



# Observing Application

Date : Aug, 25 2011  
 Proposal ID : VLA/11B-217  
 Legacy ID : AS1150  
 PI : Alicia Soderberg  
 Type : Director's Discretionary  
 Time - Target of Opportunity  
 Category : Energetic Transients and Pulsars  
 Total Time : 10.0

## Deep EVLA observations of a young Type Ia supernova in M101

### Abstract:

While Type Ia supernovae are used increasingly as cosmological probes to trace the expansion history of the Universe, the nature of their progenitors remains enshrouded in mystery. In the favored model for these explosions, a white dwarf accretes material from a Hydrogen-rich donor star (e.g. red giant). Yet despite numerous observational attempts, only minimal evidence for the donor star or its stellar wind have been revealed. A necessary implication of this model is the production of weak radio emission as the SN blastwave plows through the wind of the donor star. Previous radio searches have been unsuccessful, largely attributed to the fact that the expected emission lies just beyond the old VLA sensitivity. Here we propose to build on the success of our ongoing EVLA program to search for radio emission from the Type Ia SN PTF11kly in M101 (d~6.4 Mpc), the nearest SN Ia discovered in the EVLA era. We propose 10 hrs of 2-GHz bandwidth observations spaced over the next 2 weeks to provide the deepest coadd image of a Type Ia SN to date, a factor of 10 deeper than recent 1-hr observations with 256-GHz bandwidth by an external team.

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### Related proposals:

AS1015

### Joint:

Not a Joint Proposal

### Observing type(s):

Continuum

**VLA Resources**

Name	Conf.	Frontend & Backend	Setup
Any	A	C Band 6 cm 4000-8000 MHz WIDAR ECSO	Comments: Michael Rupen

**Sources:**

Name	Position		Velocity		Group
SNIa	Coordinate System	Equatorial	Convention	Redshift	Supernova Group
	Equinox	J2000			
	Right Ascension	14:03:05.81	Ref. Frame	LSRK	
		00:00:00.0			
Declination	+54:16:25.0	Redshift	0.008		
	00:00:00.0				

**Sessions:**

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
SNIa	1.00	10	2 day	00:00:00	24:00:00	0

**Session Constraints:**

Name	Constraints	Comments
SNIa		These are 10 1-hr observations of the SN in A-array.

**Session Source/Resource Pairs:**

Session Name	Source	Resource	Time	Figure of Merit	Subarray
SNIa	SNIa	Any	1.0 hour	0.006 mJy/bm	

Present for observation: no

Staff support: None

Plan of Dissertation: no