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Gamma-ray opacity and the high-redshift UV background

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The UV-optical photon background is closely related to the cosmological star formation history. I will present recent estimates of this background based on semi-analytic models of galaxy formation and evolution. Observations of extragalactic gamma-ray sources provide a test of UV and IR background fields, through attenuation of gamma rays due to photon-photon pair-production interactions. GeV scale emission from high-redshift gamma-ray bursts (GRBs) can potentially be a valuable probe of the UV background produced by early galaxies. Combined Fermi LAT data on distant blazars and GRBs has already disfavored models with a very high level of background light, and future observations with this instrument and next-generation atmospheric Cherenkov telescopes could provide much stronger limits.

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