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Event Reconstruction Techniques in NOvA

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The NOvA experiment is a long baseline neutrino oscillation experiment utilizing the NuMI beam generated at Fermilab. The experiment will measure the oscillations within a muon neutrino beam in a 300 ton Near Detector located underground at Fermilab and a functionally-identical 14 kiloton Far Detector placed 810 km away. The detectors are liquid scintillator tracking calorimeters with a fine-grained cellular structure that provides a wealth of information for separating the different particle track and shower topologies. Each detector has its own challenges with the Near Detector seeing multiple overlapping neutrino interactions in each event and the Far Detector having a large background of cosmic rays due to being located on the surface. A series of pattern recognition techniques have been developed to go from event records, to spatially and temporally separating individual interactions, to vertexing and tracking, and particle identification. This combination of methods to achieve the full event reconstruction will be presented.

Authors: NINER, Evan (Indiana University); SACHDEV, Kanika (University of Minnesota); BAIRD, Michael (Indiana University)

Co-authors: AURISANO, Adam (University of Cincinnati); ROCCO, Dominick (urn:Google)

Presenter: ROCCO, Dominick (urn:Google)

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