



# Observing Application

Date : Aug, 23 2012  
Proposal ID : VLA/12B-374  
Legacy ID : AS1218  
PI : Sarah Spolaor  
Type : Director's Discretionary  
Time - Exploratory Time  
Category : Active Galactic Nuclei  
Total Time : 1.0

## The Compact Radio Source in Abell 2261's Brightest Cluster Galaxy

### Abstract:

The flat profile of the immense core in Abell 2261's brightest cluster galaxy (BCG2261) is theorised to arise from a supermassive black hole binary which scoured the inner regions during its evolution towards coalescence (Postman et al, 2012, ApJ in press). The location and morphology of a compact radio source (unresolved in low-resolution archival VLA data) within this remnant would provide critical information for the interpretation of this system. We propose higher resolution observations, which will enable us to locate and resolve the supermassive black hole(s) within this system. This simple measurement could provide the first direct confirmation of a recoiling supermassive black hole, as proposed by Postman et al. for the system, or could reveal multiple cores as one might expect if a scouring supermassive binary has not yet coalesced. The discovery of a centrally-positioned compact symmetric object might also arise, allowing us to estimate a merger age, and place limits on the origin of the outstanding features of the larger-scale galactic structure.

### Authors:

Name	Institution	Email	Status
Sarah Spolaor	Jet Propulsion Laboratory	sarahbspolaor@gmail.com	
Joseph Lazio	Jet Propulsion Laboratory	Joseph.Lazio@jpl.nasa.gov	
Tod Lauer	National Optical Astronomy Observatory	lauer@noao.edu	
Leonidas Moustakas	Jet Propulsion Laboratory	leonidas@jpl.nasa.gov	
Marc Postman	Space Telescope Science Institute	postman@stsci.edu	

Principal Investigator: Sarah Spolaor  
Contact: Sarah Spolaor  
Telephone: 8182165595  
Email: sarahbspolaor@gmail.com

### Related proposals:

### Joint:

Not a Joint Proposal

### Observing type(s):

Continuum

### VLA Resources

Name	Conf.	Frontend & Backend	Setup
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Name	Conf.	Frontend & Backend	Setup
9GHz	A	X Band 3.6 cm 8000 - 12000 MHz WIDAR OSRO, Full Polarization	Rest frequencies: 8500.0,9500.0 MHz Subband Bandwidth: 128.0 MHz No. of Channels: 64 Poln. products: 4.0 Channel Width: 2000.0 kHz Total Bandwidth: 2,048.00 MHz

Testing Resource Images

### Sources:

Name	Position		Velocity		Group
BCG2261	Coordinate System	Equatorial	Convention	Radio	Target + phase cal
	Equinox	J2000			
	Right Ascension	17:22:27.18 00:00:00.0	Ref. Frame	LSRK	
	Declination	+32:07:57.30	Velocity	0.00	
		00:00:00.0			
cal1735+362	Coordinate System	Equatorial	Convention	Radio	Target + phase cal
	Equinox	J2000			
	Right Ascension	17:35:00.0 00:00:00.0	Ref. Frame	LSRK	
	Declination	+36:20:00.0	Velocity	0.00	
		00:00:00.0			
primary1642+398	Coordinate System	Equatorial	Convention	Radio	Target + phase cal
	Equinox	J2000			
	Right Ascension	16:42:00.0 00:00:00.0	Ref. Frame	LSRK	
	Declination	+39:08:00.0	Velocity	0.00	
		00:00:00.0			

### Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
Main	1.00	1	0 day	14:00:00	20:00:00	0

### Session Constraints:

Name	Constraints	Comments

### Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
Main	BCG2261 cal1735+362 primary1642+398	9GHz	1.0 hour	0.01 mJy/bm	

Present for observation: no

Staff support: None

Plan of Dissertation: no