



Observing Application

Date : Jun, 09 2011
 Proposal ID : VLA/11A-274
 Legacy ID : AC1053
 PI : Brad Cenko
 Type : Director's Discretionary
 Time - Target of Opportunity
 Category : Energetic Transients and Pulsars
 Total Time : 11.0

The Emerging Class of Prompt Relativistic Outflows from Supermassive Black Holes

Abstract:

The recent discovery of the transient source Swift J164449.3+573451 (Swift 1644) has revealed a potential new class of high-energy outbursts. Like long-duration gamma-ray bursts, these sources exhibit prompt, catastrophic energy release which drives relativistic outflows. However, the central engine powering these events is the supermassive black hole at the center of a normal galaxy. While not unequivocal, these data can best be explained by the tidal disruption of a star which passes too close to the nuclear black hole creating an episode of hyper-critical accretion. Motivated by this fascinating discovery, we have searched for new examples that have the necessary properties (luminous X-ray and/or radio, long-lived high energy emission, evidence for beaming) and we have found Swift J2058 (2011 May 18) and PTF 11agg (2011 Jan. 30). Just as for Swift J1644, radio observations for these objects test the tidal disruption hypothesis through accurate astrometry, measuring the spectrum, and determining the timescale for variability. These data hold the key to tying the emission to the central black hole, and constraining the size, age and total energetics of the relativistic outflows.

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Related proposals:

10B-221, 11A-258

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Single Pointing(s)

VLA Resources

Name	Conf.	Frontend & Backend	Setup
Cwide	A	C Band 6 cm 4000-8000 MHz WIDAR OSRO1: 2 Subbands/Full polz	Rest frequencies: 4900,7900.0 MHz Subband Bandwidth: 128.0 MHz No. of Channels: 64 Poln. products: 4.0 Channel Width: 2000.0 kHz
Kband	A	K Band 1.3 cm 18000 - 26500 MHz WIDAR OSRO1: 2 Subbands/Full polz	Rest frequencies: 21500.0,22500.0 MHz Subband Bandwidth: 128.0 MHz No. of Channels: 64 Poln. products: 4.0 Channel Width: 2000.0 kHz

Sources:

Name	Position		Velocity		Group
PTF11agg	Coordinate System	Equatorial	Convention	Radio	PTF
	Equinox	J2000			
	Right Ascension	08:22:17.2 00:00:00.0	Ref. Frame	LSRK	
	Declination	+21:37:38.0 00:00:00.0	Velocity	0.00	
SwJ2058.4	Coordinate System	Equatorial	Convention	Radio	PTF
	Equinox	J2000			
	Right Ascension	20:58:19.9 00:00:00.0	Ref. Frame	LSRK	
	Declination	+05:13:33.0 00:00:00.0	Velocity	0.00	

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
DetectK	1.00	1	0 day	19:00:00	23:00:00	0
DetectC	1.00	1	0 day	19:00:00	23:00:00	0
ISS	5.00	1	0 day	19:00:00	24:00:00	0
Monitor	1.00	4	30 day	19:00:00	23:00:00	0

Session Constraints:

Name	Constraints	Comments
DetectK		
DetectC		
ISS		Measuring dynamic spectrum on 15-30 min timescales.
Monitor		