

Search for CPT and Lorentz Invariance Violation Effects in the Muon g-2 Experiment at Fermilab.

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The Muon g-2 Experiment at Fermilab, whose second result was published in August 2023, conducts the world's most precise measurement of the anomalous magnetic moment of the muon. Muon g-2 data can be used to search for a sidereal variation of the anomalous spin precession of the muon, one of the important signatures of CPT and Lorentz Invariance Violation (LIV) in the muon sector. The BNL Muon g-2 experiment was the first to conduct this search at the sidereal frequency. The Fermilab Muon g-2 experiment searched for a variation of the anomalous spin precession of the muon at the sidereal frequency and at its harmonics. This represents the first search for CPT and LIV signatures in the muon sector at sidereal harmonics. The main focus of this talk is to discuss the result of the CPT and LIV search with Fermilab Muon g-2 Run-2/3 data and the details of the analysis framework used. The projected sensitivity of this search will approach $O(10^{-25})$ GeV, well surpassing the Planck scale.

Alternate track

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