

PROPOSAL COVERSHEET

DEADLINES: 1st of Feb., June, Oct.

rcvd:

(1) Date Prepared: June 28, 2007

(2) Title of Proposal: Accurate distance to the Orion Trapezium

(3) AUTHORS (Add * for new location)	INSTITUTION	E-mail	Students Only		
			G/U	For Thesis?	Ph.D. Year
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(4) Related previous or current VLBI proposal(s): BL118, BL124, BL128, BL136 Resubmission

(5) Contact author for scheduling: Amy Mioduszewski (6) Telephone: 505-835-7263
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 Array Operations Center
 1003 Lopezville Road
 Socorro, NM 87801-0387

(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: 8 MHz

Aggregate bit rate: 256 (8 BB channels at 16 MSamples/sec of 1 bit, 2 bit)

(10) Multi-epoch observation: 3 epochs of 2 hours each, separated by 1 week

(11) Network	Requested antennas	Total time requested
EVN & MERLIN		
VLBA	ALL	6
other NRAO		
Non-VLBI Instruments		

(12) ABSTRACT (Do not write outside this space. Please type)

Two VLBI distances to the Orion cluster have been published in the last month. One is based on observations of masers associated with source I in the BN/KL region, and was obtained with the Japanese system VERA. The other is from VLBA 15 GHz continuum observation of a peculiar T Tauri star (GMR A) believed to be associated with the Trapezium region. Surprisingly, the two distances are only very marginally consistent with one another: 437 ± 19 pc for the masers in source I against 389^{+24}_{-21} for GMR A. Since the size of the entire Orion region projected over the plane of the sky is only a few parsecs, it is unlikely that its depth would be as large as 50 pc, as these measurements suggest. To unambiguously decide which of these two results actually corresponds to the distance to Orion, we propose to obtain the parallax of a low-mass companion of θ^1 Orionis A. This source is clearly a Trapezium member, and is known to be a fairly bright (10 mJy) non-thermal radio source. Our observations will settle once and for good the issue of the distance to Orion (arguably one of the most important regions of star-formation in the sky) for a very modest amount of observing time.

Scheduler use only

- (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 λ s 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) Post processing 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)	θ^1 Ori A			
RA (hh mm)	05 33			
Dec (dd.d)	-5.42			
GST range (Europe)	10:00 – 16:00			
GST range (US)				
GST range (Other)				
Band(s)	3.6 cm			
Flux density (Total, Jy)	20 mJy			
Flux density (correlated, mJy)	~ 5 mJy			
RMS needed (mJy/beam)	0.12 mJy beam $^{-1}$			
Peak/RMS needed	≥ 10			

- (21) Preferred VLBI session or range of dates for scheduling, and why:
- (22) Dates which are NOT acceptable, and why:
- (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).