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Status of Long-Baseline Neutrino Experiments

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The current generation of long-baseline neutrino oscillation experiments employ an off-axis ν_μ (or $\bar{\nu}_\mu$) beam produced by the decay of pions created when a proton beam strikes a target. The beam is monitored at detector facilities near the production point before travelling hundreds of kilometres to a far detector. Aiming the beam centre slightly away from the far detector provides the off-axis configuration which selects a narrow energy band beam tuned to maximize the oscillation probability. The status of these experiments will be presented.

The Tokai to Kamioka (T2K) experiment consists of a ν_μ beam produced at the Japan Proton Accelerator Research Centre (J-PARC) in Tokai on the East coast of Japan, which is monitored by a suite of detectors before travelling 295 km to the Super-Kamiokande (SK) water Cerenkov detector. T2K has been in operation since 2010 and has been continually releasing new and exciting neutrino oscillation results. The most recent precision $\nu_\mu \rightarrow \nu_e$ appearance and ν_μ disappearance oscillation measurements as well as initial results running the experiment in the $\bar{\nu}_\mu$ beam configuration will be presented.

The NO ν A experiment, utilizing the NuMI beam and a near detector at Fermilab and a far detector at a distance of 810 km, began operation in 2014. The current status of NO ν A will also be shown.

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