



Canadian Association  
of Physicists

Association canadienne  
des physiciens et physiciennes

Contribution ID: 3934 Type: **Poster Competition (Graduate Student) / Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

## **(G\*) (POS-2) A Xe-127 calibration source for liquid Xe experiments**

*Tuesday 20 June 2023 17:30 (2 minutes)*

The Light-only Liquid Xenon (LoLX) experiment is designed to study the properties of light emission and transport in liquid xenon (LXe) using silicon photomultipliers (SiPMs). A particular focus of LoLX is to measure and study Cherenkov and scintillation light emission in LXe. LoLX is currently being upgraded to investigate the long-term behaviour and performance of Hamamatsu VUV4 and FBK VUV-HD3 SiPMs. Both models are currently being considered for application in the neutrinoless double beta decay experiment nEXO.

A proposed method to monitor the long-term stability and performance of the aforementioned SiPMs in LXe is to augment the xenon with radioactive  $^{127}\text{Xe}$  (an electron capture source with a half-life of 36.3 days and a Q-value of 662.3 keV). This allows for an *in-situ* calibration and performance characterization while the detector is operational. This poster will introduce the concept and focus on the neutron activation estimates of  $^{127}\text{Xe}$  from  $^{\text{nat}}\text{Xe}$ , as well as the methodology for deploying it in LoLX.

### **Keyword-1**

Liquid Xe calibration source

### **Keyword-2**

Neutrinoless double beta decay

### **Keyword-3**

**Primary author:** RUDOLPH, Lisa

**Co-authors:** DE ST. CROIX, Austin (TRIUMF/UBC); CHANA, Bindiya; MALBRUNOT, Chloe (CERN); GAL- LACHER, David; RETIERE, Fabrice; GALLI, Luca (INFN); TÉTRAULT, Marc-André; Dr GIAMPA, Pietro (SNO- LAB); NOWICKI, Sarah (McGill University); VIEL, Simon (Carleton University); AL KHARUSI, Soud; BRON, Stephanie (TRIUMF); BRUNNER, Thomas (McGill University)

**Presenter:** RUDOLPH, Lisa

**Session Classification:** PPD Poster Session & Student Poster Competition (6) | Session d'affiches PPD et concours d'affiches étudiantes (6)

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