

# Simulation of Cosmogenic Backgrounds to nEXO

*Sunday, 18 February 2024 09:15 (15 minutes)*

The nEXO experiment is being designed to search for neutrino-less double beta decay ( $0\nu\beta\beta$ ) in a 5000 kg liquid xenon time projection chamber (TPC) enriched to the isotope xenon-136. nEXO requires unprecedentedly low radioactive background levels to achieve its desired sensitivity exceeding  $10^{28}$  years. External backgrounds are shielded in part by immersing the TPC and its cryostat in a concentric cylindrical water tank. This water shield will be instrumented with PMTs to detect the Cherenkov light of passing cosmic muons and permit potential muon-induced background events to be vetoed in the analysis.

Extensive simulations of muon-induced cosmogenic backgrounds were performed in FLUKA and GEANT4 and compared with each other. In particular neutron activation rates of Xe-136 to Xe-137 as well as of detector components were studied in detail for the anticipated location of nEXO at SNOLAB. This study and comparison between FLUKA and GEANT4 results will be presented.

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