VSOP AO2 PROPOSAL COVER SHEETS

DEADLINE : 8 May, 1998
SEND TO : VSOG, ISAS, 3-1-1 Yoshinodai, Sagamihara, Kanagawa 229-8510, JAPAN

Please read Appendix C of Announcement of Opportunity for details on how to fill in this Cover Sheet.

(1) Date prepared : 28 April 1998

(2) Proposal title : The Central 1 mas of the Seyfert Galaxy Mrk 231

(3)	INVESTIGATORS	INSTITUTION
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(5) Proposal Abstract :

We propose VSOP imaging at 5 GHz of the Seyfert 1 galaxy Mrk 231 using the VLBA, Y27, and EB, quasi-simultaneously with VLBA imaging at higher frequencies. Our recent VLBA images show a north-south triple of extent 50 mas, plus a central double/triple 1 mas (0.6 h^{-1} pc) in extent with $T_b > 10^9$ K and aligned nearly east-west. This central source, 100–150 mJy at 5 GHz, shows a spectral turnover between 5 and 10 GHz but ground VLBI can only resolve it at 15 GHz and higher frequencies, where it is optically thin. Thus VSOP imaging of the 1-mas source at 5 GHz is essential to determine component turnover frequencies, the nature of the absorption, and the peak brightness temperatures. Mrk 231 is the best candidate among bona fide Seyfert galaxies to exhibit synchrotron self-absorption. VSOP imaging of Mrk 231 will therefore impose new and unique constraints on the physical conditions in Seyfert nuclei.

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

Object type:

☑ AGN, ☐ Maser, ☐ Stellar, ☐ Pulsar, ☐ Other :

Observation type:

☑ Continuum, ☐ Spectral Line, ☐ Polarization, ☑ Time-critical, ☐ Other :

(7) Number of proposed experiments

An 'experiment' is one or more observations of one source at a fixed HALCA set-up. A request to observe the same source at 1.6 GHz and separately at 5 GHz requires two columns to be filled in in item (8) below. A request to observe the same source with HALCA simultaneously observing at 1.6 GHz and 5 GHz requires one column to be filled in. Multi-epoch observations of the same source at the same frequency – a 'monitoring experiment' – requires only one column to be filled in. Suggested observing dates, especially for for time-critical and monitoring experiments, should be specified in item (10).

The number of experiments in this proposal is: 1

(8) Details of proposed experiments

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name (J*hhmm*±*ddmm*)	J1256+5652			
Alternative name	Mrk 231			
RA(J2000) (hh mm ss.ssss)	12 56 14.2344			
Dec(J2000) (dd mm ss.ssss)	+56 52 25.2367			
Observing frequency band (GHz)	5			
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)				
FWHM of field of view required (mas)				
Min. spectral channels per IF channel				
Correlator averaging time (sec)				
No. of correlating passes (if >1)				
Total flux density (Jy)	0.3			
Correlated flux (mJy)	140			
Ground Radio Telescopes:				
Suggested array given at Item (10)?	☑	☐	☐	☐
GRT observing mode:				
128Mbps LCP (standard)	☑	☐	☐	☐
128Mbps LCP/RCP	☐	☐	☐	☐
256Mbps LCP/RCP	☐	☐	☐	☐
Preferred correlator:				
No preference	☐	☐	☐	☐
Mitaka	☐	☐	☐	☐
Penticton	☐	☐	☐	☐
Socorro	☑	☐	☐	☐
Monitoring programs:				
Number of observations				
Mean interval (days)				
Related AO1 proposal code(s)				

(9) 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),

☐ Other:

Phase calibration tones:

☑ On (Standard continuum mode),

☐ Off (Standard spectral line mode)

(Include justification of any non-standard choice at (10) below)

(10) Additional notes to the scheduler :

Suggested GRTs: VLBA, Y, EB.
The central 1-mas source is elongated in PA 70°, so we desire long baselines in that direction.
Sample (u,v) coverages show that 1999 June 1 and 1999 November 1 are especially good.
Quasi-simultaneous VLBA imaging at 8 and 15 GHz will be proposed to the VLBA.

(11) 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 229-8510 JAPAN

In addition, e-mail the completed LaTeX file to submit@vsop.isas.ac.jp

Information from the Cover Sheets of scheduled proposals will be made available from the VSOP WWW site.

Proposals must be received at ISAS by 8 May 1998