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

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The Scintillating Bubble Chamber (SBC) collaboration is designing and building a bubble chamber to search dark matter and measure coherent elastic neutrino-nucleus scattering utilizing argon as a target material. The bubble chambers excel as exceptional detectors for uncovering rare events like neutrino interactions, owing to their insensitivity to electron recoils and capability to reject backgrounds through acoustic bubble formation and the light signal produced by scintillation. In this talk, an update will be presented on the progress of the SBC scintillating bubble chambers program focusing on studying neutrinos in nuclear reactors. The physics reach of this detector will be introduced, including the sensitivity for an electroweak precision test, a new vector mediator, and the neutrino magnetic moment. Additionally, the sensitivity to other New Physics searches will also be discussed, considering scenarios for sterile neutrinos, unitarity violation, and non-standard interactions.

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