Contribution ID: **1067** Type: **Parallel Talk**

Searching for dark matter with the PICO bubble chambers

Saturday, 9 July 2022 17:00 (20 minutes)

The PICO-60 C_3F_8 dark matter detector is a bubble chamber consisting of 52 kg of C_3F_8 operating at 2.45-keV and 3.29-keV thermodynamic thresholds, reaching exposures of 1404-kg-day and 1167-kg-day, respectively. The detector was located at SNOLAB, 2 km underground in Sudbury, Ontario in Canada. This experiment set the most stringent direct-detection constraints to date on the WIMP-proton spin-dependent cross-section at 2.5×10^{-41} cm^2 for a WIMP mass of 25 GeV/c^2. The physics program of PICO bubble chambers will be presented in this talk, including the latest results from the PICO-60 detector, setting leading limits on the couplings for photon-mediated interactions using non-relativistic contact operators in an effective field theory framework. Leading limits for dark matter masses between 2.7 GeV/c^2 and 24 GeV/c^2 were set for couplings to the electromagnetic current through higher multipole interactions, such as anapole moment, electric, and magnetic dipole moments, and millicharge. The current status of the PICO-40L and PICO500 detectors will also be presented.

In-person participation

Yes

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