

Implications of NSI Effects in Long-Baseline Neutrino Experiments

The upcoming long-baseline (LBL) neutrino experiments will be sensitive to non-standard interaction effects and can provide information on the unknown oscillation parameter values. We explore the parameter degeneracies that can occur in DUNE, T2HK experiments, and a combination of both due to nonstandard interactions (NSI) arising simultaneously from two different off-diagonal sectors, i.e., $e-\mu$ and $e-\tau$. We derive constraints on both the NSI sectors using the combined $\text{NO}\nu\text{A}$ and T2K results. Our analysis reveals a significant impact that dual NSIs may have on the sensitivity of atmospheric mixing angle θ_{23} in the normal ordering (NO) case. Furthermore, when non-standard interaction from the $e-\mu$ and $e-\tau$ sectors are included, we see significant changes in the probabilities for DUNE, T2HK, and the CP asymmetry also exhibits an appreciable difference.

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