ID de Contribution: **174** Type: **Ordinary**

Searching for Sterile Neutrinos with MINOS

lundi 14 mars 2016 08:50 (15 minutes)

Over the last couple of decades physicists across the world have obtained model-independent evidence for neutrino oscillations, with the majority of experiments confirming the compatibility with a three-favour model i.e three neutrino mass and flavour states. However, there have been a few anomalous results in the community which among other explanations, can be explained by the existence of additional neutrinos known as sterile neutrinos. This talk will discuss the latest results for a 3+1 sterile neutrino search using the MINOS experiment data set from 2005 - 2012. MINOS is a two-detector on-axis experiment based at Fermilab. The NuMI neutrino beam encounters the MINOS Near Detector 1 km downstream before travelling 734 km through the Earth's crust, to reach the Far Detector located at the Soudan Underground Laboratory in Northern Minnesota. By searching for oscillations driven by a large mass splitting, MINOS is sensitive to the existence of sterile neutrinos through looking for any energy dependent perturbations using a charged current sample, as well as looking at any relative deficit between neutral current events between the far and near detectors. This talk will discuss the novel analysis that enabled a search for sterile neutrinos covering five orders of magnitude in the mass splitting and setting a limit in the previously unexplored regions in the parameter space $\Delta m^2_{41} - \theta_{24}$. This talk will show results of a search for sterile neutrinos that is sensitive to the parameter space suggested by LSND and MiniBooNE. This MINOS search for muon neutrino disappearance complements other previous experimental searches for sterile neutrinos in the electron neutrino appearance channel.

Author: M. TIMMONS, Ashley (University of Manchester)

Orateur: M. TIMMONS, Ashley (University of Manchester)

Classification de Session: Neutrinos

Classification de thématique: Experiment