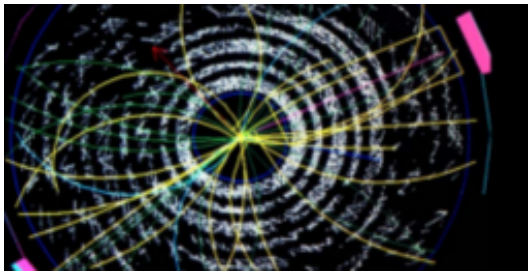

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NOvA Short-Baseline Tau-Neutrino Appearance Search

Monday, 5 June 2017 12:00 (15 minutes)

Three-flavor neutrino oscillations have successfully explained a wide range of neutrino oscillation experiment results. However, anomalous results, such as the electron-antineutrino appearance excesses seen by LSND and MiniBooNE, do not fit the three-flavor paradigm and can be explained by the addition of a sterile neutrino at a larger mass scale than the existing three flavor mass states.
The NOvA experiment consists of two finely segmented, liquid scintillator detectors operating 14.6 mrad off-axis from the NuMI muon-neutrino beam. The Near Detector is located on the Fermilab campus, 1 km from the NuMI target, while the Far Detector is located at Ash River, MN, 810 km from the NuMI target. The NOvA experiment is primarily designed to measure electron-neutrino appearance at the Far Detector using the Near Detector to control systematic uncertainties. However, the Near Detector is well suited for searching for anomalous short-baseline oscillations. I will present a novel method for selecting tau neutrino interactions with high purity at the Near Detector using a convolutional neural network. Further, I will discuss the sensitivity to anomalous short-baseline tau-neutrino appearance due to sterile neutrino oscillations determined using this method.

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