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Lorentz invariance violation search with the Cherenkov Telescope Array Observatory Large-Sized Telescope

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The fast variability of sources such as pulsars, gamma-rays bursts (GRB) or flares of active galactic nuclei (AGN) can be used to detect or constrain Lorentz invariance violation (LIV) by measuring time lags in time of flight of high-energy photons. However, an important source of uncertainty arises from the intrinsic processes within the source. Combining observations of different sources allows us to increase the precision of these measurements as well as to distinguish LIV-induced lag from intrinsic source effects. This has motivated a collaboration among H.E.S.S., MAGIC, and VERITAS to pool their data together in a consortium called Gamma-ray LIV Working Group (γLIV WG). The Cherenkov Telescope Array Observatory (CTAO) is the next-generation TeV gamma-ray observatory. We will present the first results for LIV searches obtained from AGN observations performed with its first prototype, the Large-Sized Telescope (LST-1). LST-1 has joined the γLIV WG in 2023 and the method of combination of these results with the rest of the data will be presented as well.

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