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 : 10 November, 1995

(2) Proposal title : Multi-frequency Observations of the BL Lac Object 0235+164

(3)	INVESTIGATORS	INSTITUTION
P.I.	S. Frey	FÖMI SGO, Hungary
co-I.	L.I. Gurvits	JIVE, The Netherlands
co-I.	D.R. Altschuler, M.M. Davis	NAIC, Arecibo Observatory, Puerto Rico
co-I.	H. Hirabayashi	ISAS, Japan
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(4) Principal Investigator (or contact person) details...

Name : Sándor Frey
Address : FÖMI Satellite Geodetic Obs.
: P.O.Box 546
: H−1373 Budapest
: Hungary

Internet : frey@novell.sgo.fomi.hu
Other e-mail :
Fax : +36 27 310982
Telephone : +36 27 310980

(5) Proposal Abstract :

We propose to observe the BL Lac object AO 0235+164 at all 3 VSOP frequencies (1.6, 5 and 22 GHz). The source is one of the most violently variable extragalactic objects at optical as well as radio wavelengths. The time scale of variability at centimeter wavelengts is some weeks. We propose monitoring of this source within the time interval permitted by the VSOP observing constraints. The multi-frequency imaging experiment will reveal whether there is any frequency dependence in the presumably time variable mas and sub-mas structures. The experiment would provide a critical test for alternative theoretical models of this peculiar BL Lac object. Its very compact core and the flat spectrum qualify 0235+164 as an ideal target for Space VLBI observations at all available frequencies.

(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: 3

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	0235+164	0235+164	0235+164	
RA (hh mm ss.s)	02 38 38.93	02 38 38.93	02 38 38.93	
Dec (dd mm ss)	+16 36 59.3	+16 36 59.3	+16 36 59.3	
J2000 or B1950?	J2000	J2000	J2000	
Observing frequency band (GHz)	22	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)	4.35	1.93	1.2	
Measured correlated flux density on > 5000 km baseline (Jy)	2.53	1.8	1.2	
Image RMS needed (mJy/beam)	0.2	0.2	0.2	
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	6	6	6	
Number of large telescopes	0	0	0	
Suggested array given at Item (14)	☑	☑	☑	☐
Length of observation:				
Preferred length (orbits)	2	2	2	
Minimum acceptable length (orbits)	2	2	2	
Scheduling constraints:				
Preferred P.A. of beam *major* axis (deg)	-45	-45	-45	
'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 $97-02-05$	$97-01-01$ to $97-02-05$	$97-01-01$ to $97-02-05$	to
For monitoring programs:				
Number of observations	2	2	2	
Mean interval (days)	200	200	200	
Acceptable variance from mean (days)	20	20	20	

(14) Additional notes to the scheduler :

Total flux densities are variable; correlated flux densities for experiments 2 and 3 are estimates based on the formulas given in the Proposer's Guide.

Suggested array for all 3 experiments: VLBA (or a part of it), Arecibo and VLA-27 (at 1.6 and 5 GHz), VLA-27 and Goldstone (at 22 GHz).

Considering the VSOP observing constraints we propose one observation in Jan-Feb 97 and another observation in Aug-Sep 1997 at all frequencies.

The observations at different frequencies are requested to be scheduled nearly adjacent.

(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