PROCEEDINGS OF SCIENCE

Indications of geoeffective space weather events in cosmic rays observed during the rising period of the solar cycle 24

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The galactic cosmic ray (GCR) flux recorded by neutron monitors on the ground and space probes provides persistent information about events originating from the Sun. In this study, we examine time periods of sporadic Forbush decreases that occurred during the rising phase of the 24th solar cycle. We analyze various parameters related to solar, heliospheric, and geomagnetic activity during these periods, using different machine learning techniques. We also calculate the geoelectric field in the Poland region for this time period using a 1-D layered conductivity Earth model. On the base of these parameters, we investigate the changes in the number of transmission line failures in southern Poland. Our findings suggest an increase in the average number of failures during the appearance of solar transients in the GCR flux, indicating a potential coupling between these events.

38th International Cosmic Ray Conference (ICRC2023)
26 July - 3 August, 2023
Nagoya, Jap

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PoS(ICRC2023)1332