Observing Application

Date :	Apr, 20 2011
Proposal ID :	VLBA/11A-136
Legacy ID :	BL182
PI :	Andrei Lobanov
Type :	Director's Discretionary Time - Exploratory Time
Category :	Energetic Transients and Pulsars
Total Time :	24.0

Deciphering the Crab Nebula: High-resolution imaging of flaring emission

Abstract:

Over the last week (09-17 April 2011) the Crab Nebula showed a dramatic flaring activity in the gamma-ray and X-ray regime, with the gamma-ray flux density reaching unprecedented levels. Building up on a successful VLBI detection of radio emission from the previous flare in the Crab nebula, we propose to observe it with the VLBA at 1.6 GHz at two epochs within the next 14 days (concurrently with the targeted followups with Fermi and Chandra) to image the flaring emission during the extremely high state of activity and attempt to discern between the wind interaction and
magnetic field build-up mechansisms for flare production.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Single Pointing(s)

VLBA Resources

Name	Wavelength	Processor	Stations	Observing Parameters	Correlation Parameters

Name	Wavelength	Processor	Stations	Observing Parameters	Correlation Parameters
Crab-18cm	18 cm	Socorro-DiFX	VLBA ☑ Br ☑Fd ☑Hn ☑Kp ☑ La ☑Mk ☑Kp ☑Ov ☑ Pt ☑Sc ☑ HSA Ar Ef GBT VLA-Y27 VLA-Y1 Geodetic	Bandwidth: 8 MHz Baseband Channels 8 Sample Rate (Msample/s) 32 Bits/Sample 2 Polarization Dual Agg. Bit Rate (Mbits/sec) 512	Full Polarization Pulsar Gate Correlator Passes 1 Integration Period (sec) 2.0 Spectral Points /BBC 8 No of Fields 1

Sources:

Name	Position		Velocity		Group
Crab-C1	**Coordinate System**	Equatorial	**Convention**	Radio	PWN
	Equinox	J2000			
	Right Ascension	05:34:32.422	**Ref. Frame**	Barycentric	
		00:00:00.1			
	Declination	+22:00:52.85	**Velocity**	0.00	
		00:00:00.5			
J0518+2054	**Coordinate System**	Equatorial	**Convention**	Radio	CRS
	Equinox	J2000			
	Right Ascension	05:18:03.82451	**Ref. Frame**	Barycentric	
		00:00:00.0			
	Declination	+00:00:00.0	**Velocity**	0.00	
		20:54:52.49739			
J0521+2112	**Coordinate System**	Equatorial	**Convention**	Radio	CRS
	Equinox	J2000			
	Right Ascension	05:21:45.965846	**Ref. Frame**	Barycentric	
		00:00:00.0			
	Declination	+21:12:51.45151	**Velocity**	0.00	
		00:00:00.0			

Sessions:

Name	Session Time (hours)	Repeat	Separation	GST minimum	GST maximum	Elevation Minimum
Crab ToO	12.00	2	10 day	00:06:00	20:00:00	0

Session Constraints:

Name	Constraints	Comments
Crab ToO		to be scheduled in the April 25 - May 08 period.

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit
Crab ToO	Crab-C1	Crab-18cm	8.5 hour	0.07 mJy/bm
Crab ToO	J0518+2054 J0521+2112	Crab-18cm	3.5 hour	0.04 mJy/bm

Staff support: Consultation Plan of Dissertation: no