VLBA PROPOSAL COVERSHEET

rcvd:

DEADLINES: 1st of Feb., June, Oct.

(1) Date Prepared: December 16, 2005

(2) Title of Proposal: Frequency Phase Transfer Astrometry to align AGB-star maser images

(3) AUTHORS (Add * for new location)	INSTITUTION	E-mail	G/U	Students Only: For Thesis?	Students Only: Ph.D. Year
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(4) Related previous or current VLBI proposal(s): BD108 ◯ Resubmission

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(7) Scientific Category: ⊗ astrometry & geodesy ⊗ galactic ◯ extragalactic ◯ other:
Rapid Response Science: ◯ Known Transient ◯ Exploratory ⊗ Target of Opportunity

(8) Wavelength(s) requested (those not available on the global network are indicated with a small circle):
◯ 90cm ◯ 50cm ∘ 30cm ◯ 21cm ◯ 18cm ◯ 13cm ◯ 6cm ∘ 5cm ◯ 3.6cm ◯ 3.6/13cm
∘ 2cm ◯ 1.3cm ⊗ 7mm ⊗ 3mm
◯ Global Network standard bands ⊗ Special frequencies: 43.122,86.243-GHz

(9) Recording format: ◯ Default continuum setup (VLBA only), ⊗ VLBA/MkIV, ◯ MkIII: Mode
Bandwidth per BaseBand channel: 16
Aggregate bit rate: 128 (2 BB channels at 32 MSamples/sec of ◯ 1 bit, ⊗ 2 bit)

(10) ◯ Multi-epoch observation: ______ epochs of ______ hours each, separated by ______

(11) Network	Requested antennas	Total time requested
EVN & MERLIN		
VLBA	ALL	6 hrs
other NRAO		
Non-VLBI Intruments		

(12) ABSTRACT (Do not write outside this space. Please type)

Our project, BD108, is to develop a new astrometric multi-frequency phase transfer method, using the rapid frequency switching capability of the VLBA. At the analysis, we will use the scaled phases from the lower frequency observations to calibrate the higher frequency. This method of transferring the phase will allow the frames of the two observations to be astrometically aligned. We have successfully proposed to observe the ν=1 J=1→0 and J=2→1 SiO maser transitions (at 43 and 86 GHz) plus the 22 GHz H_2O and SiO ν=1,2 J=1→0 masers (at 22 and 43 GHz). We used the allocated time to observe the first line pair on TX-Cam, and will observe the second on IK Tau. When the first observations were made IK Tau was undetected at Pico Veleta. Now we find that IK Tau is strong. We have scheduled the 22/43 GHz observations on this source. We would like to observe the 43/86 GHz pair as well. This would allow us (if the two observations are close in time) to astrometrically align the 86-, the two 43- and the 22-GHz observations. If we wait for the normal proposal cycle we would miss this opportunity.

Scheduler use only
(8/03)

(13) Observation type: ⊗ Interferometry, ◯ Spectroscopy, ◯ Pulsar, ⊗ Phase referencing

(14) Proposal is ⊗ Suitable ◯ Unsuitable for dynamic scheduling.

(15) Polarization: ◯ Single Polarization ⊗ Dual Circular Polarization
Global network standard for single polarization is LCP for all λs except 13cm (RCP) and 3.6cm (RCP).

(16) Tape usage (Show <recording time>/<total time>): 6 hrs/6 hrs

(17) Assistance required:
Observation Setup: ⊗ Consultation, ◯ Extensive help, ◯ Observe file preparation
Postprocessing: ⊗ Consultation, ◯ Extensive help, ◯ Calibration service

(18) Processor: ⊗ Socorro, ◯ JIVE, ◯ Haystack, ◯ Bonn, ◯ Washington, ◯ Other________
Special processing: ◯ XPol, ◯ Pulsar gate, ◯ Multiple Fields: ____
Averaging time: 1s Spectral channels per baseband channel: 512
◯ Other special processing: ________

(19) Postprocessing Location: OAN

(20) Source list: ⊗ J2000 ◯ B1950
If more than 4 sources, please attach list. If more than 30, give only selection criteria and GST range(s)

	Source 1	Source 2	Source 3	Source 4
Name(s)	IK Tau			
RA (hh mm)	03:53:28.84			
Dec (dd.d)	11:24:22.4			
GST range (Europe)				
GST range (US)	8-14 GST			
GST range (Other)				
Band(s)	7mm,3mm			
Flux density (Total, Jy)	∼350 Jy/kms			
Flux density (correlated, mJy)	∼10 Jy/kms			
RMS needed (mJy/beam)	0.1 Jy/kms			
Peak/RMS needed				

(21) Preferred VLBI session or range of dates for scheduling, and why:
Observations near the time of the 22/43-GHz experiment. (*see text for detailed explanation*).

(22) Dates which are NOT acceptable, and why:

(23) Attach a self-contained scientific justification, not in excess of 1000 words.
Preprints or reprints will not be forwarded to the referees.

Information about the capabilities of the VLBA may be found on the World Wide Web by starting at the NRAO home page, http://www.nrao.edu, and selecting the VLBA from "Sites and Telescopes."

A brief summary of the capabilities of the EVN antennas is given in the EVN STATUS TABLE in the EVN USER GUIDE, which may be found at http://www.evlbi.org/user_guide/user_guide.html.

Please include the full postal addresses for first-time users or for those that have moved (if not contact author).