GRBs with GLAST and Swift
Numerology

GBM expects ~215 bursts/year
LAT ~50 bursts/year

GBM is ~9 sr (LAT 2.4 sr)
BAT is 2 sr (partially coded)

So for GBM-BAT coincidences we expect
215 yr\(^{-1}\) \times (2 \text{ sr} \div 9 \text{ sr}) \approx 48 \text{ yr}^{-1} \approx 4/\text{month} (~1/\text{month in LAT FoV})
Expect BAT to see all the GBM bursts that are in its FOV.

We currently see ~1/month coincident with WIND/Konus and
~1-2/month coincident with Suzaku/WAM.

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Examples of joint fits with Konus and WAM

WAM: Shield for Suzaku HXD -- 100 keV -- 5 MeV

GRB 06117
Jointly observed with Swift/BAT and Suzaku/WAM

GRB 051008
Jointly observed with Swift/BAT and WIND/Konus

Konus: Scintillator detectors -- 10 keV -- 10 MeV

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Importance of extended energy range

Most GRBs have $E_{\text{peak}}$ above BAT energy range

Figure from Y. Kaneko et al 2006, ApJS 166, 298
Need to determine validity of $E_{\text{peak}}$ relations for Swift/GLAST bursts

Swift doesn’t see jet breaks, but we do have redshifts for ~40% of bursts, so we can determine $E_{\text{iso}}$.

Figure from G. Ghirlanda et al 2004, ApJ 616, 331
Possibility for very broad coverage

With LAT high energy detection could cover 16 orders of magnitude

z = 1.314
Conclusions

✓ Swift and GLAST to both operate for ≥ 3 years

✓ Expect ~3 coincident bursts per month with GBM.

✓ Swift/BAT team has developed experience with joints fits with Konus and Suzaku/WAM.

✓ Can constrain $E_{\text{peak}}$ for all coincident bursts and use redshift to determine burst luminosity, etc.

✓ Some bursts will have simultaneous detections from R band to > 1 GeV.

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