Observation of cosmic ray moon shadow with KM3NeT/ARCA detector

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The thesis presents one-dimensional analysis of the Moon shadow effect produced by cosmic rays, performed using data from the KM3NeT/ARCA detector. The analysis uses data from 21 Detection Units of the ARCA detector, covering the period from September 23, 2022, to September 11, 2023.

The aim of the analysis was to experimentally confirm the detector's angular resolution capabilities through the observation of the Moon shadow effect — a phenomenon that arises when the Moon blocks part of the atmospheric muon flux.

The distribution of muons as a function of the angular distance from the Moon was studied. The statistical significance of the observed shadow amounts to 5.3 standard deviations (σ).

The obtained graphical and statistical results confirm the detector's effectiveness and its good angular resolution.