VSOP AO5 PROPOSAL COVER SHEETS

DEADLINE : 1 February, 2001
SEND TO : VSOG, ISAS, 3-1-1 Yoshinodai, Sagamihara, Kanagawa 229-8510, JAPAN

(1) Date prepared : 1 February, 2001

(2) Proposal title : Free-Free Absorption towards an Active Galaxy NGC 1052

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(5) Proposal Abstract :

We propose coordinated VSOP and VLBA observations at five frequencies (1.6 and 5 GHz with VSOP, and 2.3, 8.4, and 15.4 GHz with VLBA) towards an active galaxy NGC 1052. Our previous trichromatic VLBA observations at 2.3, 8.4, and 15.4 GHz towards this object revealed that the convex spectrum peaked at GHz-frequency is due to free–free absorption (FFA) rather than synchrotron self-absorption (SSA). We discovered that the FFA opacity was concentrated at the contral sub-pc region. The asymmetric distribution of the opacity, which does not cover the approaching jet but does the receding one, implied that a dense plasma torus perpendicular to the jet is the origin of the FFA. To confirm this result, five-frequency observations with comparable resolutions are necessary. Higher resolution at low frequency is crucial to reveal the density profile of the torus.

(6) Proposal Category (indicate all that apply):
Object type:
☑ AGN, ☐ Maser, ☐ Stellar, ☐ Pulsar, ☐ Other :
Observation type:
☑ Continuum, ☐ Spectral Line, ☐ Polarization, ☐ Time critical,
☐ Phase-reference, ☐ 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 (11).

The number of experiments in this proposal is:2

(8) Details of proposed experiments

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name (J*hhmm*±*ddmm*)	J0241-0815	J0241-0815		
Alternative name	NGC 1052	NGC 1052		
RA(J2000) (hh mm ss.ssss)	02 41 04.7984	02 41 04.7984		
Dec(J2000) (dd mm ss.sss)	-08 15 20.750	-08 15 20.750		
Observing frequency band (GHz)	1.6	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	128	128		
Correlator averaging time (sec)				
No. of correlating passes (if >1)				
Total flux density (Jy)	0.9	1.4		
Correlated flux (mJy)	100	200		
Ground Radio Telescopes:				
Suggested array given at Item (11)?	☑	☑	☐	☐
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 VSOP proposal code(s)				

(9) VSOP spacecraft observing mode (see Section 3 and Table 2 of the VSOP Proposer's Guide):

- [x] 2 channel x 16 MHz, 2-bit (Standard mode),
- [ ] Other:

Phase calibration tones:

- [x] On (Standard continuum mode),
- [ ] Off (Standard spectral line mode)

(Include justification of any non-standard choice at (11) below)

(10) Assistance with preparation of ground telescope schedule files:

[ ] VSOG assistance requested, [ ] Consultation desired, [x] No assistance required

(11) Additional notes to the scheduler :

To obtain a certain spectral fit with a 0.03-mas accuracy of registration, VSOP and VLBA observations should be coordinated within 1 month, since this object show a jet motion with 0.4 mas/yr. According to the FAKESAT, this object can be observed during July 22 – August 8 with VSOP. Since the correlated flux density is expected to be marginal for fringe detection, we request attendance of (at lease one) large GRT such as the phased VLA, Effelsberg, and ATCA.

(12) Attach a scientific and technical justification, not in excess of 2 pages of text and 2 pages of figures. Refer to the VSOP Announcement of Opportunity for detailed instructions. Preprints and reprints will not be forwarded to the Scientific Review Committee.

EITHER e-mail the completed LaTeX file to submit@vsop.isas.ac.jp and 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

OR e-mail the completed LaTeX Cover Sheets file and, in a separate e-mail, the postscript file of the scientific and technical justification, 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 1 February 2001