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: 5 May 2005

(2) Title of Proposal: An exploratory proposal to confirm first radio detection of a *young* brown dwarf (TWA 5B)

(3) AUTHORS (Add * for new location)	INSTITUTION	E-mail	G/U	Students Only For Thesis?	Ph.D. Year
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Ray Jayawardhana	U. of Toronto	rayjay@astro.utoronto.ca			

(4) Related VLA previous proposal number(s): AO 190

(5) Contact author for scheduling: Rachel Osten
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(7) Scientific Category: ○ solar system ⊗ galactic ○ extragalactic ○ other:
Rapid Response Science: ○ Known Transient ⊗ Exploratory ○ Target of Opportunity

(8) Configurations (one per column) (A+Pt, A, B, C, D, BnA, CnB, DnC, Any)	B,CnB				
(9) Wavelength(s) (400, 90, 20, 6, 3.5, 2, 1.3, 0.7 cm)	3.6				
(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)

We propose for an exploratory observation of the young brown dwarf TWA 5B in the TW Hydrae association (TWA), which has a likely VLA detection. The comparison of TWA 5B with another TWA brown dwarf, 2M1207, which has also been studied at X-ray and radio wavelengths, will elucidate the connection between T Tauri phenomena and their substellar analogs. TWA 5B has an X-ray detection (and possible radio detection), and its Hα emission is thought to originate from magnetic activity, whereas 2M1207 has an X-ray and radio upper limit, and its Hα is thought to be dominated by accretion activity. Confirming TWA 5B as a radio source would strengthen the general trend of radio detections of wTTS (consistent with magnetic activity) and radio nondetections of cTTS. TWA 5B is a companion to TWA 5, an M1.5 dwarf, with a separation of 2". By observing for two hours before the array moves into C configuration at 3.6 cm, we can determine reliably whether the source is detected from an earlier archival observation.

NRAO use only
(08/03)

(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)
TWA5B	11 31, -34.6	B, CnB	3.6		50		pt. src.	1σ=30 μJy		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): We request two hours of observing time while the array is still in B configuration, or during the first few days of reconfiguration going into CnB.

(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).

v4.2 8/03