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Searching for Lorentz violation with astrophysical sources : review, problems, and prospects

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A possible violation of Lorentz Invariance (LIV) appeared in the late 90s as a striking prediction of some models developed with the goal to provide a full theory of Quantum Gravity (QG). Since then, several ways to probe quantum spacetime at the Planck scale from high-energy gamma-ray observations of distant sources have been followed and provided stringent limits on the energy scale of QG.
In this talk, the latest results obtained from observations of Gamma-Ray Bursts (GRBs), flaring Active Galactic Nuclei (AGNs) and pulsars (PSRs) will be briefly reviewed. Then, focusing on the search for energy-dependent time-delays with flaring AGNs, the main problem encountered in this kind of analysis will be emphasized. Then, efforts on-going to solve this issue will be discussed and put in context with the beginning of the Cherenkov Telescope Array (CTA) operations in the next few years.

Content of the contribution

Experiment

Author: BOLMONT, Julien (LPNHE Paris)

Co-author: Dr PERENNES, Cédric (LPNHE Paris)

Presenter: BOLMONT, Julien (LPNHE Paris)

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