Observing Application

Imaging the shock in Gamma Ray Nova Mon 2012

Abstract:

Nova Mon 2012 was discovered on June 29, 2012 by the Fermi Gamma-ray Space Telescope. Subsequent radio observations with the VLA showed a source which brightened from <1mJy to 10mJy at 6.5 GHz over a period of 70 days. EVN observations on Sept 18, 2012 show a two component, slightly resolved, source. There are many things that are unknown about gamma-ray nova such as the emission mechanisms. The radio emission in these nova might come from a similar place as the X-rays and gamma-ray, i.e., shocks, but are the shocks internal to the ejecta, shocks between the ejecta and CBM or in a jet. On the other hand the radio may also arise from the hot thermal gas that is known to exist. We propose to observe Nova Mon 4 times with a gap of 1-2 weeks at L, C and possibly X-band in order to: 1) directly image the early expansion and morphological evolution; 2) determine the emission mechanism; 3) compare with quasi-simultaneous eMERLIN and VLA imaging; and 4) Provide superb astrometry, and possibly even a geometric parallax.

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Related proposals:

VLA/12B-375

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Single Pointing(s), Monitoring, Astrometry

VLBA Resources

Name	Details	Stations	Observing Parameters	Correlation Parameters
C band	**Wavelength:** 6 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: PFB System Bandwidth: 32 MHz Baseband Channels 16 Sample Rate (Msample/s) 64 Bits/Sample 2 Polarization Dual Agg. Bit Rate (Mbits/sec) 2048	Full Polarization ☐ Pulsar Gate ☐ Convert to Mark4 ☐ Correlator Passes 1 Integration Period (sec) 2.0 Spectral Points /BBC 64 No of Fields 1
X band	**Wavelength:** 3.6 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: PFB System Bandwidth: 32 MHz Baseband Channels 16 Sample Rate (Msample/s) 64 Bits/Sample 2 Polarization Dual Agg. Bit Rate (Mbits/sec) 2048	Full Polarization ☐ Pulsar Gate ☐ Convert to Mark4 ☐ Correlator Passes 1 Integration Period (sec) 2.0 Spectral Points /BBC 64 No of Fields 1
L band	**Wavelength:** 18 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: PFB System Bandwidth: 32 MHz Baseband Channels 16 Sample Rate (Msample/s) 64 Bits/Sample 2 Polarization Dual Agg. Bit Rate (Mbits/sec) 2048	Full Polarization ☑ Pulsar Gate ☐ Convert to Mark4 ☐ Correlator Passes 1 Integration Period (sec) 2.0 Spectral Points /BBC 64 No of Fields 1

Sources:

Name	Position		Velocity		Group
Nova Mon	**Coordinate System**	Equatorial	**Convention**	Radio	Nova
	Equinox	J2000			
	Right Ascension	06:39:38.57 00:00:00.0	**Ref. Frame**	LSRK	
	Declination	+05:53:53.4 00:00:00.0	**Velocity**	0.00	

Sessions:

Name	Session Time (hours)	Repeat	Separation	GST minimum	GST maximum	Elevation Minimum
Monitor	6.00	4	10 day	22:30:00	04:30:00	0