

Abstract Submitted
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Temperature-Controlled Cooling Tests of Photomultiplier Tubes for the miniCLEAN Dark Matter Search VICTOR GEHMAN, Los Alamos National Laboratory, MINICLEAN COLLABORATION — The miniCLEAN experiment will search for WIMP dark matter with a WIMP-neutron cross section sensitivity of 10^{-45}cm^2 . The detector has a fiducial volume of over 100 kg of liquid argon with the capability to be changed to liquid neon for background studies. The miniCLEAN experiment will be located at SNOLAB in Sudbury, Canada in late 2009. It will use position reconstruction and the time structure of scintillation light pulses to distinguish signals from backgrounds on an event-by-event basis. Because of the use of the time structure of scintillation light for background discrimination, careful understanding of the performance of photomultiplier tubes deployed in the experiment is important for successful operation. We have undertaken a program at Los Alamos National Laboratory aimed at characterizing miniCLEAN photomultipliers as a function of bias voltage at a variety of temperatures ranging from room temperature down to near the boiling point of neon (27 K). Specifically our efforts have centered on: gain, efficiency, dark current, and linearity. Recent progress and future plans for this test bench as well as its place in the overall miniCLEAN photomultiplier tube characterization program will be presented.

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