VSOP PROPOSAL COVER SHEETS

ID :

TR :

SR :

DEADLINE : 17 November, 1995
SEND TO : VSOP SOG, ISAS, 3-1-1 Yoshinodai, Sagamihara, Kanagawa 229, JAPAN

Please read Appendix C of Announcement of Opportunity for details on how to fill in this Cover Sheet.

(1) Date prepared : November 9th, 1995

(2) Proposal title : Quasar Phase-Reference Mapping and Astrometry with VSOP

(3)	INVESTIGATORS	INSTITUTION
P.I.	J.C. Guirado	Jet Propulsion Laboratory, USA
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co-I.	J.-F. Lestrade	Observatoire de Meudon, France
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

Observations of strong, closely-spaced, quasar pairs are the best suited to study the capabilities and limitations of VSOP for phase-reference mapping and differential astrometry. We propose 5 GHz observations of the pair 1342+662/1342+663 and 5 and 1.6 GHz observations of the pair 4C39.25/0920+390 as a means to *(i)* test the phase-reference mapping techniques at different frequencies and geometric configurations, and *(ii)* improve the present precision of the ground-based astrometry via the combination of simultaneous VLBA astrometry and VSOP+VLBA maps of the radio sources. Knowledge of VSOP capabilities in these areas is key to use of these techniques later in this mission and in future space VLBI missions. In addition, the observations in the proposal will permit us to measure unambiguously the proper motion of component b in 4C39.25 as well as obtain high resolution images of all the observed radio sources.

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

Object type:

☑ AGN, ☐ Masers, ☐ Stellar, ☐ Other :

Experiment type:

☐ Single-observation, ☑ Monitoring, ☐ Polarization,

☐ Time-critical, ☐ Target of Opportunity, ☑ Other : Phase-referencing

(7) VSOP spacecraft observing mode (see Section 3 and Table 5 of the VSOP Proposer's Guide):

☑ 2 channel x 16 MHz, 2-bit (Standard mode),

☐ 2 channel x 32 MHz, 1-bit,

☐ 1 channel x 32 MHz, 2-bit

Phase calibration tones:

☑ On (Standard continuum mode),

☐ Off (Standard spectral line mode)

(Include justification of any non-standard choice at (14) below)

(8) Ground radio telescope setup

Polarization :

☑ VSOP Standard (IEEE LCP), ☐ Non-standard :

Recording mode :

☑ As for VSOP spacecraft (Standard), ☐ Other :

(9) Investigator participation in scheduling

☑ PI (or co-I) wishes to participate in scheduling ground radio telescopes

☑ PI (or co-I) wishes to participate in scheduling the space radio telescope

(10) Preferred correlator (see Sections 9.11 and 12 of VSOP Proposer's Guide):

☐ No preference, ☐ Mitaka, ☑ Socorro, ☐ Other :

(11) Preferred post-correlation data analysis location:

☑ Home Institution, ☐ Mitaka, ☐ NRAO AOC, ☐ JIVE, ☐ Other

(12) Post-correlation data analysis assistance required:

☐ None, ☑ Consultation, ☐ Extensive help

(13) Details of proposed experiments

An 'experiment' is one or more observations of one source in one wavelength band.
A request to observe the same source in all 3 wavelength bands requires 3 columns to be filled in.
To observe the same source at the same frequency multiple times – a 'monitoring experiment' – requires only one column to be filled in.
Number of experiments in this proposal: 3

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	1342+662	1342+663	4C39.25	0920+390
RA (hh mm ss.s)	13:43:45.96	13:44:08.68	09:27:03.01	09:23:14.45
Dec (dd mm ss)	66:02:25.7	66:06:11.6	39:02:20.8	38:49:39.9
J2000 or B1950?	J2000	J2000	J2000	J2000
Observing frequency band (GHz)	5	5	5	5
Continuum observations:				
Standard VSOP freq. channels?	☑	☑	☑	☑
Channel A range (MHz)				
Channel B range (MHz)				
Spectral line observations:				
Ch.A spectral line rest freq. (MHz)				
Ch.A LSR velocity (km/s)				
Ch.B spectral line rest freq. (MHz)				
Ch.B LSR velocity (km/s)				
Min. spectral channels per IF channel				
Correlator averaging time (sec)				
FWHM of field of view required (mas)				
No. of correlating passes (if >1)				
Measured total flux density (Jy)	0.30	0.60	10.1	0.40
Measured correlated flux density on $>$ 5000 km baseline (Jy)	0.28	0.55	4.2	0.25
Image RMS needed (mJy/beam)	2	2	5	2
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10		10	
Number of large telescopes				
Suggested array given at Item (14)	☑	☐	☑	☐
Minimum acceptable:				
Number of medium telescopes	4		4	
Number of large telescopes				
Suggested array given at Item (14)	☑	☐	☑	☐
Length of observation:				
Preferred length (orbits)	2		2	
Minimum acceptable length (orbits)	1		1	
Scheduling constraints:				
Preferred P.A. of beam *major* axis (deg)			0 deg	
'No holes' (u,v) coverage?	☐	☐	☐	☐
Or maximum resolution (u,v) coverage?	☑	☐	☑	☐
Preferred range of dates for scheduling (for monitoring experiments give range for 1st observation only)	to	to	97-03-15 to 97-05-15	to
For monitoring programs:				
Number of observations			2	
Mean interval (days)			365	
Acceptable variance from mean (days)			30	

	Experiment 5	Experiment 6	Experiment 7	Experiment 8
Source name	4C39.25	0920+390		
RA (hh mm ss.s)	09:27:03.01	09:23:14.45		
Dec (dd mm ss)	39:02:20.8	38:49:39.9		
J2000 or B1950?	J2000	J2000		
Observing frequency band (GHz)	1.6	1.6		
Continuum observations:				
Standard VSOP freq. channels?	☑	☑	☐	☐
Channel A range (MHz)				
Channel B range (MHz)				
Spectral line observations:				
Ch.A spectral line rest freq. (MHz)				
Ch.A LSR velocity (km/s)				
Ch.B spectral line rest freq. (MHz)				
Ch.B LSR velocity (km/s)				
Min. spectral channels per IF channel				
Correlator averaging time (sec)				
FWHM of field of view required (mas)				
No. of correlating passes (if >1)				
Measured total flux density (Jy)	3.3	0.5		
Measured correlated flux density on > 5000 km baseline (Jy)	1.95	0.33		
Image RMS needed (mJy/beam)	3	2		
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10			
Number of large telescopes				
Suggested array given at Item (14)	☑	☐	☐	☐
Minimum acceptable:				
Number of medium telescopes	4			
Number of large telescopes				
Suggested array given at Item (14)	☑	☐	☐	☐
Length of observation:				
Preferred length (orbits)	2			
Minimum acceptable length (orbits)	1			
Scheduling constraints:				
Preferred P.A. of beam *major* axis (deg)	0 deg			
'No holes' (u,v) coverage?	☐	☐	☐	☐
Or maximum resolution (u,v) coverage?	☑	☐	☐	☐
Preferred range of dates for scheduling (for monitoring experiments give range for 1st observation only)	97-03-15 to 97-05-15	to	to	to
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

(14) Additional notes to the scheduler :

PHASE-REFERENCED OBSERVATIONS

Exp. 1 and Exp. 2 correspond to a single observation. Both sources lie within the primary beam of VSOP and VLBA antennas. Preferred and minimum acceptable array: VLBA

Exp. 3 and Exp. 4 correspond to a single observation. VSOP (using the mode for switching over small angles) and VLBA antennas will observe alternatively both sources. Preferred and minimum acceptable array: VLBA

Exp. 5 and Exp. 6 correspond to a single observation. Both sources lie within the primary beam of VSOP. VLBA antennas will observe alternatively both sources. Preferred and minimum acceptable array: VLBA

(15) Attach a scientific and technical justification, not in excess of 2 pages of text and 2 pages of figures. Up to one page of (u,v) plots per source may optionally be included.
(Refer to the VSOP Announcement of Opportunity for detailed instructions.)
Preprints and reprints will not be forwarded to the Scientific Review Committee.

Send two paper copies of the complete proposal to:

VSOP Observing Proposals
VSOP Science Operations Group
Institute of Space and Astronautical Science
3-1-1 Yoshinodai, Sagamihara
Kanagawa 229 JAPAN

In addition, e-mail the completed LaTeX file to submit@vsopgw.isaslan1.isas.ac.jp

Cover Sheets of accepted proposals will be made available to the astronomical community.

Proposals must be received at ISAS by 17 November 1995