

## Swift Observations of GRB 070911

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### 1 Introduction

BAT triggered on GRB 070911 at 05:57:44.47 UT (trigger=290624) (Krimm, *et al.*, *GCN Circ.* 6777). This was a 1.024 sec rate-trigger on a long burst with  $T_{90} = 162$  sec. Because the Swift operations team was still in the process of resuming normal operations, there were no automatic follow-up observations by the XRT or UVOT. Following a commanded slew, XRT began follow-up observations at  $T + 14.5$  hours. UVOT did not observe this burst. Our best position is the XRT location  $\text{RA}(J2000) = 25.8094^\circ$  (01h43m14.26s),  $\text{Dec}(J2000) = -33.4842^\circ$  ( $-33^\circ 29' 03.1''$ ) with an error of 6 arcsec (90% confidence, including boresight uncertainties).

### 2 BAT Observation and Analysis

Using the data set from  $T - 299$  to  $T + 300$  sec, further analysis of BAT GRB 070911 has been performed by Swift-BAT team (Palmer, *et al.*, *GCN Circ.* 6778). The BAT ground-calculated position is  $\text{RA}(J2000) = 25.819^\circ$  (1h43m16.5s),  $\text{Dec}(J2000) = -33.484^\circ$  ( $-33d29'3''$ )  $\pm 1.5$  arcmin, (radius, systematic and statistical, 90% containment). The partial coding was 88% (the bore sight angle was  $21.24^\circ$ ).

The mask tagged light curve (Fig.1) starts to rise at around  $T - 70$  sec and continues above baseline until  $T + 160$  sec. The burst contains multiple strong peaks in a cluster from  $T - 5$  to  $T + 55$  sec, then a drop in flux and another cluster of peaks from  $T + 85$  to  $T + 145$  sec. The first cluster of peaks has a harder spectrum than the second.  $T_{90}(15 - 350\text{keV})$  is  $162 \pm 10$  sec (estimated error including systematics).

The time-averaged spectrum from  $T - 73.0$  to  $T + 158.8$  sec is best fit by a simple power-law model. The power law index of the time-averaged spectrum is  $1.72 \pm 0.04$ . The fluence in the 15-150 keV band is  $1.2 \pm 0.02 \times 10^{-5} \text{erg cm}^{-2}$ . The 1-sec peak photon flux measured from  $T + 36.13$  sec in the 15-150 keV band is  $3.9 \pm 0.2 \text{ph cm}^{-2} \text{sec}^{-1}$ . All the quoted errors are at the 90% confidence level.

### 3 XRT Observations and Analysis

Using the data from the first nine orbits of XRT data of GRB 070911 (6.8 ksec in Photon Counting mode), the refined XRT position is  $\text{RA}(J2000) = 25.8094^\circ$  (01h43m14.26s),  $\text{Dec}(J2000) = -33.4842^\circ$  ( $-33^\circ 29' 03.1''$ )  $\pm 6$  arcsec (90% confidence, including boresight uncertainties).

The 0.3 – 10 keV light curve (Fig.2) shows a decline with a slope of  $1.47 \pm 0.04$ . Fitting the data from  $T + 300$  ks with a simple power law model we find a steeper decay index  $\alpha = -1.9 \pm 0.2$ .

The 0.3-10.0 keV X-ray spectrum with 6.8 ks of integration time, is well fit by an absorbed power law with a photon index of  $2.2 \pm 0.3$  and a total column density of  $N_H = (1.3 \pm 0.5) \times 10^{21} \text{cm}^{-2}$  ( $\chi^2/\text{dof} = 0.8/6$ ). The Galactic column density in the direction of the source is  $2.4 \times 10^{20} \text{cm}^{-2}$  (Dickey & Lockmann 1990). The 0.3-10 keV observed flux is  $1.9 \times 10^{-12} \text{erg cm}^{-2} \text{s}^{-1}$  (unabsorbed:  $2.8 \times 10^{-12} \text{erg cm}^{-2} \text{s}^{-1}$ ). We note that the XRT CCD is now operating with a raised substrate voltage, and thus has a different gain. The new gain is not yet well calibrated, and so our spectral results are only preliminary.

## 4 UVOT Observation and Analysis

Since the UVOT was not operating at the time of this burst, there are no UVOT observations.

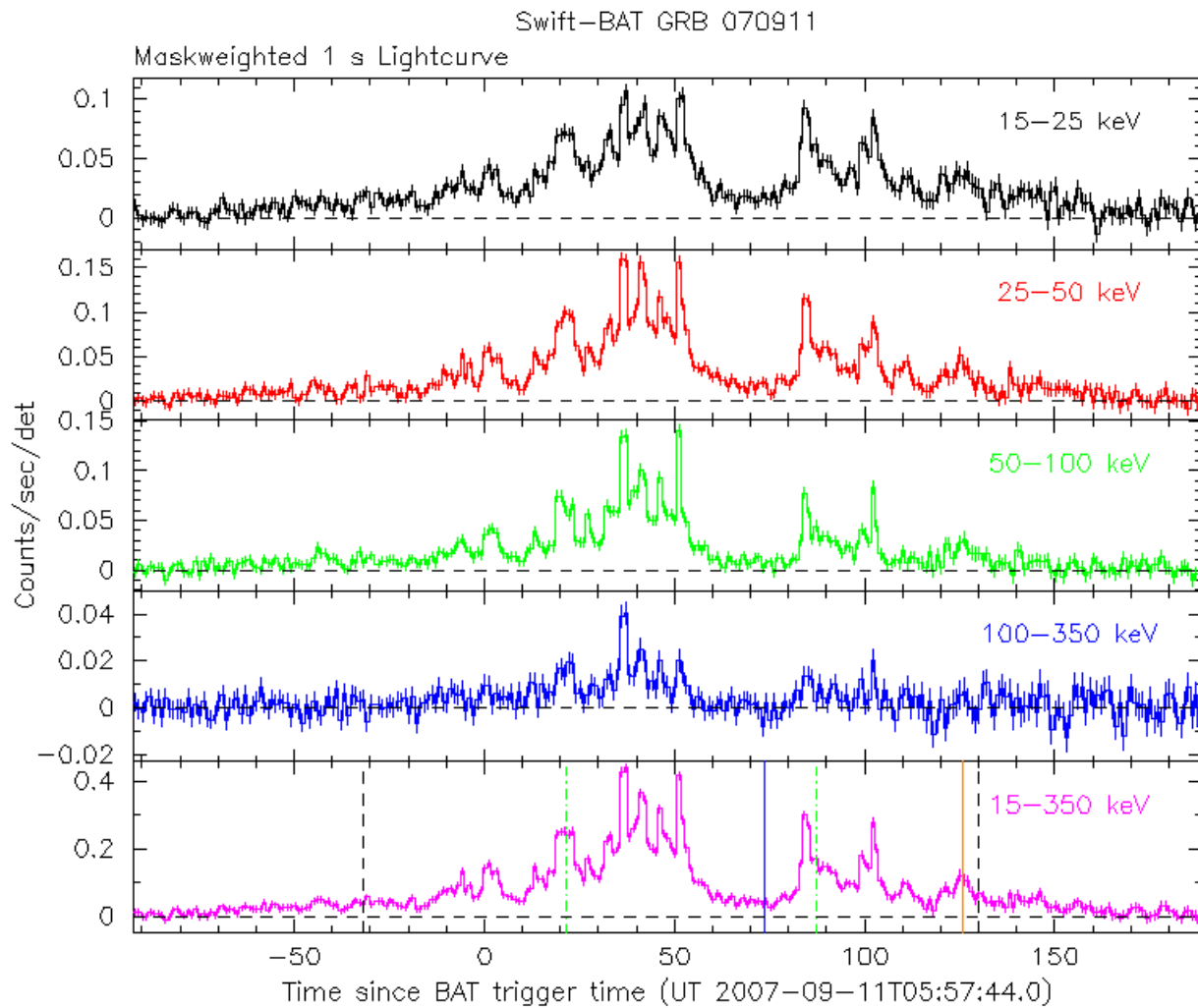


Figure 1: BAT Light curve. The mask-weighted light curve in the 4 individual plus total energy bands. The units are counts/sec/illuminated-detector (note illum-det = 0.16cm<sup>2</sup>).

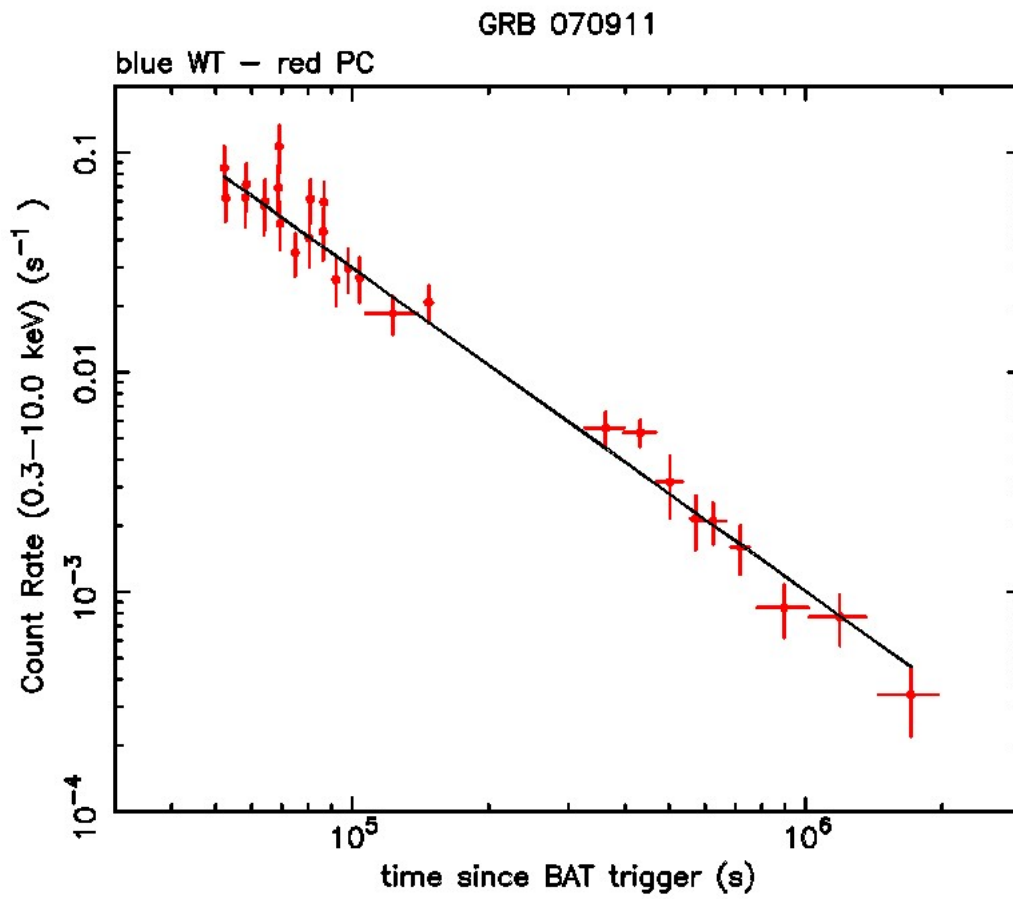


Figure 2: XRT Lightcurve. Counts/sec in the 0.3-10 keV band in the Photon Counting mode (red).