Observing Application

Date :	Sep, 18 2012
Proposal ID :	VLBA/12B-382
Legacy ID :	BC214
PI :	C. (Teddy) Cheung
Type :	Director's Discretionary Time - Target of Opportunity
Category :	Active Galactic Nuclei
Total Time :	20.0

Radio Imaging of a Gravitationally Lens Blazar after Gamma-ray Outbursts

Abstract:

Sustained bright gamma-ray flaring activity from the radio double-imaged gravitationally lensed blazar, S3 0218+35, was detected with the Fermi LAT beginning late August with daily fluxes exceeding ~10 - 20 times the source's nominal flux of 1 x 10^-7 ph/cm2/s (> 100 MeV). This afforded a unique opportunity to search for and measure the expected gravitationally lensed echo emission. Temporal and spectral analysis of the LAT observations during this active period indicate gamma-ray flaring activity separated by ~10 days, consistent with the previously determined gravitational lens radio delay by Biggs et al. (1999) and Cohen et al. (2000). We request target-of-opportunity radio imaging in order to obtain spatially resolved fluxes of the two components to quantify the frequency dependent magnification ratios in order to compare to the gamma-ray measurements.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum

VLBA Resources

Name	Details	Stations	Observing Parameters	Correlation Parameters
S/X band	**Wavelength:** 3.6/13 cm **Processor:** Socorro-DiFX **Observing Mode:** Standard	VLBA ☑ Br ☑ Fd ☑ Hn ☑ Kp ☑ La ☑ Mk ☑ Nl ☑ Ov ☑ Pt ☑ Sc ☑ HSA ☐ Ar ☐ Ef ☐ GBT ☐ VLA-Y27 ☐ VLA-Y1 ☐ Geodetic	Observing System: Legacy System Bandwidth: 16 MHz Baseband Channels 8 Sample Rate (Msample/s) 32 Bits/Sample 2 Polarization Dual Agg. Bit Rate (Mbits/sec) 512	Full Polarization ☐ Pulsar Gate ☐ Convert to Mark4 ☐ Correlator Passes 1 Integration Period (sec) 2.0 Spectral Points /BBC 32 No of Fields 1
K band	**Wavelength:** 1.3 cm **Processor:** Socorro-DiFX **Observing Mode:** Standard	VLBA ☑ Br ☑ Fd ☑ Hn ☑ Kp ☑ La ☑ Mk ☑ Nl ☑ Ov ☑ Pt ☑ Sc ☑ HSA ☐ Ar ☐ Ef ☐ GBT ☐ VLA-Y27 ☐ VLA-Y1 ☐ Geodetic	Observing System: Legacy System Bandwidth: 16 MHz Baseband Channels 8 Sample Rate (Msample/s) 32 Bits/Sample 2 Polarization Dual Agg. Bit Rate (Mbits/sec) 512	Full Polarization ☐ Pulsar Gate ☐ Convert to Mark4 ☐ Correlator Passes 1 Integration Period (sec) 2.0 Spectral Points /BBC 32 No of Fields 2

Sources:

Name	Position		Velocity		Group
S30218+35	**Coordinate System**	Equatorial	**Convention**	Optical	0218+35
	Equinox	J2000			
	Right Ascension	02:21:05.47	**Ref. Frame**	Barycentric	
		00:00:00.0			
	Declination	+35:56:13.7	**Redshift**	0.68466	
		00:00:00.0			

Sessions:

Name	Session Time (hours)	Repeat	Separation	GST minimum	GST maximum	Elevation Minimum
Lens	2.00	10	3 day	22:00:00	06:00:00	0

Session Constraints:

Name	Constraints	Comments