Swift Observations of GRB 081025

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1 Introduction

Swift BAT Slew Survey (BATSS) triggered on GRB 081025 at 08:22:02 UT (Trigger 020089) (Copete *et al.*, *GCN Circ.* 8409). XRT observations began at $T + 74.5$ ks and discovered a faint X-ray source within the BATSS error circle (Mao *et al.*, *GCN Circ.* 8411). UVOT began ToO observations $T + 20.7$ hours after the trigger and did not detect any new source at the XRT position (Schady *et al.*, *GCN Circ.* 8414).

Konus-Wind detected the GRB 081025 at 08:23:06 UT and the burst light curve had a multipeaked structure (Golenetskii *et al.*, *GCN Circ.* 8412). Suzaku WAM observed the GRB 081025 at 08:23:07 UT, presenting a multipeaked structure of light curve (Kira *et al.*, *GCN Circ.* 8445). Fermi GBM triggered GRB 081025 at 08:23:05 UT and a multipeaked structure was also shown in the light curve (von Kienlin & Bissaldi, *GCN Circ.* 8483).

The Russian-Turkish telescope RTT150 observed the GRB 081025 approximately 11.5 hours after the trigger and it did not detect any new source. The limit magnitude of g band is about 22 (Khamitov *et al.*, *GCN Circ.* 8418). TLS Tautenburg 1.34m Schmidt telescope observed the field of GRB 081025 and no new source was detected. The 2-sigma limit magnitude of Ic is 21.5 and Rc is 22.5 (Kann *et al.*, *GCN Circ.* 8420).

2 BAT Observation and Analysis

Using the data set from T+9 to T+129 sec (T is here defined as the beginning of the Swift slew maneuver), we report further analysis of BATSS GRB 081025 (Copete *et al.*, *GCN Circ.* 8409).

Using the the previously reported position, the partial coding averaged over the event was 70%. This is 2.1 arcmin from the XRT afterglow candidate (Mao *et al.*, *GCN Circ.* 8411).

The mask-weighted light curve (Fig. 1) features a main peak starting at T+63 sec lasting 12 sec, followed in succession by 3 peaks, a 1.4 sec long peak at T+77 sec, a 4.2 sec long peak at T+83 sec, and a 2.2 sec long peak at T+88 sec. T90 (15-350 keV) is 23 ± 2 sec (estimated error including systematics).

The time-averaged spectrum from T+63 to T+89 sec is best fit by a simple power-law model. The power law index of the time-averaged spectrum is 1.12 ± 0.05. The fluence in the 15-150 keV band is $(1.9 \pm 0.2) \times 10^{-6} erg\ cm^{-2}$. The 1-sec peak photon flux measured from T+68 sec in the 15-150 keV band is $1.3 \pm 0.2\ ph\ cm^{-2}\ s^{-1}$. All the quoted errors are at the 90% confidence level.

The results of the analysis will be available at `http://gcn.gsfc.nasa.gov/notices_s/BATS0021/BA/`.

3 XRT Observations and Analysis

Swift-XRT began observing the field of the Swift-BATSS GRB 081025 74.5 ks after the trigger. In 2.9 ks of Photon Counting mode data, we detect a single uncatalogued source within the BAT error circle at a position of RA(J2000)=16 21 27.90 and Dec(J2000)= +60 28 27.4 with an uncertainty of 6.7 arcsec (radius, 90% containment). The source lies 125 arcsec from the BAT centroid and has a count rate of $3.4 \times 10^{-3} count/s$ during this observation.

Swift-XRT re-observed the Swift-BATSS GRB 081025 from 12.9 days after the burst with an exposure time of 6.9 ks. We did not detect any source in the field. The 3-sigma upper limit is $1.7 \times 10^{-3} count/s$. We compared this result with the previous observation. Thus we confirm that XRT observed the fading afterglow of GRB 081025.

Detailed light curves in both count rate and flux units are available in both graphical and ASCII formats at `http://www.swift.ac.uk/xrt_curves/`.

4 UVOT Observation and Analysis

The UVOT began ToO observations of the Swift-BATSS GRB 081025 20.7 hours after the trigger (Schady & Mao, *GCN Circ.* 8414). We do not detect any new source in any of the individual or co-added images down to the following 3-sigma upper limits:

Filter	$T_{start}(hrs)$	Exp(s)	3-sigma UL
b	21.2	130	> 19.44
u	20.9	885	> 20.18
uvw1	20.7	1015	> 20.60
uvm2	22.2	886	> 20.63

Table 1: Magnitudes from UVOT observations.

The values quoted above are on the UVOT Photometric System (Poole et al, 2008, MNRAS 383,627). They are not corrected for the expected Galactic extinction corresponding to a reddening of E(B-V)=0.02 mag in the direction of the burst (Schlegel *et al.*, 1998).

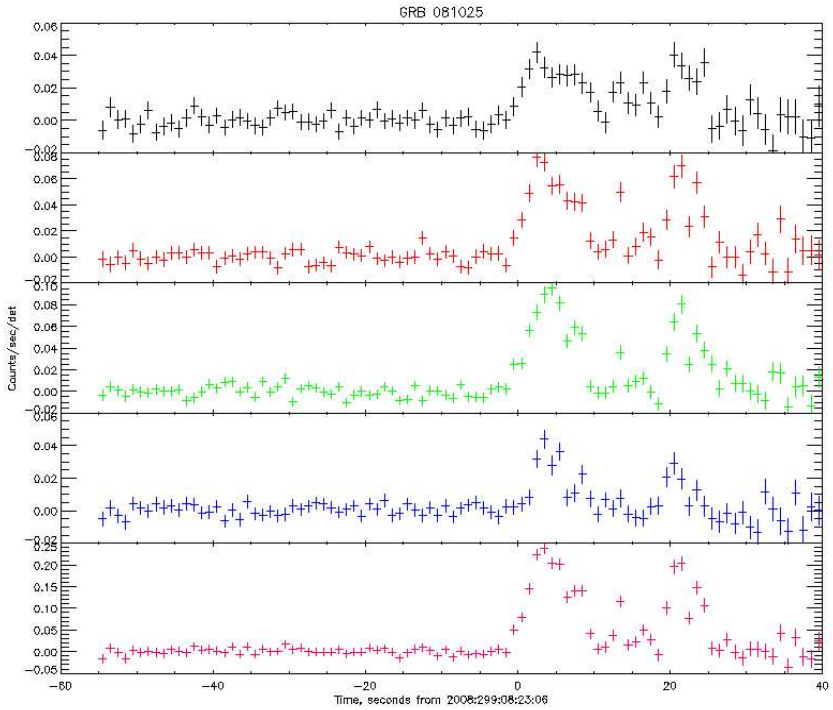

Figure 1: BAT Lightcurve. The mask-weighted light curve in the 4 individual plus total energy bands: 15-25 keV (black), 25-50 keV (red), 50-100 keV (green), 100-350 keV (blue), 15-350 keV (magenta).

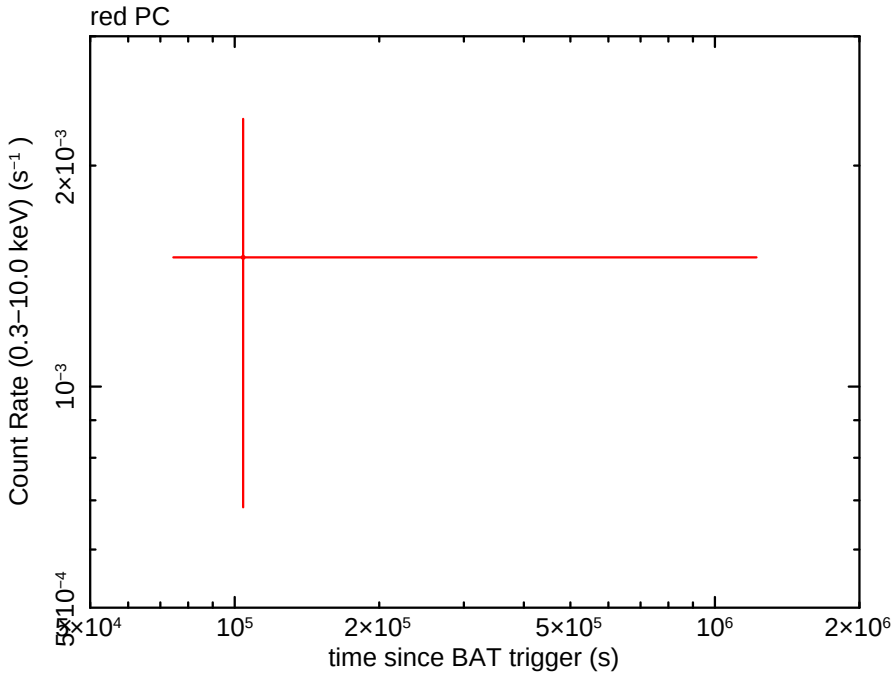

Figure 2: XRT Lightcurve in the 0.3-10 keV band.