



# Observing Application

Date : Jul, 27 2011  
 Proposal ID : VLBA/11A-292  
 Legacy ID : BC199  
 PI : Stephen Cenko  
 Type : Director's Discretionary  
 Time - Target of  
 Opportunity  
 Category : Energetic Transients and  
 Pulsars  
 Total Time : 8.0

## Sw J2058+05: A Possible Second Relativistic Tidal Disruption Flare

### Abstract:

The recent discovery of the transient source Sw J1644+57 (aka GRB110328A) has unveiled an entirely new class of high-energy outbursts. Like GRBs, the outburst was believed to mark the birth of a relativistic jet, generating luminous X-ray and radio emission. However, the central engine powering Sw J1644+57 was the super-massive black hole in the nucleus of an otherwise normal (i.e., non-active) galaxy. While not conclusive, the observed emission may result from the tidal disruption of a star passing too close to the central black hole. Here we request observations of a newly identified high-energy transient, Sw J2058+05, that shares many of the same properties. VLBA observations will enable us to pinpoint the location of the transient to the host galaxy nucleus (cementing the association with a super-massive black hole), and also constrain the angular size of the outflow, limiting the age of the inferred relativistic jet.

### Authors:

Name	Institution	Email	Status
Stephen Cenko	California at Berkeley, University of	cenko@astro.berkeley.edu	
Geoffrey Bower	California at Berkeley, University of	gbower@astro.berkeley.edu	
Dale Frail	National Radio Astronomy Observatory	dfrail@nrao.edu	
Assaf Horesh	California Institute of Technology	assafh@astro.caltech.edu	
Shri Kulkarni	California Institute of Technology	srk@astro.caltech.edu	
Josh Bloom	California at Berkeley, University of	jbloom@astro.berkeley.edu	

Principal Investigator: Stephen Cenko  
 Contact: Stephen Cenko  
 Telephone: 510-508-8220  
 Email: cenko@astro.berkeley.edu

### Related proposals:

### Joint:

Not a Joint Proposal

### Observing type(s):

Continuum, Single Pointing(s), Astrometry

## VLBA Resources

Name	Details	Stations	Observing Parameters	Correlation Parameters
Xband	<b>Wavelength:</b> 3.6 cm	VLBA <input checked="" type="checkbox"/>	Bandwidth: 16 MHz	Full Polarization <input checked="" type="checkbox"/>
	<b>Processor:</b> Socorro-DiFX	Br <input checked="" type="checkbox"/> Fd <input checked="" type="checkbox"/> Hn <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/>	Baseband 8	Pulsar Gate
	<b>Observing</b> Standard	La <input checked="" type="checkbox"/> Mk <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> Ov <input checked="" type="checkbox"/>	Channels	Correlator Passes 1
		Pt <input checked="" type="checkbox"/> Sc <input checked="" type="checkbox"/>	Sample Rate (Msample/s) 32	Integration Period (sec) 2.0
	HSA	Ar Ef GBT	Bits/Sample 2	Spectral Points /BBC 8
	VLA-Y27		Polarization Dual	No of Fields 1
	VLA-Y1		Agg. Bit Rate (Mbits/sec)	
	Geodetic			
Kband	<b>Wavelength:</b> 1.3 cm	VLBA <input checked="" type="checkbox"/>	Bandwidth: 16 MHz	Full Polarization <input checked="" type="checkbox"/>
	<b>Processor:</b> Socorro-DiFX	Br <input checked="" type="checkbox"/> Fd <input checked="" type="checkbox"/> Hn <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/>	Baseband 8	Pulsar Gate
	<b>Observing</b> Standard	La <input checked="" type="checkbox"/> Mk <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> Ov <input checked="" type="checkbox"/>	Channels	Correlator Passes 1
		Pt <input checked="" type="checkbox"/> Sc <input checked="" type="checkbox"/>	Sample Rate (Msample/s) 32	Integration Period (sec) 2.0
	HSA	Ar Ef GBT	Bits/Sample 2	Spectral Points /BBC 8
	VLA-Y27		Polarization Dual	No of Fields 1
	VLA-Y1		Agg. Bit Rate (Mbits/sec)	
	Geodetic			

## Sources:

Name	Position		Velocity		Group
Sw J2058+05	<b>Coordinate System</b>	Equatorial	<b>Convention</b>	Redshift	Sw J2058+05 Group
	<b>Equinox</b>	J2000	<b>Ref. Frame</b>	LSRK	
	<b>Right Ascension</b>	20:58:19.898 00:00:00.0	<b>Redshift</b>	1.1853	
	<b>Declination</b>	+05:13:32.25 00:00:00.0			

## Sessions:

Name	Session Time (hours)	Repeat	Separation	GST minimum	GST maximum	Elevation Minimum
Sw2058	4.00	1	0 day	00:00:00	24:00:00	0
Sw2058-K	4.00	1	0 day	00:00:00	24:00:00	0

## Session Constraints:

Name	Constraints	Comments

## Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit
Sw2058	Sw J2058+05	Xband	4.0 hour	0.040 mJy/bm
Sw2058-K	Sw J2058+05	Kband	4.0 hour	0.080 mJy/bm

Staff support: None

Plan of Dissertation: no