

# Design considerations for the cosmic-ray-veto system of the Mu2e experiment at Fermilab

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Since the discovery of the muon, particle physicists have carried out a series of experiments aimed at measuring flavor violation in charged-lepton interactions. To date, no such violation has been observed. 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  $2.3 \times 10^{-17}$  while limiting the total background to about half of an event. 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. In this talk some of the many challenges influencing the design of the cosmic-ray-veto system will be discussed.

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