

## Swift Observation of GRB 071006

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### 1 Introduction

At 06:41:40 UT on 2007 October 6, the Swift Burst Alert Telescope (BAT) triggered on GRB 071006 (trigger=293250, Cummings, GCN Circ. 6858). The burst began just before a preplanned slew, and no source was found automatically onboard. Since the burst was detected on the ground, there are no prompt XRT data. The UVOT is currently offline. The best Swift position is therefore that determined from the BAT detection, RA(J2000)= 335.282 deg, Dec(J2000)= -23.154 deg, which is RA(J2000) 22<sup>h</sup>21<sup>m</sup>10.4<sup>s</sup>, Dec(J2000) = -23<sup>d</sup> 08' 47", with an uncertainty of 2 arcmin (radius, 90% containment). Swift observations of GRB 071006 are complete and no NFI observations are planned.

No detection from ground-based facilities has been reported.

The long GRB 071006 triggered Konus-Wind (Golenetskii et al., GCN Circ. 6867) at  $T_0 = 24133.617$  s UT (06:42:13.617). The burst started at  $T - T_0 \sim 35$  s and had a duration of  $\sim 60$  s. As observed by Konus-Wind the burst had a fluence of  $(2.08^{+0.11}_{-1.25}) \times 10^{-5}$  erg cm<sup>-2</sup>, and a 256-ms peak flux measured from  $T_0 + 1.264$  s of  $(2.66^{+0.45}_{-1.51}) \times 10^{-6}$  erg cm<sup>-2</sup> s<sup>-1</sup> (both in the 20 keV–2 MeV energy range). The spectrum integrated over the main peak (from  $T_0$  to  $T_0 + 8.448$  s) is well fitted (in the 20 keV–2 MeV range) by a power law with exponential cutoff model:  $dN/dE \propto E^{-\alpha} * e^{(-E*(2-\alpha)/E_p)}$  with  $\alpha = 0.84^{+0.22}_{-0.26}$  and  $E_p = 334^{+95}_{-61}$  keV ( $\chi^2 = 62.2/60$  dof). The fluence of this part is  $(8.52^{+0.47}_{-4.63}) \times 10^{-6}$  erg cm<sup>-2</sup>.

### 2 BAT Observation and Analysis

At 06:41:40 UT on 2007 October 6, the Swift Burst Alert Telescope (BAT) triggered on GRB 071006 (trigger=293250, Cummings, GCN Circ. 6858). The burst began just before a preplanned slew, and no source was found automatically onboard. A source was found during later ground analysis, at a location of RA(J2000)= 335.282 deg, Dec(J2000)= -23.154 deg, which is RA(J2000) 22<sup>h</sup>21<sup>m</sup>07.7<sup>s</sup>, Dec(J2000) = -23<sup>d</sup> 09' 14", with an uncertainty of 2 arcmin (radius, 90% containment, including systematic uncertainty). The BAT light curve shows two small peaks on top of a gradual rise to a large peak at  $T + 32$  s. The total duration is about 80 s. The spectrum appears to be of average hardness for a long GRB.

Using the data set from  $T_0$  to  $T + 13$  s (which covers only one of the minor peaks in the burst), Markwardt et al. (GCN Circ. 6875) report a position RA(J2000)= 335.294 deg, Dec(J2000)= -23.147 deg, which is RA(J2000) 22<sup>h</sup>21<sup>m</sup>10.4<sup>s</sup>, Dec(J2000) = -23<sup>d</sup> 08' 47", with an uncertainty of 1.9 arcmin, (radius, sys+stat, 90% containment). The partial coding was 6%.

There is no mask-weighted light curve for this event. The raw light curve based on the whole detector rate shows 3 peaks of increasing size, the two minor peaks at  $T - 2$  and  $T + 10$  s, and the main peak at  $T + 32$  s. The two smaller peaks are each about 6 seconds long and the larger about 30 seconds long. All the peaks are roughly symmetric.  $T_{90}$  is  $50 \pm 10$  s (estimated error including systematics).

The time-averaged spectrum from  $T + 0$  to  $T + 13$  s is best fit by a simple power-law model. The power law index of the time-averaged spectrum is  $0.75 \pm 0.21$ . The fluence in the 15–150 keV band is  $(1.4 \pm 0.2) \times 10^{-7}$  erg cm<sup>-2</sup>.

The 1-s peak photon flux occurs where no event data is available. By comparing the portions of the raw light curve and the mask-weighted light curve that do overlap, we extrapolate a peak flux of  $13 \pm 3$

$\text{ph cm}^{-2} \text{s}^{-1}$  in the 15–150 keV band. Similarly, we extrapolate a total fluence of  $(1.0 \pm 0.3) \times 10^{-6}$   $\text{erg cm}^{-2}$ . All the quoted errors are at the 90% confidence level.

### 3 XRT Observations and Analysis

Since the burst was detected on the ground, there are no prompt XRT data.

### 4 UVOT Observation and Analysis

The UVOT was not operating at the time of GRB 071006, therefore there are no UVOT observations.

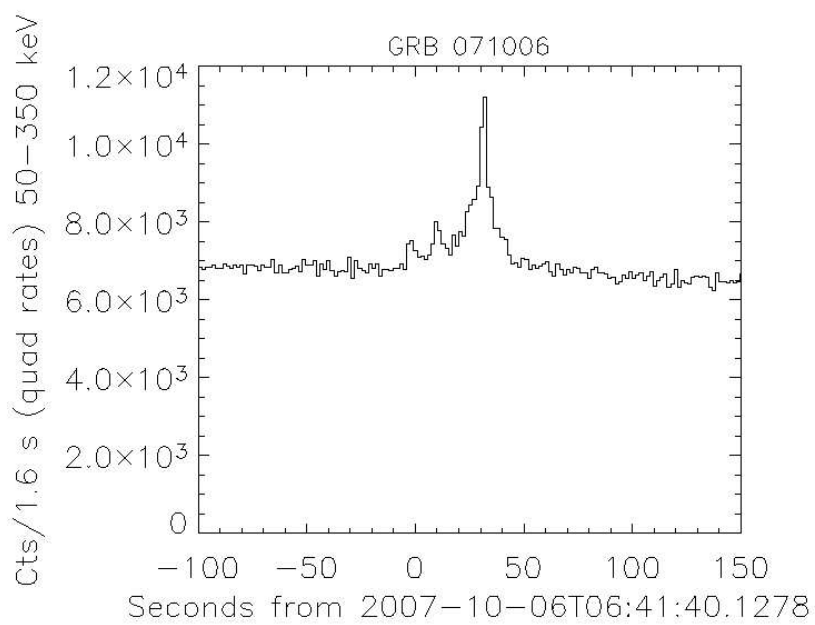


Figure 1: BAT Light curve.