

The Present and Future of Long Baseline Neutrino Oscillations with T2K and DUNE

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Neutrinos oscillate among flavors as they travel because a neutrino of a particular flavor is also a superposition of multiple neutrinos with slightly different masses. The interferometric nature of oscillations allows this mixing to be measured, but it requires powerful neutrino sources and massive detectors. T2K, with the J-PARC neutrino beam and Super-Kamiokande as far detector, uses a narrow band, off-axis beam to make measurements of neutrino oscillations at an L/E precisely tuned to atmospheric-sector oscillations. DUNE (formerly ELBNF) will use an even more powerful, wide band, on-axis beam from Fermilab and a massive, underground liquid argon time projection chamber to measure atmospheric oscillations with unprecedented precision. Here I will present the latest oscillation results from the T2K experiment as well as the status of DUNE, and its prospects for addressing the questions which the current generation of experiments cannot.

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