









FLUCTUATIONS IN THE FLUX OF ENERGETIC PROTONS IN HELIOSPHERE BEFORE AND DURING SUDDEN DECREASES IN GALACTIC COSMIC RAY INTENSITY

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Abstract. Extreme events originated from Sun, such as solar flares and coronal mass ejections, can induce various processes in the Sun's heliosphere, like shock waves, particles acceleration (Waterfall et al. 2023). These events can increase the flux of charged particles in heliosphere, leading not only to modulation of primary cosmic rays but also affect Earth's magnetosphere and systems (see Belov et al. 2022, Kolarski et al. 2023 and references within). With the rising phase of current solar cycle 25, a better understanding and study of these transient phenomena caused by solar activity are of great importance (Savić et al. 2023), primarily due to the potential negative effects those events can have on Earth's environment (Kataoka et al. 2018). In a presented work, relationship between event-integrated fluence spectra of energetic protons, various solar activity indices measured at Lagrange point L1 and parameters of cosmic rays modulations measured at Earth have been studied. The focus of the investigation is on analyzing correlation between power indices used to parameterize the differential fluence spectra, coronal mass ejection parameters and the magnitude of associated cosmic rays modulation. This parametrization uses several different proposed models to model the fluence spectra before and during extreme events, which can provide a valuable new parameters in analysis of mentioned phenomena.

References

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