

## Spectral characteristics of EMIC waves observed at THEMIS probes in the outer magnetosphere

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We have statistically examined the properties of EMIC waves observed by THEMIS probes in the outer magnetosphere ( $L = 6\sim 12$ ) for 2008-2011. The wave events were identified in 3-min intervals through a semiautomated wave selection procedure. Using Fourier spectral analysis for each 3-min segments, we determine the ellipticity, the azimuth orientation angle of the polarization ellipse, and wave normal angle between the wave propagation vector orientation and background field direction. Unlike previous studies, spectral properties are examined for wave events showing high coherence ( $> 0.7$ ) between two transverse ( $\delta B_x$ : radial and  $\delta B_y$ : eastward) components (i.e., phase-coherent sinusoidal wave events) because wave polarization characteristics obtained from the spectral analysis are meaningful only in the case of a plane wave. We found that only  $\sim 10\%$  of EMIC waves show high coherence. This indicates that most of EMIC waves in the outer magnetosphere are phase-incoherent waves. In this study we compare previous observations and our statistical results. In addition, we also compare the wave normal angles obtained from Fourier analysis and the minimum variance analysis.