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Investigation of scalar Non-Standard Interactions at P2SO and DUNE

Neutrinos can interact with some scalar fields through some unknown couplings referred as scalar non-standard interaction (SNSI). Unlike vector NSI, SNSI parameters do not appear as potential term in neutrino oscillation rather appeared as a correction to neutrino mass term. Significant effects of SNSI parameters on neutrino oscillation can be observed at neutrino long baseline experiments. For the first time, we have obtained bounds on the diagonal SNSI parameters from the two longest baseline experiments DUNE (1300 KM) and P2SO (2595 KM). Our findings indicate that P2SO provides tighter constraints on the diagonal SNSI parameters compared to DUNE, except for η_{ee}. We found that the mass hierarchy and CPV sensitivities are mostly affected by η_{ee} compared to $\eta_{\mu\mu}$ and $\eta_{\tau\tau}$. On the other hand octant sensitivity is mostly affected by $\eta_{\mu\mu}$ and $\eta_{\tau\tau}$.

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