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Development of a scaleable 40L gaseous TPC module with micromegas strip readout for directional reconstruction of low-energy nuclear recoils

Wednesday 8 October 2025 15:00 (20 minutes)

The directions of low energy nuclear recoils open windows into previously unprobed areas of physics. Specifically, directional detection of coherent elastic neutrino nucleus scattering (CE□NS) would probe for new, beyond-the-standard-model (BSM) gauge bosons involved in that interaction as well as provide a tool for distinguishing between dark matter and neutrino scattering. This talk presents work from the development, construction, and first commissioning results of a 40L prototype gaseous TPC for directional detection of low energy nuclear recoils, as well as the prospects for scaling our TPCs up to active volumes of order $1m^3$, which is necessary for both directional CE□NS measurements and for dark matter searches.

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