



Observing Application

Date : Mar, 01 2013
 Proposal ID : VLBA/13A-502
 Legacy ID : BR188
 PI : Bindu Rani
 Type : Director's Discretionary
 Time - Target of Opportunity
 Category : Active Galactic Nuclei
 Total Time : 9.0

ToO VLBI observations to trace BL LAC during decay phase of historic outburst

Abstract:

The source BL Lac showed a historic broad-band outburst in Nov./Dec. 2012, with a peak of $S \sim 14.5$ Jy at 230 GHz and associated rapid gamma-ray variability observed by Fermi-LAT. To study the structural and spectral variations related to this extreme flare, we observed BL Lac at 86 GHz on Feb. 18, 2013 with the VLBA. The next observations are scheduled for May 2013 (in GMVA session). We notice that the flux density of the source now is decaying very fast, therefore we ask for one additional VLBI observations to bridge the long time gap until May. We do not want to miss the transition from synchrotron cooling to adiabatic cooling in the spectral evolution of the inner jet region during this decay. We therefore propose a 22, 43 and 86 GHz VLBA observation of BL Lac well before May. The key objectives are (1) to better trace the structural/spectral evolution on the <0.5 mas scale, in a region where moving and stationary components coexist, (2) relate (helical) motion and polarization variations, (3) check if the gamma-rays are produced by either moving or colliding shocks.

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Related proposals:

BR176, GR034

Joint:

Not a Joint Proposal

Observing type(s):

VLBA Resources

Resource Name: 13mm

Details	Stations	Observing Parameters	Correlation Parameters	Special Features
Wavelength: 1.3 cm Processor: Socorro-DiFX Observing Mode: Standard	VLBA ☒ Br ☒ Fd ☒ Hn ☒ Kp ☒ La ☒ Mk ☒ NI ☒ Ov ☒ Pt ☒ Sc ☒ HSA ☐ Ar ☐ Ef ☐ GBT ☐ VLA-Y27 ☐ VLA-Y1 ☐ Geodetic	Observing DDC System: System Bandwidth: 32 MHz Baseband Channels 4 Polarization Dual Agg. Bit Rate (Mbits/sec) 512	Correlator Passes 1 Integration Period (sec) 1.0 Spectral Points /BBC 64 No of Fields 1	Full Polarization ☒ Pulsar Gate ☐ Convert to Mark4 ☒

Resource Name: 7mm

Details	Stations	Observing Parameters	Correlation Parameters	Special Features
Wavelength: 7 mm Processor: Socorro-DiFX Observing Mode: Standard	VLBA ☒ Br ☒ Fd ☒ Hn ☒ Kp ☒ La ☒ Mk ☒ NI ☒ Ov ☒ Pt ☒ Sc ☒ HSA ☐ Ar ☐ Ef ☐ GBT ☐ VLA-Y27 ☐ VLA-Y1 ☐ Geodetic	Observing DDC System: System Bandwidth: 32 MHz Baseband Channels 4 Polarization Dual Agg. Bit Rate (Mbits/sec) 512	Correlator Passes 1 Integration Period (sec) 1.0 Spectral Points /BBC 64 No of Fields 1	Full Polarization ☒ Pulsar Gate ☐ Convert to Mark4 ☒

Resource Name: 3mm

Details	Stations	Observing Parameters	Correlation Parameters	Special Features
Wavelength: 3 mm Processor: Socorro-DiFX Observing Mode: Standard	VLBA ☒ Br ☒ Fd ☒ Hn ☐ Kp ☒ La ☒ Mk ☒ NI ☒ Ov ☒ Pt ☒ Sc ☐ HSA ☐ Ar ☐ Ef ☐ GBT ☐ VLA-Y27 ☐ VLA-Y1 ☐ Geodetic	Observing DDC System: System Bandwidth: 32 MHz Baseband Channels 4 Polarization Dual Agg. Bit Rate (Mbits/sec) 512	Correlator Passes 1 Integration Period (sec) 1.0 Spectral Points /BBC 64 No of Fields 1	Full Polarization ☒ Pulsar Gate ☐ Convert to Mark4 ☒

Sources:

Name	Position	Velocity	Group
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