

The first GLE (# 73 – 28-Oct-2021) of solar cycle 25: a study using space-borne and NM data

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The first solar proton event of solar cycle 25 was detected on 28 October 2021 by several neutron monitors (NMs) in the polar region as well as the fleet of space-borne instruments. It is identified as the GLE (ground-level enhancement) #73 in the International GLE database, with the strongest signal registered by the DOMC/DOMB monitors located at the Antarctic plateau at the Concordia French-Italian research station. Here, we report the observations and the study of this event using the global NM network and SOHO/ERNE records. We present the derived angular and spectral features of solar energetic protons, including their dynamical evolution throughout the event employing a state-of-the-art model based on analysis of the neutron monitor data. Discussion related to the prompt and delayed component of the GLE inducing solar protons is performed. Several applications of the derived results are discussed.

Primary author: MISHEV, Alexander (University of Oulu)

Co-authors: Dr KOCHAROV, Leon (University of Oulu); Dr KOLDOBSKIY, Sergey (University of Oulu); Mr LARSEN, Nicholas (University of Oulu); Dr RIIHONEN, Esa (University of Turku); Prof. USOSKIN, Ilya (University of Oulu); Prof. VAINIO, Rami (University of Turku)

Presenter: MISHEV, Alexander (University of Oulu)

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