Swift Observation of GRB 110207A
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report for the Swift Team

1 Introduction

BAT triggered on GRB 110207A at 11:17:20 UT on the 7th of February 2011 (Trigger 444912) (Littlejohns, et al., GCN Circ. 11658). This was a long burst with a $T_{90}(15-350 \text{ keV}) = 80.3 \pm 16.2 \text{ s}$. The best position available for this burst is the BAT ground-calculated position, RA(J2000) = 12°540 (00h 50m 09s.5), Dec(J2000) = $-10^\circ.790 (-10^\circ 47^\prime 23^\prime.8) \pm 1.3$ (90% confidence) (Palmer, et al., GCN Circ. 11664). Initially, Swift could not slew on to the target, due to a Moon constraint, which lasted until 13:20 UT on the 8th of February. Further observations were restricted as the source position went in to a Sun constraint at 04:17 UT on the 11th of February. 5.0 ks of XRT data were taken once the source was out of the Moon constraint, but no source was found within the BAT error circle to a 3-$\sigma$ upper limit of $2.0 \times 10^{-3}$ cts.s$^{-1}$.

This burst was also observed by the Fermi GBM, which obtained a $T_{90}(50 - 300 \text{ keV}) = 39 \text{ s}$ (von Kienlin, GCN Circ. 11671). Additionally, Suzaku WAM triggered on the burst, measuring a $T_{90}(50 - 5000 \text{ keV}) = 2.9 \text{ s}$ for a lightcurve with multiple peaks (Tsai, et al., GCN Circ. 11695). Ground-based Observations were performed by MASTER (Yurkov, et al., GCN Circ. 11660) and TAROT (Klotz, et al., GCN Circ. 11667), but only upper limits were found in each case.

2 BAT Observation and Analysis

Using the data set from $T - 240$ to $T + 962 \text{ s}$, further analysis of the BAT data for GRB 110207A has been performed by Swift team (Palmer, et al., GCN Circ. 11664). The BAT ground-calculated position is RA(J2000) = 12°540 (00h 50m 09s.5), Dec(J2000) = $-10^\circ.790 (-10^\circ 47^\prime 23^\prime.8) \pm 1.3$, (radius, systematic and statistical, 90% containment). The partial coding was 100%.

The masked-weighted light curves (Fig.1) from $T - 20.1$ to $T + 138.3 \text{ s}$ show seven short peaks, the first starting at approximately $T - 0.1 \text{ s}$ and the last at $T + 20 \text{ s}$ with a long decay extending out to approximately $T + 100 \text{ s}$. $T_{90}(15 - 350 \text{ keV})$ for this burst is $80.3 \pm 16.2 \text{ s}$ (estimated error including systematics).

The time-averaged spectrum from $T - 0.1$ to $T + 108.3 \text{ s}$ is best fitted by a simple power law model. The power law index of the time-averaged spectrum is $1.30 \pm 0.12$. The fluence in the 15-150 keV band is $1.6 \pm 0.1 \times 10^{-6} \text{ erg.cm}^{-2}$. The one second peak photon flux measured from $T - 0.11 \text{ s}$ in the 15-150 keV band is $1.1 \pm 0.1 \text{ ph.cm}^{-2}.\text{s}^{-1}$. All the quoted errors are at the 90% confidence level.

3 XRT Observations and Analysis

The XRT took 5.0 ks of photon counting mode data between 14:39:12 UT and 21:11:07 UT on the 8th of February, approximately one day after the trigger time. No source was detected within the BAT error circle with a significance of 3-$\sigma$ down to an upper limit of $2.0 \times 10^{-3}$ cts.s$^{-1}$. 
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 = 0.16 cm$^2$) and $T_0$ is 11:17:20.0 UT.