

Light only Liquid Xenon with Silicon Photomultipliers

Wednesday, May 26, 2021 10:42 AM (18 minutes)

The Light only Liquid Xenon experiment (LoLX) is a few cm scale octagon housing of 96 Hamamatsu VUV4 Silicon Photomultipliers (SiPMs) packaged by group of 4, with radioactive needles (β -source Sr-90 or α -source Po-210) in the centre. The project aims to study light production and transport and the operating of SiPMs in liquid xenon. In the first phase, 22 out of the 24 SiPM groups are covered by 225nm longpass filters blocking the scintillation light, in order to detect the Cerenkov photons that are several orders of magnitude less abundant than scintillation photons. The current analysis focuses on comparison between measured external cross-talk (light emitted from SiPM avalanche triggering avalanche in another SiPM) and GEANT4 simulation, to allow characterizing cross-talk photon production, propagation in the chamber and detection. Future development includes upgrading the sampling electronics to reach sub nano-second timing resolution and repeating measurement with argon.

TIPP2020 abstract resubmission?

No, this is an entirely new submission.

Funding information

Primary author: Mr DE ST. CROIX, Austin (TRIUMF/UBC)

Co-authors: Dr GIAMPA, Pietro (SNOLAB); Dr RETIERE, Fabrice (TRIUMF); Dr VIEL, Simon (SNOLAB); Ms CHANA, Bindiya (Carleton University); Dr MCELROY, Thomas (McGill University); Dr TÉTRAULT, Marc-André (Université de Sherbrooke); Dr GOELDI, Damian (Carleton University); Dr BRUNNER, Thomas (McGill University); Dr GORNEA, Razvan (Carleton University); Dr SIGNORELLI, Giovanni (INFN Sezione di Pisa); Mr KHARUSI, Soud Al (McGill University); XIE, Liang (TRIUMF)

Presenter: Mr DE ST. CROIX, Austin (TRIUMF/UBC)

Session Classification: Sensors: Noble liquid detectors

Track Classification: Sensors: Sensors: Noble liquid detectors