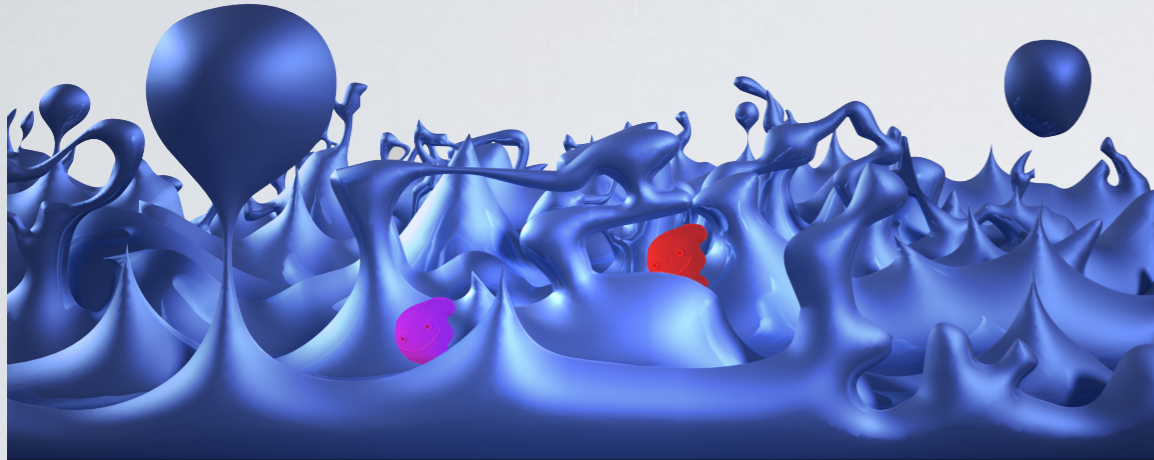


Lorentz Invariance Violation and gamma-ray astronomy - Status and prospects



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Quantum Gravity space time foam

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Production and acceleration mechanisms

Energy Dependent time delays

$$\Delta t_{\text{meas}} = \Delta t_{\text{int}} + \Delta t_{\text{LIV}} + \dots$$

Propagation effect
Varies with source distance

Source intrinsic effect
Do not vary with distance

Tests with keV-GeV
GRB, AGN, PSR data

AGN **Modeling**
for now purely leptonic

$$\Delta t_{\text{meas}} \sim 0 \text{ s/TeV}$$

$$\mathcal{O}(-100 \text{ s/TeV}) < \Delta t_{\text{int,mod}} < \mathcal{O}(100 \text{ s/TeV})$$

$$\Delta t_{\text{LIV}} \sim 0 \text{ s/TeV}$$

Lags strongly correlated in X and gamma
SIE → a new way to constrain models

* $E_{\text{QG}} > E_{\text{P}} \sim 10^{19} \text{ GeV}$ * $E_{\text{QG}} > 10^{17} \text{ GeV}$

Need to be tested with more sources up to TeV energies
→ CTA

Need to be compared with data and extended to GRBs
→ CTA

Need for population studies

Joint Working Group
H.E.S.S./MAGIC/VERITAS/LST I

Joint Working Group
LPNHE/LUTh

Combined constraints