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The Search for Dark Matter with MiniCLEAN

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The direct search for dark matter is entering a period of improved sensitivity to the hypothetical Weakly Interacting Massive Particle (WIMP). One such experiment is the MiniCLEAN detector. MiniCLEAN utilizes over 500 kg of liquid cryogen to detect nuclear recoils from WIMP dark matter with a projected sensitivity of 2×10^{-45} cm² for a mass of 100 GeV. The liquid cryogen is interchangeable between argon and neon to study the A^2 dependence of the potential signal and examine backgrounds. MiniCLEAN utilizes a unique modular design with spherical geometry to maximize the light yield using cold photomultiplier tubes in a single-phase detector. Pulse shape discrimination techniques are used to separate nuclear recoil signals from electron recoil backgrounds. Assembly of the experiment has begun at SNOLAB and an update on the project will be given.

¹on behalf of the MiniCLEAN Collaboration