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# (U*) POS-J89 – Modelling bubble nucleation efficiency in superheated liquid argon

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Astronomical and cosmological observations strongly suggest the existence of dark matter in the Universe. The favourite candidate is the WIMP (Weakly Interacting Massive Particles) and can be detected directly via elastic scattering on the target nuclei. Physicists are relying on more innovative and sensitive detectors in hope of capturing the nuclear recoil created by this mysterious particle. One of those detectors is the bubble chamber, which is made up of an outer shell filled with superheated liquids (argon, xenon, fluorocarbons etc). Once incoming particles collide with the liquid molecules, they deposit energy and can cause bubble(s) to form: this is named the nucleation. Therefore, by understanding the conditions of bubble formation and how this process is efficient, we can gain information about the incoming particles, and potentially gather evidence about the existence of dark matter particles. After describing the method used to model the bubble formation, I will present the current results we have obtained to extract the nucleation efficiency of nuclear recoils in superheated liquid argon and compare with the observed bubble nucleation efficiency in the detector. Finally, I will discuss how it can improve the sensitivity of the bubble chambers to potential dark matter particles.

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