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Background modeling for the nEXO neutrinoless double beta decay experiment

The nEXO Collaboration is developing a tonne-scale neutrinoless double beta decay experiment employing an enriched ^{136}Xe target. The enriched liquid xenon is operated as a time projection chamber (TPC) providing event timing and position reconstruction. The goal is to search for excess events at the 2458 keV end-point of the ^{136}Xe double beta-decay energy spectrum. An event excess at this energy would imply the existence of a decay branch that does not emit the otherwise required two antineutrinos that should accompany the beta particles. Current measurements set a limit on the neutrinoless double beta decay of ^{136}Xe at a half-life of greater than 10^{26} years. To investigate the possibly of neutrinoless double beta decay with a longer half-life, a tonne-scale experiment must limit interfering background interactions in the TPC due to naturally occurring radioactive impurities in the experimental construction materials. This poster will present the modeling and methods used to evaluate the background contributions to the planned tonne-scale nEXO neutrinoless double beta decay experiment.

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