

NEXT: NEW backgrounds and extrapolation to NEXT-100

Authorship annotation

for the NEXT collaboration

Session and Location

Monday Session, Poster Wall #49 (Auditorium Gallery Right)

Abstract content

The NEXT experiment aims at the sensitive search of the neutrino-less double beta decay of ^{136}Xe at the LSC. A large-scale prototype of a high-pressure gas-Xenon electroluminescent TPC (NEW) is being operated since 2016, proving both the excellent energy resolution and the topological capabilities for background rejection. NEW is currently measuring the backgrounds for the $\beta\beta$ search. The internal ^{222}Rn activity has been measured, yielding $(37.5 \pm 2.3 \text{ (stat.)} \pm 5.9 \text{ (syst.)}) \text{ mBq/m}^3$. The Rn-induced electron background has been characterized allowing for the validation of the MC expectations. The corresponding extrapolation to the NEXT-100 detector demonstrates that Rn will not be a dominant background source. For an expected total background below $4 \times 10^{-4} \text{ counts} \cdot \text{keV}^{-1} \cdot \text{kg}^{-1} \cdot \text{yr}^{-1}$, NEXT-100 will reach a sensitivity to the $\beta\beta_{0\nu}$ half-life of $6 \times 10^{25} \text{ y}$ after 3 years of data taking.

Poster included in proceedings:

yes

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