

Test of Lorentz and CPT violation with Neutrinos

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Abstract :

Lorentz symmetry is a fundamental symmetry for both the Standard Model and general relativity. However, the violation of Lorentz symmetry, or Lorentz violation, has been shown to occur in quantum-gravity motivated models, and there is a worldwide effort to look for Lorentz violation. The expected effect of Lorentz violation is tiny, however, interference experiments and other special systems can gain enough sensitivity to search for it. Since neutrino oscillation is a natural interferometer, neutrinos offer a natural place to search for Lorentz violation.

In this talk, I will introduce Lorentz violation and Lorentz violating neutrino oscillations. And I examine whether the existing neutrino data may be explained through a Lorentz violation model. Finally, I will discuss the best possible Lorentz violation test on the neutrino sector through the astrophysical very high-energy neutrinos at IceCube.