



GMRT Observing Application

Cycle No: 42 Primary Backend: GWB

(Note: This PDF is generated by version 1.44 coversheet generator script running in L^AT_EX mode)

Proposal Code: 42_067

Submission Date: 15-01-2022

Title: GMRT mapping of eight episodic radio source candidates

Related Proposals:

Abstract:

Radio loud Active Galactic Nuclei (AGN) are observed to exhibit episodic jet activity with the active phases being short term compared to the life time of the galaxy. The search for such episodic radio sources is a tedious process and most of the known ones were identified based on their morphology with clear two pairs of lobes (double-double radio sources). We have developed a new morphology independent method to look for radio sources with episodic activity based on the spectral index at low and high radio frequencies. The goal of this search is to increase the number of known episodic sources which may not follow clear double-double morphology. Using this technique, we have found over 100 candidate episodic radio sources by cross matching VLSS, TGSS, NVSS and PMN catalogues at frequencies ranging from 74 MHz to 4.8 GHz. Here we propose to observe eight new episodic radio source candidates from our sample with uGMRT at 250–500 MHz (band-3) and 550–850 MHz (band-4). These sources have significantly excess radio emission at low frequencies as compared to high frequencies (concave spectra). The main goals of this study is to understand its morphology, spectral index properties and to understand the origin of excess emission at low radio frequencies. We intend this observation to be a pilot study leading to an extensive survey identifying larger number of episodic sources. We request two hours per band for all the eight objects; 16 hours at 250–500 MHz (band-3) and another 16 hours at 550–850 MHz (band-4) with a total of 32 hours.

Proposers:

The first name on the list of proposers is the Principal Investigator for this proposal.

Proposer	Institution	Observer	Email	Nationality	PhD Student
Aparna Raj	Newman College	No	rajaparna45@gmail.com	INDIA	Yes
BIJU.K.G	WMOC	No	kgbiju42@gmail.com	INDIA	No
Joe Jacob	Newman College	No	drjoephysics@gmail.com	INDIA	No
C.H. IshwaraChandra	NCRA	No	ishwar@ncra.tifr.res.in	INDIA	No

Phd Students table:

Student	Project Title	Year of Completion
Aparna Raj	Investigation of the nature and environmental interactions of episodic radio sources	2023

PI Contact Details:

Address: Moolayil House
Changanacherry
Kurumpanadom P.O

City: Kottatyam

State: Kerala

Country: INDIA

Telephone: 9747280286

Fax:

Technical Category: Continuum

Scientific Categories: Active Galactic Nuclei and Radio Galaxies

Time Requested Summary:

Band 2 (130-260 MHz)	Band 3 (250-500 MHz)	Band 4 (550-900 MHz)	Band 5 (1000-1450 MHz)	Total Time Requested (hrs)
0.0	16.0	16.0	0.0	32.0

Authors have been allotted time in GMRT before: Yes

Data Reduction at: home

Support Required: none

Minimum length of time slot required: 2.0 hrs

Maximum length of time slot required:

Special requirements of hardware, software, or operating procedures, etc:

Is integration time less than 8 seconds required for extended periods?: No

Expected disk space requirement for the project: 0.0 GB

Non Standard Frequency: No

Any other special requirements: Night time scheduling for band-3 to minimize the effects of RFI

Source List:

(Please note that, the text shown inside () next to group name is the source name used during gtac scheduling)

Group Name	Source Name	RA (hh mm ss.sss)	DEC (dd mm ss.sss)	Epoch	Wave band	Freq (MHz)	Base band BW (MHz)	Flux Density - Line (mJy)	Flux Density - Cont (mJy)	Max Angular Size (arcmin)	Req RMS (mJy/beam)	Time Req (hrs)	LST Start	LST Stop
G1 (S1)		03 12 57.42	+08 22 08.0	2000	Band 3 (250-500 MHz)	400.0					30.0	2.0	22 14 44.12	08 13 31.88
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G2 (S2)		03 12 57.42	+08 22 08.0	2000	Band 4 (550-900 MHz)	650.0					17.0	2.0	22 14 44.12	08 13 31.88
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G3 (S3)		04 17 16.95	-05 53 50.6	2000	Band 3 (250-500 MHz)	400.0					30.0	2.0	23 39 26.13	08 57 15.87
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G4 (S4)		04 17 16.95	-05 53 50.6	2000	Band 4 (550-900 MHz)	650.0					17.0	2.0	23 39 26.13	08 57 15.87

Group Name	Source Name	RA (hh mm ss.sss)	DEC (dd mm ss.sss)	Epoch	Wave band	Freq (MHz)	Base band BW (MHz)	Flux Density - Line (mJy)	Flux Density - Cont (mJy)	Max Angular Size (arcmin)	Req RMS (mJy/beam)	Time Req (hrs)	LST Start	LST Stop
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G5 (S5)		08 00 09.62	+08 27 26.6	2000	Band 3 (250-500 MHz)	400.0					30.0	2.0	03 02 01.3	13 00 40.7
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G6 (S6)		08 00 09.62	+08 27 26.6	2000	Band 4 (550-900 MHz)	650.0					17.0	2.0	03 02 01.3	13 00 40.7
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G7 (S7)		11 10 22.70	+03 21 32.3	2000	Band 3 (250-500 MHz)	400.0					30.0	2.0	06 19 00.26	16 03 59.74
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												

Group Name	Source Name	RA (hh mm ss.sss)	DEC (dd mm ss.sss)	Epoch	Wave band	Freq (MHz)	Base band BW (MHz)	Flux Density - Line (mJy)	Flux Density - Cont (mJy)	Max Angular Size (arcmin)	Req RMS (mJy/beam)	Time Req (hrs)	LST Start	LST Stop
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date		Preferred/Not Preferred									
G8 (S8)		11 10 22.70	+03 21 32.3	2000	Band 4 (550-900 MHz)	600.0					17.0	2.0	06 19 00.26	16 03 59.74
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date		Preferred/Not Preferred									
G9 (S9)		12 11 34.36	-08 03 16.0	2000	Band 3 (250-500 MHz)	400.0					30.0	2.0	07 37 40.56	16 47 43.44
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date		Preferred/Not Preferred									
G10 (S10)		12 11 34.36	-08 03 16.0	2000	Band 4 (550-900 MHz)	650.0					17.0	2.0	07 37 40.56	16 47 43.44
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date		Preferred/Not Preferred									
G11 (S11)		15 01 58.25	+07 52 43.7	2000	Band 3 (250-500 MHz)	400.0					30.0	2.0	10 04 29.61	20 01 36.39

Group Name	Source Name	RA (hh mm ss.sss)	DEC (dd mm ss.sss)	Epoch	Wave band	Freq (MHz)	Base band BW (MHz)	Flux Density - Line (mJy)	Flux Density - Cont (mJy)	Max Angular Size (arcmin)	Req RMS (mJy/beam)	Time Req (hrs)	LST Start	LST Stop
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G12 (S12)		15 01 58.25	+07 52 43.7	2000	Band 4 (550-900 MHz)	600.0					17.0	2.0	10 04 29.61	20 01 36.39
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G13 (S13)		15 40 30.16	-05 14 35.8	2000	Band 3 (250-500 MHz)	400.0					30.0	2.0	11 01 53.52	20 21 26.48
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G14 (S14)		15 40 30.16	-05 14 35.8	2000	Band 4 (550-900 MHz)	600.0					17.0	2.0	11 01 53.52	20 21 26.48
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												

Group Name	Source Name	RA (hh mm ss.sss)	DEC (dd mm ss.sss)	Epoch	Wave band	Freq (MHz)	Base band BW (MHz)	Flux Density - Line (mJy)	Flux Density - Cont (mJy)	Max Angular Size (arcmin)	Req RMS (mJy/beam)	Time Req (hrs)	LST Start	LST Stop
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G15 (S15)		22 05 38.53	-05 35 33.7	2000	Band 3 (250-500 MHz)	400.0					30.0	2.0	17 27 17.13	02 46 16.87
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										
G16 (S16)		22 05 38.53	-05 35 33.7	2000	Band 4 (550-900 MHz)	600.0					17.0	2.0	17 27 17.13	02 46 16.87
Observation Types:		continuum												
Backend Config options:		400 MHz BW Mode, Interferometer Non-Polar Beam1 : No Beam, Beam2 : No Beam												
Backend Config sp.req :														
Dates Preferred/ Not Preferred:		Start Date	End Date	Preferred/Not Preferred										

Comments related to source list:

Secondary Configuration used: