The first skymap of the extragalactic background light from gamma-ray spectra, a new window on cosmological anisotropies

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Extragalactic gamma-ray sources have been proven to be great probes to measure the extragalactic background light (EBL) over a large frequency range and for various redshifts. However, our knowledge of the amplitude and distribution of EBL spatial anisotropies is still mostly uncharted territory. Thanks to more than a decade of gamma-ray observations with the space telescope Fermi-LAT and more than two decades of ground-based Cherenkov telescope operations, we now have gamma-ray spectral measurements of hundreds of extragalactic sources, mostly blazars, that efficiently constrain the EBL opacity. This study presents an EBL analysis based on Fermi (4FGL-DR3 and 3FHL) catalogs and archival very-high-energy spectra from ground-based Cherenkov observatories from the new catalog STeVECat. By using this exhaustive sample of gamma-ray spectra, we build the first-ever full skymap of EBL opacity from gamma-ray observations. We discuss its implications on probing for large-scale EBL anisotropies.