

Exploring NSI effects in Long-baseline neutrino Experiments

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Neutrino oscillation in the matter could be affected by the sub-dominant, yet unknown, non-standard interactions (NSI). The upcoming long-baseline (LBL) neutrino experiments will be sensitive to these effects and can provide information on the unknown oscillation parameter values. The observed shift in δ_{CP} value observed for NOvA in case of standard model (SM) and NSIs arising simultaneously from two different off-diagonal sectors, $e - \mu$ and $e - \tau$ could be attributed to beyond standard model physics. We extend the study to the upcoming long-baseline experiments: DUNE and T2HK. We derive constraints on the NSI sectors using the combined datasets of NOvA and T2K. Our analysis reveals a significant impact that dual NSIs may have on the sensitivity of standard CP phase δ_{CP} and atmospheric mixing angle θ_{23} . Furthermore, when non-standard interaction from the $e - \mu$ and $e - \tau$ sectors are included, we see significant changes in the CP sensitivity due to the presence of dual NSIs, and also the CP asymmetry exhibits an appreciable difference.

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