

Abstract Submitted
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Cosmic Ray Background Analysis for MuLAN MICHAEL MANGIALARDI, University of Illinois at Urbana-Champaign — The goal of the MuLAN experiment is to make a measurement of the muon lifetime to a precision of 1 ppm so that a 5 ppm value of the Fermi coupling constant can be calculated. To do this, a beam of positive muons is stopped in a target surrounded by 340 scintillating detectors arranged in a geodesic around the target. Once the muons stop in the target, they decay, and the product positrons are emitted outward, where they are detected by the scintillators. By examining the spectrum of decay times, the lifetime of positive muons can be calculated. One of the myriad factors affecting this measurement is the background of cosmic ray muons constantly showering upon the detector. To study this background, an angular distribution of the cosmic rays was found, and the rate at which cosmic ray muons “rain” upon the detector was calculated. In addition, the cosmic rays were used to examine the timing differences between the individual scintillators.

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