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 : 6 November 1995

(2) Proposal title : High Resolution Observations of the Gravitational Lens MG 0414+0534

(3)	INVESTIGATORS	INSTITUTION
P.I.	Christopher B. Moore	M.I.T
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(4) Principal Investigator (or contact person) details...

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(5) Proposal Abstract :

We propose VSOP observations of MG 0414+0534, a four-image gravitational lens, in order to probe high-resolution structure of the images. Such structure can be used to constrain models for the lensing potential, revealing information about the gravitational potential of a distant galaxy. Furthermore, given a model for the lensing potential and a measurement of the differential time delay between two images, one can derive a unique measure of the angular diameter distance to the lensing galaxy that is independent of cosmological assumptions. Measurements of this kind provides a measurement of the angular diameter distance–redshift relation at redshifts large enough for the effects of Ω_0 and Λ to be important.

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

Object type:

☑ AGN, ☐ Masers, ☐ Stellar, ☑ Other : Gravitational Lenses

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: 1

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	MG 0414+0534			
RA (hh mm ss.s)	04 14 37.6885			
Dec (dd mm ss)	+05 34 43.198			
J2000 or B1950?	J2000			
Observing frequency band (GHz)	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)	4			
Measured total flux density (Jy)	2.09 (1.4 GHz)			
Measured correlated flux density on > 5000 km baseline (Jy)	0.3			
Image RMS needed (mJy/beam)	0.5			
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10			
Number of large telescopes	1–2			
Suggested array given at Item (14)	☑	☐	☐	☐
Minimum acceptable:				
Number of medium telescopes	5			
Number of large telescopes	1			
Suggested array given at Item (14)	☑	☐	☐	☐
Length of observation:				
Preferred length (orbits)	4			
Minimum acceptable length (orbits)	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 :

The 5000 km baseline flux density has been estimated by assuming that the compact VLBA component has flux 460 mJy (see Scientific and Technical Justification) and that (consistent with GPS sources, see STJ) it is a circular gaussian of linear size 10 pc.

Since the largest ground telescope will be critical to finding fringes on long baselines, we request that the telescope employed be of as high a sensitivity as possible.

(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