

Abstract Submitted
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Projected WIMP Sensitivity of XENONnT JACQUES PIENAAR,
University of Chicago, XENON COLLABORATION — The multi-tonne XENONnT detector is the next step in the evolution of the XENON project. The experiment, aimed at direct detection of WIMPs, utilizes 5.9t of instrumented liquid xenon. Using a detailed GEANT4 model of the detector and radioassay results from detector components, we project the expected material background in the detector. In conjunction with improvements in suppressing intrinsic backgrounds from electronic recoil sources this allows XENONnT to reduce this background to an expected level 1/6th that of its predecessor within a 4t fiducial volume. The addition of a neutron veto around the XENONnT cryostat allows for significant suppression of the overall neutron background as well. In this talk we present the work done to model the response of the detector to energy deposition in the LXe volume. We project the 20 ty sensitivity to spin-independent WIMP-nucleon interactions to reach a cross-section of $1.4 \times 10^{-48} \text{ cm}^2$ for a $50 \text{ GeV}/c^2$ mass WIMP at 90% confidence level, more than one order of magnitude beyond the current best limits.

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