Observing Application

Date :	May, 19 2011
Proposal ID :	VLA/11A-269
Legacy ID :	AM1108
PI :	James Miller-Jones
Type :	Director's Discretionary Time - Target of Opportunity
Category :	Energetic Transients and Pulsars
Total Time :	10.0

EVLA observations of the flaring X-ray binary in the globular cluster M15

Abstract:

To date, M15 is the only Galactic globular cluster ever observed to have simultaneously active X-ray binaries (XRBs), with three such sources having been identified. On 2011 May 16, two X-ray bursts were detected by MAXI, on top of a longer X-ray outburst. A follow-up observation by Swift has measured an X-ray luminosity of 1.3e37 erg/s (0.5-10 keV) and a position consistent with the core of M15. The emission could be arising from either the edge-on accretion disc corona (ADC) source AC 211, the ultracompact XRB M15 X-2, or a new transient XRB. The identification of the current flare with either of the known sources would be surprising, as would be the discovery that there is a fourth actively accreting XRB in M15. Depending on which source is responsible for the flare, multi-wavelength observations of the current outburst could critically change our understanding of accretion discs, improve our understanding the mass transfer histories of transient XRBs, and/or improve our understanding of the populations of compact object binaries in globular clusters. Rapid EVLA observations will likely detect radio emission from the XRB and accurately constrain its position.

Authors:

Name	Institution	Email	Status
James Miller-Jones	Curtin University of Technology	james.miller-jones@curtin.edu.au	
Gregory Sivakoff	Virginia, University of	grs8g@virginia.edu	
Craig Heinke	Northwestern University	cheinke@northwestern.edu	

Principal Investigator: James Miller-Jones
Contact: James Miller-Jones
Telephone: +61 8 9266 9899
Email: james.miller-jones@curtin.edu.au

Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Single Pointing(s), Monitoring, Astrometry

VLA Resources

Name	Conf.	Frontend & Backend	Setup

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RSRO	Any	C Band 6 cm 4000-8000 MHz WIDAR RSRO	Comments: 2.048 GHz of bandwidth requested in the C band, under James Miller-Jones' RSRO time allocation (as approved by Claire Chandler). Two 1024 MHz basebands will be used, separated as far as possible within the C-band while avoiding known RFI.

Sources:

Name	Position		Velocity		Group
M15 XRB	**Coordinate System**	Equatorial	**Convention**	Radio	M15
	Equinox	J2000			
	Right Ascension	21:29:57.9	**Ref. Frame**	LSRK	
		00:00:00.0			
	Declination	+12:10:06.0	**Velocity**	0.00	
		00:00:00.0			

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
M15 1h	1.00	2	7 day	16:00:00	03:00:00	10
M15 3h	3.00	1	0 day	16:00:00	03:00:00	10
M15 5h	5.00	1	0 day	16:00:00	03:00:00	10

Session Constraints:

Name	Constraints	Comments
M15 1h	First observation to be taken as soon as possible.	
M15 3h	Quasi-simultaneous with the 2011 May 30 Chandra DDT observation.	
M15 5h	To be observed after the flare is over and the X-ray flux for the globular cluster has returned to its quiescent level.	

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
M15 1h	M15 XRB	RSRO	1.0 hour	0.007 mJy/bm	
M15 3h	M15 XRB	RSRO	3.0 hour	0.004 mJy/bm	
M15 5h	M15 XRB	RSRO	5.0 hour	0.003 mJy/bm	

Present for observation: no Staff support: None Plan of Dissertation: no