



CU Physics Department Particle Seminar

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MAYLY SANCHEZ

ARGONNE NATIONAL LAB / HARVARD UNIVERSITY

Beyond muon-neutrino disappearance in the MINOS Experiment

MINOS is a long baseline neutrino oscillation experiment designed to make precision measurements of the neutrino mixing parameters associated with the atmospheric neutrino mass splitting. Using a high powered muon neutrino beam from the Main Injector (NuMI) facility at Fermilab, it compares the neutrino energy spectrum observed in two large detectors located at Fermilab and in the Soudan mine in northern Minnesota at a distance of 735km. Beyond the main muon-neutrino disappearance measurement, I will show recent results on the sterile neutrino search using the neutral current energy spectrum after two years of data-taking corresponding to $2.5e20$ protons on target. Furthermore, if the mixing angle related to electron-neutrino appearance is in the vicinity of the current experimental limit, it will be possible for MINOS to make the first measurement of this parameter. Non-oscillated data at the near detector has been used to study the background contributions for this analysis and the resulting data-driven sensitivities for this measurement will be shown.

