Swift Observation of GRB 090712

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1 Introduction

BAT triggered on GRB 090712 on 2009 July 12 at 03:51:05 UT (Trigger 357072) (Holland, *et al.*, GCN Circ. 9659). This was a long burst with $T_{90} = 145 \pm 52$ s. *Swift* did not slew to this burst due to a Sun constraint, so there were no follow-up observations with *Swift*'s narrow-field instruments. Our best position is the refined BAT location, RA, Dec (J2000.0) = 70.°097, +22.°525, which corresponds to

$$\begin{aligned} \text{RA (J2000.0)} &= 04^{\rm h}40^{\rm m}23.^{\rm s}2 \\ \text{Dec (J2000.0)} &= +22^\circ 31' 29'' \end{aligned}$$

with an uncertainty of 1.′6 (radius, 90% containment, including systematics).

GRB 090712 was also observed by the *Fermi* Gamma-Ray Burst Monitor, which found that the spectrum is best fit by a power law with an exponential cutoff. The power-law index is 0.68 ± 0.13 and the cutoff energy is $E_{\rm peak} = 505 \pm 101$ keV.

The Burst Advocate for this burst is Stephen Holland (`Stephen.T.Holland@nasa.gov`). Please contact the Burst Advocate by e-mail if you require additional information regarding *Swift* follow-up observations of this burst. In extremely urgent cases, after trying the Burst Advocate, you can contact the *Swift* PI by phone (see the *Swift* ToO Web site for information: `http://www.swift.psu.edu/too.html`).

2 BAT Observation and Analysis

Using the data set from $T - 239$ to $T + 355$ s we find the following. The BAT ground-calculated position is RA, Dec (J2000.0) = 70.°097, +22.°525, which corresponds to

$$\begin{aligned} \text{RA (J2000.0)} &= 04^{\rm h}40^{\rm m}23.^{\rm s}2 \\ \text{Dec (J2000.0)} &= +22^\circ 31' 29'' \end{aligned}$$

with an uncertainty of 1.′6, (radius, systematic + statistical errors, 90% containment). The partial coding was 67%.

The mask-weighted light curves (Fig. 1) show a mostly smooth peak startin at about $T - 160$ s, peaking at T_0, and ending at about $T + 170$ s. T_{90} (15–350 keV) $= 145 \pm 52$ s (estimated error including systematics).

The time-averaged spectrum from $T - 99.1$ to $T + 157.8$ s is best fit by a simple power-law model. The power-law index of the time-averaged spectrum is 1.33 ± 0.11. For this model the total fluence in the 15–150 keV band is $(4.0 \pm 0.3) \times 10^{-6}$ erg cm^{-2}. The 1-s peak photon flux measured from $T - 6.10$ s in the 15–150 keV band is 0.9 ± 0.2 ph cm^{-2} s^{-1}. All the quoted errors are at the 90% confidence level.

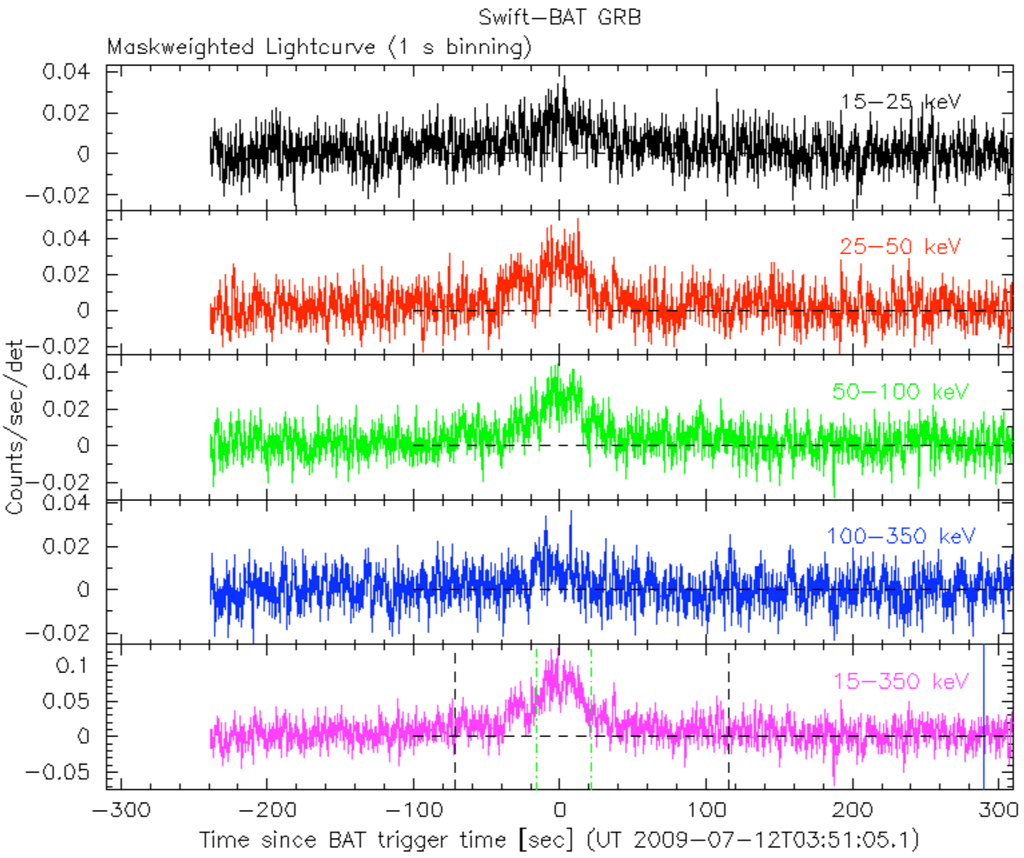

Figure 1: BAT light curves. The mask-weighted 1 s light curves in the four individual plus total energy bands. The units are count s^{-1} illuminated-detector^{-1} and T_0 is 03:51:05.1 UT.