Contribution ID: **14** Type: **not specified**

Understanding Short-Term Modulation of Cosmic Rays

Monday 24 April 2017 11:45 (30 minutes)

Short-term (few-day duration) modulations of the galactic cosmic ray intensity have been observed for many decades by ground-based instruments and spacecraft, and are associated with structures in the heliosphere, in particular, interplanetary coronal mass ejections (including magnetic clouds) and co-rotating interaction regions. For all of the observations, there is still no consensus on the physical cause(s) of these events which may include processes that involve changes in solar wind velocity, magnetic field strength, and turbulence. We will discuss how new data from PAMELA, which can measure modulation effects over a wide range in rigidity, may help resolve the relative importance of these various processes in CIR-associated modulations.

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Session Classification: Late Monday Morning