Simulations of Prototype Photon Detection Technologies for ELBNF JOHNATHON LOWERY, JON URHEIM, STUART MUFSON, DENVER WHITTINGTON, BRUCE HOWARD, Indiana University, ELBNF COLLABORATION — Efficient detection of 128-nm scintillation light from particle interactions in large liquid argon Time Projection Chambers, such as those foreseen for the proposed "Experiments at the Long Baseline Neutrino Facility," poses significant challenges. Many different prototype photon detection technologies are currently under evaluation for ELBNF. Each technology has been tested at the TallBo dewar at Fermilab in two modes. They were studied with self-triggered cosmic rays and with tracks selected with a hodoscope array. In this work, I present the results of several simulations which seek to compare the performance of these technologies. In these simulations, line source generators are used to create photons which are propagated using ray-tracing. By comparing the results of the simulations to data taken in the runs at TallBo, it is possible to compute the photon detection efficiencies for these technologies. In addition, simulations of the propagation of light through coated acrylic bars are discussed.

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