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 : Observation of Selected γ-ray Blazars

(3)	INVESTIGATORS	INSTITUTION
P.I.	Wenge Xu	JPL/Caltech, USA
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

We propose to observe seven γ-ray blazars with Space VLBI at 5 and 22 GHz. This is part of our effort to explore the relationship between γ-ray emission and nonthermal emission at other wavebands. Proposed observations, combined with standalone VLBA observations at 15 and 43 GHz, will enable us to measure accurately the spectral index and size of the jet components, the synchrotron self-absorption frequency and flux density at this freqency. These properties are critical to the inverse Compton calculation. Together with observations with VLBA, MERLIN and VLA, they will also allow us to trace the jet from arcsecond scales to the innermost region of the core. With detection of helical jets with a few complete turns, we will be able to explore the binary black hole scenario, and model the jets geometrically or kinematically to constrain the jet angle to the line of sight.

(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: 14

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	0234+285	0234+285	0716+714	0716+714
RA (hh mm ss.s)	02 34 55.5932	02 34 55.5932	07 16 13.0316	07 16 13.0316
Dec (dd mm ss)	28 35 11.353	28 35 11.353	71 26 15.247	71 26 15.247
J2000 or B1950?	B1950	B1950	B1950	B1950
Observing frequency band (GHz)	5	22	5	22
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)	2.5	3.2	1	1.5
Measured correlated flux density on $>$ 5000 km baseline (Jy)	1.5	$\sim$ 1	0.6	$\sim$ 1
Image RMS needed (mJy/beam)	1	1	1	1
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10	10	10
Number of large telescopes	0	0	0	0
Suggested array given at Item (14)	☑	☑	☑	☑
Minimum acceptable:				
Number of medium telescopes	5	5	5	5
Number of large telescopes	0	0	0	0
Suggested array given at Item (14)	☐	☐	☐	☐
Length of observation:				
Preferred length (orbits)	4	4	4	4
Minimum acceptable length (orbits)	1	1	1	1
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)	97-01-01 to 97-01-30	97-01-01 to 97-01-30	97-02-01 to 97-04-07	97-02-01 to 97-04-07
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

	Experiment 5	Experiment 6	Experiment 7	Experiment 8
Source name	0804+499	0804+499	0836+710	0836+710
RA (hh mm ss.s)	08 04 58.3955	08 04 58.3955	08 36 21.5586	08 36 21.5586
Dec (dd mm ss)	49 59 23.100	49 59 23.100	71 04 22.463	71 04 22.463
J2000 or B1950?	B1950	B1950	B1950	B1950
Observing frequency band (GHz)	5	22	5	22
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)	2.1	1.5	2.6	1.5
Measured correlated flux density on $>$ 5000 km baseline (Jy)	1.2	0.5	$\sim$ 1	$\sim$ 0.8
Image RMS needed (mJy/beam)	1	1	1	1
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10	10	10
Number of large telescopes	0	0	0	0
Suggested array given at Item (14)	☑	☑	☑	☑
Minimum acceptable:				
Number of medium telescopes	5	5	5	5
Number of large telescopes	0	0	0	0
Suggested array given at Item (14)	☐	☐	☐	☐
Length of observation:				
Preferred length (orbits)	4	4	4	4
Minimum acceptable length (orbits)	1	1	1	1
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)	97-04-01 to 97-05-01	97-04-01 to 97-05-01	97-02-01 to 97-05-01	97-02-01 to 97-05-01
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

	Experiment 9	Experiment 10	Experiment 11	Experiment 12
Source name	0917+449	0917+449	1633+382	1633+382
RA (hh mm ss.s)	09 17 41.9179	09 17 41.9179	16 33 30.6285	16 33 30.6285
Dec (dd mm ss)	44 54 39.5971	44 54 39.5971	38 14 10.053	38 14 10.053
J2000 or B1950?	B1950	B1950	B1950	B1950
Observing frequency band (GHz)	5	22	5	22
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)			2	
Measured total flux density (Jy)	1.5	1.2	2.3	1.7
Measured correlated flux density on > 5000 km baseline (Jy)	> 0.5	1	> 0.7	1.3
Image RMS needed (mJy/beam)	1	1	1	1
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10	10	10
Number of large telescopes	0	0	0	0
Suggested array given at Item (14)	☑	☑	☑	☑
Minimum acceptable:				
Number of medium telescopes	5	5	5	5
Number of large telescopes	0	0	0	0
Suggested array given at Item (14)	☐	☐	☐	☐
Length of observation:				
Preferred length (orbits)	4	4	4	4
Minimum acceptable length (orbits)	1	1	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)	97-04-01 to 97-05-01	97-04-01 to 97-05-01	97-05-20 to 97-06-10	97-05-20 to 97-06-10
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

	Experiment 13	Experiment 14	Experiment 15	Experiment 16
Source name	1739+522	1739+522		
RA (hh mm ss.s)	17 39 29.0025	17 39 29.0025		
Dec (dd mm ss)	52 13 10.453	52 13 10.453		
J2000 or B1950?	B1950	B1950		
Observing frequency band (GHz)	5	22		
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	2		
Measured correlated flux density on > 5000 km baseline (Jy)	1.5	1.15		
Image RMS needed (mJy/beam)	1	1		
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10		
Number of large telescopes	0	0		
Suggested array given at Item (14)	☑	☑	☐	☐
Minimum acceptable:				
Number of medium telescopes	5	5		
Number of large telescopes	0	0		
Suggested array given at Item (14)	☐	☐	☐	☐
Length of observation:				
Preferred length (orbits)	4	4		
Minimum acceptable length (orbits)	1	1		
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)	97-03-01 to 97-04-10	97-03-01 to 97-04-10	to	to
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

(14) Additional notes to the scheduler :

Preferred ground array for all these observations is VLBA since we will combine them with standalone VLBA observations at 15 and 43 GHz (matching resolution) to measure the spectral index and size of jet compoents.

(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