Swift Observations of GRB 110918A
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1 Introduction

GRB 110918A was not a BAT trigger. It triggered Konus-WIND at 21:27:02.856 UT (Golenetskii, et al., GCN Circ. 12362). The burst was reported as the most intense long GRB event in the history of Konus-Wind observations since November, 1994 (Figure 1). GRB110918A was also observed by INTEGRAL (SPI-ACS), Konus-Wind, Mars Odyssey (HEND), and MESSENGER (GRNS) at 21:26:57 UT. At the time of the burst, Swift was in the SAA and earth-occulted, and Fermi was Earth-occulted. Using the Interplanetary Network (IPN; Hurley, et al., GCN Circ. 12357), a position was determined and Swift was able to observe and localize this burst. XRT began follow-up observations at \( T + 107.4 \) ksec.

The best position is from an Isaac Newton Telescope observation (Tanvir, et al., GCN Circ. 12365) at a location RA(J2000) = 32\(^{\circ}\).539125 (02h10m09.39s), Dec(J2000) = −27\(^{\circ}\).105444 (−27d06′19.6″) with an error of 0.5 arcsec.

Using the GMOS-N spectrograph on Gemini-N, Mauna Kea on 20-Sep-2011 12:51 UT, Levan, et al., (GCN Circ. 12368) determined a spectroscopic redshift of \( z = 0.982 \). This was later confirmed by Ugarte Postigo, et al., (GCN Circ. 12375) with the 10.4m GTC telescope at Roque de los Muchachos Observatory (Spain), who reported \( z = 0.984 \pm 0.001 \).

2 XRT Observations and Analysis

Using the data from the first 2.5 ks of XRT observations of GRB 110918A (all in Photon Counting mode), the refined XRT position is RA(J2000) = 32\(^{\circ}\).53860 (02h10m9.27s), Dec(J2000) = −27\(^{\circ}\).10610 (−27d06′22.0″) ± 1.5 arcsec (90% confidence, including boresight uncertainties).

The 0.3 – 10 keV light curve obtained over 48 days of observations (Fig.2) shows a continual steady decline with a slope of 1.629 ± 0.037. The second-to-last point dips below the decay extrapolation at \( 4 \times 10^{-4} \) ct s\(^{-1} \), but the final point is again consistent with the extrapolation. Thus there is no clear evidence for a jet break.

The first segment of the X-ray lightcurve can be modeled with an absorbed power-law with spectral index of 2.12 ± 0.26. The \( N_H \) column density is in excess of galactic, 1.5 ± 0.7 \( \times 10^{21} \) cm\(^{-2} \). The galactic column density in this direction is 1.7 \( \times 10^{20} \) cm\(^{-2} \) (Kalberla et al. 2005). The average observed (unabsorbed) flux over 0.3 – 10 keV for this spectrum is \( 8.3 \times 10^{-12} \) (1.2 \( \times 10^{-11} \)) ergs/cm\(^2\)/sec.

3 UVOT Observation and Analysis

The UVOT began observing the field of GRB 110918A 153272 s after the IPN Trigger. (Siegel et al., GCN Circ. 12371). A source consistent with the XRT position was detected in the initial UVOT exposures. Observations are summarized in Figure 3 and early observations in Table 1.
Figure 1: Konus-WIND Light curve in the full energy range (top) and in three energy bands (bottom) (from Golenetskii, et al., GCN Circ. 12362)
Figure 2: XRT Lightcurve. Counts/sec in the 0.3-10 keV band all in Photon Counting mode. The approximate conversion is 1 count/sec = \( \sim 2.9 \times 10^{-11} \) ergs/cm\(^2\)/sec.

Figure 3: UVOT Lightcurve in the White filter. This shows a power law decay with index of approximately -1.15
Table 1: Magnitudes from the initial UVOT observations. The magnitudes in the table are not corrected for the Galactic extinction due to the reddening of E(B-V) = 0.02 in the direction of the burst (Schlegel et al. 1998).

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