Selecting Electron Neutrino Events in the MINOS Detectors
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TION — The MINOS Collaboration recently completed a search for ν_e appearance
in the NuMI beam at Fermilab. Since obtaining the first result, we have worked
on improving the particle identification algorithms that distinguish ν_e charged cur-
rent events from various background events. These include ANN (Artificial Neural
Network) and LEM (Library Event Matching). ANN is a neural network that uses
a set of reconstructed quantities that characterize the longitudinal and transverse
energy deposition profiles of a given event. LEM is a pattern-recognition algorithm
that compares the hit pattern of a given event to the hit patterns of many simulated
"library" events; it then constructs discriminant variables from those library events
that best match that event. The development of particle identification algorithms
of such fundamentally different natures allows us to make a cross-check of our re-
sults. Event topologies in the detectors are discussed, and the effectiveness of these
algorithms in selecting electron neutrino events is examined.

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