

PICO-60: World's largest bubble chamber for dark matter detection

The evidences of large amount of missing-mass (or dark matter) in the universe are multiple. The widely accepted hypothesis is, that the particles that carry the missing mass are Weakly Interacting (and) Massive Particles (WIMP). In the experimental efforts of the direct detection of WIMPs, alpha, beta and gamma radiations are the primary sources of background that experiments are continuously trying to understand and discriminate from the candidate WIMP events. PICO-60, currently world's largest bubble chamber, uses superheated fluids as the target. This gives PICO an unique advantage of both tuning its sensitivity to a broad range of nuclear recoil energy and also discriminate between the backgrounds and a candidate event. We give a detailed description of PICO-60 detector and its most recent result which was background free and excluded the spin dependent dark matter cross-section to $3.4 \times 10^{-41} \text{ cm}^2$ in a 1167 kg-day live time run. We will give a brief introduction of the next generation PICO detectors which will further reduce the backgrounds and explore the WIMP search parameter space exhaustively.

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