

Characterization of VUV-sensitive SiPMs for nEXO

The nEXO experiment will operate an ultra-low background TPC filled with 5 tons of isotopically enriched LXe for the search for the neutrinoless double beta decay of Xe-136. The detector will use 4 m² of silicon photomultipliers (SiPM) operated at approx. -104 °C to collect scintillation light. There are strong requirements on the background levels, light collection efficiency and SiPM performance to target a half-life sensitivity of approximately 10²⁸ years, which is an improvement of two orders of magnitude over current experimental limits.

The SiPMs need to be sensitive to the VUV scintillation light of LXe at 178 nm which is not given for regular SiPMs. Performance requirements adopted by nEXO are (among others) a photon detection efficiency of at least 15% at 178 nm, a correlated avalanche probability of less than 20% and a low dark rate.

We present measurements with state-of-the-art VUV-sensitive SiPMs focussing on these characteristics.

Authorship annotation

for the nEXO collaboration

Session and Location

Monday Session, Poster Wall #74 (Auditorium Gallery Right)

Poster included in proceedings:

yes

Primary author: Mr WAGENPFEL, Michael (University of Erlangen-Nürnberg, ECAP)

Presenter: Mr WAGENPFEL, Michael (University of Erlangen-Nürnberg, ECAP)

Track Classification: Poster (participating in poster prize competition)