

Vacuum ultra-violet SiPM development for nEXO

nEXO is an experiment being designed to search for neutrino-less double beta decay in liquid Xenon. Excellent energy resolution is required for background rejection which in turns require excellent efficiency for the detection of scintillation photons. At the same time, the intrinsic radioactive background of component must be minimize which rules out using photo-multiplier tube (PMTs). Silicon photo-multipliers (SiPMs) appear ideally suited for nEXO providing single photon sensitivity, low dark noise at the liquid Xenon temperature and very low radioactive material content. The main challenge of the R&D effort within nEXO had been to achieve good photo-detection efficiency between 165 and 190nm (Vacuum Ultra-Violet, VUV). The current best SiPM from Fondazione Bruno Kessler achieves about 25% efficiency at 175nm, which is sufficient for nEXO. Nevertheless the nEXO collaboration is investigating solutions for enhancing the efficiency by using anti-reflective coating. In this talk we will show the development of VUV SiPM within the nEXO collaboration.

Primary author: RETIERE, Fabrice (TRIUMF)

Presenter: RETIERE, Fabrice (TRIUMF)

Session Classification: Poster Session A

Track Classification: SiPM