VLBA PROPOSAL COVERSHEET

rcvd:

DEADLINES: 1st of Feb., June, Oct.
EMAIL TO: toosoc@nrao.edu
OR MAIL TO: Director NRAO, Edgemont Rd. Charlottesville, VA 22903-2475, USA

(1) Date Prepared: October 12, 2004

(2) Title of Proposal: VLBA Spacecraft Navigation Observations of the Cassini Spacecraft During a Flyby of Iapetus

(3) AUTHORS (Add * for new location)	INSTI-TUTION	E-mail	G/U	Students Only: For Thesis?	Students Only: Ph.D. Year
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(4) Related previous or current VLBI proposal(s): ◯ Resubmission

(5) Contact author for scheduling: J. D. Romney
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(7) Scientific Category: ⊗ astrometry & geodesy ◯ galactic ◯ extragalactic ◯ other:
Rapid Response Science: ◯ Known Transient ◯ Exploratory ⊗ Target of Opportunity

(8) Wavelength(s) requested (those not available on the global network are indicated with a small circle):
◯ 90cm ◯ 50cm ∘ 30cm ◯ 21cm ◯ 18cm ◯ 13cm ◯ 6cm ∘ 5cm ⊗ 3.6cm ◯ 3.6/13cm
∘ 2cm ◯ 1.3cm ◯ 7mm ∘ 3mm
⊗ Global Network standard bands ◯ Special frequencies:_____

(9) Recording format: ◯ Default continuum setup (VLBA only), ◯ VLBA/MkIV, ◯ MkIII: Mode_____
Bandwidth per BaseBand channel: 16
Aggregate bit rate: 128 (2 BB channels at 32 MSamples/sec of ◯ 1 bit, ⊗ 2 bit)

(10) ⊗ Multi-epoch observation: 5 epochs of 1 or 3 hours each, separated by 1 – 2 days

(11) Network	Requested antennas	Total time requested
EVN & MERLIN		
VLBA	ALL available	9 hours
other NRAO		
Non-VLBI Intruments		

(12) ABSTRACT (Do not write outside this space. Please type)
We propose the first operational use of the VLBA spacecraft navigation technique, to assist in prediction of the Huygens probe's trajectory. We request brief observations of the Cassini spacecraft, five times over seven days, centered on its flyby of the Saturnian satellite Iapetus on 2004 October 17. These measurements should allow a better determination of the mass of Iapetus, and thus of the trajectory of the Huygens probe in its subsequent flyby of Iapetus, approximately one week after its separation from Cassini. The dates of the proposed observations are fixed, in order to match Cassini's flyby of Iapetus and the already fixed DSN downlink schedule. A total of nine hours of VLBA observing time is requested. Our proposal represents a compromise between accommodating other, dynamically-scheduled VLBA observations and a conservative approach to a still-experimental observing technique.

Scheduler use only
(8/03)

(13) Observation type: ⊗ Interferometry, ◯ Spectroscopy, ◯ Pulsar, ⊗ Phase referencing

(14) Proposal is ◯ Suitable ⊗ Unsuitable for dynamic scheduling.

(15) Polarization: ◯ Single Polarization ⊗ Dual Circular Polarization
Global network standard for single polarization is LCP for all λs except 13cm (RCP) and 3.6cm (RCP).

(16) Tape usage (Show <recording time>/<total time>): _____

(17) Assistance required:
Observation Setup: ◯ Consultation, ◯ Extensive help, ◯ Observe file preparation
Postprocessing: ◯ Consultation, ◯ Extensive help, ◯ Calibration service

(18) Processor: ⊗ Socorro, ◯ JIVE, ◯ Haystack, ◯ Bonn, ◯ Washington, ◯ Other_____
Special processing: ◯ XPol, ◯ Pulsar gate, ◯ Multiple Fields: _____
Averaging time: _____ Spectral channels per baseband channel: _____
◯ Other special processing: _____

(19) Postprocessing Location: NRAO-SOC

(20) Source list: ⊗ J2000 ◯ B1950
If more than 4 sources, please attach list. If more than 30, give only selection criteria and GST range(s)

	Source 1	Source 2	Source 3	Source 4
Name(s)	Cassini	J0748+2400	J0802+1809	5 additional
RA (hh mm)	07:55:42.4248	07h48m36.109280s	08h02m48.031942s	phase-ref
Dec (dd.d)	+20:40:22.142	+24d00'24.11018"	+18d09'49.24966"	calibrators
GST range (Europe)				
GST range (US)	14:00 – 17:00	14:00 – 17:00	14:00 – 17:00	14:00 – 17:00
GST range (Other)				
Band(s)	3.6cm	3.6cm	3.6cm	3.6cm
Flux density (Total, Jy)	50 Jy in 62.5 kHz	350 mJy	621 mJy	246 – 349 mJy
Flux density (correlated, mJy)	[unresolved]	[unresolved]	[unresolved]	[unresolved]
RMS needed (mJy/beam)				
Peak/RMS needed				

(21) Preferred VLBI session or range of dates for scheduling, and why:
2004/10/14 13:30 - 14:30 UT *
2004/10/16 13:30 - 14:30 UT *
2004/10/17 12:15 - 15:15 UT
2004/10/19 12:15 - 15:15 UT
2004/10/20 13:15 - 14:15 UT *
These dates are *fixed* in order to match (1) Cassini flyby of Iapetus; (2) Cassini downlink schedule.
* These time ranges could be shifted earlier or later by 1 hour.

(22) Dates which are NOT acceptable, and why:
Any others.

(23) Attach a self-contained scientific justification, not in excess of 1000 words.
Preprints or reprints will not be forwarded to the referees.

Information about the capabilities of the VLBA may be found on the World Wide Web by starting at the NRAO home page, http://www.nrao.edu, and selecting the VLBA from "Sites and Telescopes."

A brief summary of the capabilities of the EVN antennas is given in the EVN STATUS TABLE in the EVN USER GUIDE, which may be found at http://www.evlbi.org/user_guide/user_guide.html.

Please include the full postal addresses for first-time users or for those that have moved (if not contact author).