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Coherent elastic neutrino-nucleus scattering in argon with a scintillating bubble chamber

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The Scintillating Bubble Chamber Collaboration (SBC) is developing a liquid-noble detector ideal for GeV-mass WIMP searches and coherent elastic neutrino-nucleus scattering (CEνNS) detection. The detector is now being commissioned at Fermilab and consists of a 10-kg bubble chamber using liquid argon with the potential to reach and maintain sub-keV energy thresholds. This detector will combine the event-by-event energy resolution of a liquid noble scintillation detector with the world-leading electron-recoil discrimination capability of the bubble chamber. The physics reach of this detector using CEνNS will be presented in this poster and includes the sensitivity to the weak mixing angle, neutrino magnetic moment, and a light Z$'$ gauge boson mediator, in addition to other sensitivity to New Physics scenarios like light scalar mediators, sterile neutrino oscillations, unitarity violation, and non-standard interactions.

Summary

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