



MEETING OF THE AMERICAN PHYSICAL SOCIETY DIVISION OF PARTICLES AND FIELDS

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Studies of effect of aging and studies to optimize scintillation counter response for the Mu2e Cosmic Ray Veto System

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The Mu2e experiment will conduct a search for charged lepton flavor violation through observation of a neutrino-less muon-to-electron conversion. In order to reduce backgrounds from cosmic ray muons, a cosmic ray veto consisting of counters made from scintillating plastic will be read out by wavelength-shifting fibers. The cosmic ray veto must have an overall detection efficiency of 99.99%. In order to meet this requirement, the light yield must be optimized and well understood. The counters are designed to meet photoelectron yield requirements over a working lifetime of 10 years. Aging studies are measuring the temporal response of the light yield of the scintillator and transmission of light through optical fibers. An oven has been used to heat samples to simulate an advanced aging process. Tests include measuring the attenuation of light through the aged optical fiber using an LED flasher with a photodiode or spectrometer and measuring the response of aged counters to radioactive sources and cosmic rays. We will describe the affect from aging on the counter and fiber response as well as several measurements aimed at improving the light yield, including the investigation of different reflectors at the far end of counters with single-ended readout.

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