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Fabrication of A High-efficiency Cosmic Ray Veto Detector for the Mu2e Experiment

The Mu2e experiment at Fermilab will search for the charged-lepton-flavor-violating process of coherent muon-to-electron conversion in the presence of a nucleus with a sensitivity four orders of magnitude beyond the current strongest limits. The goal of single-event sensitivity requires that all backgrounds must sum to significantly less than one event. One potential background is due to cosmic-ray muons producing an electron with signal characteristics within the Mu2e apparatus. The cosmic-ray-veto system of the Mu2e experiment is tasked with vetoing such cosmic-ray-induced backgrounds with high efficiency while inducing low dead time and while operating in the high-intensity environment of the Mu2e experiment. The UVA HEP group has been leading the effort to design and prototype the CRV, and has recently started the fabrication this detector on site. Highlights of this effort including production detector performance will be presented.

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