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 : 9 November 1995

(2) Proposal title : Evolution of the Parsec-Scale Radio Jet of 3C 279

(3)	INVESTIGATORS	INSTITUTION
P.I.	Ann E. Wehrle	IPAC/JPL/Caltech, USA
co-I.	Stephen C. Unwin	Caltech, USA
co-I.	Alma C. Zook	Pomona College, USA
co-I.	Wenge Xu	IPAC/JPL/Caltech, USA
co-I.	Esko Valtaoja	Turku University Observatory, Finland
co-I.	Hari Teräsranta	Helsinki University of Technology, Finland
co-I.	Makoto Inoue	University of Tokyo, Japan
co-I.		
co-I.		

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

Name : Dr. Ann E. Wehrle
Address : IPAC / JPL
: Mail Code 100-22
: Pasadena, CA 91125
: USA

Internet : aew@ipac.caltech.edu
Other e-mail :
Fax : +1 818 397 9600
Telephone : +1 818 397 9588

(5) Proposal Abstract :

We propose to monitor the parsec-scale structure of the gamma-ray emitting quasar 3C 279, at 5 and 22 GHz. The goals are to study jet collimation on the scale of a light-year; to measure superluminal motion close to the core; to resolve individual components in the superluminal jet to learn about shock formation and propagation; and to measure the spectral shape of jet components. The latter goal is aimed at a calculation of the physical conditions (magnetic field and particle energy densities) which give rise to inverse-Compton X-rays. From the physical parameters we can derive constraints on models of the relativistic jet formation.

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

Object type:

☑ AGN, ☐ Masers, ☐ Stellar, ☐ Other :

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: 4

	Experiment 1	Experiment 2	Experiment 3	Experiment 4
Source name	3C 279	3C 279	3C 279	3C 279
RA (hh mm ss.s)	12 56 11.2	12 56 11.2	12 56 11.2	12 56 11.2
Dec (dd mm ss)	-05 47 22	-05 47 22	-05 47 22	-05 47 22
J2000 or B1950?	J2000	J2000	J2000	J2000
Observing frequency band (GHz)	5	22	5	22
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)				
Measured total flux density (Jy)	10 - 15	10 - 15	10 - 15	10 - 15
Measured correlated flux density				
on > 5000 km baseline (Jy)	8 - 12	8 - 12	8 - 12	8 - 12
Image RMS needed (mJy/beam)	1.0	2.0	1.0	2.0
Ground Radio Telescopes:				
Preferred choice:				
Number of medium telescopes	10	10	10	10
Number of large telescopes				
Suggested array given at Item (14)	☑	☑	☑	☑
Minimum acceptable:				
Number of medium telescopes	7	7	7	7
Number of large telescopes				
Suggested array given at Item (14)	☑	☑	☑	☑
Length of observation:				
Preferred length (orbits)	2	2	2	2
Minimum acceptable length (orbits)	2	2	2	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	97-05-01	97-05-01	98-04-01	98-04-01
(for monitoring experiments give	to	to	to	to
range for 1st observation only)	97-06-01	97-06-01	98-05-01	98-05-01
For monitoring programs:				
Number of observations	2	2	4	4
Mean interval (days)	30	30	30	30
Acceptable variance from mean (days)	10	10	10	10

(14) Additional notes to the scheduler :

We request two sessions of monitoring, with 5 GHz and 22 GHz scheduled in pairs as close in time as possible:
Session 1: 2 epochs during 1 May 1997 – 30 Jun 1997, preferably separated by ~ 30 days.
Session 2: 4 epochs during 1 May 1998 – 30 Jul 1998, at intervals of ~ 30 days.

Since 3C 279 is very bright and compact, as imaged by ground arrays, we anticipate no special problems in fringe-detection and imaging with VSOP. SNR calculations indicate a substantial margin is available.
Suggested array is the VLBA.

(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