Contribution ID: **5** Type: **Original Talk**

A New Approach to Ground Level Enhancement analysis

Ground Level Enhancement (GLE) refers to a rapid increase in the intensity of cosmic particles reaching the Earth's surface, typically associated with solar flares and coronal mass ejections. This phenomenon is of significant interest due to the high energy of solar particles required to initiate secondary particles in the atmosphere that can reach sea level, subsequently increasing the counting rate in neutron monitors. This study proposes a novel approach by focusing on the enhancements observed in the neutron monitors. The signals of 76 events were analyzed and classified based on their morphological features. Four distinct classes of GLE were identified. Further examination of their temporal and amplitude characteristics revealed patterns that suggest varying underlying processes. This research provides valuable insights into the nature of GLEs and may contribute to a better understanding of space weather phenomena.

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Session Classification: Cosmo- and geophysical aspects of cosmic rays at the ground level

Track Classification: Cosmo- and geophysical aspects of cosmic rays at the ground level