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Space Plasmas in the Solar System, including Planetary Magnetospheres (D)
Galactic Cosmic Rays and their Anti-particles (D1.2)

PRECURSOR SIGNATURES OF THE STORM SUDDEN COMMENCEMENT OBSERVED BY A NETWORK OF MUON DETECTORS

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Plasma structures ejected from solar eruptions travel in interplanetary space with speed of hundreds of kilometers per second and may hit the Earth. Signatures preceding the arrival of such plasma structures can be detected in the high-energy cosmic ray intensity observed with four multidirectional muon telescopes in the Global Muon Detector Network (GMDN) on the Earth. A typical signature is a "loss cone" effect which is observed as a systematic intensity decrease of cosmic rays with small pitch angles measured from the sunward interplanetary magnetic field direction. Corrections for the atmospheric pressure and temperature effects are applied to the muon data before examining the pitch angle distributions in the two-days-period preceding geomagnetic storms registered in 2008. The contribution of the first order anisotropy, which is of primary interest when searching for the "loss cone" effect is calculated and effects which are common for all directional channels of a given station but different from one station to another are removed.