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Calibration of Scintillating Bubble Chambers

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The Scintillating Bubble Chamber (SBC) collaboration is currently constructing its first physics-scale detector, a bubble chamber containing 10 kg of liquid argon. This first device (SBC-Fermilab) will be used for calibrations in superheated liquid argon, with a goal of attaining sensitivity to 100 eV nuclear recoils while remaining insensitive to bubble nucleation by electron recoils. Similar bubble chambers will subsequently be deployed for dark matter and CE ν NS experiments. Bubbles associated with nuclear recoils of higher energy (above about 5 keV) are expected to be accompanied by detectable scintillation light, which can be used to veto background events from neutrons created by cosmic rays or radioactive materials in the detector. A small xenon bubble chamber has demonstrated many of these desirable properties, with operation at thermodynamic thresholds as low as 500 eV. I will present the progress made on calibrations with the xenon bubble chamber and outline the plans for calibrations with SBC-Fermilab.

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