ON THE RELATIONSHIP BETWEEN THE OCURRENCE OF PC5 ULF WAVES IN THE MAGNETOSPHERE AND THE EVOLUTION OF THE RADIATION BELT

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Previous studies have shown that ultralow frequency (ULF) waves power is correlated with the dynamics of relativistic electrons in the Earth's outer radiation belts during the recovery phase of geomagnetic storms. Relativistic electron fluxes can be depleted, enhanced or not affected at all following intense geomagnetic activity, and their response can be affected by several variables such as location, energy, storm type, solar wind conditions etc. As one of the mechanisms affecting the dynamics of the radiation belt is drift-resonance interactions between relativistic electrons and ULF waves, in this work we perform a statistical study of the relationship between the ULF wave power (Pc5) and relativistic electron fluxes in the range of 1.8 MeV < E < 6.3 MeV in the outer radiation belt during most geomagnetic storms that occurred between 2012 and 2017, by using magnetic field and particle fluxes data measured by the Van Allen Probes. We evaluated the correlation between the changes in flux and the cumulative effect of ULF wave power activity during the main and recovery phases of the storms for different L-shells in the outer radiation belt and for different energy channels. Our results show that there is a good correlation between the intensity of ULF wave power and the changes in fluxes during the recovery phase of geomagnetic storms and that the correlation varies as a function of energy. Additionally, there is a dependence on location, with some L-shells showing better correlation for different storm phases. This suggests different interactions between ULF waves and particles of different energies [1][2][3].

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