

## Astrophysics &gt; High Energy Astrophysical Phenomena

# The Cosmological Evolution of Blazars and the Extragalactic Gamma-Ray Background in the Fermi Era

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(Submitted on 31 Dec 2009)

The latest determination of the extragalactic gamma-ray background (EGRB) radiation by Fermi is compared with the theoretical prediction of the blazar component by Inoue & Totani (2009; hereafter IT09). The Fermi EGRB spectrum is in excellent agreement with IT09, indicating that blazars are the dominant component of the EGRB, and contributions from any other sources (e.g., dark matter annihilations) are minor. It also indicates that the blazar SED (spectral energy distribution) sequence taken into account in IT09 is a valid description of mean blazar SEDs. The possible contribution of MeV blazars to the EGRB in the MeV band is also discussed. In five total years of observations, we predict that Fermi will detect ~1200 blazars all sky down to the corresponding sensitivity limit. We also address the detectability of the highest-redshift blazars. Updating our model with regard to high-redshift evolution based on SDSS quasar data, we show that Fermi may find some blazars up to  $z \sim 6$  during the five-year survey. Such blazars could provide a new probe of early star and galaxy formation through GeV spectral attenuation signatures induced by high-redshift UV background radiation.

Comments: 2009 Fermi Symposium, Washington, D.C., Nov. 2-5, eConf Proceedings C091122

Subjects: **High Energy Astrophysical Phenomena (astro-ph.HE)**; Cosmology and Extragalactic Astrophysics (astro-ph.CO)

Cite as: [arXiv:1001.0103v1](#) [astro-ph.HE]

## Submission history

From: Yoshiyuki Inoue [[view email](#)]

[v1] Thu, 31 Dec 2009 16:05:42 GMT (45kb)

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