

Abstract Submitted
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Study of the Sensitivity of Plastic Scintillators to Fast Neutrons

DAVID ABBOTT, University of Virginia — The Mu2e experiment at Fermilab plans to use a two-out-of-three coincident requirement in a plastic scintillator based detector to veto cosmic ray events. This veto system must operate efficiently in a high-radiation environment. In this investigation, three plastic scintillator bars containing wavelength-shifting fibers represent the veto system. These bars were placed together, in series, in front of a deuterium-deuterium neutron generator, which produced fast neutrons of approximately 2.8MeV, in order to study the sensitivity of the plastic scintillators to fast neutrons. Multi-anode photomultiplier tubes read out the light from the fibers. The collected data was analyzed to determine the rate of interaction, approximate amount of energy deposited, and numerous other aspects of the neutrons' interactions. The rate of coincidental and correlated hits in multiple scintillator bars was the primary reason for the investigation, in order to understand the sensitivity of the plastic scintillators to fast neutrons.

David Abbott
University of Virginia

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