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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 current limits. The experiment will have a single event sensitivity of about 3×10^{-17} while limiting the total background to about 0.5 events. One potential background is due to cosmic-ray muons producing an electron that is indistinguishable from signal within the Mu2e apparatus. The cosmic-ray-veto system of the Mu2e experiment is tasked with vetoing cosmic-ray-induced backgrounds with high efficiency, without inducing significant dead time and while operating in a high-intensity environment. The design of the cosmic-ray-veto system will be discussed.

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