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Assessing SWGO Sensitivity to Lorentz Invariance Violation through Transparency Studies

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This work presents a sensitivity study exploring the capability of the planned Southern Wide-Field Gamma-Ray Observatory (SWGO)—a future water Cherenkov detector array to be built in Chile and designed to probe gamma rays up to the PeV scale—enabling studies such as the search for potential signatures of Lorentz Invariance Violation (LIV). Focusing on transparency studies, we simulate the gamma-ray flux from selected astrophysical sources and model their spectra under both standard special relativity and a quadratic subluminal LIV scenario. The analysis is based on a specific SWGO array configuration and incorporates the corresponding instrument response functions. By comparing the simulated fluxes to the projected detector sensitivity, we assess the potential of SWGO to constrain LIV-induced spectral anomalies.

Working Group

WG2 - High Energy QG Experiment

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