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The PICO-40L Dark Matter Search

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The PICO Collaboration uses bubble chamber technology for direct-detection searches of Weakly-Interacting Massive Particles (WIMP). Filled with superheated C_3F_8, the thermodynamic threshold of PICO detectors can be set such that the detectors are optimised for dark matter detection while being insensitive to gammas from electron recoils. The presence of fluorine atoms in the C_3F_8 gives PICO the potential to set world-leading exclusion limits for spin-dependent WIMP-proton interactions. PICO-40L is currently operating 2 km underground at SNOLAB in Sudbury, Ontario, Canada. It is the first large-scale implementation of the "right-side up" bubble chamber design, in which the absence of a buffer fluid in contact with the C_3F_8 minimises background rates from particulates entering the chamber. It acts as a proof-of-concept for the next generation PICO-500 detector, a 260-L bubble chamber with a projected ton-year exposure currently in the assembly phase at SNOLAB. This talk will present the status of the PICO-40L detector as well as an overview of preliminary analyses of PICO-40L data.

Collaboration you are representing

PICO

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