Geophysical Research Abstracts
Vol. 21, EGU2019-17133, 2019
EGU General Assembly 2019

TRAcking interplanetary Coronal mass Ejections with foRbush decreases (TRACER)

Athanasios Papaioannou (1), Anatoly Belov (2), Angelos Vourlidas (1,3), and Anastasios Anastasiadis (1)

(1) Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing (IAASARS), National Observatory of Athens, Athens, Greece , (2) Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation (IZMIRAN), 42092 Troitsk, Moscow Region, Russia, (3) The Johns Hopkins University, Applied Physics Laboratory, 11100 Johns Hopkins Road, Laurel, MD, 20723, USA

During their travel from Sun to Earth, coronal mass ejections (CMEs) interact with Galactic cosmic rays (GCRs) that fill the interplanetary (IP) space. The leading shock wave when present and the following CME structure modulate GCRs, which results in a reduction of the cosmic ray (CR) intensity, known as Forbush decrease (FD). CMEs are regularly observed via both remote sensing (coronagraph and heliospheric imaging instruments) and in-situ measurements of plasma and magnetic field. However, this two way approach can be augmented with the identification of FDs in the measurements of GCRs; one may detect interplanetary CMEs passing by the observational site. Thereby, the recordings of FDs at different points within the heliosphere could be used as tracers of the IP evolution of CMEs. In this work, we present FD events that have been recorded at Earth by neutron monitors and in the inner heliosphere by the Helios 1 and 2 spacecraft. Using these FDs as a tracer of the agent CMEs, we identify their kinematics from 0.3 to 1 AU and quantify the effect of the CME physical parameters to the recorded intensity decrease during the FDs.