VLA OBSERVING APPLICATION

A

rcvd:

DEADLINES: 1st of Feb., June., Oct. for next configuration following review
INSTRUCTIONS: Each numbered item must have an entry or N/A
E-MAIL TO: propsoc@nrao.edu (different for some Rapid Response Science)
OR MAIL TO: Director NRAO, 520 Edgemont Rd., Charlottesville, VA 22903-2475

(1) Date Prepared: Dec. 23, 2004

(2) Title of Proposal: SN04D2jz - a new high-redshift type Ic supernova from the Canada-France-Hawaii Legacy Survey, possibly associated with a GRB.

(3) AUTHORS (Add * for new location)	INSTITUTION	E-mail	G/U	Students Only For Thesis?	Ph.D. Year
Avishay Gal-Yam*	Caltech	avishay@astro.caltech.edu			

(4) Related VLA previous proposal number(s):

(5) Contact author for scheduling: Avishay Gal-Yam
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E-mail: avishay@astro.caltech.edu, cc ams@astro.caltech.edu
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(7) Scientific Category: ○ solar system ○ galactic ⊗ extragalactic ○ other:
Rapid Response Science: ○ Known Transient ○ Exploratory ⊗ Target of Opportunity
Joint Proposal: ○ VLA/VLBA ○ VLA/GBT ○ VLA/VLBA/GBT

(8) Configurations (one per column) (A+Pt, A, B, C, D, BnA, CnB, DnC, Any)	A				
(9) Wavelength(s) (400, 90, 20, 6, 3.5, 2, 1.3, 0.7 cm)	3.5 cm				
(10) Time requested (hours)	2				

(11) Type of observation: ⊗ continuum ○ spectroscopy ○ multichannel continuum ○ polarimetry ○ solar
(check all that apply) ○ pulsar ○ high-time resolution ○ Pie Town link ○ other:

(12) Suitable for dynamic scheduling? ⊗ Suitable ○ Unsuitable

(13) ABSTRACT (do not write outside this space)

SN04D2jz was discovered in the course of the Canada-France-Hawaii Legacy Survey on November 19, and follow up spectroscopy using the Keck-I telescope reveals this is a type Ic SN, spectroscopically similar to the famous GRB-associated events SN 1998bw, SN 2003dh and SN 2003lw, at z=0.323. The calibrated optical magnitude of this event is also similar to that of these extremely luminous events. The combination suggests this is quite possibly another SN associated with Gamma-Ray Burst (GRB), and may represents the first detection of a GRB not triggered by high energy space missions. We propose a 2-hour target of opportunity DD observation at 8.5 GHz, to conduct the following simple luminosity experiment, based on the fact the GRB-SNe are approximately 1000 times brighter than non-GRB type Ic SNe. We expect not to detect normal SNe Ic, while a powerful GRB will result in a strong detection. Should this turn out to be a GRB-like event, our observations will demonstrate a new way to investigate the population of cosmic explosion (GRB-SNe) using ongoing and future large optical SN surveys.

NRAO use only
(10/04)

(14) Observer present for observations? ○ Yes ⊗ No Data analysis at? ⊗ Home ○ AOC or CV (2 weeks notice)

(15) Help required: ⊗ None ○ Consultation ○ Friend (extensive help)

(16) Spectroscopy only	line 1	line 2	line 3	line 4
Transition (HI, OH, etc.)				
Rest Frequency (MHz)				
Velocity (km/s)				
Observing frequency (MHz)				
Correlator mode				
IF bandwidth(s) (MHz)				
Hanning smoothing (y/n)				
Number of channels per IF				
Frequency Resolution (kHz/channel)				
Rms noise (mJy/bm, nat. weight., 1 hr)				
Rms noise (K, nat. weight., 1 hr)				

(17) Number of sources:	**1**

(If more than 10 please attach list. If more than 30 give only selection criteria and LST range(s).)

(18) NAME	Coordinates 1950 ○ 2000 ⊗ RA hh mm Dec. ± xx.x°	Conf.	λ (cm)	Corr. mode	Band-width per IF (MHz)	Total Flux (Jy)*	LAS	Required rms (mJy/bm)	Required dynamic range	Time request (hr)
SN04D2jz	10 00 +02.0	A	3.5			20μ				2

*For spectral line, this should be the total flux at the peak of the line

Notes to the table (if any):

(19) Restrictions to elevation (other than hardware limits) or HA range (give reason):

(20) Preferred range of dates for scheduling (give reason): Assuming that this even has similar properties to those of GRB-SNe observed in the past (e.g., SN 1998bw, see Berger et al. above), it will begin to decline significantly in about 20 observer-frame days, so scheduling prior to that is critical. Even prompter observations by the VLA will enable us to trigger follow-up efforts in other bands (X-ray, optical) ASAP, so the sooner we get the data the better.

(21) Dates which are not acceptable:

(22) Special hardware, software, or operating requirements:

(23) Please attach a self-contained Scientific Justification **not in excess of 1000 words.** (Preprints or reprints will be ignored.) Please include the full addresses (postal and e-mail) for first-time users or for those that have moved (if not contact author). When your proposal is scheduled, the contents of the cover sheets become public information (Any supporting pages are for refereeing only).