Reconstruction Algorithms for Electon Neutrino Appearance in NOvA EVAN NINER, Indiana University, NOVA COLLABORATION — The NuMI Off-Axis ν_e Appearance (NOvA) experiment is a long-baseline neutrino experiment. The project uses two functionally identical detectors placed 14 milliradians off-axis from the NuMI beamline at Fermilab and located 810km apart to study a number of parameters. Among the scientific goals are measurements of $\sin^2 2\theta_{23}$, $\sin^2 2\theta_{13}$, δ and the mass hierarchy. The detectors are a grid of plastic cells filled with liquid scintillator to provide 3D tracking and calorimetry. This new detector technology requires different techniques for track reconstruction. A new algorithm suitable for track and shower reconstruction being used in the electron-neutrino appearance analysis will be presented. This method works by first identifying the event vertex using a Hough transform in combination with an elastic arms vertex fit. A fuzzy-k means clustering is then applied to identify the features associated with the vertex. Performance of an artificial neutral net based particle identification for selecting electron neutrino charged current events using this reconstruction as an input will also be shown.

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