

Department of Physics

Particle Physics

The Denys Wilkinson Building, Keble Road, Oxford OX1 3RH



Experimental Particle Physics Seminar

at 2.15 pm

Dennis Sciama Lecture Theatre

Tuesday 18th June 2019

Dr Leigh Whitehead
University of Cambridge

Search for Sterile Neutrinos in MINOS and MINOS+ Using a Two-Detector Fit

Abstract

A search for mixing between active neutrinos and light sterile neutrinos has been performed by looking for muon neutrino disappearance in two detectors at baselines of 1.04 and 735 km, using a combined MINOS and MINOS+ exposure of 16.36×10^{20} protons on target. A simultaneous fit to the charged-current muon neutrino and neutral-current neutrino energy spectra in the two detectors yields no evidence for sterile neutrino mixing using a 3+1 model. The most stringent limit to date is set on the mixing parameter $\sin^2(\theta_{24})$ for most values of the sterile neutrino mass splitting $\Delta m^2_{41} > 10^{-4} \text{ eV}^2$.