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The first GLE (# 73 – 28-Oct-2021) of solar cycle 25: a study of the related terrestrial effects using neutron monitor 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 regions, the strongest signal was registered by the DOMC/DOMB monitors located at the Antarctic plateau at Concordia French-Italian research station. It is identified as the GLE (ground-level enhancement) #73 in the International GLE database. Here, we report the observations of the GLE by the global NM network and present the derived angular and spectral features of solar energetic protons with their dynamical evolution throughout the event employing a state-of-the-art model based on analysis of the neutron monitor data. Using the derived spectra we computed the related terrestrial effects, namely the cosmic rate induced ionization at several altitudes on a global map and discuss possible implications.