

Swift Observation of GRB 071101

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1 Introduction

BAT triggered on GRB 071101 at 17:53:46 UT (Trigger 295779) (McBreen, *et al.*, *GCN Circ.* 7030). This was rate-trigger on a burst with $T_{90} = 9 \pm 1$ sec. Swift slewed to this burst immediately and XRT began follow-up observations at $T + 85$ sec, and UVOT at $T + 82$ sec. Our best position is the XRT location $RA(J2000) = 48.1772deg$ (03h12m42.53s), $Dec(J2000) = +62.5002deg$ (+62d30'00.7") with an error of 7 arcsec (90% confidence, including boresight uncertainties).

2 BAT Observation and Analysis

Using the data set from $T - 240$ to $T + 962$ sec, further analysis of BAT GRB 071101 has been performed by Swift team (Ukwatta *et al.*, *GCN Circ.* 7039). The BAT ground-calculated position is $RA(J2000) = 48.179deg$ (03h12m42.9s), $Dec(J2000) = +62.524deg$ (+62d31'27") with an uncertainty of 2.7 arcmin, (radius, systematic and statistical, 90% containment). The partial coding was 99% (the bore sight angle was 12.73 deg).

The mask-weighted light curves (Fig.1) shows a single peak starting at a low level at $T - 20$, then spiking at $T + 1$ sec and ending at $T + 10$ sec. $T_{90}(15 - 350keV)$ is 9 ± 1 sec (estimated error including systematics).

The time-averaged spectrum from $T - 1.9$ to $T + 6.1$ sec is best fitted by a simple power law model. This fit gives a photon index of 2.25 ± 0.58 , ($\chi^2 = 52.1$ for 59 d.o.f.). For this model the total fluence in the 15 – 150 keV band is $(7.6 \pm 2.6) \times 10^{-8} ergs/cm^2$ and the 1-sec peak flux measured from $T + 0.07$ sec in the 15 – 150 keV band is $0.4 \pm 0.1 ph/cm^2/sec$. All the quoted errors are at the 90% confidence level.

3 XRT Observations and Analysis

Using the first 13 ksec of data of GRB 071101, the refined XRT position for GRB 071101 is $RA(J2000) = 48.1772deg$ (03h12m42.53s), $Dec(J2000) = +62.5002 deg$ (+62d30'00.7") with an error radius of 7 arcsec (90% confidence, including boresight uncertainties) (Pagani *et al.*, *GCN Circ.* 7034, Godet *et al.*, *GCN Circ.* 7038).

The 0.3 – 10 keV light curve (Fig.2) shows a decline with a slope of 0.9 ± 0.2 (Evans *et al.*, 2007).

The X-ray spectrum using the full 36 ksec of data can be modeled with an absorbed power-law with spectral indices of $3.0_{-1.2}^{+1.5}$ and a total absorbing column of $NH = (2.2_{-1.2}^{+2.0}) \times 10^{22} cm^{-2}$. The Galactic value is $5.7 \times 10^{21} cm^{-2}$ in the direction of the burst. The average observed (unabsorbed) flux over 0.3 – 10 keV for this spectrum (spanning a time of 85 sec – 92 ksec seconds after the trigger) is 1.0×10^{-13} (8.9×10^{-13}) $ergs/cm^2/sec$.

4 UVOT Observation and Analysis

The UVOT began observing the field of GRB 071101 82 *sec* after the initial BAT trigger (McBreen *et al.*, *GCN Circ.* 7030).

UVOT took a finding chart exposure of 100 seconds with the White (160-650 nm) filter starting 82 seconds after the BAT trigger. No afterglow candidate has been found in the initial data products. The 2.7'x2.7' sub-image covers 25% of the BAT error circle. The typical 3-sigma upper limit has been about 18.5 mag. The 8'x8' region for the list of sources generated on-board covers 100% of the BAT error circle. The list of sources is typically complete to about 18 mag. No correction has been made for the large, but uncertain extinction expected.

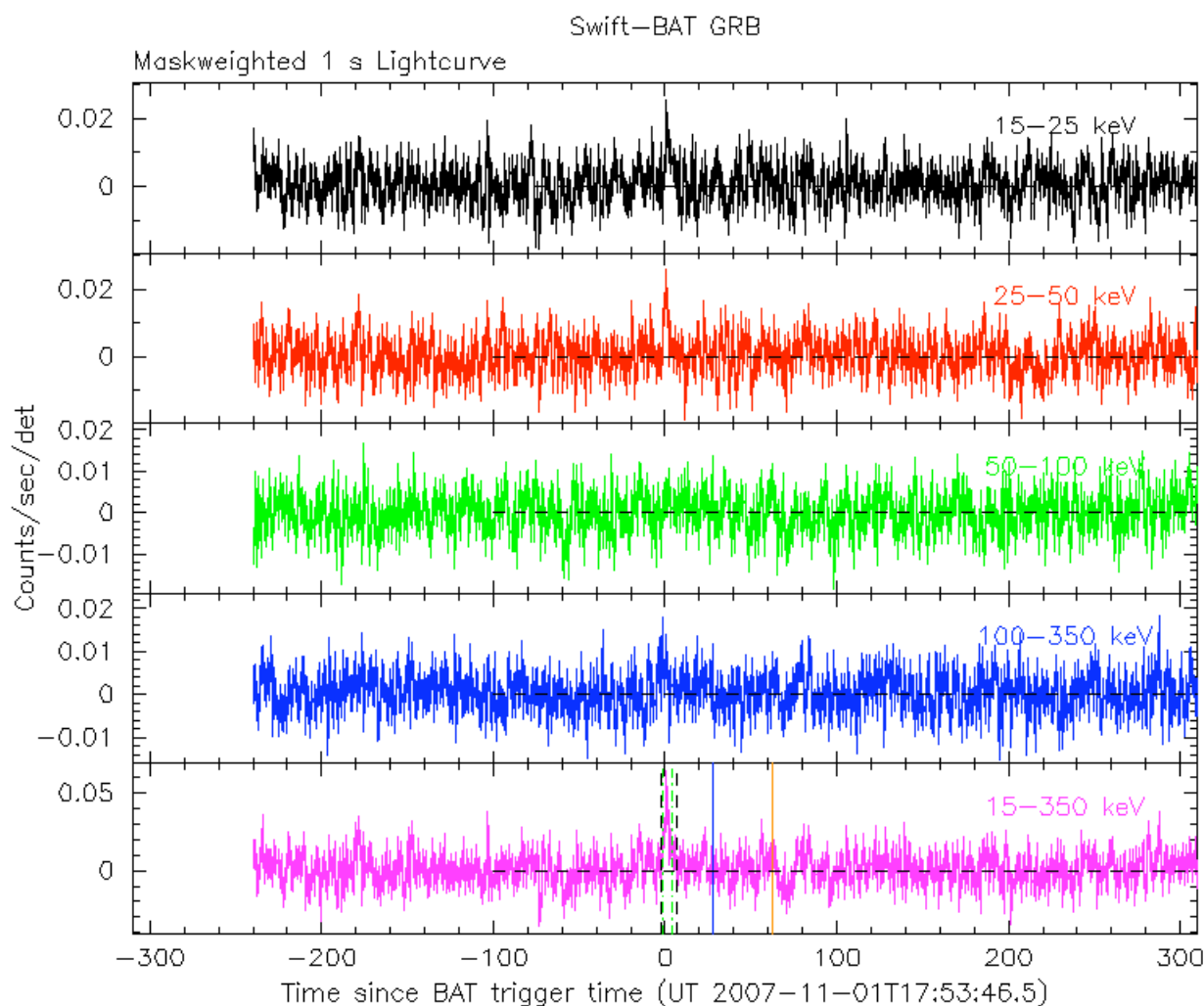


Figure 1: BAT Light curve. The mask-weighted light curve in the 4 individual plus total energy bands. The units are counts/sec/illuminated-detector and T_0 is 17:53:46 UT.

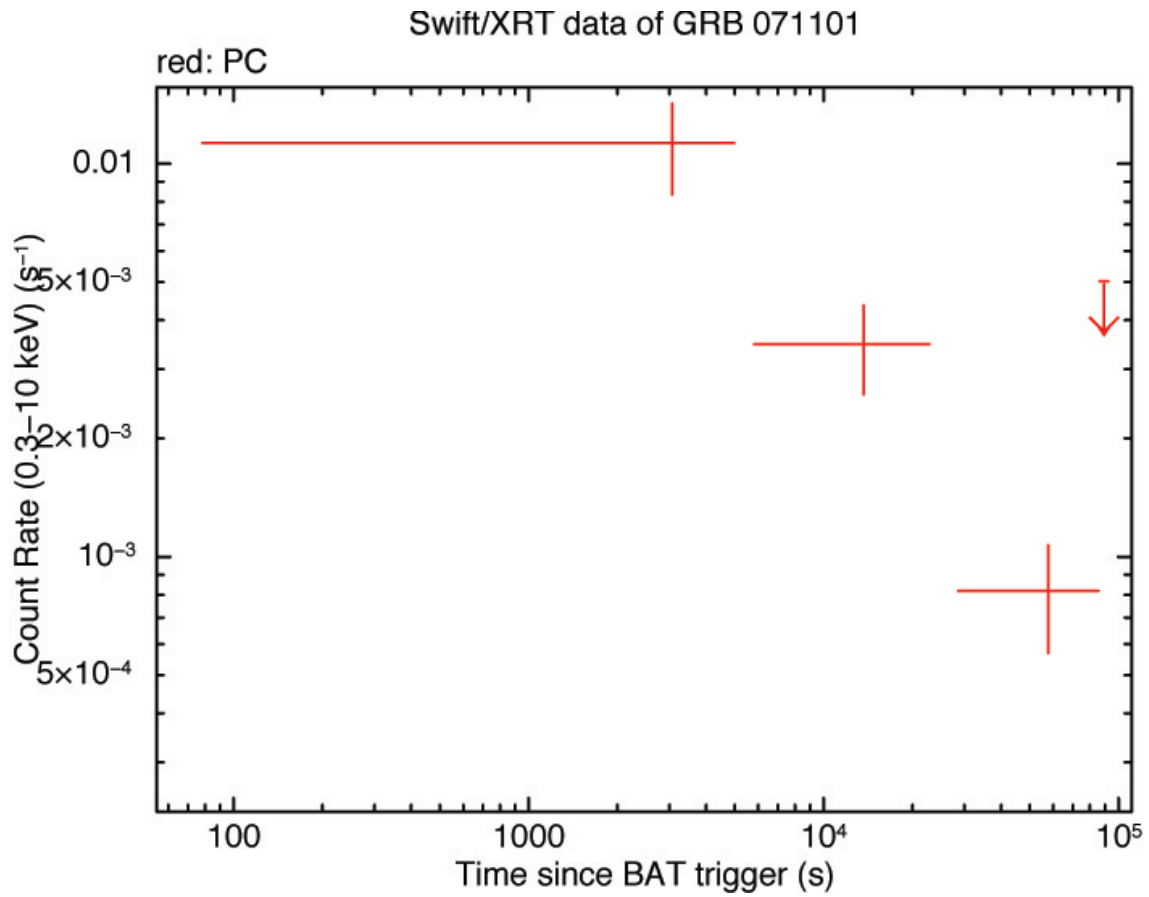


Figure 2: XRT Lightcurve. Counts/sec in the 0.3-10 keV band: Photon Counting mode (red). The approximate conversion is 1 count/sec $\sim 1.1 \times 10^{-10}$ ergs/cm²/sec.