Modeling and Constraining the Extragalactic Background Light

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— The extragalactic background light (EBL) from the near infrared (IR) through the visible and extending into the ultraviolet (UV) is thought to be dominated by starlight. This is the most important energy range for interacting with the TeV photons from distant sources, such as blazars and gamma-ray bursts and producing electron-positron pairs, thus absorbing the high energy photons. Direct measurement of the EBL is difficult due to contamination by foreground zodiacal and Galactic light. Gamma-ray observations of blazars with Atmospheric Cherenkov telescopes may be used to put upper limits on the EBL, and models taking into account observations of luminosity densities may elucidate the problem. We model the starlight component of the EBL by integrating over cosmic time and including post-main sequence evolution, exploring various combinations of star formation rates and initial mass functions, and comparing our models with results of luminosity density measurements. Our modeling results indicate a starlight EBL that is very close to the minimum found from observations of galaxy counts.

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