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 : 30 September 1999

(2) Proposal title : Distinguishing between Different Radio Core Structures

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(5) Proposal Abstract :

VSOP observations have the potential to probe the structure of the very compact cores seen in AGN, but experiments to date lack the necessary high SNR data on the longest baselines. We propose to use VSOP and the most sensitive ground telescopes, especially Arecibo, to observe the compact sources AO 0235+164 and 0735+178. This high SNR, long-baseline data will allow us to distinguish between different radio core structures and measure brightness temperatures to much better than the currently-obtained factor of two precision. A better understanding of these possibly high Lorentz-factor cores will have implications for jet production models in many types of objects. Our results also will help determine the best methods for estimating core brightness temperatures using VSOP or ground VLBI data, and is especially critical to proper interpretation of the large VSOP Survey Program.

(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: 4

(8) Details of proposed experiments

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name (J*hhmm*±*ddmm*)	J0238+1636	J0238+1636	J0738+1742	J0738+1742
Alternative name	AO 0235+164	AO 0235+164	B 0735+178	B 0735+178
RA(J2000) (hh mm ss.ssss)	02 38 38.931	02 38 38.931	07 38 07.394	07 38 07.394
Dec(J2000) (dd mm ss.ssss)	+16 36 59.28	+16 36 59.28	+17 42 19.00	+17 42 19.00
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	128	128	128	128
Correlator averaging time (sec)				
No. of correlating passes (if >1)				
Total flux density (Jy)	≈ 1-4	≈ 1-4	≈ 1-3	≈ 1-3
Correlated flux (mJy)	≈ 200	≈ 200	≈ 200	≈ 200
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				
Mean interval (days)				
Related VSOP proposal code(s)				

(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 :

Coverage by Arecibo during a 3-hour period (for each source) when the projected Arecibo-VSOP baseline covers the full range from less than an Earth diameter to VSOP apogee is critical. This can be accomplished on a few specific dates during 2000 for each source. The best dates are 30 July 2000 for AO 0235+164, and 31 January 2000 for 0735+164. If the VSOP orbit changes, these dates will change.

In addition to Arecibo, we request the full (phased) VLA and Effelsberg to provide additional sensitive baselines for calibration cross-checking. The VLBA recording system is the only one common to all three requested ground telescopes, so we also request correlation in Socorro.

(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