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 : 6 November, 1995

(2) Proposal title : VSOP Polarization Monitoring of 4 BL Lacertae Objects at 5 and 1.6 GHz

(3)	INVESTIGATORS	INSTITUTION
P.I.	D. Gabuzda	Lebedev Physical Institute
co-I.	A. Lobanov	New Mexico Institute of Mining and Technology
co-I.	K. Leppänen	Helsinki University of Technology
co-I.	A. Mioduszewski	University of Michigan
co-I.	D. Roberts	Brandeis University
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co-I.		
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

We propose two-epoch polarization observations for the four BL Lacertae objects OJ 287, 0954+658, 1803+784, and 2007+777 at 5 and 1.6 GHz. These sources have all been observed to have especially compact and highly polarized components that have been observed to vary dramatically on timescales ∼1-2 years. Use of the VLBA in these observations would make it possible to obtain simultaneous matching resolution ground coverage, providing quasi-simultaneous coverage at three frequencies. The proposed observations would render much new information about the evolution of transverse shocks and magnetic field structures on subparsec scales, the relationship between the spectral indices and polarization of individual components, and the distribution of Faraday rotation near the cores of BL Lacertae objects.

(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 : Dual polarization

Recording mode :

☐ As for VSOP spacecraft (Standard), ☑ Other : 4 16-MHz 2-bit sampled channels

(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: 8

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	0954+658	OJ287	1803+784	2007+777
RA (hh mm ss.s)	09 58 47.2	08 54 48.9	18 00 45.7	20 05 31.0
Dec (dd mm ss)	65 33 54.8	20 06 30.6	78 28 04.0	77 52 43.2
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)	1.4	3.0	3.5	2.3
Measured correlated flux density on > 5000 km baseline (Jy)	0.6	1.7	1.3	1.2
Image RMS needed (mJy/beam)	0.05	0.05	0.05	0.05
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	12	12	12	12
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	2	2	2	2
Suggested array given at Item (14)	☑	☑	☑	☑
Length of observation:				
Preferred length (orbits)	3	3	3	3
Minimum acceptable length (orbits)	2	2	2	2
Scheduling constraints:				
Preferred P.A. of beam *major* axis (deg)	75	-10	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)	97-09 to 98-04	98-02 to 98-04	98-01 to 98-08	97-01; 98-06 to 97-04; 98-11
For monitoring programs:				
Number of observations	2	2	2	2
Mean interval (days)	150	90	150	150
Acceptable variance from mean (days)	30	30	30	30

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	0954+658	OJ287	1803+784	2007+777
RA (hh mm ss.s)	09 58 47.2	08 54 48.9	18 00 45.7	20 05 31.0
Dec (dd mm ss)	65 33 54.8	20 06 30.6	78 28 04.0	77 52 43.2
J2000 or B1950?	J2000	J2000	J2000	J2000
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)				
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)	0.7	2.3	1.8	1.0
Measured correlated flux density on > 5000 km baseline (Jy)	0.5	1.8	1.5	0.9
Image RMS needed (mJy/beam)	0.05	0.05	0.05	0.05
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	12	12	12	12
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	2	2	2	2
Suggested array given at Item (14)	☑	☑	☑	☑
Length of observation:				
Preferred length (orbits)	3	3	3	3
Minimum acceptable length (orbits)	2	2	2	2
Scheduling constraints:				
Preferred P.A. of beam *major* axis (deg)	75	-10	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)	97-09 to 98-04	98-02 to 98-04	98-01 to 98-08	97-01; 98-06 to 97-04; 98-11
For monitoring programs:				
Number of observations	2	2	2	2
Mean interval (days)	150	90	150	150
Acceptable variance from mean (days)	30	30	30	30

(14) Additional notes to the scheduler :

Ground telescopes must be dual polarization. Possible telescopes: EF, NR, MC, JO (only 5 GHz), ON (only 1.6 GHz), NO, WB, VLBA, TR, VLA-27, UD. EF is preferable to WB because the polarization performance of EF is more reliable. The P.I. must participate in scheduling the GRT to ensure that the ground observations allow adequate polarization calibration of all ground telescopes. 1-orbit observation of a standard polarization calibrator must be scheduled adjacent in time to the target observations; space-ground coverage needed on short VSOP baselines.
The ground telescope aggregate bit rate would be made less than the nominal 256 mbits/sec by reduced recording at the ground stations during times when VSOP is unable to observe due to telemetry or other constraints.
PREFERRED ARRAY: EF VL UD VLBA; MC + JO (5 GHz) or TR + ON (1.6 GHz)
MINIMUM ARRAY: EF UD 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