

Characterization of the cosmic muon background in the ν GeN experiment

H. Le (on behalf of ν GeN collaboration)

Joint Institute for Nuclear Research, Dubna, Russia

e-mail: leviethuy1@duytan.edu.vn

The ν GeN experiment aims to detect coherent elastic neutrino-nucleus scattering (CEvNS) using reactor antineutrinos and a specially designed low-background low-threshold germanium detector at the Kalinin Nuclear Power Plant [1]. Located at a shallow depth, the detector is subjected to a dominant background from cosmic muons, in which they induce secondary electromagnetic radiation and neutrons production within the shield. Characterization of this background is essential for the experiment's sensitivity to the CEvNS signal in the region of interest. This work presents the methodology and results of modeling the muon background using Monte Carlo simulation and experimental measurement employing a triple-coincidence muon telescope. The calculation of ν GeN site's overburden and muon flux spectrum with the dependency of zenith/azimuth angle, and muon-induced background in the shield are discussed.

References

1. I. Alekseev [et al.], ν GeN collaboration, Phys. Rev. D. **106**, L051101 (2022).