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COSMIC-RAY MODULATION MODELS: PREDICTING COSMIC-RAY INTENSITIES
THROUGHOUT THE HELIOSPHERE

Abstract

Numerical models for the modulation of galactic cosmic rays vary from very simple spherically symmetric ones that use ad hoc diffusion coefficients, to sophisticated ab initio time-dependent fully three-dimensional models. The latter include a diffusion tensor based on current knowledge of parallel- and perpendicular diffusion, and on particle drift, and have a turbulence transport model as input. Our goal is to understand how the relevant microphysics eventually determine the cosmic-ray intensity at any given time and position in the heliosphere. I will review some of the latest developments in modulation models and illustrate how e.g. particle drifts may play a role in determining long-term radiation exposure in the inner heliosphere.