



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3332

(Étudiant(e) du 1er cycle)

Type: **Poster Competition (Undergraduate Student) / Compétition affiches**

(U*) (POS-40) Cosmogenic Muon Background Characterization for nEXO

Tuesday, 7 June 2022 17:56 (2 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's $> 10^{28}$ year sensitivity reach to the $0\nu\beta\beta$ half-life requires extremely low backgrounds from external sources. Backgrounds are dealt with in part by surrounding the TPC with an outer detector (OD) in the form of a cylindrical water tank. The OD serves both to shield from incident particles like gamma and neutron radiation, as well as to veto cosmogenic backgrounds by detecting the Cherenkov light of passing muons using photomultiplier tubes (PMTs).

In this talk, we discuss the simulation of incident cosmic muons and their respective event characterization. We examine the interrelatedness of muon path lengths, muon impact parameters, PMT geometries and the comparative detection efficiencies for the incident particles.

Primary author: ROSS, Regan

Co-authors: LICCIARDI, Caio (Laurentian University); AL KHARUSI, Soud; KLEMETS, Emma (McGill University, UBC); BRUNNER, Thomas (McGill University); RETTY, Liam (Laurentian University); WICHOSKI, Ubi (Laurentian University); NEXO COLLABORATION

Presenter: ROSS, Regan

Session Classification: PPD Poster Session & Student Poster Competition (21) | Session d'affiches PPD et concours d'affiches étudiantes (21)

Track Classification: Technical Sessions / Sessions techniques: Particle Physics / Physique des particules (PPD)