



Observing Application

Date: Jun 10, 2006
Proposal ID: VLA/06C-254
Legacy ID: AJ328
Type: Rapid Response Target of Opportunity
Joint: Not a Joint Proposal
Category: Extragalactic
Total time: 3.9900002 hour

A Supernova Candidate in the Ultra-Low Metallicity Galaxy SBS0335-052

Abstract:

We have detected a supernova candidate in the extreme low metallicity galaxy SBS0335-052. The source appeared in 7mm observations in August of 2005 with a flux density of ~ 0.4 mJy, but is not detected in observations at any other wavelength (including C, X, U, K, and Q-bands) from June 2003 to June 2005. If verified, this will be the first known example of a SN exploding in an extremely metal poor galaxy, making it the first case of a high-redshift analog that we can observe locally. We are admittedly catching the SN later than would be ideal (first-year teaching duties prohibited the reduction until now), and getting observations as soon as possible is essential, more so because we require good spatial resolution. Based on radio light curves of other type II supernova, we estimate the source to currently have a flux density of 0.1 - 0.4 from 3.6cm - 20cm. Our primary goals are (1) to verify whether the object really is a SN, (2) to measure for the first time the light curve of an extremely low-metallicity SN, and how it changes with frequency, and (3) assess the importance of density in SN evolution.

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Observing type(s):

Continuum

Resources:

Resource name	Tele. Conf.	Frontend & Backend	Set up
X-band	VLA B	X Band 3.6 cm 8080 - 8750 MHz VLA Correlator - Single Channel Continuum	Bandwidth: 50 MHz Rest frequencies: 8435.1,8485.1 MHz
C-band	VLA B	C Band 6 cm 4500 - 5000 MHz VLA Correlator - Single Channel Continuum	Bandwidth: 50 MHz Rest frequencies: 4885.1,4835.1 MHz
L-band	VLA B	L Band 20 cm 1240 - 1700 MHz VLA Correlator - Single Channel Continuum	Bandwidth: 50 MHz Rest frequencies: 1464.9,1385.1 MHz

Sources:

Source name	RA	DEC	System	RA range	DEC range	Velocity/z	Group name
SBS0335-052	03:37:44.5	-05:02:38	J2000	00:00:00.0	00:00:00	0 Km/s	

Sessions:

Session Name	Session Time	Repeat	Separation	LST Minimum	LST Maximum	Elevation Minimum
SBS_B	3.9900002 hours	1	0 day	00:00:00	07:00:00	0

Session Constraints:

Session Name	Constraint	Comments
SBS_B	As soon as possible (the SN is evolving as we wait!), and we wish to take advantage of the best possible resolution before the array is fully moved into the B-configuration.	If the SN is verified in these initial observations, we request to continue with the multiepoch stage of this ToO proposal in the B-array, with similar observations every 30-45 days. See discussion in proposal.

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit
SBS_B	SBS0335-052	X-band	1.33 hour	0.02mJy/bm
SBS_B	SBS0335-052	L-band	1.33 hour	0.02mJy/bm
SBS_B	SBS0335-052	C-band	1.33 hour	0.02mJy/bm

Session Resource/Source Constraints:

Session/Source/Resource	Comments
SBS_B/SBS0335-052/X-band	
SBS_B/SBS0335-052/L-band	
SBS_B/SBS0335-052/C-band	

Present for observation: no Staff support: None