Follow-up observations from observatories based in Spain.

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Abstract. We present a review of the follow-up observations carried out from observatories located in Spain; Calar-Alto, Izaña and Roque de Los Muchachos. It summarizes the observations carried out by our group for 27 GRBs occurred in the period 1999-2000, spanning from GRB990123 to GRB001007.

1 Introduction

Since the discovery of the GRB optical counterparts in 1997 [26] a great effort in the field has been carried out from many ground-based observatories. Here we present a summary of the optical/IR follow-up observations performed in 1999-2000 from several observatories based in Spain; La Palma, Izaña and Calar Alto (CAHA).

2 Observations and Results

We have performed optical and IR observations in 1999-2000 for many SAX, XTE and IPN GRB error boxes.

For the optical observations we have used the following telescopes: the 1.5OSN, INT, IAC80, JKT, NOT, TCS, 1.23-m CAHA and specially the 2.2-m CAHA Telescope. The observations at JKT, NOT, IAC80 and INT were performed at Spanish time. The CAHA observations were done by means of override programs either at German Time (P.I.: J. Greiner and S. Klose) or Spanish time (P.I.: A.J. Castro - Tirado).

Concerning the IR follow-ups, the observations have been mostly performed from CAHA, which is equipped with IR instrumentation very suitable for GRB follow-ups. Among the IR instruments mounted on the CAHA

Table 1. Summary of the observations performed from Calar Alto, Izaña and La Palma.

Name	OT	Telescope	Filter	Reference
GRB990123	YES	NOT, 2.2m(CAFOS), 1.23m, 3.5m, TCS	BVRIJHK'	[1]
GRB990520	NO	2.2m(CAFOS), 3.5m(OMEGA)	RH	[2]
GRB990704	NO	NOT, IAC80(CCD), 2.2m(CAFOS)	BIR	[3]
GRB991106	NO	INT(WFC), 1.23m(CCD), 1.5OSN(CCD)	RI	[4–6]
GRB991208	YES	INT(WFC), 2.2m(CAFOS), 1.23m(CCD)	BVRI	[7]
GRB991216	YES	2.2m(CAFOS)	VR	[25]
GRB000115	NO	IAC80(CCD), 1.23m(CCD)	BVR	[19]
GRB000301A	NO	1.23m(CCD)	R	—
GRB000301C	YES	1.23m(CCD), 2.2m(CAFOS)	BVRI	[20,23]
GRB000313	NO	1.23m(MAGIC), JKT(CCD)	BVRIK'	[8]
GRB000315	NO	NOT(ALFOSC)	R	—
GRB000408	NO	IAC80(CCD)	R	[18]
GRB000418	YES	1.23m(MAGIC), 3.5m(OMEGA)	JK'	[21]
GRB000424	NO	1.23m(MAGIC)	K'	—
GRB000508B	NO	NOT(ALFOSC)	R	—
GRB000519	NO	1.23m(MAGIC)	JK'	—
GRB000604	NO	2.2m(CAFOS)	R	—
GRB000607	NO	2.2m(CAFOS)	R	—
GRB000615	NO	IAC80(CCD)	R	[22]
GRB000620	NO	2.2m(CAFOS)	R	[14]
GRB000623	NO	2.2m(CAFOS)	R	[15]
GRB000630	YES	2.2m(CAFOS)	R	[17,12]
GRB000830	NO	2.2m(CAFOS)	V	—
GRB000911	NO	2.2m(CAFOS)	R	[24]
GRB000925	NO	2.2m(CAFOS)	R	—
GRB000926	YES	2.2m(CAFOS)	BVRI	[16,13]
GRB000107	YES	IAC80(CCD)	BVR	[9]

telescopes we would like to remark Omega-Cass and Omega-Prime mounted on the 3.5-m Telescope. The field of view (FOV) of Omega-Prime ($6.8' \times 6.8'$) and Omega-Cass (up to $5' \times 5'$) allow to cover SAX (and even IPN) error boxes with single pointings, avoiding inconvenient mosaics. Also the MAGIC IR camera mounted on the 1.23-m Telescope is a very important support of the observations performed at the 3.5-m Telescope, as occurred for the discovery of the GRB000418 counterpart [21].

As it can be seen in Table 1 the most used telescope/instrumentation is the 2.2m(+CAFOS) configuration. The large FOV of CAFOS (diameter of $16'$) is specially useful to cover IPN and XTE error boxes. We have not included in Table 1 the observations carried out by the BOOTES alerting system (see [10]).

3 Conclusion

Among the fifteen optical counterparts discovered in 1999 - 2000 nine were visible from Spain, begin seven of them detected (only GRB990308 and GRB000911 were not detected). Two of these seven afterglows were discovered from CAHA (GRB991208 and GRB000926, this last one co-discovered jointly with the NOT [11]). These numbers show the relevant role that observations from Spain (and specially from CAHA) have played in the GRB field.

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