



Session Solar Physics, Inner Heliosphere, and Cosmic Rays

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Analyzing the Galactic Cosmic Ray flux in the passage of ICMEs and SIRs

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Galactic Cosmic Rays (GCRs) are high energy particles of galactic origin. Forbush Decreases (FDs) consist of abrupt decreases in the GCRs flux. These decreases are observed at ground level and measured by different instruments, as Neutron Monitors. It is well known that the passage of Interplanetary Coronal Mass Ejections (ICMEs) and Stream Interaction Regions (SIRs) are potential drivers of FDs. ICMEs are the interplanetary counterpart of Coronal Mass Ejections and their origins are in the active regions of the Sun. SIRs are formed when fast solar wind streams, that arise in the Sun Coronal Holes, interact with the slower ambient solar wind.

In this work we use data from ACE Spacecraft and MCMurdo Neutron Monitors to study all the ICMEs that occurred in the period (1998-2016) and all the SIRs occurred in the period (1995-2009).

We make a statistical analysis of all the ICMEs/SIRs, and then we apply the superposed epoch analysis (SEA) technique to different samples of events. Finally we analyze the difference and similarities of the FDs produced by both structures.

We find that FDs produced by ICMEs are very sensible to the mean velocity of the structures. While in the FDs produced by SIRs, the mean velocity of them does not appear to affect the FDs amplitude.

We also find that the minimum of the GCRs flux in ICMEs occur at the middle of the ICME, while in SIRs the minimum of the GCRs flux is at the end of the SIR.