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Pc5 Magnetic Pulsations During Outer Electron Radiation Belt

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

Keywords—magnetic field; Pc5 magnetic pulsations; electron fluxes, radiation belt