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 : April 23, 1998

(2) Proposal title : Do pc-scale AGN Jets Consist of a Pair Plasma?

(3)	INVESTIGATORS	INSTITUTION
P.I.	Kouichi Hirotani	NAO, Mitaka, Tokyo, Japan
co-I.	Kiyoaki Wajima	Ibaraki Univ., Ibaraki, Japan
co-I.	S. Sato, S. Iguchi	NAO, Mitaka, Tokyo, Japan
co-I.	M. Kimura, M. Imai	NAO, Mitaka, Tokyo, Japan
co-I.	Y. Asaki, K. Fujisawa	NAO, Mitaka, Tokyo, Japan
co-I.	S. Horiuchi, S. Kameno	NAO, Mitaka, Tokyo, Japan
co-I.	H. Hirabayashi	ISAS, Kanagawa, Japan
co-I.		
co-I.		

(4) Principal Investigator (or contact person) details...

Name : Kouichi HIROTANI
E-mail : hirotani@hotaka.mtk.nao.ac.jp
Fax : +81-422-34-3869
Phone : +81-422-34-3879

Address : National Astronomical
: Observatory,
: 2-21-1 Osawa, Mitaka,
: Tokyo 181-8588,
: JAPAN

(5) Proposal Abstract :

We propose to investigate the matter content of AGN jets in pc-scales. To distinguish whether a jet component is dominated by a normal plasma or by an electron-positron plasma, we must obtain a severe upper limit of the angular diameter of the component together with its surface brightness, and combine the results with kinematices of the jet and the theory of synchrotron self-absorbed radio component. It is VSOP that gives the highest resolution and hence the severest upper limit of the angular diameter of the jet components of which spectra peak at 1.6 or 5 GHz.

(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: 17

(8) Details of proposed experiments

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name (J*hhmm*±*ddmm*)	J0319+4130	J0319+4130	J0433+0521	J0433+0521
Alternative name	3C84	3C84	3C120	3C120
RA(J2000) (hh mm ss.ssss)	03 19 48.1600	03 19 48.1600	04 33 11.0955	04 33 11.0955
Dec(J2000) (dd mm ss.ssss)	+41 30 42.103	+41 30 42.103	+05 21 15.620	+05 21 15.620
Observing frequency band (GHz)	1.6	5	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				
Correlator averaging time (sec)				
No. of correlating passes (if >1)				
Total flux density (Jy)	21.20	42.37	3.85	5.19
Correlated flux (mJy)	130	2000	480	500
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)				

(8) Details of proposed experiments

	Experiment 5	Experiment 6	Experiment 7	Experiment 8
Source name (*Jhhmm±ddmm*)	J0522-3627	J0522-3627	J1104+3812	J1230+1223
Alternative name	PKS	PKS	Mrk421	3C274
RA(J2000) (hh mm ss.ssss)	05 22 57.9846	05 22 57.9846	11 04 27.3146	12 30 49.4233
Dec(J2000) (dd mm ss.ssss)	-36 27 30.8480	-36 27 30.8480	+38 12 31.78	+12 23 28.044
Observing frequency band (GHz)	1.6	5	5	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)				
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)	16.30	8.18	0.72	22.37
Correlated flux (mJy)	990	1000	220	710
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)				

(8) Details of proposed experiments

	Experiment 9	Experiment 10	Experiment 11	Experiment 12
Source name (J*hhmm*±*ddmm*)	J1230+1223	J1642+3948	J1642+3948	J1653+3945
Alternative name	3C274	3C345	3C345	Mrk 501
RA(J2000) (hh mm ss.ssss)	12 30 49.4233	16 42 58.8099	16 42 58.8099	16 53 52.2167
Dec(J2000) (dd mm ss.ssss)	+12 23 28.044	+39 48 36.993	+39 48 36.993	+39 45 36.609
Observing frequency band (GHz)	5	1.6	5	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)				
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)	61.16	6.60	8.36	1.42
Correlated flux (mJy)	600	2120	2000	460
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)				

(8) Details of proposed experiments

	Experiment 13	Experiment 14	Experiment 15	Experiment 16
Source name (J*hhmm±ddmm*)	J1653+3945	J1806+6949	J1806+6949	J2202+4216
Alternative name	Mrk 501	3C371	3C371	BL Lac
RA(J2000) (hh mm ss.ssss)	16 53 52.2167	18 06 50.6806	18 06 50.6806	22 02 43.2913
Dec(J2000) (dd mm ss.ssss)	+39 45 36.609	+69 49 28.108	+69 49 28.108	+42 16 39.979
Observing frequency band (GHz)	5	1.6	5	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)				
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)	1.37	2.26	2.19	4.69
Correlated flux (mJy)	500	1010	400	720
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)				

(8) Details of proposed experiments

	Experiment 17	Experiment 0	Experiment 0	Experiment 0
Source name (J*hhmm*±*ddmm*)	J2202+4216			
Alternative name	BL Lac			
RA(J2000) (hh mm ss.ssss)	22 02 43.2913			
Dec(J2000) (dd mm ss.ssss)	+42 16 39.979			
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)	3.59			
Correlated flux (mJy)	1000			
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 :

We require VLBA+(a large telescope) as ground-based telescopes for the observations of 3C84 (1.6GHz), 3C120 (1.6GHz/5GHz), Mrk 421 (5GHz), 3C274 (1.6GHz/5GHz), Mrk 501 (1.6GHz/5GHz), and 3C371 (5GHz), because their correlated flux densities are not enough to detect with middle-sized telescopes. All the correlated flux densities at 1.6 GHz are estimated from the results at 2.3 GHz with 10,000 km baselines (Preston et al. 1985, Astron. J. **90**, 1599). We desire that both the observations at 1.6 and 5 GHz of an object will be scheduled within a month to obtain a spectrum of each jet component. For each observation, 2 or 3 orbits are required.

(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