



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3337

(Étudiant(e) du 1er cycle)

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

(U*) (POS-39) PMT Response Simulation and Long-Term Reliability Studies for nEXO's Muon Veto

Tuesday, 7 June 2022 17:54 (2 minutes)

nEXO is an experiment currently under design to search for neutrinoless double-beta decay using 5000 of enriched Xe-136. nEXO's sensitivity to the neutrinoless double beta decay halflife of 1.35×10^{28} yr at the 90% confidence level, under an ultra-low background environment. This will be accomplished partly by the implementation of an Outer Detector (OD) which serves to shield the liquid xenon time projection chamber from external radiation, as well as to veto backgrounds arising from the passage of nearby cosmogenic muons. Photomultiplier tubes (PMT) will be installed on the internal surfaces of the water tank to detect the Cherenkov light produced by those muons. The arrangement of the PMTs in the tank and their individual and collective performance directly impacts the muon tagging efficiency.

This talk will outline the PMT response model, the effect of PMT failures on the muon tagging efficiency as well as risk mitigation procedures and strategies to ensure its stable and reliable long-term operation.

Primary author: RETTY, Liam

Co-authors: KLEMETS, Emma (McGill University, UBC); WICHOSKI, Ubi (Laurentian University); LICCIARDI, Caio (Laurentian University); AL KHARUSI, Soud; BRUNNER, Thomas (McGill University); ROSS, Regan

Presenter: RETTY, Liam

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)