

Abstract Submitted
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In Situ Optical Calibration of MiniCLEAN¹ JUI-JEN WANG, FRANCO GIULIANI, MICHAEL GOLD², University of New Mexico, MINICLEAN COLLABORATION — The MiniCLEAN dark matter experiment will exploit a single-phase liquid-argon detector instrumented with 92 photomultiplier tubes placed in the cryogen temperature with $4\text{-}\pi$ coverage of a 500 kg (150 kg) target (fiducial) mass. The detector design strategy emphasizes scalability to target masses of order 10 tons or more. The detector is designed also for a liquid-neon target that allows for an independent verification of signal and background and a test of the expected dependence of the WIMP-nucleus interaction rate. Being MiniCLEAN, as for the scintillation detector the PMT stability and calibration are essential. The optical calibration will be able monitor the system stability and keep the PMT in check. In MiniCLEAN, we use a Light-Emitting Diode(LED)-based light injection system to calibrate the PMTs. LEDs exhibit minimal pulse to pulse fluctuations in intensity, so the response of the PMT is dominated by photoelectron statistic. Also, the light intensity can be changed by software and high repetition rates are possible, so the calibration can be carried out quickly, which gives advantage on performing the calibration.

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