Localtime Dependence of the Pc5 Wave associated with MeV Electron Flux Enhancement Observed by two GOES Satellites

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It is well known that MeV electron flux efficiently increases during the recovery phase of magnetic storms. ULF wave propagating in the magnetosphere is recognized as one of the possible candidates which can accelerate the electron in the radiation belt while various acceleration processes have been widely proposed by many investigators.
In this study, total 20 electron flux enhancement events associated with the CIR (Corotating Interaction Region) driven storms in 2008 have been analyzed using the magnetic field vector data obtained by GOES 10 and 11 satellites. The GOES 10 and 11 were located at 60 deg. and 75 deg. West in geographical longitude, respectively, which corresponds to 1 hour separation in local time. We used the bandpass filtered (150-1000 sec) magnetic data in the ENP coordinate system to investigate the oscillation mode of the field line and the propagation characteristics of Pc5 pulsations in the GEO orbit (6.6 Re).
As a result, following features are observed, that is: both the P (compressional mode) and T (transverse mode) components of the Pc5 strongly enhances at th beginning of the electron flux decreasing in the night side sectors: the Pc5 power is relatively low at the mooning sectors: the dominant frequencies vary from high to low during the electron flux decreasing, which is quite apparent at the afternoon-night sectors. These observational facts indicates that the source region of the Pc5 during the electron flux decreasing can be considered at the evening sectors. The particle injection from night side associated with substorms may generates the ULF wave in the evening sectors. The decreasing of the dominant frequencies also suggests the particle injection from night side associated with substorms from the night to evening sectors.

Keywords: ULF wave, MeV electron flux, Substorm

