

Recent Results from the MINOS Experiment

Friday, July 17, 2009 11:55 AM (20 minutes)

The MINOS experiment utilizes the NuMI beam of muon neutrinos to study the phenomenon of neutrino oscillations. Neutrinos are sent over a baseline of 735 km, with a detector near the production point at Fermilab and one at the Soudan underground laboratory in northern Minnesota. By measuring the disappearance characteristic of oscillations, MINOS has made the best measurement of the atmospheric neutrino mass splitting to date. By looking for electron neutrino appearance, a limit has been placed on the the mixing angle $\sin^2(2\theta_{13})$ of < 0.29 at 90% c.l. (for $\delta_{CP} = 0$ and normal mass hierarchy). A study of neutral current interactions has allowed limits to be placed on the existence of additional, sterile neutrino flavours beyond the three of the standard oscillation model. Using the 7% muon antineutrino component of the beam, the first direct observation of muon antineutrinos in a long baseline experiment has been made, along with direct limits on the antineutrino oscillation parameters. In September 2009, the current in the NuMI focusing horns will be reversed to begin running with a dedicated antineutrino beam. This will allow the first precision measurements of the atmospheric-regime antineutrino oscillation parameters, an important test of CPT-invariance in the neutrino sector.

Primary author: Dr EVANS, Justin (University College London)

Presenter: Dr EVANS, Justin (University College London)

Session Classification: I. Neutrino Physics

Track Classification: Neutrino Physics