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: 10-05-05

(2) Title of Proposal: Discovery of Water Maser Emission in Two Nearby AGN with the GBT

(3) AUTHORS (Add * for new location)	INSTITUTION	E-mail	G/U	Students Only For Thesis?	Students Only Ph.D. Year
P. T. Kondratko	Harvard University	pkondrat@cfa.harvard.edu	G	Yes	2006
L. J. Greenhill	SAO	lgreenhill@cfa.harvard.edu			
J. M. Moran	SAO	moran@cfa.harvard.edu			
J. A. Braatz	NRAO	jbraatz@nrao.edu			

(4) Related VLA previous proposal number(s): AK579, AK574, AK555, AG636

(5) Contact author for scheduling: Paul T. Kondratko
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(6) Telephone: 617 496 3433
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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)	Any				
(9) Wavelength(s) (400, 90, 20, 6, 3.5, 2, 1.3, 0.7 cm)	1.3 cm				
(10) Time requested (hours)	2×2 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)

Water maser emission traces warm dense gas in the inner parsec of accretion disks around supermassive black holes. We are currently participating in a high sensitivity, broadband search for new masers with the Green Bank Telescope. We recently discovered water maser emission in two nearby active galaxies. One of the discoveries is most likely an NGC4258-like system and thus constitutes a candidate for the determination of accretion disk structure, black hole mass, and possibly a geometric distance. We request two VLA snapshots so that we can **1)** corroborate our single-dish discoveries, **2)** confirm the association of the discovered maser emission with the AGN, **3)** determine the position of the maser sources with sub-arcsecond accuracy necessary for follow-up with the VLBI, and **4)** estimate the level of accompanying continuum emission and search for nearby ($< 1°$) calibrators in preparation for VLBI studies.

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.)	H_2O			
Rest Frequency (MHz)	22235.08			
Velocity (km/s)	2716-5931			
Observing frequency (MHz)	21803-22041			
Correlator mode	2AC			
IF bandwidth(s) (MHz)	6.25			
Hanning smoothing (y/n)	n			
Number of channels per IF	64			
Frequency Resolution (kHz/channel)	97.656			
Rms noise (mJy/bm, nat. weight., 1 hr)	1			
Rms noise (K, nat. weight., 1 hr)	7×10^{-5}			

(17) Number of sources:	**2**

(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)
NGC1320	03 24, -03.0	Any	1.3	2AC	6.25	0.1	~0.01″	1	10	2
NGC0017	00 11, -12.1	Any	1.3	2AC	6.25	0.02	~0.01″	1	10	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):
As we hope to submit the results of the GBT survey for publication within upcoming months, we politely request prompt scheduling, if possible.

(21) Dates which are not acceptable: N/A

(22) Special hardware, software, or operating requirements: N/A

(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