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Detecting atmospheric cosmic ray induced muon showers with the NO ν A Far Detector MEHREEN SULTANA, University of Georgia, NOVA COLLABORATION¹ — The research goals of Fermilab's NuMi Off-Axis Electron Neutrino Appearance (NO ν A) are to observe muon neutrino to electron neutrino oscillations, determine the ordering of neutrino masses, and explain violation of matter/anti-matter symmetry. However, NO ν A can also be used to study cosmic ray induced high energy extensive air showers. This poster describes the initial characterization of NO ν A as a cosmic ray detector. The detector has a combination of large size and high spatial resolution that will allow future studies of the hadronic cores of cosmic ray air showers. A large component of these showers are muons. Multiple parallel muon tracks seen in a single event with the NO ν A detectors result from the same primary cosmic ray collision in the upper atmosphere. In order to use these muon bundles to probe the cosmic ray physics involved, we determine event characteristics such as the multiplicity of observed multiple muons, the effective area of the detector, the angular resolution of the detector, the scattering of individual muons, and the effectiveness of identifying and isolating these parallel muon shower events from background and noise.

¹NuMi Off-Axis Electron Neutrino Appearance Experiment

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