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Cosmic Ray Muon Data in the NOvA Far Detector

NOvA is a long-baseline neutrino oscillation experiment in Fermilab's NuMI beam. The experiment consists of two functionally identical detectors, a Near Detector (ND) at Fermilab and a Far Detector (FD) at Ash River in Northern Minnesota. Both detectors are almost fully constructed and are being commissioned. The FD is located on the surface under 14 radiation lengths of barite and concrete overburden. The abundant cosmic rays passing through the FD are an ideal tool for calibration, but also present a unique challenge in cosmic ray background rejection. The 15 m x 15 m x 63 m volume detects a cosmic ray muon at approximately 120 kHz. The NOvA FD has recorded cosmic ray data since March 2013 in a partially active detector configuration. In this poster, we show cosmic ray muon data compared to the Monte Carlo simulation. We also demonstrate preliminary cosmic ray muon background rejection capabilities using current particle ID algorithms.

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