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Analysis of non-isotropic Lorentz Invariance Violation for $\text{NO}\nu\text{A}$ experiment in disappearance channel

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Lorentz Invariance Violation (LIV) is a trending topic in Beyond Standard Model Physics. Lorentz symmetry is well established in the low-energy realm of physics. But there are various theories, which suggest its violation at the Planck scale phenomenon. As neutrinos, having tiny mass, are the particles that are breaking down the barriers of the Standard Model, they may be an excellent tool for searching such Planck-suppressed signals. For this study, we have opted the Standard model extension as the theoretical framework, which contains all Lorentz violating terms in it. We study the non-isotropic LIV, which causes the sidereal effect in the neutrino beamline experiment. The neutrino disappearance channel is simulated for the $\text{NO}\nu\text{A}$ far detector. We find that $\text{NO}\nu\text{A}$ FD is highly sensitive to the LIV and new limits of LIV coefficients are also predicted.

Session

Neutrino Physics

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