

The nEXO TPC: High Voltage Design R&D

nEXO, a next-generation experiment to search for neutrino-less double beta decay, uses 5 tonnes of enriched liquid xenon instrumented as a single-drift time projection chamber (TPC) and contained inside an ultra-low background, right-cylindrical copper vessel 1.2 m long. Xenon scintillation is detected by an array of silicon photomultipliers (SiPMs). Ionization is collected on a segmented planar, tiled anode. The xenon-filled standoff between the TPC and the grounded copper vessel is kept as small as possible to guarantee safe operations. When fully biased, the stored electrostatic energy in the TPC is several Joule, which demands proper spark-preventing design. Electrodes, and the cathode in particular, are optimized to keep the surface electric field within 50 kV/cm. An alternative, resistive TPC layout is investigated which would contain the peak currents should a discharge ever occur. The R&D on HV design is discussed, with a focus on non-standard resistive options.

Authorship annotation

for the nEXO Collaboration

Session and Location

Monday Session, Poster Wall #102 (Auditorium Gallery Left)

Poster included in proceedings:

yes

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Track Classification: Poster (not participating in poster prize competition)