

Galactic cosmic rays as signatures of coronal mass ejections

Monday, 25 July 2022 16:45 (15 minutes)

Coronal mass ejections (CMEs), interplanetary shocks, and corotating interaction regions (CIRs) drive heliospheric variability, causing various interplanetary as well as planetary disturbances. One of their very common in-situ signatures are short-term reductions in the galactic cosmic ray (GCR) flux (i.e. Forbush decreases), which are measured by ground-based instruments at Earth and Mars, as well as various spacecraft throughout the heliosphere (most recently by Solar Orbiter). We recently developed an analytical model to explain CME-related Forbush decreases, using an expansion-diffusion approach (ForbMod, Dumbovic et al., 2018; 2020). The model takes into account the energy dependence of the detector with which the measurements are made. ForbMod is currently tested through model-to-observations comparison using SOHO/EPHIN and could ultimately provide a helpful tool to analyse Forbush decreases with various detectors. With new modelling efforts, as well as observational analysis we are one step closer in utilizing GCR measurements to provide information on CMEs, especially where other measurements (e.g. plasma, magnetic field) are lacking.

Primary authors: DUMBOVIC, Mateja (Hvar Observatory); Dr VRSNAK, Bojan (Hvar Observatory); Prof. HEBER, Bernd (University of Kiel); KRAMARIC, Luka (Hvar Observatory); BENKO, Ilona (Hvar Observatory); HORLOCK, Malte (University of Kiel); MARTINIC, Karmen (Hvar Observatory)

Presenter: DUMBOVIC, Mateja (Hvar Observatory)

Session Classification: Parallel 2

Track Classification: SH