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[Poster]

Recent Solar Activity: A Preliminary Analysis Based on Cosmic-Ray Observations

Nikola Veselinović¹, Mihailo Savić¹, Darije Maričić², Mila Ranitović³,
Dejan Joković¹, Radomir Banjanac¹, Žarko Medić¹

¹Institute of Physics Belgrade, University of Belgrade, Pregrevica 118, 11080 Belgrade, Serbia

²Astronomical Observatory Zagreb, Opatička 22, 10000 Zagreb, Croatia

³University of Novi Sad, Department of Physics, Novi Sad, Serbia

*Correspondence: veselinovic@ipb.ac.rs

Abstract: Space weather describes variable conditions in the near-Earth environment driven by solar activity, which can affect technological systems and human activities. Solar Cycle 25 has remained highly active during 2025–2026, characterized by frequent solar flares, coronal mass ejections, and disturbances in the solar wind. Changes in the magnetic environment carried by the solar wind modulate galactic cosmic rays propagating through the heliosphere, producing measurable variations in cosmic-ray intensity at Earth. In this contribution, we present a preliminary analysis of cosmic-ray variations during 2025–2026 using observations from the Belgrade Muon Station, operated by the Low-background Laboratory for Nuclear Physics (LBLNP) at the Institute of Physics, University of Belgrade, together with data from other ground-based stations. Cosmic-ray muon variations are examined in relation to solar activity and solar-wind parameters measured both in situ and at ground level, with particular focus on transient solar and interplanetary disturbances. The results provide a complementary ground-based approach to investigating solar activity and space-weather phenomena.

Keywords: space weather, cosmic rays, solar activity, Belgrade muon station