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 : May 5, 1998

(2) Proposal title : **Search for the smallest structure in the Galactic molecular clouds**

(3)	INVESTIGATORS	INSTITUTION
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(5) Proposal Abstract :

We propose trial observations to search for the smallest structure in the Galactic molecular clouds by detecting spatial contrast and its time variation in the profiles of formaldehyde absorptions towards extragalactic radio sources. The previous observtions suggest gas structure smaller than 10 AU, but have never found any lower cutoff of the structure size. High mapping quality and spatial resolution of VSOP should reveal fine structure of the background extragalactic sources and their time variations, and be free ideally from beam dilution to smear the absorption profiles. We propose to observe suitiable strong sources near the Galactic plane, 0212+735, DA193, 0528+134, and NRAO530 in two observing sessions for the each source. Such a study makes us understand a universal picuture for interstellar molecular clouds and how density contrast and turbulence, which affect star formation, are created.

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

Object type:

☐ AGN, ☐ Maser, ☐ Stellar, ☐ Pulsar, ☑ Other : The Galactic molecular absorption line

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: 4

(8) Details of proposed experiments

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name (J*hhmm*±*ddmm*)	J0217+73	J0530+13	J0555+39	J1733-13
Alternative name	0212+735	0528+134	DA193	NRAO530
RA(J2000) (hh mm ss.ssss)	02 17 30.8133	05 30 56.4167	05 55 30.8056	17 33 02.7058
Dec(J2000) (dd mm ss.ssss)	+73 49 32.622	+13 31 55.150	+39 48 49.166	-13 04 49.548
Observing frequency band (GHz)	5	5	5	5
Continuum observations:				
Standard VSOP freq. channels?	☐	☐	☐	☐
Channel A range (MHz)	4821-4837	4821-4837	4821-4837	4821-4837
Channel B range (MHz)	4822-4838	4822-4838	4822-4838	4822-4838
Spectral line observations:				
Ch.A spectral line rest freq. (MHz)	4829.6594	4829.6594	4829.6594	4829.6594
Ch.A LSR velocity (km/s)	+5	-20	-20	+70
Ch.B spectral line rest freq. (MHz)	4829.6594	4829.6594	4829.6594	4829.6594
Ch.B LSR velocity (km/s)	+10	-15	-15	+75
FWHM of field of view required (mas)	300	300	300	300
Min. spectral channels per IF channel	4096	4096	4096	4096
Correlator averaging time (sec)	5	5	5	5
No. of correlating passes (if >1)	1	1	1	1
Total flux density (Jy)	4.0	7.9	4.9	8.0
Correlated flux (mJy)	2700	5300	4500	6000
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	2	2	2	2
Mean interval (days)	180	180	180	120
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 request GRTs with S2-recorders.

	Prefered GRT number	RMS noise [1] (mJy)	Obs. span (hours)	1st epoch (1999)	2nd epoch (1999)
Exp. 1	$\geq$5 or $\geq$6	<5.4	18 or 12	Feb.	Aug. – Sep.
Exp. 2	$\geq$5	<10.6	12	Jan. or Mar.	Sep. or Dec.
Exp. 3	$\geq$5	<9.0	12	Jan. or Mar.	Sep. – Oct.
Exp. 4	$\geq$5	<12	12	May – July	Sep.

[1] $\Delta\nu = 15.6$ kHz

Frequency separation should be equal to or smaller than 3.9 kHz

(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