

Statistical analysis of EMIC waves in the inner magnetosphere from the Akebono observations

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Electromagnetic ion cyclotron (EMIC) waves are often observed in the inner magnetosphere and EMIC waves are important to cause the pitch angle scattering of ring current ions as well as relativistic electrons of the radiation belts. Although the spatial distributions of EMIC waves have been investigated by several spacecraft such as CRRES and THEMIS, there have been little studies on the latitudinal distributions. In this study, we use the Akebono satellite data that has observed inner magnetosphere since 1989. We assumed that EMIC waves are the plane wave. Therefore, we have done the polarization analysis using the Means method using both electric and magnetic field data taken from the ELF instrument. We identify EMIC waves by visual inspection, considering characteristics of the wave dispersion relation. As a result of statistical study, EMIC waves are often found for $L < 3$, especially, in the dusk-side, while the EMIC waves are found in the post-noon side. Moreover, EMIC waves are found within the magnetic latitude range $|\text{MLAT}| < 30$ degrees for $L < 7$, while the EMIC waves are hardly found within the magnetic latitude range $|\text{MLAT}| > 60$ degrees. In this presentation, we report the spatial distributions of EMIC waves considering the different polarizations as functions of MLT, L and the MLAT and will compare with statistical analyses from CRRES and THEMIS.

Keywords: EMIC waves, Inner magnetosphere, Akebono