The plots above normalized to the current total number of observed GRBs per year from BATSE in the >100 MeV band for the first 1.5 days trigger time.

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Estimate of the number of GRBs per year GLAST will see based on measured EGRET/BATSE fluence ratios

- We use the fluence ratio between EGRET (100 MeV – 5 GeV) and BATSE (>20 keV) from the 5 bursts detected by EGRET spark chamber (Dingus 1995) and BATSE to determine the typical ratio of fluences in the BATSE/GBM band (>20 keV) and the EGRET/GLAST band (>100 MeV).

1. GRB 910503: f = 1.7%
2. GRB 910601: f = 2.8%
3. GRB 930311: f = 15%
4. GRB 940217: f = 0.2-2%
5. GRB 940301: f = 3.4%

Average: f = 5%

- We use BATSE 4B fluence distribution (Omodei 2005), -2 photon spectrum in EGRET/GLAST range (Dingus and Catelli 1997), and the effective area of both the EGRET and GLAST to estimate the number of GRBs GLAST should observe per year for different values of the fluence ratio ρ = 10%, 5%, 1%.

Results from the fit:

- We find that the comoving rate density of GRB sources exhibits positive evolution to z = 5, inconsistent with the shape of the star formation rate given from measurements of the blue and UV luminosity density (SFR2 & SFR4)
- The mean intrinsic beaming factor of GRBs is found to range from ~0.0625 ph/cm*s, and we can use our model to predict the integral size distribution of the BATSE GRB distribution within the statistical error bars.
- The size distribution of the Swift GRBs will extend to much lower values, ~0.0625 ph/cm*s, and we can use our model to predict the peak flux size distribution to fit the Swift data.

What assumptions do we impose to resolve the redshift discrepancy?

- The range of the jet opening angle is between 2.8° – 40°, with the corrected γ-ray mean energy release value of 4x10^51 ergs.
- The mean intrinsic beaming factor of GRBs is found to range from ~0.0625 ph/cm*s, and we can use our model to predict the integral size distribution of the BATSE GRB distribution within the statistical error bars.
- The size distribution of the Swift GRBs will extend to much lower values, ~0.0625 ph/cm*s, and we can use our model to predict the peak flux size distribution to fit the Swift data.

More Results!

- Our model predicts that for a fluence ratio ρ = 5%, there will be ≈ 130 (≈ 35) GRBs/yr full-sky from which the GLAST LAT would detect at least 5 photons with energy > 100 MeV (> 1 GeV).
- Our analysis shows that GRBs give very little (<< 1%) contribution to the diffusive extragalactic γ-ray background.