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The MiniCLEAN Dark Matter Experiment

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The MiniCLEAN dark matter experiment exploits a single-phase liquid argon (LAr) detector, instrumented with photomultiplier tubes submerged in the cryogen with nearly 4π coverage of a 500 kg (150 kg) target (fiducial) mass. The high light yield and unique properties of the scintillation time-profile in LAr provide effective defense against radioactive backgrounds through pulse-shape discrimination and event position-reconstruction. The detector is also designed for a liquid neon target which, in the event of a positive signal in LAr, will enable an independent verification of backgrounds and provide a unique test of the expected A^2 dependence of the WIMP interaction rate. The conceptually simple design can be scaled to target masses in excess of 10 tons in a relatively straightforward and economic manner. The experimental technique and current status of MiniCLEAN will be summarized.

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