

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 : 1995/11/11

(2) Proposal title : The Core of 3C84

(3)	INVESTIGATORS	INSTITUTION
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co-I.	D. C. Backer	Univ. of Calif., Berkeley, CA, USA
co-I.	J. M. Benson	NRAO, Socorro, NM, USA
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co-I.	K. I. Kellermann	NRAO, Charlottesville, VA, USA
co-I.	A. C. S. Readhead	Caltech, Pasadena, CA, USA
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

We propose multi-frequency VSOP observations of 3C84 at each of three epochs. Combining these with our complementary VLBA observations at two or three times higher frequency will allow us to separate resolution and spectral effects, and extend our knowledge of the brightness distribution, structural variations, and component spectra to finer angular scales. Our scientific goals concentrate on the high-brightness core. We seek to localize the true center of activity, study the spectral index of the core, determine the structure and orientation of the innermost jet regions — including whether the jet is intrinsically one- or two-sided, and detect motions within the core. Our VLBA observations at complementary frequencies also enhance our ability to predict that sufficiently bright structures should be detectable in VSOP observations. Satisfactory (u, v) coverage is available during Phase 1, but only within narrow time windows.

(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: 8

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	3C84	3C84	3C84	3C84
RA (hh mm ss.s)	03 19 48.16053	03 19 48.16053	03 19 48.16053	03 19 48.16053
Dec (dd mm ss)	41 30 42.1034	41 30 42.1034	41 30 42.1034	41 30 42.1034
J2000 or B1950?	J2000	J2000	J2000	J2000
Observing frequency band (GHz)	22	5	1.6	22
<i>Continuum observations:</i>				
Standard VSOP freq. channels?	☒	☒	☒	☒
Channel A range (MHz)				
Channel B range (MHz)				
<i>Spectral line observations:</i>				
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) *	21	28	36	21
Measured correlated flux density on > 5000 km baseline (Jy) **	0.5	1.5	0.4	0.5
Image RMS needed (mJy/beam)	5	2	2	5
<i>Ground Radio Telescopes:</i>				
<i>Preferred choice:</i>				
Number of medium telescopes	10	10	10	10
Number of large telescopes	3	3	4	3
Suggested array given at Item (14)	☒	☒	☒	☒
<i>Minimum acceptable:</i>				
Number of medium telescopes	10	10	10	10
Number of large telescopes	2	2	2	2
Suggested array given at Item (14)	☒	☒	☒	☒
<i>Length of observation:</i>				
Preferred length (orbits)	4	4	4	4
Minimum acceptable length (orbits)	2	2	2	2
<i>Scheduling constraints:</i>				
Preferred P.A. of beam <i>major</i> axis (deg)				
‘No holes’ (<i>u,v</i>) coverage?	☐	☐	☐	☐
<i>Or</i> maximum resolution (<i>u,v</i>) coverage?	☐	☐	☐	☐
Preferred range of dates for scheduling (for monitoring experiments give range for 1st observation only)	97-01-01 to 97-01-10	97-01-01 to 97-01-10	97-01-01 to 97-01-10	97-02-28 to 97-03-09
<i>For monitoring programs:</i>				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

	Experiment 5	Experiment 6	Experiment 7	Experiment 8
Source name	3C84	3C84	3C84	3C84
RA (hh mm ss.s)	03 19 48.16053	03 19 48.16053	03 19 48.16053	03 19 48.16053
Dec (dd mm ss)	41 30 42.1034	41 30 42.1034	41 30 42.1034	41 30 42.1034
J2000 or B1950?	J2000	J2000	J2000	J2000
Observing frequency band (GHz)	5	22	5	1.6
<i>Continuum observations:</i>				
Standard VSOP freq. channels?	☒	☒	☒	☒
Channel A range (MHz)				
Channel B range (MHz)				
<i>Spectral line observations:</i>				
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) *	28	21	28	36
Measured correlated flux density on > 5000 km baseline (Jy) **	1.5	0.5	1.5	0.4
Image RMS needed (mJy/beam)	2	5	2	2
<i>Ground Radio Telescopes:</i>				
<i>Preferred choice:</i>				
Number of medium telescopes	10	10	10	10
Number of large telescopes	3	3	3	4
Suggested array given at Item (14)	☒	☒	☒	☒
<i>Minimum acceptable:</i>				
Number of medium telescopes	10	10	10	10
Number of large telescopes	2	2	2	2
Suggested array given at Item (14)	☒	☒	☒	☒
<i>Length of observation:</i>				
Preferred length (orbits)	4	4	4	4
Minimum acceptable length (orbits)	2	2	2	2
<i>Scheduling constraints:</i>				
Preferred P.A. of beam <i>major</i> axis (deg)				
‘No holes’ (<i>u,v</i>) coverage?	☐	☐	☐	☐
<i>Or</i> maximum resolution (<i>u,v</i>) coverage?	☐	☐	☐	☐
Preferred range of dates for scheduling (for monitoring experiments give range for 1st observation only)	97-02-28 to 97-03-09	97-07-30 to 97-09-06	97-07-30 to 97-09-06	97-07-30 to 97-09-06
<i>For monitoring programs:</i>				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

(14) Additional notes to the scheduler :

- (6) “Monitoring” seemed best approximation. More specifically, program consists of multi-frequency sessions at each of three epochs, determined with little latitude by spacecraft constraints.
- (9) P/Co-I’s seek to ensure that adequate calibration sources are scheduled each orbit.
- (13) * “Measured total flux density” is total from our VLBA images at each frequency; except at 1.6 GHz is total from our 2.3-GHz image.
- (13) ** “Measured correlated flux density” taken at extreme UV distance (8400 km) in our VLBA observations *at two or three times higher frequency*, as described in Technical Considerations.
- (13) **Preferred GRT Arrays** — 22 GHz: VLBA EF GO VL; 5 GHz: VLBA EF WB VL; 1.6 GHz: VLBA EF JO GO VL
- (13) **Minimum Acceptable GRT Array** at all frequencies: VLBA + 2 Large GRTs in northern hemisphere with VLBA-compatible recorders.

(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, Sagami-hara
Kanagawa 229 JAPAN

In addition, e-mail the completed L^AT_EX 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