



Poster session 1 - Monday 4 July

P1.033 Event reconstruction in NOvA

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The NOvA experiment is a two-detector long-baseline neutrino oscillation experiment utilizing the NuMI beam originating at Fermilab. The experiment employs a 300 ton Near Detector located underground at Fermilab, and a functionally-identical 14 kiloton Far Detector placed 810 km away in Ash River, MN. The detectors are liquid scintillator tracking calorimeters with a cellular structure that provides detailed information for fine-grained 3D tracking and calorimetry, and allows for the reconstruction of different particle track and shower topologies. The Near Detector records multiple overlapping neutrino interactions in each beam spill, and the Far Detector is exposed to a substantial background of cosmic ray muons due to its location on the surface.

The oscillation analyses rely on accurate reconstruction of neutrino interactions in order to precisely measure the neutrino energy and identify the neutrino flavour and interaction mode. Similarly, measurements of neutrino cross sections using the Near Detector require accurate identification of the particle content of each interaction.

A series of pattern recognition techniques have been developed to separate individual interactions spatially and temporally, identify event vertices, isolate and follow particle tracks, and perform particle identification. This poster will describe the full suite of techniques used to achieve complete event reconstruction in the NOvA detectors.