



Observing Application

Date : Oct, 16 2012
 Proposal ID : VLA/12B-392
 Legacy ID : AC1137
 PI : Mark Claussen
 Type : Director's Discretionary
 Time - Exploratory Time
 Category : Solar System, Stars,
 Planetary Systems
 Total Time : 9.0

High Angular Resolution of Spiral Structure in R Sculptoris

Abstract:

We propose to observe the newly-discovered CO spiral in the detached shell of the circumstellar envelope (CSE) of the AGB star R Sculptoris, in order to try to detect the extension of the spiral to small angular scales. We will use the VLA in its current A configuration. If detected, the very close-in spiral should pinpoint the location of companion, and give direct evidence (heretofore very weak) for binarity in AGB stars, and thus strengthen the case for binarity being the source of collimated outflows which sculpt the CSEs and provide the variety of complex geometrical shapes found in planetary nebulae. This is a high-risk, high-gain proposal, which, if successful, would showcase the synergy between VLA and ALMA observations.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Spectroscopy

VLA Resources

Name	Conf.	Frontend & Backend	Setup
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Name	Conf.	Frontend & Backend	Setup
rscl.spiral	A	Ka Band 0.9 cm 26500 - 40000 MHz WIDAR ECSO	Comments: We would like to use the 8 bit samplers, providing 2x1 GHz basebands. In one baseband we would like to set up one subband-pair at 128 MHz bandwidth and 2048 spectral channels to observe the SiS J=2-1 line at 36.309 MHz, with 0.5 km/s spectral resolution. All the rest of the subbands will be set to 128 MHz bandwidth, dual polarization and 128 spectral channels, thus providing 1.92 GHz bandwidth for a continuum measurement.

Testing Resource Images

Sources:

Name	Position		Velocity		Group
R Scl	Coordinate System	Equatorial	Convention	Radio	spiral AGB
	Equinox	J2000		Ref. Frame	
	Right Ascension	01:26:58.09492 00:00:00.0	Velocity		
	Declination	-32:32:35.4374 00:00:00.0			

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
rscl.session	3.00	3	0 day	00:00:00	03:00:00	20

Session Constraints:

Name	Constraints	Comments
rscl.session		8 uJy/beam for continuum observations; 1.4 mJy/beam per 0.5 km/s channel for SiS line observations, after combining all 3 sessions.

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
rscl.session	R Scl	rscl.spiral	3.0 hour	0.014 mJy/bm	

Present for observation: no

Staff support: Consultation

Plan of Dissertation: no