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 : November 10, 1995

(2) Proposal title : The Nuclear Jet in M87

(3)	INVESTIGATORS	INSTITUTION
P.I.	Mark J. Reid	Harvard-Smithsonian CfA
co-I.	Lincoln J. Greenhill	Harvard-Smithsonian CfA
co-I.	Karl M. Menten	Harvard-Smithsonian CfA
co-I.	James M. Moran	Harvard-Smithsonian CfA
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

M87 is the archetypical extragalactic jet source. Previous global VLBI observations at 18 cm wavelength revealed a complex limb-brightened jet with *sub*-luminal motions. We propose to use VSOP, in conjunction with the VLBA, to image the jet with significantly greater angular resolution than available with Earth-bound VLBI arrays. We hope to image structures in the jet which are currently unresolved, determine why the "pattern" speed of the jet appears slow (0.3 c), and increase our understanding of the helical structures within the jet that may reflect (magneto-)hydrodynamic instabilities.

(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	M87	M87		
RA (hh mm ss.s)	12 28 17.6	12 28 17.6		
Dec (dd mm ss)	12 40 02	12 40 02		
J2000 or B1950?	B1950	B1950		
Observing frequency band (GHz)	1.6	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)	180	180		
Measured correlated flux density				
on > 5000 km baseline (Jy)	0.5	0.5		
Image RMS needed (mJy/beam)	10	30		
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	15	15		
Number of large telescopes	4	4		
Suggested array given at Item (14)	☑	☑	☐	☐
Minimum acceptable:				
Number of medium telescopes	10	10		
Number of large telescopes	0	0		
Suggested array given at Item (14)	☑	☑	☐	☐
Length of observation:				
Preferred length (orbits)	8	4		
Minimum acceptable length (orbits)	4	2		
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	98-05-01	97-05-20		
(for monitoring experiments give	to	to	to	to
range for 1st observation only)	98-07-10	97-07-10		
For monitoring programs:				
Number of observations		2		
Mean interval (days)		720		
Acceptable variance from mean (days)		30		

(14) Additional notes to the scheduler :

Preferred array: VLBA, VLA-27, EF, UD, HT, TI (orPA)
Minimum array: VLBA

(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