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Construction of PVC Extrusions for the NOvA Near and Far Detectors

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Content :

NOvA, or NuMI Off-Axis ve Appearance experiment, is a long baseline neutrino experiment using an off-axis beam produced by the main injector (NuMI) neutrino beamline at Fermilab. The experiment is designed to study muon neutrino to electron neutrino oscillations. It consists of two PVC and liquid scintillator detectors and a beamline upgrade. The large far detector weighs 15 kTon and will be located in Ash River, Minnesota, 810 km from NuMI. The smaller, 222 Ton near detector will be located underground at Fermi National Accelerator Laboratory. Each detector consists of planes of PVC extrusions containing liquid scintillator and wavelength shifting fiber. The PVC extrusions are made using a formula specially designed for high reflectivity, ease of extrusion and tensile qualities. Custom extrusion dies and extruding procedures have been created to ensure a uniform product that holds to strict dimensional and material tolerances. The construction of the NOvA near detector on the surface (NDOS) extrusions will be presented, addressing the challenges of creating physics quality PVC extrusions and the QA techniques used to ensure that quality. Finally, preparations for construction of the far detector will be discussed.

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