



Observing Application

Date : Oct, 13 2008
Proposal ID : VLA/08C-242
Legacy ID : AP569
PI : William Peterson
Type : Rapid Response - Target
of Opportunity
Category : Stellar
Total Time : 4.0

Follow-Up Radio Observations of a Very Bright X-Ray Flare on Algol

Abstract:

We propose rapid radio follow-up observations of a very bright X-ray flare observed on Algol earlier today (21:42UT, GCN 8371). These observations will test the "Explosive Evaporation" model (Fisher et al. 1985 ApJ 289) for Algol, in which a radio (and UV) flare is followed rising X-ray flux which is the time integral of the radio burst (Neupert effect, e.g. Gudel 2002, A&AR). The physical picture is of an impulsive heating event, resulting in gyrosynchrotron emission from particles trapped in a coronal loop, which is then heated and generates thermal X-ray emission. Although we have recently completed a six-epoch VLBI imaging study of the radio magnetosphere of Algol, this observation will provide a unique multi-wavelength opportunity to test this effect for stellar flares on late-type stars. We request three hours of full polarization observations at four well-spaced, EVLA-supported frequencies in order to characterize the time history of the (possible) radio flare. As far as we are aware, no previous near-simultaneous X-ray/radio observations of a flare in this system have been previously published.

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Related proposals:

BM267

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Polarimetry

VLA Resources

Name	Conf.	Frontend & Backend	Setup
20cm	A	L Band 20 cm 1000 - 2000 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 1464.9, 1385.1 MHz Bandwidth: 50 MHz

Name	Conf.	Frontend & Backend	Setup
6cm	A	C Band 6 cm 4200-7700 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 4885.1,4835.1 MHz Bandwidth: 50 MHz
1.3cm	A	K Band 1.3 cm 18000 - 26500 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 22485.1,22435.1 MHz Bandwidth: 50 MHz
7mm	A	Q Band 0.7 cm 40000 - 50000 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 43314.9,43364.9 MHz Bandwidth: 50 MHz

Sources:

Name	RA / RA Range	Dec / Dec Range	Epoch	Velocity / z	Group
Algol-B	03:08:10.1 00:00:01.0	+40:57:20 00:00:01	J2000	Velocity : 0.00	Algol

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
20cm	1.00	1	0 day	01:30:00	5:30:00	0
6cm	1.00	1	0 day	01:30:00	05:30:00	0
1.3cm	1.00	1	0 day	01:30:00	05:30:00	0
7mm	1.00	1	0 day	01:30:00	05:30:00	0

Session Constraints:

Name	Constraints	Comments
20cm		Observe as soon as possible
6cm		
1.3cm		
7mm		

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
20cm	Algol-B	20cm	1.0 hour	0.1 mJy/bm	
6cm	Algol-B	6cm	1.0 hour	0.1 mJy/bm	
1.3cm	Algol-B	1.3cm	1.0 hour	0.1 mJy/bm	
7mm	Algol-B	7mm	1.0 hour	0.1 mJy/bm	

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

