

Tests of Lorentz and CPT Violation with Neutrino Oscillation Experiments

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Abstract content

Lorentz violation is a predicted signal from Planck scale physics. Since neutrino oscillation experiments are natural interferometers, they may be sensitive to small space-time effect, such as Lorentz violation through their sidereal time dependence. The sensitivity is comparable to precision optical measurements (10^{-19} GeV). Thus, neutrino oscillations may be the first place where we see Lorentz and CPT violation. Recently the MiniBooNE neutrino oscillation experiment published electron and anti-electron neutrino appearance oscillation results that cannot be understood within the accepted three-massive-neutrinos oscillation model. In this talk, I will introduce Lorentz violation and Lorentz violating neutrino oscillations. Then, I examine whether the MiniBooNE data may be explained through a Lorentz violation model. Finally, I discuss the test of Lorentz violation with reactor neutrino oscillation experiments, such as Double Chooz.

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