, we proposed a method to estimate the unobserved electric field components based on the spin dependence. Using this method, we determined the wave number at each frequency from the phase velocity and examined the dispersion relation. By comparing the theoretical dispersion curve, we attempted to estimate the electron temperature of the cold population that corresponds to energies lower than the measurement range of the Low-Energy Particle Experiments - Electron Analyzer (LEP-e). We have analyzed several events and found that the frequency-wavenumber relationship generally agrees with the dispersion curves for low-energy electron temperatures of a few eV.

We will continue to consider the causes of some disagreement parts for better agreement and will also apply the analysis to more events.