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 : 17 Nov, 1995

(2) Proposal title : VSOP Continuum and Absorption Study for Cygnus A

(3)	INVESTIGATORS	INSTITUTION
P.I.	KAMENO Seiji	NAO, Japan
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co-I.	FUJISAWA Kenta, Hirabayashi Hisashi	ISAS, Japan
co-I.	HAGIWARA Yoshiaki, KAWABE Ryouhei	NRO, Japan
co-I.	Baltasar Vila-Vilaro	NRO, Japan
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

We propose continuum and absorption line observations for the archetypal radio galaxy Cygnus A. Huge extinction at near infrared, soft X-ray absorption and HI absorptioin were found, and these support the 'hidden quasar' hypothesis. Recombination absorption line observations will test this hypothesis. It will be a new probe close to core, which displays velocity field i.e. the central mass and/or gas infall. We also investigate physical condition of the jets. VSOP resolution of ~ 0.1 pc reveales inner structure of the acceleration region. Comparing two-band continuum images, we can obtain distribution of spectral index, which indicates energy transfer in jets. Precise jet configuration can be derived from accurate jet speed by two-epoch images and jet-to-counterjet brightness ratio R, thanks to high resolution and high quality images taken by VSOP.

(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: 2

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	Cygnus A	Cygnus A		
RA (hh mm ss.s)	19 59 28.4	19 59 28.4		
Dec (dd mm ss)	+40 44 02	+40 44 02		
J2000 or B1950?	J2000	J2000		
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)	5008.92	23404.38		
Ch.A LSR velocity (km/s)	16848.34	16848.34		
Ch.B spectral line rest freq. (MHz)	5148.70	23420.38		
Ch.B LSR velocity (km/s)	16848.34	16848.34		
Min. spectral channels per IF channel	256	128		
Correlator averaging time (sec)	10	2		
FWHM of field of view required (mas)	40	40		
No. of correlating passes (if >1)				
Measured total flux density (Jy)	350	60.6		
Measured correlated flux density				
on > 5000 km baseline (Jy)	0.112	0.25		
Image RMS needed (mJy/beam)	0.25	0.5		
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	3	3		
Number of large telescopes	6	5		
Suggested array given at Item (14)	☑	☑	☐	☐
Minimum acceptable:				
Number of medium telescopes	2	2		
Number of large telescopes	2	2		
Suggested array given at Item (14)	☑	☑	☐	☐
Length of observation:				
Preferred length (orbits)	4	4		
Minimum acceptable length (orbits)	3	3		
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	97-04-01	97-04-01		
(for monitoring experiments give	to	to	to	to
range for 1st observation only)	97-06-30	97-06-30		
For monitoring programs:				
Number of observations	2	2		
Mean interval (days)	400	400		
Acceptable variance from mean (days)	200	200		

(14) Additional notes to the scheduler :

Please schedule two experiments for each epoch within a week. Interval between two epochs should be more than 200 days.
Preferd Array : VLA or Effelsberg at 5 GHz, DSN at 22 GHz.

(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