

Neutrinoless double decay with the nEXO experiment

Tuesday, 18 June 2024 17:30 (2 hours)

The nEXO experiment will search for neutrinoless double beta ($0\nu\beta\beta$) decay using a 5-tonne liquid xenon (LXe) time projection chamber (TPC), enriched to 90% in Xe^{136} , with a projected half-life sensitivity $> 10^{28}$ years after 10 years of lifetime. The observation of lepton number non-conserving $0\nu\beta\beta$ decay would imply new physics and require neutrinos to be Majorana fermions. With a general overview of the nEXO experiment, we present tests carried out in LXe at Stanford of prototype cryogenic application specific integrated circuits (ASICs) for the readout of ionization charge specifically developed for nEXO by SLAC. This solution is chosen to meet low noise requirements due to reduced capacitance and to allow for high density channels without large masses of radioactive cabling. Additionally, we will share details of a 64kg LXe TPC, able to accommodate a 4-tile charge readout module (each tile is 10cm x 10cm) is under construction to investigate cross-talk between tiles and its impact on energy resolution. Finally, we will present on a LXe purity monitor, designed and built to measure the concentration of electronegative species emanated by materials considered for nEXO.

Poster prize

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Collaboration (if any)

nEXO

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