

Abstract Submitted
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Study of Light Collection Efficiency for a Neutron Veto for the DarkSide-50 Dark Matter Detector SHAWN WESTERDALE, EMILY SHIELDS, Princeton University, DARKSIDE COLLABORATION — DarkSide-50 is a 50-kg liquid argon dark matter detector that will use a borated liquid scintillator to veto neutron-induced background events. The liquid scintillator consists of a mixture of tri-methyl-borate and pseudocumene with wavelength shifters. The scintillator is contained in a 4-meter diameter sphere with an array of photomultiplier tubes on the inside surface. To enhance the detection efficiency of low energy products in the neutron capture reaction $n + {}^{10}\text{B} \rightarrow {}^4\text{He} + {}^7\text{Li}$, the inside surface of the sphere is covered with a reflector. A small test chamber has been built to measure the light collection efficiency produced by the borated scintillator with various combination of reflectors, and primary and secondary wavelength shifters. In addition, we have attempted to generalize our measured results to the proposed detector through a Monte Carlo simulation of the light collection. In this talk, the results from these studies will be presented.

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