

Characterization of the electron transport properties in pure xenon with NEXT-White and study of helium-xenon mixtures as a promising alternative.

The NEXT experiment aims to identify a neutrinoless double-beta decay (0vbb) signal in ^{136}Xe employing a high pressure gaseous xenon (HPGXe) EL TPC. The detector techniques employed take advantage of a sub-percent energy resolution at Qbb combined with a topological reconstruction of events at this energy.

The detector NEXT-White (NEW) operating at the Canfranc Underground Laboratory allowed us, by using krypton calibration data, to perform the first simultaneous characterization of the electron transport properties in high pressure xenon at standard conditions for a 0vbb search.

Also, one of the major stakes in building a competitive ton scale HPGXe EL TPC is to reduce the high diffusion of pure xenon which limits the efficiency of the background rejection based on the topological reconstruction. We found that a helium-xenon gas mixture is a very promising alternative detection medium to reduce the diffusion while maintaining its excellent energy resolution.

Authorship annotation

for the NEXT collaboration

Session and Location

Monday Session, Poster Wall #55 (Auditorium Gallery Right)

Poster included in proceedings:

yes

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Track Classification: Poster (participating in poster prize competition)