

## Swift Observations of GRB 061110B

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### 1. INTRODUCTION

At 21:58:45 UT, the Swift Burst Alert Telescope (BAT) triggered and located GRB 061110B (trigger=238174). The GCN Notices for this burst were delayed (~10 min) because this trigger occurred during a Malindi downlink pass, during which the TDRSS data stream is buffered on-board the spacecraft. Because of an Earth limb constraint, the spacecraft did not slew promptly to the BAT position, and so there were no immediate XRT or UVOT Notices. The XRT and UVOT began observing this field at 22:49 UT. Our best location is the XRT position: RA,Dec(2000) = 21 35 40.42,+06 52 34.0.

### 2) BAT OBSERVATION AND ANALYSIS

Using the data set from T-239 to T+963 sec from recent telemetry downlinks, we report further analysis of BAT GRB 061110B (trigger #238174) (Fox, et al., GCN Circ. 5800). The BAT ground-calculated position is RA,Dec = 323.912, 6.872 deg {21h 35m 38.9s, 6d 52' 20.0"} (J2000) +/- 1.6 arcmin, (radius, sys+stat, 90% containment). The partial coding was 100%. The off-axis angle was 15.4 deg.

The mask-weighted lightcurve has several peaks starting at ~T-18 sec out to ~T+38 sec. There is ongoing low-level emission out to at least T+172 sec at which time the spacecraft slewed to a planned target and the burst location slewed out of the BAT FOV. T90 (15-350 keV) is at least 128 +/- 5 sec (estimated error including systematics).

The time-averaged spectrum from T-16.5 to T+127.9 is best fit by a simple power-law model. The power law index of the time-averaged spectrum is 1.03 +/- 0.16. The lower limit to the fluence in the 15-150 keV band is 1.3 +/- 0.1 x 10<sup>-6</sup> erg/cm<sup>2</sup>. The 1-sec peak photon flux measured from T+3.26 sec in the 15-150 keV band is 0.4 +/- 0.1 ph/cm<sup>2</sup>/sec. All the quoted errors are at the 90% confidence level.

### 3. XRT OBSERVATION AND ANALYSIS

We have analyzed the first three orbits of Swift XRT data of GRB 061110B. The X-ray position was determined from the XRT image using the new teldef file: RA,Dec(2000) = 21 35 40.42,+06 52 34.0 with an 4.2" error (90% confidence). This position is 2" away from the initial position given by Kennea et al. (GCN Circ 5805) and 0.1" away from the optical position reported by Melandri et al. (GCN Circ 5804).

The X-ray light curve (Fig 2) can be fitted by a single power law decay slope alpha=1.35+/-0.10. The flux at 4ks after the burst was 2.4e-12 ergs/s/cm<sup>2</sup>.

The spectral analysis shows a typical GRB afterglow spectrum with a power law photon index Gamma=1.9+/-0.4. The absorption column density is consistent with the Galactic value (4.83e20 cm<sup>-2</sup>).

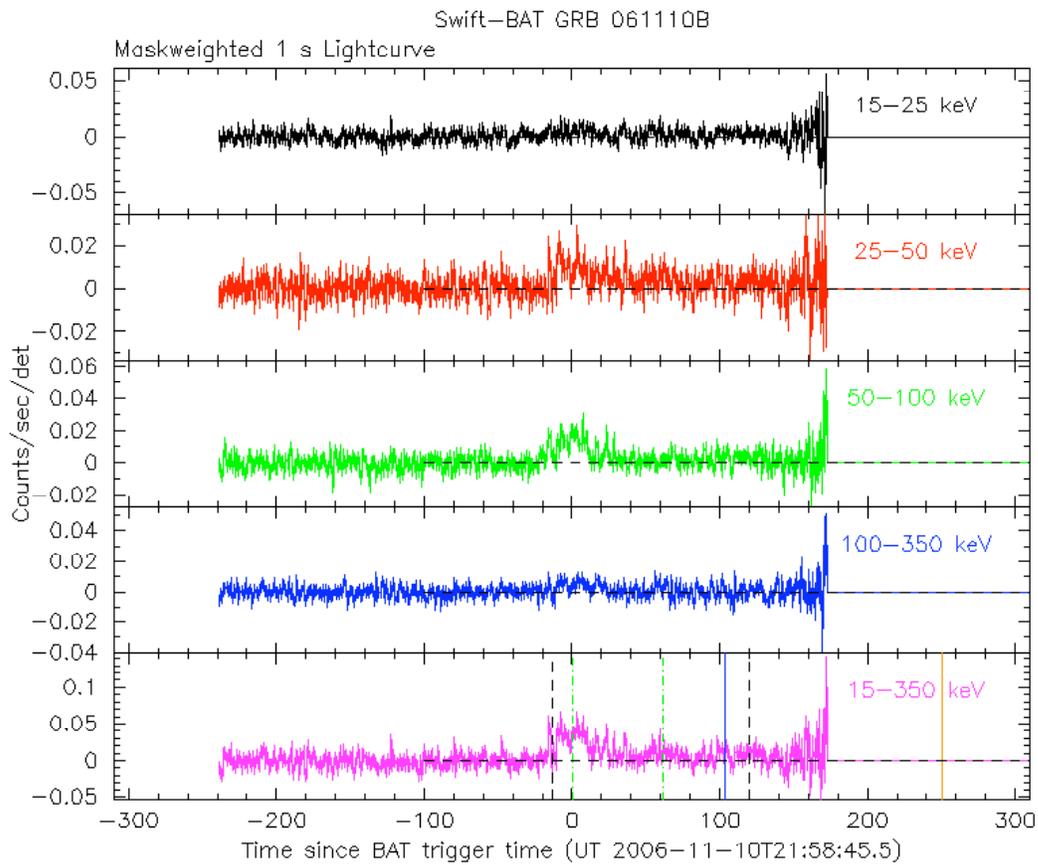
### 4. UVOT OBSERVATION AND ANALYSIS

The Swift/UVOT began observing the field of GRB 061110b at 22:49:14 on 2006-11-10 UT, ~50 minutes after the BAT trigger (Fox et al., GCN Circ 5800). No new source was detected within the XRT error circle (Grupe et al., GCN Circ 5811) or at the afterglow position reported by Melandri et al. (GCN Circ 5804) in coadded images in any filter down to the following 3-sigma magnitude upper limits:

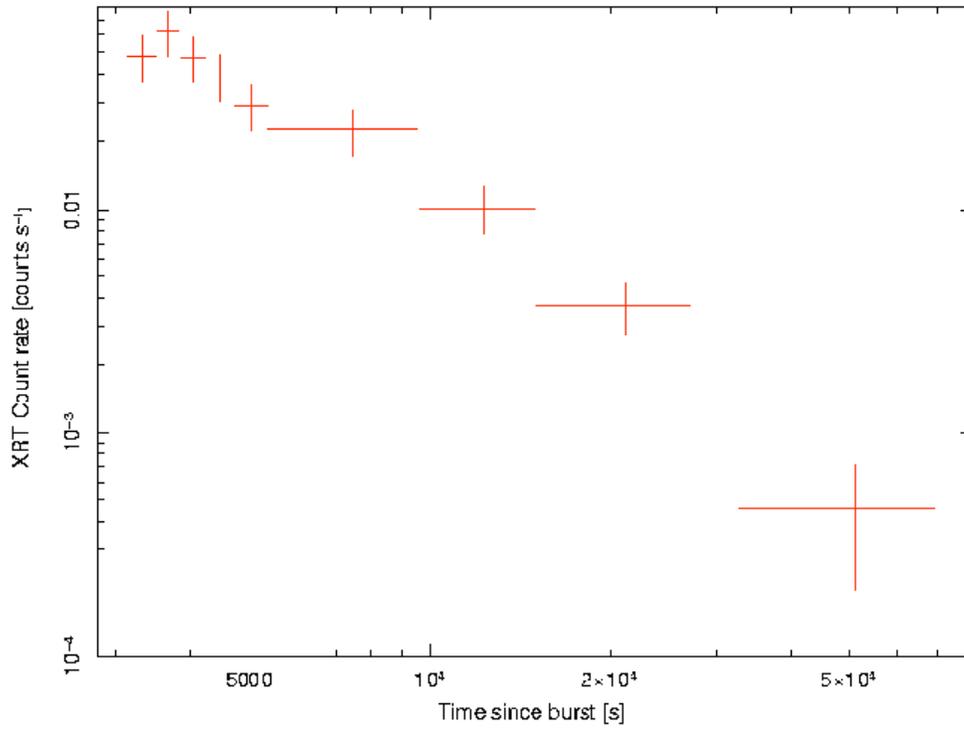
GCN Report 14.1 12Nov06 02:15 UT

Filter	T_mid (s)	Exp. (s)	3-sigma UL
V	12256	1438	20.14
B	19296	2815	21.57
U	18864	2164	21.08
UVW1	18288	1928	20.58
UVM2	18192	1279	20.61
UVW2	13376	1737	20.99
White	15952	2494	21.03

T\_mid is the mid time of the coadded exposure with respect to the BAT trigger. These upper limits are not corrected for Galactic extinction  $E(B-V) = 0.04$ .



**Fig.1:** BAT Lightcurve. The light curve in the 4 individual plus total energy bands. The increased variance approaching T+70 sec is due to the burst location moving out of the edge of the BAT FOV (the percent coding is going to zero); it is not due to any o-going burst activity.



**Fig. 2:** The XRT light curve of the first 60 ks after GRB 061110B (27.0 ks total exposure time). The last data point is 4.5e-4 counts/s. The decay slope at the end is 2.04 $\pm$ 0.13.