

Neutrinos as Probes for Lorentz and CPT Symmetry

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The coming decade is poised to witness an abundance of measurements with the potential of substantial improvements of our understanding of neutrino physics. Many of these measurements can be harnessed for unprecedented studies of both Lorentz and CPT invariance, two closely intertwined cornerstones of established physics. These symmetries may nevertheless be violated in many theoretical approaches to underlying physics including ones involving departures from the ordinary classical spacetime structure. Within effective field theory, Lorentz and CPT breakdown is predicted to affect neutrino propagation, the kinematics of particle reactions involving neutrinos, and flavor oscillations including transformations between neutrinos and antineutrinos.

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