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 : Nov. 10, 1995

(2) Proposal title : Polarization Variability of Intraday Variable Sources

(3)	INVESTIGATORS	INSTITUTION
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

About 30 % of extragalactic compact flat spectrum radio sources show intraday variability (IDV) with brightness temperatures of up to 10^{18-19} K in the radio. Correlated rapid variations of intensity and polarization indicate, that the emitting regions are smaller than typically 1 lightday (corresponding to microarcsecond sizes), making these objects (for which we have flux and VLBI-monitoring data since 1980) ideally suited for high angular resolution space-VLBI observations. We propose to image the sub-mas structure of a small sample of particularly well suited IDV-Quasars and IDV-BL Lacs in total and polarized flux. Repetition of these observations after a few days and after 1-2 weeks will allow to detect the theoretically expected structural variability (in I & P) in the sub-pc structures of IDV sources, putting hard constraints to our present understanding of the still 'mysterious' phenomenon of IDV.

(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 : 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 :

(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: 6

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	0716+714	0804+499	0917+624	0954+658
RA (hh mm ss.s)	07:16:13.0316	08:04:58.3955	09:17:40.3146	09:54:57.8519
Dec (dd mm ss)	71:26:15.247	49:59:23.100	62:28:38.605	65:48:15.557
J2000 or B1950?	B1950	B1950	B1950	B1950
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)	1.1	0.9	1.5	0.8
Measured correlated flux density on > 5000 km baseline (Jy)	> 0.4	> 0.5	> 0.4	> 0.4
Image RMS needed (mJy/beam)	0.2	0.2	0.1	0.2
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10	10	10
Number of large telescopes	4	4	4	4
Suggested array given at Item (14)	☑	☑	☑	☑
Minimum acceptable:				
Number of medium telescopes	5	5	5	5
Number of large telescopes	2	2	2	2
Suggested array given at Item (14)	☑	☑	☑	☑
Length of observation:				
Preferred length (orbits)	2	2	2	2
Minimum acceptable length (orbits)	1	1	1	1
Scheduling constraints:				
Preferred P.A. of beam *major* axis (deg)	100	30	70	0
'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)	97-02-01 to 97-04-30	97-04-01 to 97-05-30	97-03-01 to 97-05-30	97-02-01 to 97-05-30
For monitoring programs:				
Number of observations	3	3	3	3
Mean interval (days)	3	3	3	3
Acceptable variance from mean (days)	30	30	30	30

	Experiment 5	Experiment 6	Experiment 7	Experiment 8
Source name	1803+784	2007+776		
RA (hh mm ss.s)	18:03:39.1772	20:07:20.4350		
Dec (dd mm ss)	78:27:54.289	77:43:58.092		
J2000 or B1950?	B1950	B1950		
Observing frequency band (GHz)	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)	2.0	1.3		
Measured correlated flux density on > 5000 km baseline (Jy)	> 0.5	> 0.2		
Image RMS needed (mJy/beam)	0.1	0.1		
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10		
Number of large telescopes	4	4		
Suggested array given at Item (14)	☑	☑	☐	☐
Minimum acceptable:				
Number of medium telescopes	5	5		
Number of large telescopes	2	2		
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	0		
'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)	97-02-01 to 97-04-30	97-02-01 to 97-05-30	to	to
For monitoring programs:				
Number of observations	3	3		
Mean interval (days)	3	3		
Acceptable variance from mean (days)	30	30		

(14) Additional notes to the scheduler :

Pref. Array = VLBA + EF + VL + NR + UD
Medi. Array = VLBA + EF + NR
Min. Array = EF, TR, MC, NO, ON, JO, NR
If scheduling in spring 1997 is not possible, scheduling in spring 1998 may be considered
If tape resources are short the following restrictions (sorted by priority from high to low) can be applied: reduce number of participating stations (keep $N \geq 7$), reduce observing bandwidth to VSOP (16 instead of 32 MHz, thus GRT's observe at 128 Mbits/s, 2 x 16 MHz x 2 bit), reduce number of sources observed more than once (high to low priority: 0716+71, 0954+65, 1803+78, 2007+77, 0917+62, 0804+49), do not observe polarization but keep multiple epochs, do single epoch intensity imaging.

(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