



Forbush decrease model for expanding CMEs (ForbMod)

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The Project ForbMod aims to unravel how galactic cosmic rays are influenced by solar storms in the inner solar system (Sun to Mars) by developing a new model and utilizing a number of spacecraft and planetary observation, including those by the Radiation Assessment Detector aboard the Mars Rover Curiosity. The project focuses on Forbush decreases (FDs) in the galactic cosmic ray flux, which can be used as one of the "signatures" of an ICME passage. An analytical diffusion-expansion FD model was developed that is based on the widely used approach of an initially empty, closed magnetic structure (i.e. flux rope) that fills up slowly with particles by perpendicular diffusion. Remote CME observations and 3D reconstruction is used to constrain initial and boundary conditions. CME evolutionary properties are taken into account by incorporating the flux rope expansion. Several options of flux rope expansion are regarded as competing mechanism to diffusion, which can lead to different FD characteristics. This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 745782.