

Lorentz Invariance & CPT symmetry theory motivation

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The prospects for testing Lorentz and CPT symmetry in muon $g-2$ experiments are presented. Using muons for testing Lorentz and CPT symmetry is essential as existing constraints on muon Lorentz- and CPT-violating operators comprise only a small fraction of the available limits. Possible signals for Lorentz and CPT violation in $g-2$ experiments include annual and sidereal variations of the spin-precession frequency. The advantages of performing negative muon measurements are considered. Fermilab and J-PARC experiments are sensitive to slightly different combinations of Standard-Model Extension (SME) coefficients. A discussion about the relative advantages of both experiments is included.

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