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 : 11 November, 1995

(2) Proposal title : Subparsec scale structure of X-ray selected BL Lacertae objects

(3)	INVESTIGATORS	INSTITUTION
P.I.	R. I. Kollgaard	The Pennsylvania State University
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co-I.	E. D. Feigelson	The Pennsylvania State University
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

The *HEAO-1* all-sky X-ray survey provides a well-defined sample of X- ray selected BL Lacertae objects (XBLs). These objects lie within FR I radio galaxies with $0.03 < z < 0.3$ (closer than the XBL samples from *Einstein* and *Rosat*) and are the only sample of XBLs suitable for detailed VLBI studies. Our VLA studies show that *HEAO-1* XBLs are less core-dominated and likely less strongly beamed than radio-selected BL Lacs (RBLs). Our initial work shows intrinsic differences between XBL and RBL parsec-scale jets, in addition to orientation effects. We request VSOP observations of the radio brightest *HEAO-1* XBLs to complement our ongoing VLA, VLBA and X-ray observations. Both by themselves and with coordinated X-ray observations, the VSOP results can test competing theories about XBLs and RBLs and elucidate the physical conditions in the relativistic jets.

(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: 11

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	0829+046	1101+384	1011+496	2155-304
RA (hh mm ss.s)	08 31 55.1	11 01 40.6	10 15 04.3	21 58 52.1
Dec (dd mm ss)	+08 47 44	+38 28 43	+49 25 56	-30 13 32.1
J2000 or B1950?	J2000	J2000	J2000	J2000
Observing frequency band (GHz)	5	5	5	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)	1.0	0.5	0.4	0.3
Measured correlated flux density on > 5000 km baseline (Jy)	0.7	0.4	0.2	0.2
Image RMS needed (mJy/beam)	0.1	0.1	0.1	0.1
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10	10	10
Number of large telescopes	2	2	2	2
Suggested array given at Item (14)	☐	☐	☐	☐
Minimum acceptable:				
Number of medium telescopes	4	4	4	4
Number of large telescopes	1	1	2	2
Suggested array given at Item (14)	☐	☐	☐	☐
Length of observation:				
Preferred length (orbits)	3	3	4	4
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)	97-12 to 98-04	97-03; 97-12 to 97-06; 98-5	97-03; 97-11 to 97-05; 97-8	97-06 to 97-09
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

	Experiment 5	Experiment 6	Experiment 7	Experiment 8
Source name	0219-164	0521-365	1652+398	1807+698
RA (hh mm ss.s)	02 22 00.7	05 22 58.0	16 53 52.2	18 06 50.7
Dec (dd mm ss)	-16 15 16	-36 27 31	+39 45 37	+69 49 28
J2000 or B1950?	J2000	J2000	J2000	J2000
Observing frequency band (GHz)	1.6	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)	0.3	3.1	1.4	1.4
Measured correlated flux density on > 5000 km baseline (Jy)	0.2	1.2	0.5	0.6
Image RMS needed (mJy/beam)	0.1	0.1	0.1	0.1
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10	10	10
Number of large telescopes	2	2	2	2
Suggested array given at Item (14)	☐	☐	☐	☐
Minimum acceptable:				
Number of medium telescopes	4	4	4	4
Number of large telescopes	2	1	1	1
Suggested array given at Item (14)	☐	☐	☐	☐
Length of observation:				
Preferred length (orbits)	4	3	3	3
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)	97-07 to 97-08	97-01 to 97-04	97-02; 98-05 to 97-03; 98-05	97-01; 98-02 to 97-06; 98-05
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

	Experiment 9	Experiment 10	Experiment 11	Experiment 12
Source name	2007+776	1147+245	0454+844	
RA (hh mm ss.s)	20 05 30.9	11 50 19.2	05 08 42.4	
Dec (dd mm ss)	+77 52 43	+24 17 54	+84 32 04.5	
J2000 or B1950?	J2000	J2000	J2000	
Observing frequency band (GHz)	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)	2.3	0.6	0.5	
Measured correlated flux density on > 5000 km baseline (Jy)	1.2	0.4	0.3	
Image RMS needed (mJy/beam)	0.1	0.1	0.1	
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	4	4	4	
Number of large telescopes	1	1	1	
Suggested array given at Item (14)	☐	☐	☐	☐
Length of observation:				
Preferred length (orbits)	3	3	3	
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)	97-01; 98-02 to 97-07; 98-05	97-04; 97-12 to 97-06; 98-02	97-01; 98-01 to 97-04; 98-04	to
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

For the objects in the southern sky we request at least one southern hemisphere station in order to improve the *uv* coverage.

(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