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JUNO constraints on Lorentz-violating coefficients and implications for neutrino mass ordering

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Using the 59.1-day publicly released JUNO spectrum, we investigate isotropic Lorentz-invariance violation (LIV) in reactor antineutrino oscillations within the minimal Standard Model Extension framework. We perform two-dimensional $\Delta\chi^2$ scans for selected CPT-even and CPT-odd LIV coefficient combinations, considering both normal and inverted mass ordering. From these scans, we derive correlated and individual constraints on the isotropic LIV coefficients and study their effects on the $\sin^2\theta_{12}-\Delta m^2_{21}$ parameter space. We find that LIV can modify the allowed regions, with the size of the shifts depending on the coefficient combination and mass-ordering hypothesis considered. These results illustrate how the released JUNO spectrum can probe isotropic Lorentz-violating effects and their interplay with neutrino mass-ordering studies.

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