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 : 16 November, 1995

(2) Proposal title : OH Megamaser Emission from a Nuclear Torus in Arp 220

(3)	INVESTIGATORS	INSTITUTION
P.I.	Willem BAAN	NAIC, Arecibo Observatory, Puerto Rico
co-I.	Yoshiharu ASAKI	GUAS–NAO, Japan
co-I.	Kenta FUJISAWA	ISAS, Japan
co-I.	Tetsuo SASAO	NAO, Japan
co-I.	Leonid GURVITS, Richard SCHILIZZI	JIVE, The Netherlands
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

We propose to study a subparsec structure in the 1.6 GHz megamaser source associated with the nuclear region of the galaxy Arp 220. The resolving power of VSOP combined with phase-referencing technique in its multi-antenna application will provide an unprecedently deep view inside the the nuclear region, presumably formed by the nuclear torus. With this proposal we would like
(i) to investigate so far untouched area of the inner parsec in megamasers, and
(ii) to demonstrate the ultimate potential of the Space VLBI in general, and the VSOP mission in particular.

(6) Proposal Category (indicate all that apply):

Object type:

☑ AGN, ☑ Masers, ☐ Stellar, ☑ Other : Megamaser

Experiment type:

☑ Single-observation, ☐ Monitoring, ☐ Polarization,
☐ Time-critical, ☐ Target of Opportunity, ☑ Other : Phase-referencing

(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:

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	Arp 220	1530+246		
RA (hh mm ss.s)	15 32 46.90	15 32 29.90		
Dec (dd mm ss)	23 40 07.9	24 15 47.0		
J2000 or B1950?	B1950	J2000		
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)	2	2		
Measured total flux density (Jy)				
Measured correlated flux density on > 5000 km baseline (Jy)				
Image RMS needed (mJy/beam)				
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	–	–		
Number of large telescopes	4	4		
Suggested array given at Item (14)	☑	☑	☐	☐
Minimum acceptable:				
Number of medium telescopes	–	–		
Number of large telescopes	2	2		
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)				
'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)	to	to	to	to
For monitoring programs:				
Number of observations				
Mean interval (days)				
Acceptable variance from mean (days)				

(14) Additional notes to the scheduler :

Preferred ground array: VLA-27, WSRT, Arecibo, Lovell.
Minimum accaptable array: VLA-27, WSRT.
VLA and WSRT must be split into two subarrays, with roughly equal number of antennas in each subarray.
Setup of the experiment is highly non-standard. Participation of the PI or co-investigators in the experiment scheduling is crucial

(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