Universitas Indonesia Library >> Artikel Jurnal

Pc5 magnetic pulsations during the outer electron radiation belt

L. Muhammad Musafar K, author

Deskripsi Lengkap: https://lib.ui.ac.id/detail?id=9999920521600&lokasi=lokal

---

Abstrak

Since the discovery of the radiation belt decades ago, there still remain some fundamental questions as to which one is the mechanism responsible for the acceleration of electrons. Ground-based Pc5 magnetic pulsation during the process of increasing of 2-MeV electron fluxes has been analyzed. First, a filter bandpass in the period range of 150-600 seconds has been used to localize the Pc5 waves. Second, we then applied a wavelet transform procedure, whereby the Morlet function as a mother wavelet was selected to analyze Pc5 wave packets. First, we show that dynamic pressure of solar wind controls the power of Pc5 magnetic pulsations. Second, by performing a cross-spectrum analysis of Pc5 wavelet during electron radiation belts we show that the wavelet power of Pc5 magnetic pulsations which is associated with a maximum wavelet cross spectrum show a similar change of Pc5 pulsations occurs during radiation belt events. Increasing of electron fluxes which is initiated by the presence of large power of Pc5 magnetic pulsations has been observed. This indicates that Pc5 magnetic pulsations could play a role in the acceleration and transport mechanism of the electron radiation belt. Also, 4-5 days from the beginning of increasing of electron fluxes we observed globally, a depression in the power of Pc5 magnetic pulsations as well as a monotonically decreasing of the solar wind dynamic pressure. On the other hand, during the end period of the electron belt, we also observed a sudden increasing of Pc5 power. We suggest that during the expansion periode of the outer electron radiation belt outward to interplanetary electron belt pressure that will reduce the solar wind dynamic pressure and consequently a decrease occurs in the power of Pc5 magnetic pulsation. And, in the end period of the electron radiation belt the electron fluxes back to its normal level and consequently a sudden increase of the Pc5 solar wind dynamic pressure occurs and that sudden increase also drives the sudden increasing power of Pc5 magnetic pulsations.