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gLike for Lorentz invariance violation time-of-flight searches: A joint-likelihood framework and thesis case study on BL Lacertae

mercredi 4 février 2026 11:30 (30 minutes)

This talk presents results and methods previously published in my PhD thesis. Because robust tests of Lorentz invariance violation (LIV) require the combination of multiple datasets to disentangle intrinsic source effects from propagation-induced lags, I report a joint LIV time-of-flight analysis of two BL Lacertae very-high-energy flares observed by imaging atmospheric Cherenkov telescopes: MAGIC (19–20 September 2020) and LST-1 (8–9 August 2021). For the 2020 MAGIC flare, an 88-second-binned light curve template, modeled as the sum of five asymmetric pulses and a constant background, was used to capture sub-structure relevant for time-of-flight tests. The 2021 LST-1 flare is well described by two Gaussian pulses and a constant baseline, reflecting the observed double-peak structure on 10–20 minute timescales; the light curve uses non-uniform time bins due to run sub-division. The study is implemented in the open-source maximum-likelihood framework gLike, which incorporates a dedicated unbinned LIV likelihood component and a hierarchical JointLkl combination.

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Classification de Session: State-of-the-art LIV studies with photons