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The measurement of the expansion rate of the Universe from gamma-ray attenuation

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The extragalactic background light (EBL) contains fundamental cosmological and galaxy evolution information. Very high energy observations of extragalactic sources, such as blazars, can be used to extract this information because of the pair-production interaction between gamma-ray and EBL photons. We present (almost) simultaneous broad-band data of a dozen BL Lacs that allow us to make the first statistically significant detection of the cosmic gamma-ray horizon (CGRH), which is a measure of how far gamma-ray photons of different energies can travel through the Universe due to EBL attenuation. From a comparison of our CGRH detection with an EBL model built from multiwavelength data taken with deep galaxy surveys, we conclude that there is no significant amount of light escaping to galaxy surveys, at least, in the low redshift Universe. This CGRH detection also allow us to present an independent and novel technique aimed at measuring the expansion rate of the Universe from gamma-ray observations.

Collaboration

– not specified –

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