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# The responses of relativistic electrons in the outer radiation belt to Coronal Mass Ejections with different Interplanetary Magnetic Field preconditions

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Fifty-six Coronal Mass Ejections (CMEs) from 2012 to 2015 are categorized into four groups according to Interplanetary Magnetic Field (IMF) precondition. Then the outer radiation belt is quantitatively studied using the Radiation Belt Content (RBC) index. For 2.1 MeV energy, it is found that only for events with northward IMF precondition and northward IMF at CME leading edge, the outer radiation belt dropouts, with the RBC index decreasing to 46% of the unperturbed level; only for events with southward precondition and southward IMF at CME leading edge, the outer radiation belt enhances, and the RBC index is almost 3 times greater; for the other two groups of events without continuous southward or northward IMF, there are only small variances. The 5.2 MeV channel presents similar results. Our study suggests that CME-driven storms with different IMF preconditions cause different responses (enhancement, dropout or small variance) of relativistic electrons.