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Mapping the Neutrino Mixing Matrix with Long Baseline Neutrino Experiments

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Measurements of solar and atmospheric neutrinos have demonstrated neutrino oscillations between two pairs of the three neutrino mass eigenstates. However, the full 3x3 neutrino mixing matrix remains unexplored. Open questions include how strongly electron neutrinos couple to the third mass eigenstate, what the form is of the neutrino mass hierarchy, and whether neutrino mixings can produce CP symmetry violation. In this talk I will describe how current and future long baseline neutrino oscillation experiments can probe the neutrino mixing matrix by shooting high intensity neutrino beams produced at accelerators towards distant detectors located hundred of kilometers away.