Swift Observations of GRB 060926

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1. INTRODUCTION

BAT triggered on GRB 060926 at 16:48:41 UT (Trigger=231231) (Holland, et al., GCN Circ. 5612). This was a 1.024-sec rate trigger. Swift slewed immediately to this burst, and the XRT & UVOT began making follow-up observations. Our best position is the XRT location: RA,Dec(J2000)=263.9330,+13.0384. The initial UVOT detection of an afterglow was later retracted. This burst has spectroscopic redshift of 3.208 by the MISTICI collaboration (V. D'Elia et al., GCN Circ 5637).

2. BAT OBSERVATION AND ANALYSIS

Using the data set from T-119 to T+183 sec, we report further analysis of BAT GRB 060926 (Holland, et al., GCN Circ. 5612). The BAT ground-calculated position is RA,Dec = 263.925, 13.039 deg {17h 35m 41.9s, 13d 2' 21.5"} (J2000) ± 1.4 arcmin, (radius, sys+stat, 90% containment). The partial coding was 94% (the bore sight angle was 9.1 deg).

The mask-weighted lightcurve (Fig 1) shows a single FRED peak starting at T-1 sec, peaking at T+1 sec, and ending at ~T+10 sec. T90 (15-350 keV) is 8.0 ± 0.1 sec (estimated error including systematics).

The time-averaged spectrum from T-0.1 to T+8.6 sec is best fit by a simple power-law model. The power law index of the time-averaged spectrum is 2.54 ± 0.23. The fluence in the 15-150 keV band is 2.2±0.3 x 10^{-7} erg/cm^2. The 1-sec peak photon flux measured from T+0.38 sec in the 15-150 keV band is 1.1±0.1 ph/cm^2/sec. All the quoted errors are at the 90% confidence level.

3. XRT OBSERVATION AND ANALYSIS

XRT began follow-up observations at T+60 s.

We have analyzed the first three orbits of XRT data on the GRB 060926 (Holland, et al., GCN Circ. 5612). A 4.7 ks Photon Counting mode image provides a refined XRT position: RA,Dec(J2000) = 17h 35m 43.93s, +13d 02' 18.4" with an uncertainty of 5.9" (90% containment, including boresight uncertainties). This is 29.8" away from the center of the BAT refined position (Cummings et al., GCN Circ. 5621). This localization lies 11.3" from the initial XRT position.

The 0.3-10 keV X-ray light curve (Fig 2) during the first orbit shows a flare at T+430s. From the second orbit a power-law decline with a temporal index of -1.4±0.3 is observed.

The X-ray spectrum covering the time period from T+67s to T+878s is well fit by an absorbed power-law with a photon index of 2.1(±0.3) and column density of (2.2±0.9)e21 cm^{-2}. We note the Galactic column density in the direction of the source is 7.3e20 cm^{-2}.

4. UVOT OBSERVATION AND ANALYSIS

The UVOT began observing GRB 060926, 57 seconds after the BAT trigger (Holland et al., GCN Circ 5612). The initial detection of a source at the 4.8- and 4.3-sigma levels in the V- and UVW1- (251 nm) filters, respectively, was later retracted (Roming, et al., GCN Circ 5645).

No optical afterglow is detected at the 3-sigma level in individual or coadded exposures in the UVOT UVW1-, UVW2-, UVM2-, U-, or B-filters. The 3-sigma limiting magnitudes for the coadded images of the UVOT filters are listed below:

Filter	T_range(s)	Exp(s)	Upper Limit (3-sigma)
UVW1	487-11748	1337	20.4
UVW2	551-6405	432	20.1
UVM2	463-10840	1366	20.4
U	511-12283	968	20.8
B	535-6199	422	20.6

where T_range is the start and end times of the coadded exposures. No correction has been made for Galactic reddening along the line of sight (E(B-V) = 0.16).

No images were taken in the White-filter by the UVOT since bright stars were in the field-of-view.

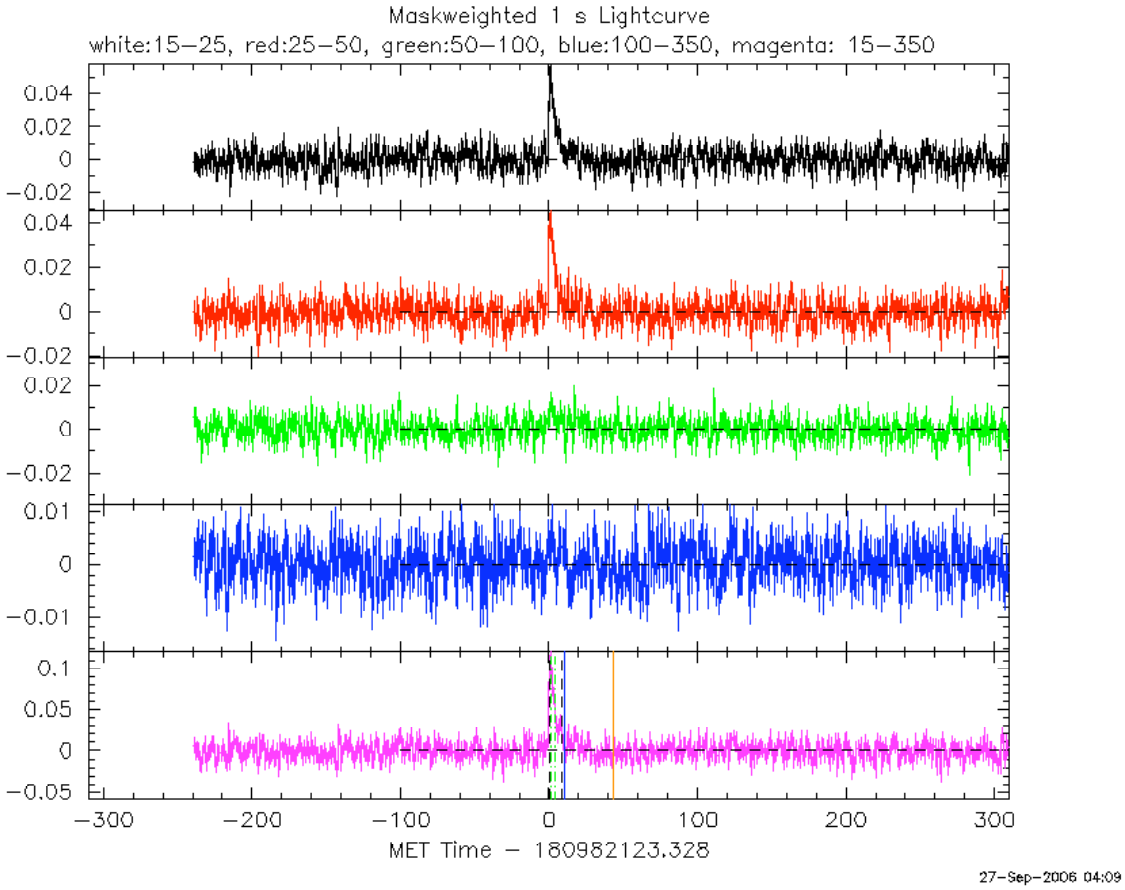

Fig.1: BAT Lightcurve. The mask-weighted light curve in the 4 individual plus total energy bands. The units are counts/sec/illuminated_detector (note illum_det = 0.16 cm^2) and T_zero is 16:48:41 UT.

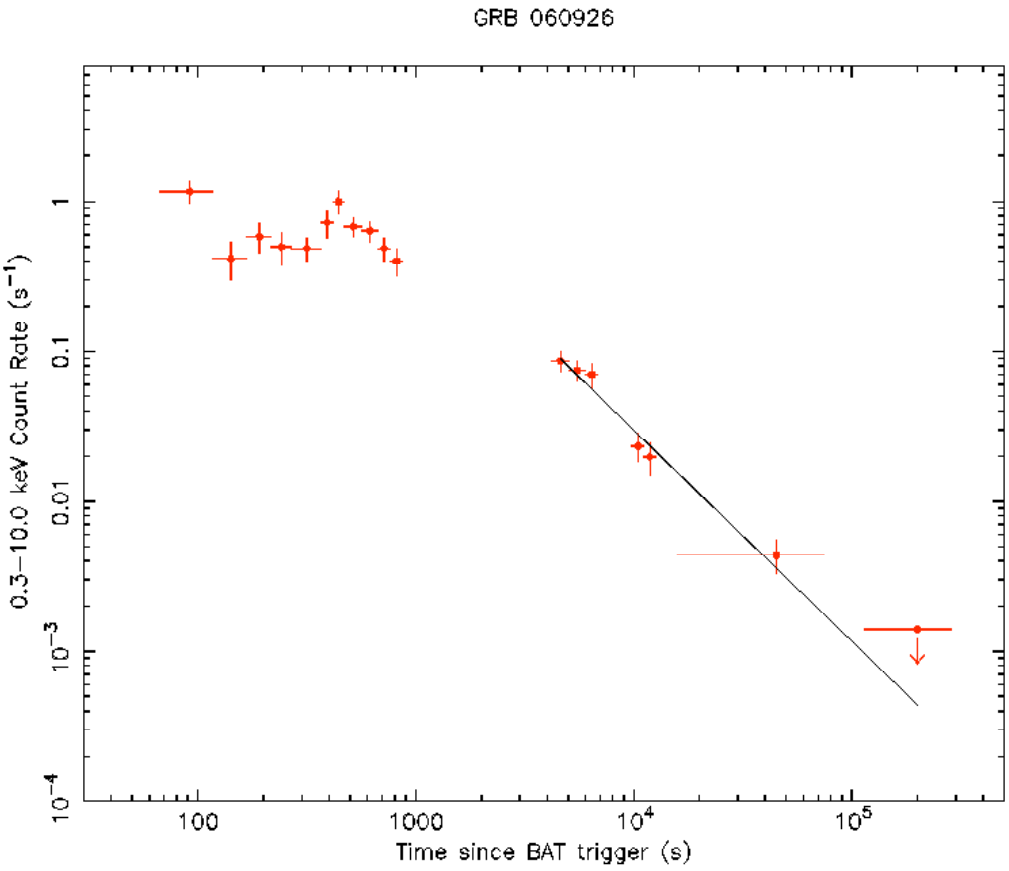

Fig. 2: XRT Lightcurve. There is a flare at T+430 sec. From the second orbit a power-law decline with a temporal index of -1.4±0.3 is observed. The conversion factor from counting rate to flux for XRT is dependent on spectrum, but is approximately, on average, 1 cnt/s = 2×10^{-11} erg/cm^{2}s.