VSOP AO3 PROPOSAL COVER SHEETS

DEADLINE : 1 October, 1999
SEND TO : VSOG, ISAS, 3-1-1 Yoshinodai, Sagamihara, Kanagawa 229-8510, JAPAN

(1) Date prepared : 29 September, 1999

(2) Proposal title : High Dynamic Range Imaging of Southern Hemisphere Blazars

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(5) Proposal Abstract :

Due to the limited number of radio telescopes in the Southern Hemisphere, ground-based VLBI images of sources in the Southern Hemisphere have poorer resolution and dynamic range than VLBI images of Northern Hemisphere objects. However, the addition of VSOP to existing ground arrays can provide (u,v) -coverage comparable to northern sources when the southern sources lie near the VSOP apogee direction. This results in images with higher dynamic range and finer resolution (by 2-3 times). We propose to use this technique to monitor six bright southern blazars. Determination of brightness temperatures, beaming angles, and jet morphology will increase our understanding of this class of objects, will be useful for testing models of gamma-ray production, and will add to the growing database on properties of gamma-/non-gamma-ray producing blazars with very high brightness temperatures.

(6) Proposal Category (indicate all that apply):

Object type:
☑ AGN, ☐ Maser, ☐ Stellar, ☐ Pulsar, ☐ Other :

Observation type:
☑ Continuum, ☐ Spectral Line, ☐ Polarization, ☑ Time-critical, ☐ Other :

(7) Number of proposed experiments

An 'experiment' is one or more observations of one source at a fixed HALCA set-up. A request to observe the same source at 1.6 GHz and separately at 5 GHz requires two columns to be filled in in item (8) below. A request to observe the same source with HALCA simultaneously observing at 1.6 GHz and 5 GHz requires one column to be filled in. Multi-epoch observations of the same source at the same frequency – a 'monitoring experiment' – requires only one column to be filled in. Suggested observing dates, especially for for time-critical and monitoring experiments, should be specified in item (11).

The number of experiments in this proposal is: 6

(8) Details of proposed experiments

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name (J*hhmm*±*ddmm*)	J1037-2934	J1107-4449	J1130-1449	J1147-3812
Alternative name	1034-293	1104-445	1127-145	1144-379
RA(J2000) (hh mm ss.ssss)	10:37:16.0797329	11:07:08.6941309	11:30:07.0525522	11:47:01.3706983
Dec(J2000) (dd mm ss.ssss)	-29:34:02.813265	-44:49:07.618595	-14:49:27.388098	-38:12:11.023423
Observing frequency band (GHz)	1.6/5	1.6/5	1.6/5	1.6/5
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)				
FWHM of field of view required (mas)				
Min. spectral channels per IF channel				
Correlator averaging time (sec)				
No. of correlating passes (if >1)				
Total flux density (Jy)	1.51	2.03	7.31	1.07
Correlated flux (mJy)	1030	1430	1490	∼ 1000
Ground Radio Telescopes:				
Suggested array given at Item (11)?	☑	☑	☑	☑
GRT observing mode:				
128Mbps LCP (standard)	☑	☑	☑	☑
128Mbps LCP/RCP	☐	☐	☐	☐
256Mbps LCP/RCP	☐	☐	☐	☐
Preferred correlator:				
No preference	☐	☐	☐	☐
Mitaka	☐	☐	☐	☐
Penticton	☐	☐	☐	☐
Socorro	☑	☑	☑	☑
Monitoring programs:				
Number of observations	2	2	3	2
Mean interval (days)	90	90	90	90
Related VSOP proposal code(s)				

	Experiment 5	Experiment 6	Experiment 7	Experiment 8
Source name ($Jhhmm\pm ddmm$)	J1246-2547	J1337-1257		
Alternative name	1244-255	1334-127		
RA(J2000) (hh mm ss.ssss)	12:46:46.8020363	13:37:39.7827759		
Dec(J2000) (dd mm ss.ssss)	-25:47:49.288681	-12:57:24.693226		
Observing frequency band (GHz)	1.6/5	1.6/5		
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)				
FWHM of field of view required (mas)				
Min. spectral channels per IF channel				
Correlator averaging time (sec)				
No. of correlating passes (if >1)				
Total flux density (Jy)	1.05	2.18		
Correlated flux (mJy)	910	1060		
Ground Radio Telescopes:				
Suggested array given at Item (11)?	☑	☑	☐	☐
GRT observing mode:				
128Mbps LCP (standard)	☑	☑	☐	☐
128Mbps LCP/RCP	☐	☐	☐	☐
256Mbps LCP/RCP	☐	☐	☐	☐
Preferred correlator:				
No preference	☐	☐	☐	☐
Mitaka	☐	☐	☐	☐
Penticton	☐	☐	☐	☐
Socorro	☑	☑	☐	☐
Monitoring programs:				
Number of observations	2	3		
Mean interval (days)	90	90		
Related VSOP proposal code(s)	W060			

(9) 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),
☐ Other:

Phase calibration tones:

☑ On (Standard continuum mode),
☐ Off (Standard spectral line mode)

(Include justification of any non-standard choice at (11) below)

(10) Assistance with preparation of ground telescope schedule files:

☑ VSOG assistance requested, ☐ Consultation desired, ☐ No assistance required

(11) Additional notes to the scheduler :

Array requested is VLBA plus southern hemisphere telescopes (ATCA, Ceduna, Hartebeesthoek, Hobart, Mopra, Tidbinbilla) with the appropriate frequency settings (*e.g.*, only 1.6 GHz at Tidbinbilla). For the two sources north of -20 degrees (J1130-1449 and J1337-1257), the EVN can be substituted for the VLBA.
Over a period of 4 months or so we do not expect any structural changes in the 1.6 GHz VSOP images. Therefore, if the first epoch is successful at 1.6 GHz, then for the second epoch observations we request that the scheduler place *both* IFs in the 5 GHz band. Our sources are sufficiently strong and compact that manual phase-cal should be successful, allowing us to combine the IFs and obtain the extra bandwidth sensitivity during the second epoch.

(12) Attach a scientific and technical justification, not in excess of 2 pages of text and 2 pages of figures. Refer to the VSOP Announcement of Opportunity for detailed instructions. Preprints and reprints will not be forwarded to the Scientific Review Committee.

EITHER e-mail the completed LaTeX file to submit@vsop.isas.ac.jp and 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 229-8510 JAPAN

OR e-mail the completed LaTeX Cover Sheets file and, in a separate e-mail, the postscript file of the scientific and technical justification, to submit@vsop.isas.ac.jp

Information from the Cover Sheets of scheduled proposals will be made available from the VSOP WWW site.

Proposals must be received at ISAS by 1 October 1999