MeV電子増加時の静止軌道におけるPc5の磁力線振動モードの特性

Characteristics of Magnetic Field Oscillation of Pc5 Wave at the GEO Associated with MeV Electron Flux Enhancement

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It is well known that MeV electron flux in the radiation belt increases during the recovery phase of magnetic storms. Acceleration process of MeV electron has been widely studied to understand the wave-particle interaction in the magnetospheric plasma process. In particular, the ULF wave is recently recognized as one of the possible cause of the MeV electron flux enhancement. The acceleration process by ULF wave is predominant during the magnetic storm driven by high speed solar wind such as CIR (Corotating Interaction Region). The Pc5 wave driven by high-speed solar wind is often interpreted as a subsequence of Kelvin-Helmholtz instability. However, the detailed process of the acceleration by ULF have not well understood while it has suggested that the oscillation mode of Pc5 wave must play an important role for the acceleration.
In this study we analyze the magnetic variation observed by GOES 10 and 11 satellites in the ENP coordinate system to compare the Pc5 pulsation observed at H057 (Maglat.=-66.42, L=6.25) and Skallen (Maglat.=-66.42, L=6.25) in Antarctica. In the case of the MeV electron flux enhancement occurred on February 26 –March 2, 2008, the P component (perpendicular northward from the orbital plane) of Pc5 power is almost comparable between the afternoon and noon sectors at the very beginning of the magnetic storm, while the Pc5 power in the N component (Eastward) is predominant in noon sector compared to that in the evening sector. During the recovery phase of the magnetic storm, the N-component Pc5 power in the in the evening is much larger than that in the noon sector, and the phase lag of the Pc5 shows the wave propagation from the evening to the noon sectors. The similar signatures also appear in the magnetic variations at H057 and Skallen.
These results suggest that the troidal oscillation of the Pc5 generated not only by KHI but also by another source in the night side play an important role of the drift resonance acceleration of the MeV electrons during the recovery phase of the magnetic storms.

キーワード：MeV電子、放射線帯、ULF波動
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