Statistical analysis of plasmaspheric EMIC waves

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Electromagnetic ion cyclotron (EMIC) waves in the inner magnetosphere are important since EMIC waves 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, THEMIS and AMPTE/CCE, there have been little studies on plasmaspheric EMIC waves. We investigate statistically EMIC wave data using the Akebono/VLF measurements. The plasmaspheric EMIC waves tend to be distributed at lower L-shell region (L˜2) than the slot region. There are no significant MLT dependences, which are different from the EMIC waves outside the plasmapause. The plasmaspheric EMIC wave frequencies depend on the equatorial cyclotron frequency, suggesting that the plasmaspheric EMIC waves are not propagated from high L-shell but generated near the equivalent L-shell magnetic equator. This result is consistent with the result of the dependence of resonance energy. Using the in-situ thermal plasma density measured by the Akebono satellite, we estimate the resonance energy of energetic ions, and the resonance energies of the plasmaspheric EMIC waves are few tens keV to ˜1 MeV. The results indicate that the ring current and radiation belt ions may contribute the generation of the plasmaspheric EMIC waves.