



Poster session 2 – Tuesday 5 July

P2.089 Search for muon antineutrino disappearance due to sterile antineutrino oscillations with the MINOS/MINOS+ experiment

RChen¹, L Whitehead² and A Sousa³

¹University of Manchester, UK, ²University College London, UK, ³University of Cincinnati, USA

on behalf of MINOS collaboration

Three-flavor neutrino oscillations have successfully explained a wide range of neutrino oscillation data. However, anomalous results, such as the electron antineutrino appearance excesses seen by LSND and MiniBooNE, can be explained by the addition of a sterile neutrino at a larger mass scale than the existing three flavor mass states.

MINOS is a two-detector, long-baseline neutrino oscillation experiment that uses magnetized tracker-calorimeter detectors to measure the energy and composition of the NuMI neutrino beam. These magnetized detectors give MINOS a unique ability to be able to separate muon neutrino and antineutrino interactions. Using data taken with the NuMI beam configured in antineutrino mode, MINOS is able to search for sterile antineutrinos by looking for the disappearance of muon antineutrinos over the 735 km baseline. The sterile antineutrino signature would be seen as modulations at high energy in the charged-current muon antineutrino spectrum and a depletion of events in the neutral current spectrum. In this poster, new results are presented from an analysis that fits neutral-current and charged-current antineutrino spectra from MINOS and MINOS+ data to a neutrino oscillation model assuming one sterile antineutrino.