Detecting the Attentuation of Blazar Gamma-ray Emission by Extragalactic Background Light with GLAST

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Gamma rays above 10 GeV will interact with optical photons through pair production. Therefore, a large enough sample of high redshift sources of these gamma rays can be used to probe the extragalactic background starlight (EBL) by examining the redshift dependence of the ratio between the flux above 10 GeV and the total gamma-ray flux above 100 MeV. GLAST, the next generation high-energy gamma-ray telescope, will detect thousands of gamma-ray blazars up to redshifts of at least z = 3, with enough angular resolution to optically identify a large fraction of them. We combined recent determinations of the gamma-ray blazar luminosity function, recent calculations of the high energy gamma-ray opacity due to EBL absorption, and projections of the likely configurations of GLAST to produce simulated samples of blazars that GLAST would detect, including their redshifts and fluxes. Our results indicate that these blazars have the potential to be a highly effective probe of the EBL.