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Detecting Solar Neutrinos and Fermionic Dark Matter with ^{136}Xe in nEXO

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Thanks to recent observations of low-lying isomeric states in the nuclear structure of ^{136}Cs, charged-current interactions in liquid xenon (LXe) time projection chambers (TPCs) of the form $\nu_e + ^{136}$Xe are expected to cause a time-delayed coincident signal in the scintillation channel which can be used to for background rejection on the order of 10^{-9} which is more than sufficient to reject the dominant 2vbb background and operate in a background free regime. In this presentation, we will discuss how nEXO, a proposed 5 tonne enriched LXe TPC designed to search for neutrinoless double beta decay, can use this detection channel to extend its scientific program to include solar neutrinos and fermionic dark matter. In the case of solar neutrinos, we find that nEXO can expect to measure the CNO neutrino flux on earth with comparable precision to Boreixno's world leading measurement, and to improve the measurement of the ^{7}Be line-shift by an order of magnitude. In regards to fermionic dark matter, we find that nEXO could both extend the sensitivity of LXe TPCs to lower masses, as well as to increase searchable parameter space by more than three orders of magnitude.

Collaboration you are representing

nEXO

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