VLBA PROPOSAL COVERSHEET

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

rcvd:

(1) Date Prepared: 28 Sep 2001

(2) Proposal Title: **Pulsar Astrometry with the VLBA**

(3) AUTHORS	INSTITUTION/LOCATION	For Grad Students Only: Observations For Ph.D. Thesis?	For Grad Students Only: Anticipated Ph.D. Year
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W. Brisken, W. M. Goss, E. B. Fomalont, J. Benson, M. McKinnon	NRAO		
S. E. Thorsett, R. Ellis	U.C. Santa Cruz		
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T. J. W. Lazio; D. C. Backer	NRL; U.C. Berkeley		
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(4) Related previous or current VLBI proposal(s): BB126, BB136, BC115, BC116

(5) Contact author for scheduling: S. Chatterjee

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(6) Scientific Category (indicate all that apply):

⊗ astrometry & geodesy, ◯ solar, ◯ propagation, ◯ planetary, ◯ stellar, ⊗ pulsar, ◯ ISM, ◯ masers,
◯ normal galaxies, ◯ active galaxies, ◯ cosmology

(7) 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 _____

(8) Recording format: ◯ Default continuum setup (VLBA only) ⊗ VLBA/MkIV ◯ MkIII (Mode ____)

Bandwidth per BaseBand channel: 8 MHz

Aggregate bit rate 256Mb/s(8 BB channels at 16 MSamples/sec of ◯ 1 bit, ⊗ 2 bit samples)

(9) ⊗ Multi-epoch observation: 30×8 epochs of 2 hours each, separated by 90 ± 10 days; + 24 hours.

(10) Network	Requested antennas	Total time requested
EVN		
VLBA	All, or any 9 (See proposal §4, item 3)	500 + 24 hours
OTHER NRAO		
Non-VLBI Instruments		

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

We propose a large multi-epoch project for VLBA astrometry on a sample of pulsars, in order to obtain parallaxes and proper motions. This project aims to: (1) at least double the number of measured pulsar parallaxes; (2) yield direct transverse velocity measurements of pulsars, which constrain the physics of supernova core-collapse and address the velocity distribution of the pulsar population; (3) provide essential calibration points for the Galactic electron density model, which improves the distance scale for those pulsars without parallax measurements; and (4) address other scientific questions, such as reference frame ties, supernova remnant associations, etc.

Building on our experience with previous pilot projects, we propose preliminary VLBA "finder" observations, followed by eight epochs (4 per year) of dynamically scheduled phase-referenced snapshot observations, with pulsar gating and ionospheric calibration, for a sample of ~ 30 pulsars.

Scheduler use only
(02/01)

(12) Observation type: ⊗ Interferometry, ○ Spectroscopy, ⊗ Pulsar, ⊗ Phase referencing, ○ Single dish,

(13) Proposal is ⊗ Suitable ○ Unsuitable for dynamic scheduling.

(14) Polarization: ⊗ Single Polarization ○ Dual Circular Polarization

Global network standard for single polarization is LCP for all λs except 13cm (RCP) and 3.6cm (RCP).

(15) Tape usage (Show <recording time>/<total time>): 2/2 per epoch

(16) Assistance required:

Observation Setup: ⊗ Consultation, ○ Extensive help, ○ Observe file preparation (VLBA only)

Postprocessing: ⊗ Consultation, ○ Extensive help, ○ Calibration service (VLBA only)

(17) Processor: ⊗ Socorro ○ JIVE ○ Haystack ○ Bonn ○ Washington ○ Other _____

Special processing: ○ XPol, ⊗ Pulsar gate, ⊗ Multiple Fields: 1 or 2

Averaging time: 2 sec Spectral channels per baseband channel: 16

○ Other special processing: _____

(18) Postprocessing Location: Cornell, AOC Socorro, etc.

(19) 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)	See Tables 2, 3.			
RA (hh mm)				
Dec (dd.d)				
GST range (Europe)				
GST range (US)				
GST range (Other)				
Band(s)				
Flux density (Total, Jy)				
Flux (correlated, mJy)				
RMS needed (mJy/beam)				
Peak/RMS needed				

(20) Preferred VLBI session or range of dates for scheduling, and why:

Preliminary observations:

6 hours centered at 7 hrs LST;

2×9 hours centered at 18 hrs LST.

Later observations: 2 hour slots distributed in LST according to our target density.

(LST ranges 03–07: 10%, 07–11: 10%, 11–15: 0%, 15–19: 40%, 19–23: 25%, 23–03: 15%.)

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

First 30 days of VLA A-array configuration, so that preliminary VLA observations (proposed separately) may be completed.

(22) 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.jive.nl/jive/evn/evn.html.

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