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Enhanced violation of Leggett-Garg Inequality in three flavour neutrino oscillations via non-standard interactions

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Neutrino oscillations occur due to non-zero masses and they are believed to maintain quantum coherence even over astrophysical length scales.It is thus natural to explore geometric aspects of the phases involved as well as think about quantification of the coherence properties of neutrinos via temporal correlations in the form of Leggett-Garg Inequalities (LGI). In this paper, we study the quantumness of three flavor neutrino oscillations by studying the extent of violation of LGI if non-standard interactions are taken into account. We report an enhancement in violation of LGI with respect to the standard scenario for certain choice of NSI parameters.

Collaboration name

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