

Abstract Submitted
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A Fast Simulation of Scintillation Counters with Embedded Wavelength-Shifting Fibers Read out by Silicon Photomultipliers RALF EHRLICH, University of Virginia, MU2E COLLABORATION — We describe a complete end-to-end simulation of the response of long scintillator counters with embedded wavelength-shifting fibers to charged particles and compare it to test-beam data. The counters were co-extruded with a titanium dioxide surface coating and two channels for the embedded wavelength-shifting fibers. The light is read out by silicon photomultipliers. The simulation includes the production and propagation of scintillation and Cerenkov photons, the response of the silicon photomultipliers, and the generation of the signal waveforms. Lookup tables are used to speed up the simulation of the photon propagation inside the counters. The simulation was tuned to match measured data obtained from a test-beam study in the Fermilab Meson Test Beam Facility using 120 GeV protons. The counters are to be used in the cosmic-ray veto detector for the Mu2e experiment at Fermilab.

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