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Reactor CENS Physics Reach with an SBC Liquid Argon Bubble Chamber NOAH LAMB, Drexel Univ, SBC COLLABORATION COLLABORATION[1] — The large flux of MeV neutrinos that nuclear reactors generate offer an excellent opportunity to study Coherent Elastic neutrino-Nucleus Scattering (CENS), but reactors also produce significant backgrounds. The Scintillating Bubble Chamber (SBC) collaboration is currently constructing a 10-kg liquid argon scintillating bubble chamber at Fermilab. The detectors target threshold is 100 eV in order to demonstrate sensitivities to sub-keV nuclear recoils while remaining highly insensitive to electron recoil backgrounds. This talk presents a physics reach analysis of such a detector for reactor CENS experiments. Specifically, for studying the sensitivities to the weak mixing angle, neutrino magnetic moment, and a light Z gauge boson mediator. Monte Carlo simulations assess the backgrounds contribution to the signal, and silicon photomultipliers (SiPM) can measure scintillation light to maximize background rejection. Nearly mono-energetic photoneutron sources can calibrate the detector for nuclear recoils below 8 keV and gamma sources can use Thomson scattering to probe the nucleation efficiency function near the target threshold.

[1]Scintillating Bubble Chamber

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