R006-23 **会場: A 会場（6F ホール）** **時間: 10 月 25 日 9:15-9:30**

Statistical Property of Long Lasting Poloidal Pc 4-5 Waves and Its Relation withProton Phase Space Density Variations

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Particle acceleration is one of the most important issues in the inner magnetosphere because the spatial and energy distributions of the ring current and radiation belt particles are dramatically changed through various acceleration mechanisms. Event studies of the drift-bounce resonance have revealed that ˜100 keV protons, which is the main component of the ring current pressure, often resonate with poloidal mode ultralow frequency (ULF) waves (e.g., Takahashi et al., 1990; Dai et al., 2013; Min et al., 2017, Oimatsu et al., 2018). Therefore, the drift-bounce resonance between ˜100 keV protons and the poloidal waves can change the ring current intensity, and the resonance should be examined in more detail to understand the ring current dynamics. However, the contribution of the poloidal waves to the acceleration of the ring current ions is not fully investigated. This is because substorm injections and the convective electric field can cause variations of ion fluxes at less than ˜100 keV and mask the variations by the wave-particle interaction.

To examine the effect of ULF waves on variations of particle distributions, we statistically analyzed energetic proton flux data provided by the Van Allen Probes (Mauk et al., 2012). First we examined the occurrence distributions and storm phase dependence of long-lasting poloidal waves because such long lasting waves are related to significant variations of the proton phase space density and hence their distributions and excitation mechanism is important. We found that the long lasting poloidal waves are often observed 0-3 days after the main phase of CME driven storms. Superposed epoch analysis of the radial distributions of the energetic protons revealed that the high occurrence rate of the poloidal waves is attributed to a steep earthward gradient during the recovery phase.

Next, we selected the data period when the |MLAT|is less than 10 degree, |SYM-H|is less than 15 nT, and the standard deviation of the SYM-H index is less than 5 nT to exclude flux variations due to geomagnetic disturbances and the latitudinal dependence. We obtained the ratio between the proton phase space density averaged over the long lasting poloidal wave intervals and that over no wave intervals. The proton phase space density during the wave intervals is greaterthan that during no wave intervals at almost all energy and L-shell, but the phase space density enhancement is suppressed at a specified energy and L > 4.5, where the poloidal waves are detected. Observed magnitude of the magnetic field and wave frequencies are used to examine the drift-bounce resonance condition. Assuming that azimuthal wave number (m) is ˜200, we find that resonance energy well corresponds to the energy for the suppression of proton phase space density enhancement. Therefore, we consider that the drift-bounce resonance can cause the energy-dependent suppression of the proton phase space density enhancement. We also estimated the contribution of the suppression to ring current decay by using Dessler-Parker-Sckopke relation (Dessler & Parker, 1959; Schopke, 1966) and we found that the variation of the Dst index due to the drift-bounce resonance is ˜0.6 nT.