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Observing Lorentz-violating effects on the gamma-ray horizon

The arrival of TeV-energy photons from distant galaxies is expected to be affected by their QED interaction with intergalactic radiation fields through electron-positron pair production. In theories where high-energy photons violate Lorentz symmetry, the kinematics of the process $\gamma + \gamma \longrightarrow e + + e-$ is altered and the cross-section suppressed. Consequently, one would expect more of the highest-energy photons to arrive if QED is modified by Lorentz violation than if it is not. In this talk, I will show the detection perspectives of such signals, using the simulated sensitivities of future detectors. I will then contrast the forecasted sensitivity with those obtained from spectral lags in γ-ray burst data.

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