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: 2005 March 15

(2) Title of Proposal: The radio counterpart of the unidentified γ-ray source TeV J2032+4130 in Cygnus

(3) AUTHORS (Add * for new location)	INSTITUTION	E-mail	Students Only G/U	For Thesis?	Ph.D. Year
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(4) Related VLA previous proposal number(s):

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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				
(10) Time requested (hours)	$2 \times 1 = 2$ h				

(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)

We have just discovered two likely radio counterpart candidates to the unidentified high energy γ-ray source TeV J2032+4130 in Cygnus, thanks to GMRT observations and analysis of VLA archival data. The two targets have very likely Chandra X-ray and point-like near infrared counterparts. They also appear slightly elongated in radio maps currently available, thus suggesting the existence of jets. We consider the possibility that one of them, perhaps both, could be a microquasar system powering the extended TeV emission. Exploratory observations with the VLA in A-configuration are urgently requested to better test the existence of the jets and provide a more accurate position to confirm the X-ray/near infrared identification. TeV J2032+4130 is the prototype of extended TeV sources where hadronic processes of γ-ray emission instead of leptonic ones could be at work. It remains completely unidentified since its discovery in 2002.

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)
TeV J2032+4130	20 31.9, +41.5	A	3.5		50	0.0004-0.0008	$\sim 10''$	0.022	$\sim 10^2$	2×1 h

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

Notes to the table (if any): rms given is for 1 h run including calibration.
Two of such observing runs separated by a few days are requested
for variability check and improved dynamic range.

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

(20) Preferred range of dates for scheduling (give reason): During the current A configuration and as soon as possible.

(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).