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OPERA experiment

Thursday 27 June 2013 09:30 (25 minutes)

This talk is focused on a general description of the OPERA experiment, which is designed to observe directly the appearance of nu-tau produced by neutrino oscillations in an almost pure nu_mu beam.
The neutrino beam is produced at CERN and detected 730 km away in an underground hall of the National Laboratory of Gran Sasso.
OPERA detector is a hybrid structure, containing nuclear emulsion detector modules with lead plates, acting as a target for the neutrino beam, complemented by electronic target trackers and muon spectrometers.
The signature of a tau neutrino interaction is the observation of the tau lepton decay and the absence of muon at the primary vertex.
To obtain information about the charged particles trajectories around the interaction vertex, the emulsion is scanned with automatic scanning systems.
The current status of data taking is reported.
The main background sources having the nu_tau event topology include the reinteraction of hadrons, the decay of charmed mesons produced in nu_mu Charged Current interaction, and the scattering of muons from nu_mu Charged Current interactions.
In this talk the estimated level of background events is reported and the results of the nu_mu->nu_tau analysis are presented.

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