



Observing Application

Date : Aug, 15 2011
 Proposal ID : VLBA/11B-213
 Legacy ID : BB316
 PI : David Boboltz
 Type : Director's Discretionary
 Time - Target of
 Opportunity
 Category : Solar System, Stars,
 Planetary Systems
 Total Time : 12.0

Multi-wavelength Imaging of the Circumstellar Atmosphere of Mira (o Cet)

Abstract:

We propose to image the ground-state ($v=0$) and two excited states ($v=1,2$) SiO masers associated with Mira (o Cet) using the VLBA concurrent with infrared observations using the Very Large Telescope Interferometer (VLTI) and sub-mm observations with the Atacama Pathfinder Experiment (APEX). We have recently been granted 23 hours of time over two epochs occurring in September and December, 2011. This time includes 15 hours on the near-infrared (VLTI-AMBER) instrument and 8 hours of APEX time to observe the six SiO maser transitions at 300 GHz. Here we request 10 hours DDT on the VLBA time to occur quasi-simultaneously with our VLTI/APEX observations. These VLBA observations will allow us to make the first high-resolution images of the $v=0$ SiO masers. The size and structure of the $v=0$ shell will be compared to that of the $v=1,2$ SiO maser shells. The concurrent VLTI/APEX observations will allow us to correlate information regarding the near-infrared molecular layers in the atmosphere with the nearby SiO masers at both 43 and 300 GHz. The combined VLBA/VLTI/APEX data will be compared to dynamic atmosphere and maser propagation models.

Authors:

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Related proposals:

AB1087, AB1088

Joint:

Not a Joint Proposal

Observing type(s):

Spectroscopy

VLBA Resources

Name	Details	Stations	Observing Parameters	Correlation Parameters

Name	Details	Stations	Observing Parameters	Correlation Parameters
SIO 42.8 43.1	Wavelength: 7 mm Processor: Socorro-DiFX Observing Standard	VLBA <input checked="" type="checkbox"/> Br <input checked="" type="checkbox"/> Fd <input checked="" type="checkbox"/> Hn <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> La <input checked="" type="checkbox"/> Mk <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> Ov <input checked="" type="checkbox"/> Pt <input checked="" type="checkbox"/> Sc <input checked="" type="checkbox"/> <hr/> HSA Ar Ef GBT VLA-Y27 <hr/> VLA-Y1 <hr/> Geodetic	Bandwidth: 8 MHz Baseband 4 Channels Sample Rate 16 (Msample/s) Bits/Sample 2 Polarization Dual Agg. Bit Rate (Mbits/sec)	Full Polarization Pulsar Gate Correlator Passes 1 Integration Period (sec) 2.0 Spectral Points /BBC 512 No of Fields 1
SiO 43.4	Wavelength: 7 mm Processor: Socorro-DiFX Observing Standard	VLBA <input checked="" type="checkbox"/> Br <input checked="" type="checkbox"/> Fd <input checked="" type="checkbox"/> Hn <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> La <input checked="" type="checkbox"/> Mk <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> Ov <input checked="" type="checkbox"/> Pt <input checked="" type="checkbox"/> Sc <input checked="" type="checkbox"/> <hr/> HSA Ar Ef GBT VLA-Y27 <hr/> VLA-Y1 <hr/> Geodetic	Bandwidth: 8 MHz Baseband 4 Channels Sample Rate 16 (Msample/s) Bits/Sample 2 Polarization Dual Agg. Bit Rate (Mbits/sec)	Full Polarization Pulsar Gate Correlator Passes 1 Integration Period (sec) 2.0 Spectral Points /BBC 512 No of Fields 1

Sources:

Name	Position		Velocity		Group
Mira	Coordinate System	Equatorial	Convention	Radio	Mira variable - omi Cet
	Equinox	J2000			
	Right Ascension	02:19:20.79 00:00:00.0	Ref. Frame	LSRK	
	Declination	-2:58:39.4 00:00:00.0	Velocity	63.8	

Sessions:

Name	Session Time (hours)	Repeat	Separation	GST minimum	GST maximum	Elevation Minimum
Mira SiO	6.00	2	90 day	06:00:00	12:00:00	0

Session Constraints:

Name	Constraints	Comments
Mira SiO	To be coordinated with ESO time on VLTI and APEX.	

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit
Mira SiO	Mira	SIO 42.8 43.1	2.0 hour	0.47 mJy/bm
Mira SiO	Mira	SiO 43.4	4.0 hour	0.33 mJy/bm

Staff support: None

Plan of Dissertation: no