

Study on 2021 November 4 Forbush decrease with Belgrade muon station

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The first significant Forbush decrease of rising phase of the solar cycle 25 was recorded on November 4, 2021. It was detected with numerous ground based cosmic rays stations around the world (Chilingarian et al. 2022). including Belgrade cosmic rays muons' station. Belgrade cosmic rays' muon station is located at the Institute of Physics Belgrade and it constantly measures muon flux during cycle 24 (and 25) originated from primary cosmic rays with higher median energy then neutron monitors (Veselinović et al. 2017). This rapid decrease in the observed galactic cosmic ray intensity was the result of a series of coronal mass ejections during October 28–November 2. (Li et al. 2022), and their interplanetary counterparts (ICME) that led to strong G3-class geomagnetic storm, auroras and even first Ground Level Enhancement of the cycle 25 (Papaioannou et al. 2022). We discuss here the variation of cosmic rays' flux detected with ground-based detectors with different median rigidity during this recent event. Also, we compare conditions, measured in-situ, in interplanetary space around Earth, flux of solar wind protons measured with SOHO/ERNE probe, at Lagrange Point 1 and properties of detected Forbush decrease in order to asses implication for solar-terrestrial coupling processes.

References

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