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Analysis of the bounds on the parameters of Lorentz violation

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Typically, Lorentz-violating theories contain a large number of independent parameters. We analyze the bounds on these parameters and use them to quantify how precise Lorentz symmetry is today, according to experimental data. We evaluate a number of general formulas for Lorentz-violating field theories, and then apply them to the CPT-invariant, QED subsectors of the Standard Model Extension (SME), and the renormalizable high-energy Lorentz-violating Standard Model. We study the dependence of our results on the energy scale and other parameters, and address a number of applications.

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