# 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 : 09-Nov-1995

**(2)** Proposal title : SVLBI POLARIMETRY WITH VSOP

| **(3)** | INVESTIGATORS | INSTITUTION |
|---|---|---|
| P.I. | A.J. Kemball | NRAO, Socorro, USA |
| co-I. | | |
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**(4)** Principal Investigator (or contact person) details...

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**(5)** Proposal Abstract :

We propose to use VSOP to conduct polarimetric observations of the quasar 1334-127 and the $H_2O$ maser source W51M with the following scientific objectives: i) to investigate the technical feasibility of polarization calibration for space VLBI observations in both line and continuum mode; and ii) to determine the polarization structure of both target sources at very high resolution, thus addressing important scientific questions for these specific 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 :

**(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 : (see (14) below)

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

Recording mode :

☐ As for VSOP spacecraft (Standard), ☑ Other : 4 chan x 16 MHz x 2-bit (see (14))

**(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 : 1334-127: Socorro; W51M: Mitaka

**(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 | 1334-127 | W51M | 1334-127 | |
| RA (hh mm ss.s) | 13 37 39.782 | 19 23 43.881 | 13 37 39.782 | |
| Dec (dd mm ss) | -12 57 24.69 | 14 30 34.37 | -12 57 24.69 | |
| J2000 or B1950? | J2000 | J2000 | J2000 | |
| Observing frequency band (GHz) | 22 | 22 | 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) | | 22235.0801 | | |
| Ch.A LSR velocity (km/s) | | +63 | | |
| Ch.B spectral line rest freq. (MHz) | | 22235.0801 | | |
| Ch.B LSR velocity (km/s) | | +63 | | |
| Min. spectral channels per IF channel | | 1024 | | |
| Correlator averaging time (sec) | | 6 (see (14)) | | |
| FWHM of field of view required (mas) | | 50 | | |
| No. of correlating passes (if >1) | | | | |
| Measured total flux density (Jy) | 6.44 | $\sim 3000$ | $\sim 5.4$ | |
| Measured correlated flux density on $> 5000$ km baseline (Jy) | 4.59 @$10^4$ km | $> 8$ | $\sim 3-4$ | |
| Image RMS needed (mJy/beam) | 1 | 300 | 1 | |
| *Ground Radio Telescopes:* | | | | |
| *Preferred choice:* | | | | |
| Number of medium telescopes | 10 | 10 | 10 | |
| Number of large telescopes | 2 | 2 | 2 | |
| Suggested array given at Item (14) | ☑ | ☑ | ☑ | ☐ |
| *Minimum acceptable:* | | | | |
| Number of medium telescopes | 10 | 6 | 10 | |
| Number of large telescopes | 1 | 1 | 1 | |
| Suggested array given at Item (14) | ☑ | ☑ | ☑ | ☐ |
| *Length of observation:* | | | | |
| Preferred length (orbits) | 4 | 4 | 4 | |
| Minimum acceptable length (orbits) | 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) | 98-02-01 to 98-08-01 | 97-03-01 to 97-06-01 | 98-02-01 to 98-08-01 | to |
| *For monitoring programs*: | | | | |
| Number of observations | | | | |
| Mean interval (days) | | | | |
| Acceptable variance from mean (days) | | | | |

**(14)** Additional notes to the scheduler :

Exp 1-3, Pref Array = VLBA, EF, GB, Min. Array = VLBA, EF.
Dual polarization recording on the ground array need not be a full 256 Mbps mode. The aggregate bit rate could be reduced by preferential recording during periods at which coverage on the ground-space baselines is maximized. Limited observations of standard polarization calibrators would be necessary on the ground array (see (9) above).

We request the Mitaka correlator for W51M and the Socorro correlator for 1334-127, due to the spectral line limitations in Socorro. Shorter integration intervals on the earth-space baselines will be required (Sect. 9.11) than the 6s correlator interval specified for W51M.

**(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**