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Prospects for Lorentz violation in atomic spectroscopy and spin-precession experiments ARNALDO J. VARGAS, V. ALAN KOSTELECKÝ, Indiana University — A breaking of Lorentz symmetry has been suggested as a low-energy signature for theories beyond the Standard Model and General Relativity. In this talk, signals of Lorentz violation in atomic spectroscopy and spin-precession experiments are discussed. The analysis is based on the general effective field theory known as the Standard-Model Extension, including contributions from operators with renormalizable and nonrenormalizable mass dimensions. Possible signals for Lorentz violation are identified, including several classes of time variations of the measured frequencies. Effects of CPT violation in matter-antimatter comparisons are also considered. Bounds on coefficients for Lorentz violation are obtained using existing analyses of muon and electron experiments, and estimates of sensitivities in future experiments are presented.

Arnaldo Vargas
Indiana University

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