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: 12-15-03

(2) Title of Proposal: The Discovery of Water Maser Emission in Five Distant 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			

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

(5) Contact author
for scheduling: Paul T. Kondratko
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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)	5×2 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 five distant ($v_{sys} > 10000$ km s^{-1}) active galaxies. Three of the discoveries reveal an archetypal spectral signature of an edge-on accretion disk and thus constitute particularly good candidates for the determination of accretion disk structure, black hole mass, and possibly a geometric distance. We request five 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 ($< 1^\circ$) 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)	10094-14810			
Observing frequency (MHz)	21476-21188			
Correlator mode	2AB			
IF bandwidth(s) (MHz)	6.25, 12.5			
Hanning smoothing (y/n)	n			
Number of channels per IF	64, 32			
Frequency Resolution (kHz/channel)	97.656, 390.626			
Rms noise (mJy/bm, nat. weight., 1 hr)	1			
Rms noise (K, nat. weight., 1 hr)	7×10^{-5}			

(17) Number of sources:	**5**

(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)
UGC09618NED02	14 57, +24.6	Any	1.3	2AB	6.25	0.030	$\sim 0.01''$	1	10	2
2MASXJ08362...	08 36, +33.5	Any	1.3	2AB	6.25	0.057	$\sim 0.01''$	1	10	2
NGC6264	16 57, +27.8	Any	1.3	2AB	6.25	0.026	$\sim 0.01''$	1	10	2
SBS0927+493	09 31, +49.1	Any	1.3	2AB	12.5	0.026	$\sim 0.01''$	1	10	2
IRAS03355+0104	03 38, +1.2	Any	1.3	2AB	12.5	0.012	$\sim 0.01''$	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):
Because the sources are very weak, we request to conduct the observations as close to the optimal elevation of $\sim 58°$ as possible.

(20) Preferred range of dates for scheduling (give reason):
Because the proposed observations are at K-band, winter observing conditions are strongly preferred. As we are hoping to follow up our discoveries with the VLBI, we ask for scheduling in advance of February 1st deadline, if feasible.

(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).