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Simulation results for a low energy NR yields measurement in liquid xenon using the MiX detector

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To increase sensitivity of liquid xenon (LXe) experiments to light WIMPs, the response of the LXe medium to sub-keV nuclear recoils must be characterized. We study the feasibility for an ultra-low energy nuclear-recoil yield measurement in LXe using neutron capture. The measurement strategy uses the recoil energies imparted to xenon nuclei during the de-excitation process following neutron capture, where promptly emitted γ cascades can provide the nuclei with up to $0.3 \text{ keV}_{\text{nr}}$ of recoil energy due to momentum conservation. In this talk we will present simulation results and the current status of the Michigan Xenon (MiX) detector, a small sub-kilogram dual-phase xenon TPC, that is being prepared to carry out this measurement.

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