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 : 951112

(2) Proposal title : VSOP Observations of OH masers - interstellar scattering and the structure of the maser spots

(3)	INVESTIGATORS	INSTITUTION
P.I.	R.S. Booth	Onsala Space Observatory
co-I.	P.J. Diamond	NRAO, Socorro
co-I.	M. Lindqvist	Onsala Space Observatory
co-I.	A.J. Kemball	NRAO, Socorro
co-I.		
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

In order to investigate interstellar scattering and its repercussions for Space VLBI of OH masers, we have tried to measure the apparent sizes of different types of maser as a function of baseline and their Galactic coordinates. Many Type I masers are fully resolved on baselines of 35 megalambda, however, some still have significant correlated flux. Indeed, the 1720 MHz maser spots in W3 are barely resolved, a result which may be understood in terms of the geometrical beaming model (Gray et al.). The same theory also predicts that the size of the 1665 MHz spots are intrinsic sizes, making it important to investigate the partially resolved sources and the W3 1720 MHz maser at the higher resolution given by VSOP. The masers associated with IR stars also show measureable correlated flux on the longest Earth baselines, although their visibility curves are complex. We will attempt to measure their intrinsic structure with VSOP.

(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 :

(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: 12

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	W33 A	W3	W3	OH127.8−0.0
RA (hh mm ss.s)	18 11 44.6	02 23 16.456	02 23 16.456	01 30 27.63
Dec (dd mm ss)	−17 52 57	+61 38 57.76	+61 38 57.76	+62 11 31.20
J2000 or B1950?	B1950	B1950	B1950	B1950
Observing frequency band (GHz)	1.6	1.6	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)	1665.4018	1665.4018	1720.5300	1612.2310
Ch.A LSR velocity (km/s)	+38	−45	−45	−55
Ch.B spectral line rest freq. (MHz)				
Ch.B LSR velocity (km/s)				
Min. spectral channels per IF channel	8192	8192	8192	8192
Correlator averaging time (sec)	1	1	1	1
FWHM of field of view required (mas)	10	10	10	10
No. of correlating passes (if >1)				
Measured total flux density (Jy)	650	250	12	35
Measured correlated flux density on > 5000 km baseline (Jy)	150	50	10	5
Image RMS needed (mJy/beam)				
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	11	11	11	11
Number of large telescopes	3	3	3	3
Suggested array given at Item (14)	☑	☑	☑	☑
Minimum acceptable:				
Number of medium telescopes	10	10	10	10
Number of large telescopes	3	3	3	3
Suggested array given at Item (14)	☑	☑	☑	☑
Length of observation:				
Preferred length (orbits)	2	2	2	2
Minimum acceptable length (orbits)	2	2	2	2
Scheduling constraints:				
Preferred P.A. of beam *major* axis (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)	980301 to 980630	970701 to 980228	970701 to 980228	970701 to 980228
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

	Experiment 5	Experiment 6	Experiment 7	Experiment 8
Source name	Mon R2	OH35.2−1.7	OH45.5+0.1	OH34.28+0.15
RA (hh mm ss.s)	06 05 20.0	18 59 12.5	19 11 46.1	18 50 46.1
Dec (dd mm ss)	−06 22 40	+01 09 16	+11 07 06	+01 11 12
J2000 or B1950?	B1950	B1950	B1950	B1950
Observing frequency band (GHz)	1.6	1.6	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)	1665.4018	1665.4018	1665.4018	1665.4018
Ch.A LSR velocity (km/s)	+11	+42.5	+59	+56
Ch.B spectral line rest freq. (MHz)				
Ch.B LSR velocity (km/s)				
Min. spectral channels per IF channel	8192	8192	8192	8192
Correlator averaging time (sec)	1	1	1	1
FWHM of field of view required (mas)	10	10	10	10
No. of correlating passes (if >1)				
Measured total flux density (Jy)	150	40	60	45
Measured correlated flux density on > 5000 km baseline (Jy)	50	30	30	40
Image RMS needed (mJy/beam)				
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	11	11	11	11
Number of large telescopes	3	3	3	3
Suggested array given at Item (14)	☑	☑	☑	☑
Minimum acceptable:				
Number of medium telescopes	10	10	10	10
Number of large telescopes	3	3	3	3
Suggested array given at Item (14)	☑	☑	☑	☑
Length of observation:				
Preferred length (orbits)	2	2	2	2
Minimum acceptable length (orbits)	2	2	2	2
Scheduling constraints:				
Preferred P.A. of beam *major* axis (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)	970901 to 980330	980301 to 980630	980301 to 980630	980301 to 980630
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

	Experiment 9	Experiment 10	Experiment 11	Experiment 12
Source name	VX Sgr	OH104.9+2.4	OH26.5+0.5	Cep A
RA (hh mm ss.s)	18 05 02.959	22 17 42.7	18 34 52.467	22 54 19.2
Dec (dd mm ss)	−22 13 55.58	+59 36 17	−05 26 36.90	+61 45 47
J2000 or B1950?	B1950	B1950	B1950	B1950
Observing frequency band (GHz)	1.6	1.6	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)	1612.2310	1612.2310	1612.2310	1665.4018
Ch.A LSR velocity (km/s)	−17	−25	+27	−13.8
Ch.B spectral line rest freq. (MHz)				
Ch.B LSR velocity (km/s)				
Min. spectral channels per IF channel	8192	8192	8192	8192
Correlator averaging time (sec)	1	1	1	1
FWHM of field of view required (mas)	10	10	10	10
No. of correlating passes (if >1)				
Measured total flux density (Jy)	16	40	300	15
Measured correlated flux density on > 5000 km baseline (Jy)	5	2	4	10
Image RMS needed (mJy/beam)				
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	11	11	11	11
Number of large telescopes	3	3	3	3
Suggested array given at Item (14)	☑	☑	☑	☑
Minimum acceptable:				
Number of medium telescopes	10	10	10	10
Number of large telescopes	3	3	3	3
Suggested array given at Item (14)	☑	☑	☑	☑
Length of observation:				
Preferred length (orbits)	2	2	2	2
Minimum acceptable length (orbits)	2	2	2	2
Scheduling constraints:				
Preferred P.A. of beam *major* axis (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)	980301 to 980630	970501 to 970830	980301 to 980630	970601 to 970830
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

(14) Additional notes to the scheduler :

We ask for the following array/telescopes: phased VLA, EF, JO, VLBA, and ON.

(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