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Leptonic Unitarity: Current and Future

Significant progress has been made over the last several decades in understanding the phenomenon of neutrino oscillations, where flavor change is a consequence of neutrinos having mass and a nontrivial mixing between their mass and flavor eigenstates. Experimental data on neutrino oscillations have been collected in a number of regimes, including atmospheric, solar, reactor, and beam neutrinos. With this, and future data, we can begin to perform precision tests on the leptonic mixing matrix, including testing whether the standard framework, depending on three mixing angles and a CP-violating phase, describes the data well. In this talk, I will discuss our current understanding of the mixing matrix, as well as projections to the future including the upcoming DUNE, JUNO, and IceCube Upgrade experiments. I will demonstrate how consistent this three-neutrino framework is in describing the data, how well we can understand if CP is violated in the lepton sector, and how well we can determine if the mixing matrix is unitary.

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