Photon Detector Modeling for LBNE DYLAN ADAMS, Undergraduate Student, RYAN WASSERMAN, Graduate Student, NORM BUCHANAN, CSU Faculty — CSU has played a very active role in developing, prototyping and testing potential photon detection systems for the far detector in the Long Baseline Neutrino Experiment (LBNE). The photon detectors will be housed in liquid argon, which gives off scintillation light at 128 nm. As available silicon photomultipliers (SiPM's) are mainly sensitive to optical light and not to deep UV wavelengths, light guides are coated/doped with wavelength shifting materials, such as TPB, to convert the scintillation light in argon (128 nm) to visible wavelengths. Using modeling techniques in Geant4, a "Monte Carlo toolkit," the various photon detector geometries being considered for the far detector can be compared in terms of geometric efficiencies. Various optical curves and other details used to model the different geometries will be presented, as well as comparisons between experimental data and simulated data from natural cosmic rays creating scintillation light in the 40L test dewar at CSU.

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