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The Scintillating Bubble Chamber (SBC) Experiment for Dark Matter and Reactor CEvNS

Tuesday, 15 February 2022 10:00 (24 minutes)

The Scintillating Bubble Chamber (SBC) experiment is a novel low-background technique aimed at detecting low-mass (0.7-7 GeV/c2) WIMP interactions and coherent scattering of reactor neutrinos (CEvNS). The detector consists of a quartz-jar-filled liquid Argon (LAr), which is spiked with ppm-levels of liquid Xenon (LXe) acting as a wavelength shifter. The target fluid is de-pressurized into a super-heated state by a mechanically controlled piston. Particles interacting with the superheated medium can generate heat (bubbles) and scintillation light, depending on the energy intensity and density. The detector is further equipped with cameras to take pictures of the bubbles, Silicon-Photo-Multipliers to measure the scintillation light, and piezo-acoustic sensors to listen to the bubble's formation. By combining these observables, the SBC detector is aiming to reach a threshold for nuclear recoils of 100 eV and a projected WIMP-sensitivity of 3.0x10-43 cm2, for a WIMP mass of 0.7 GeV/c2. In this talk, I will present the design of the SBC experiment and provide an update on the ongoing construction and commissioning at Fermilab. Finally, I will discuss the collaboration's plans for installation and operation at SNOLAB and the parallel reactor CEvNS search.

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Please select: Experiment or Theory

Experiment

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