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Backgrounds and sensitivity of the NEXT double beta decay experiment.

NEXT (Neutrino Experiment with a Xenon TPC) is a neutrinoless double-beta ($bb0\nu$) decay experiment that will operate at the Canfranc Underground Laboratory (LSC). It is an electroluminescent high-pressure gaseous xenon Time Projection Chamber based on separated-function capabilities for calorimetry and tracking. Energy resolution and background suppression are the two key features of any neutrinoless double beta decay experiment. NEXT has both good energy resolution ($<1\%$ FWHM) and an extra handle for background identification provided by track reconstruction.

This poster describes the background model of NEXT which will be validated during the first phase of the experiment using the NEW detector. Detailed detector simulation and evaluation of the detector radiopurity by material screening have been done. This leads to the determination of the sensitivity to a measurement of the two neutrino ($bb2\nu$) mode in NEW and to a $bb0\nu$ search in NEXT100. With this work we predict a background rate of 5×10^{-4} counts/(keV kg yr), and a sensitivity to the Majorana neutrino mass down to 100 meV after a 5-years run of NEXT100.

Summary

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