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Nucleation efficiency of a liquid xenon bubble chamber

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Bubble chambers using liquid xenon (and liquid argon) have been operated (resp. planned) by the Scintillating Bubble Chamber (SBC) collaboration to search for GeV-scale dark matter and CEvNS from nuclear reactors. This requires a robust calibration program of the nucleation efficiency of low-energy nuclear recoils in these target media. Such experiments were performed with a liquid xenon test chamber, gathering data in varying operating conditions and from different neutron sources. The obtained bubble formation efficiency in liquid xenon as a function of recoil energy and thermodynamic state is presented. Parametric Monte Carlo studies were also carried out to validate the model paradigm.

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