

Swift Observations of GRB 120202A

S. T. Holland (STScI), V. D'Elia, G. Stratta (ASDC), and R. Starling (Leicester) for the Swift Team

1 Introduction

GRB 120202A was detected by *INTEGRAL*/IBAS on 2012 Jan 2 at 21:40:17 UT (Mereghetti et al. 2012). This was a long burst with a duration of ~ 100 s (Mereghetti et al. 2012). *Swift* was commanded to observe this burst starting approximately 9.4 hr after the IBAS trigger. The best *Swift* position is the UVOT-enhanced XRT location, RA, Dec (J2000.0) = 203°50360, +22°77387, which corresponds to

$$\begin{aligned} \text{RA (J2000.0)} &= 13^{\text{h}}34^{\text{m}}00^{\text{s}}.86 \\ \text{Dec (J2000.0)} &= +22^{\circ}46'25''.9 \end{aligned}$$

with an uncertainty of $4''.8$ (radius, 90% containment, including systematics). No optical afterglow was detected by UVOT.

WHT, Gemini-North, UKIRT, and GROND found a faint source inside the XRT error circle, but did not find any evidence for variability. They also found a second, weakly variable, source $6''.5$ NE of the centre of the XRT error circle (Tanvir et al. 2012; Schady et al. 2012). They tentatively identify this as the afterglow.

2 XRT Observation and Analysis

The *Swift*/XRT began observing GRB 120202A ~ 33.9 ks after the IBAS trigger and detected a faint source inside the IBAS error circle. Using 4.5 ks of Photon Counting (PC) mode data and one UVOT image the astrometrically corrected X-ray position (using the XRT–UVOT alignment and matching UVOT field sources to the USNO-B1.0 catalogue) is RA, Dec (J2000.0) = 203°50360, +22°77387 (Holland et al. 2012), which corresponds to

$$\begin{aligned} \text{RA (J2000.0)} &= 13^{\text{h}}34^{\text{m}}00^{\text{s}}.86 \\ \text{Dec (J2000.0)} &= +22^{\circ}46'25''.9 \end{aligned}$$

with an uncertainty of $4''.8$ (radius, 90% containment). It is not known if this source is fading.

3 UVOT Observation and Analysis

The *Swift*/UVOT observed of the field of GRB 120202A starting at 33.9 ks after the IBAS trigger. No optical afterglow consistent with the UVOT-enhanced (Goad et al. 2008) XRT position (Holland et al. 2012) is detected in any of the UVOT exposures. Preliminary $3\text{-}\sigma$ upper limits using the UVOT photometric system (Breeveld et al. 2011) for the coadded exposures are given in Table 1. These upper limits are not corrected for the Galactic extinction due to the reddening of $E_{B-V} = 0.02$ mag in the direction of the burst (Schlegel et al. 1998).

Filter	T_{start}	T_{stop}	Exp(s)	Mag
<i>v</i>	35 727	64 596	485	> 20.0
<i>b</i>	33 899	64 484	2884	> 22.0
white	34 522	64 580	1305	> 22.4

Table 1: UVOT $3\text{-}\sigma$ upper limits for GRB 120202A. T_{start} and T_{stop} are the times, in seconds since the IBAS trigger, of the start and stop of the observations. Exp is the total exposure time.

References

Breeveld et al., 2011, AIP Conf. Proc. 1358, 373

Goad, M. R., et al., 2008, A&A, 492, 873

Holland, S. T., et al., 2012, GCN Circ. 12911

Mereghetti, S., et al., 2012, GCN Circ. 12909

Schlegel, D. J., et al., 1998, ApJS, 500, 525