Abstract Submitted
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Proper Calibration of ICARUS Detector Walls[1] WILLIAM BARDEN, APS Northwest Section — Neutrinos are incredibly small, lightweight subatomic particles that are produced in high-energy reactionsand are known to come in three flavors, determined by the reaction that produces the neutrino: tau, muon, and electron. Neutrinos can spontaneously transition from one flavor to another as they fly through space. The mechanism for this transformation is not yet understood, and could be facilitated by a fourth type, a so-called 'sterile' neutrino. The ICARUS Detector at FermiLab is comprised of multiple detector walls lined with sensors which are in turn tied to a series of "Front-End-Boards". In order for this data to be usable, the detector must be calibrated properly to exclude environmental sources of electrical noise such as cosmic rays. To this end, the detector has been built with a 'double wall' design, that is it has both inner and outer walls. Hits can be tagged by observing the path they take through the double walls. Using time-of-flight calculations, external sources of cosmic rays can be readily subtracted from the data. We analyzed the first output from these instruments in order to calibrate a Cosmic Ray Tagger system, and identified behavioral patterns in the equipment as well as the ideal range in which it could be operated.

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