



## **The dependence of the EMIC wave properties on the IMF directions: THEMIS observations**

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It is generally accepted that electromagnetic ion cyclotron (EMIC) waves are frequently observed in the postnoon-dusk sector due to the anisotropic energetic (a few tens of keV) ions injected from the plasma sheet. In this study, we investigate the role of the interplanetary magnetic field (IMF), which is one of the external sources affecting the geomagnetic activities, in the EMIC wave generation. The characteristics of EMIC waves observed from THEMIS during the long-duration (more than 4 hours) northward IMF ( $BZ \geq 1$  nT) conditions are compared with those during the long-duration southward IMF ( $BZ \leq -1$  nT) conditions. The statistical results reveal that the preferential regions of He-band EMIC waves for both IMF intervals are located in the prenoon-dusk sector (1100-2000 MLT) with the peak occurrence rates near the noon to postnoon (1100-1500 MLT) for the lower L ( $L \sim 5-8$ ), which is consistent with the results in previous studies. On the other hand, we find that H-band EMIC waves show the dependence on the IMF direction. H-band EMIC waves for northward IMF frequently occur in the dawn-prenoon sector (0400-1000 MLT) with the peak occurrence rates near the dawn (0400-0800 MLT) for the higher L ( $L \sim 8-11$ ). In contrast, the preferential region of H-band EMIC waves for southward IMF is skewed into prenoon sector (0700-1100 MLT). On the basis of these results, we will discuss the possible physical mechanisms underlying the occurrence distributions for the respective IMF conditions.