

# **EFFECTS OF ICMEs AND CIRs ON ENERGETIC PARTICLE PRECIPITATION**

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Interplanetary Coronal Mass Ejections (ICME) and Corotating Interaction Regions (CIR) are the main drivers of geomagnetic storms. A number of recent studies have identified many differences in the geomagnetic activity resulting from interaction between these solar wind structure and the Earth's magnetosphere. We present the results of a superposed epoch study to compare observations of energetic particle precipitation in the auroral region of the ionosphere during 33 ICME-driven and 38 CIR-driven storms. In this study, energetic particle precipitation is inferred from observation of enhanced Cosmic Noise Absorption (CNA) recorded by ground-based riometers. The results show differences in the intensity and duration of particle precipitation enhancement during the storms driven by the structures. ICME events show more intense CNA enhancement although the duration of the enhancement is limited by the duration of the passage of the ICME. CIR show less intense CNA however CNA enhancement can be observed over a number of days following the CIR as a result of the passage of the high speed solar wind stream (HSS) that follows a CIR. Similar trends are also evident in measurements of energetic electron flux at geosynchronous orbit made by the Los Alamos National Laboratory (LANL) satellite. While CIR events show sustained particle precipitation, precipitation is observed over a wider range of latitudes during ICME events, placing a latitudinal extent on the significance of the effect of CIRs on particle precipitation.

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