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Constraints on quantum gravity from fast VHE gamma-ray flares of AGN

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Abstract content

A number of models of quantum gravity violate Lorentz invariance and predict an energy dependence of the speed of light, leading to a dispersion of signals at high energies that travel over cosmological distances. Limits on the dispersion from short-duration substructures observed in soft gamma-rays emitted by GRBs at cosmological distances have provided interesting bounds on this violation of Lorentz invariance. The bright and fast flares observed by the Cherenkov experiment H.E.S.S. from the blazar PKS 2155-304 during the summer of 2006 provide very tight constraints, especially for high-order terms and dispersion relations with an energy dependence that is steeper than linear. We present spectral timing analysis from this event, derive limits on the dispersion and discuss limits on the violation of Lorentz invariance.

If this papers is presented for a collaboration, please specify the collaboration

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Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 4 (HE part 1), pages 749-752

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