Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

nEXO: a Tonne-Scale Next-Generation Double-Beta Decay Experiment[1] SAMUELE SANGIORGIO, Lawrence Livermore Natl Lab, NEXO COLLABORATION — The nEXO Collaboration is designing a next-generation neutrinoless double-beta decay experiment. The nEXO detector will be a 5000kg liquid-xenon time projection chamber (TPC) using isotopically enriched xenon and it is inspired by the very successful EXO-200 experiment. nEXO has been conceived as a discovery experiment thanks to its multi-parameter measurement capability which allows the simultaneous determination of event energy, position, multiplicity, and particle type. This capability, combined with the use of a large homogenous detector volume, allows to optimally determine the backgrounds while exploiting all the signal source mass. Additional background reduction techniques are built in to the detector design through the choice of materials and the use of a layered scheme of passive and active shielding. nEXO will provide a sensitivity on the neutrinoless double-beta decay half-life two orders of magnitude greater than present experiments. In this talk, I will describe the conceptual detector design and discuss the sensitivity reach as derived from a robust background model and recent Monte Carlo simulations.

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344. LLNL-ABS-733939

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Date submitted: 29 Jun 2017 Electronic form version 1.4