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 : October 18, 1995

(2) Proposal title : 3C 446: Mapping the Bent Jet in the 100-μas to 3-mas Region

(3)	INVESTIGATORS	INSTITUTION
P.I.	Alexandria B. Wiercigroch	Jet Propulsion Laboratory
co-I.	James S. Ulvestad	Jet Propulsion Laboratory
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

We propose 5-GHz and 22-GHz VSOP observations of the optically violent variable 3C 446. This quasar (z = 1.4) is a very luminous X-ray and radio source; ground VLBI observations have shown a strongly curved jet that is misaligned with the large-scale jet structure. A comparison of 5-GHz and 100-GHz ground VLBI maps shows that the jet's position angle rotates by $\sim 130^\circ$ between the 100-μas and several-mas scales. This may be caused by a nearly end-on jet following a helical path near the observer's line of sight. We will map with very fine resolution the bending of the jet in this region, model the jet dynamics, and compare the morphology that we find with other objects with similar jet properties. Nearly contemporaneous 43-GHz VLBA observations will be proposed separately to help determine the frequency at which the core becomes optically thin and to provide complementary measurements of the jet's spectral index.

(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 :

A separate 43-GHz VLBA proposal will be submitted for contemporaneous coverage.

(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	3C 446	3C 446		
RA (hh mm ss.s)	22 25 47.3	22 25 47.3		
Dec (dd mm ss)	−04 57 01	−04 57 01		
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)				
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)	3.2	5.1		
Measured correlated flux density on > 5000 km baseline (Jy)	1.8	1.2		
Image RMS needed (mJy/beam)	5	5		
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10		
Number of large telescopes	1	1		
Suggested array given at Item (14)	☑	☑	☐	☐
Minimum acceptable:				
Number of medium telescopes	5	5		
Number of large telescopes	1	1		
Suggested array given at Item (14)	☐	☐	☐	☐
Length of observation:				
Preferred length (orbits)	3	3		
Minimum acceptable length (orbits)	2	2		
Scheduling constraints:				
Preferred P.A. of beam *major* axis (deg)	0	0		
'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)	97-06-01 to 97-09-01	97-06-01 to 97-09-01	to	to
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

(14) Additional notes to the scheduler :

1. Measured 5-GHz core flux from Wehrle *et al.* (1990).

2. Core flux at 22 GHz derived from 15-GHz space VLBI TDRSS data (Linfield *et al.* 1990) (for a baseline length of 1.5 Earth diameters) assuming a flat spectrum.

3. Preferred ground array for 5-GHz observation is VLBA and NR (Green Bank); the requested array for 22-GHz observation is VLBA and TI (Tidbinbilla).

4. Scheduling requested for both observations between 97-06-01 and 97-09-01.

5. Three orbits per experiment requested to cover source visibility period from VLBA.

6. Request notification of scheduling allocation so that 43-GHz VLBA proposal may be coordinated with space VLBI time.

(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