

Model for the Redshift and Luminosity Distributions of Gamma-Ray Blazars

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A simple model is used to fit the redshift and luminosity distributions of gamma-ray blazars observed with EGRET. The model consists of collimated relativistic plasma outflows with radiation beamed along the jet axis due to Doppler boosting. The EGRET detection sensitivity is used to assess source detectability, and a range of Doppler factors and intrinsic source luminosities are used to fit the distributions. We consider beaming factors appropriate to synchrotron self-Compton and external Compton scattering scenarios. The integrated background radiation is used to constrain the distributions of source properties. Predictions for the detectability of blazars with GLAST are made. In particular, we argue that GLAST will see a much larger fraction of BL Lacs in its sample than seen by EGRET, in consequence of the stronger cosmological effects on detectability of the more distant flat spectrum quasars.