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Recent Results and Future Plans for Dark Matter Searches with PICO

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The PICO experimental program at SNOLAB uses superheated bubble chambers to search for evidence of dark matter primarily through spin-dependent interactions on ¹⁹F in C₃F₈. Recoiling nuclei from WIMP-nucleon interactions in the active fluid deposit enough energy locally to initiate a phase transition in the fluid. The bubbles which form are observed with stereo cameras and their acoustic signature is recorded by sensitive piezo-electric transducers. By controlling the degree of superheat, the detector can be made insensitive to gamma and electron backgrounds. Alpha particles with relatively longer tracks have a distinctly different acoustic signal when compared to nuclear recoils which enables this background to be identified and discriminated against. The recent results from the PICO collaboration will be presented, along with an outlook for the future program with this unique technology.

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