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Improving the Sensitivity of nEXO to Neutrinoless Double Beta Decay[1] SAMUELE SANGIORGIO, Lawrence Livermore Natl Lab, NEXO COLLABORATION — The nEXO Collaboration has conceived a 5000kg liquid-xenon time projection chamber (TPC) that will enable two orders of magnitude greater sensitivity on the neutrinoless double-beta decay ($0\nu\beta\beta$) half-life over present experiments. Such sensitivity arises from the TPCs capability to simultaneously measure multiple event characteristics. Combined with the use of a large homogenous detector volume, this allows to precisely assess the backgrounds while exploiting the signal from the entire liquid xenon volume. The sensitivity reach is also made possible by a strong radioassay program that carefully screens candidate detectors and by a combination of active and passive shielding in ultra-low-background detector design. In this talk, I will review the elements behind nEXOs sensitivity, including a background model from new radioassay results, and a more detailed modeling that incorporates reconstruction of time-correlated events and interactions in the liquid xenon outside of the central TPC region. These developments, combined with others, suggest nEXOs sensitivity will exceed 10^{28} years for the $0\nu\beta\beta$ decay half-life of ^{136}Xe.

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