GMRT Observing Application

Cycle No: 17

Proposal Code: 17_073

Submission Date:

Title: The morphology of the steepest spectrum radio sources in the cores of clusters of galaxies - echoes of AGN feedback?

Related Proposals:

Abstract:
It has recently been widely recognised that the cores of clusters of galaxies are very dynamic environments where the balance between the heating and cooling of gas shifts dramatically over time depending on the energy injected into the core from the central supermassive black hole. Much of the radio work on this area has concentrated on the most "active" systems which are actively launching radio jets into the surrounding intracluster gas but these are relatively rare. We propose to obtain a sample of 20 steep spectrum radio sources in the cores of X-ray luminous clusters selected from the VLSS at 74MHz. These sources will be either systems which were active relatively recently and have spectrally aged or systems in which a cluster-cluster merger has created a radio halo or mini-halo in the cluster centre. Our proposed GMRT 325MHz observations will provide enough spatial resolution to determine between these two possibilities. The proposed observations are complementary to previous studies that target a restricted sample of X-ray luminous clusters or the most currently active systems as our selection identifies the steepest spectrum sources in a sample of >700 clusters with a wide range in X-ray luminosity and redshift. This study will act as a prelude to the large number of similar (but fainter) sources that LOFAR will identify in the near future.

Proposers:

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

Proposer	Institution	Observer	e-mail	Nationality	PhD Student
Alastair Edge	Durham	Yes	alastair.edge@durham.ac.uk	UNITED KINGDOM	No
Huub Rottgering	Leiden	No	rottgeri@strw.leidenuniv.nl	NETHERLANDS	No
Brian Robert McNamara	Waterloo	No	mcnamara@uwaterloo.ca	UNITED STATES	No
Michael Wise	Astron	No	wise@astron.nl	UNITED STATES	No

Proposer	Institution	Observer	e-mail	Nationality	PhD Student
Marcus Bruggen	Bremen	No	m.brueggen@jacobs-university.de	GERMANY	No
Reinout van Weeren	Leiden	Yes	rvweeren@strw.leidenuniv.nl	NETHERLANDS	No
Gianfranco Brunetti	INAF-IRA	No	brunetti@ira.inaf.it	ITALY	No
J. H. Croston	Hertfordshire	No	J.H.Croston@herts.ac.uk	UNITED KINGDOM	No

Phd Students table:

PI Contact Details:

Address:	Institute of Computational Cosmology South Road
City:	Durham
State:	
Country:	UNITED KINGDOM
Telephone:	+44 191 334 3792
Fax:	+44 191 334 3645

Scientific Categories: Active galaxies

Time Requested Summary:

21 cm	50 cm	90 cm	128 cm	200 cm	dual(50/128) cm	Total Time Requested (hrs)
0.0	0.0	103.999985	0.0	0.0	0.0	5.2

Authors have been allotted time in GMRT before: No

Data Reduction at: home

Support Required: consultation

Dates Preferred/Not Preferred:

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: 20.0 GB

Non Standard Frequency: No

Short Critical Spacing: No

Any other special requirements:

Source List:

Group Name	Source Name	RA (hh mm ss.sss)	DEC (dd mm ss.sss)	Epoch	GMRT Array	Short Spacing Critical	Waveband	Freq (MHz)	Baseband BW (MHz)	Flux Density - Line (mJy)	Flux Density - Cont (mJy)	Req RMS (mJy/beam)	Time Req (hrs)	LST Start	LST Stop
G1	Abell 133	1 2 38.976	-21 57 15.408	2000	F	No	90 cm	325.0	16.0		0.0	0.0	5.2	20	6
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 2 Sideband												
G1	Abell 272	1 55 19.090	33 56 40.920	2000	F	No	90 cm	325.0	16.0				5.2	21	7
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	Zw808	03 01 38.48	+01 55 9.9	2000	F	No	90 cm	325.0	16.0				5.2	22	8
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	Abell 496	4 33 37.092	-13 14 46.320	2000	F	No	90 cm	325.0	16.0				5.2	0	9
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	MS0440+02	04 43 9.69	+02 10 20.5	2000	F	No	90 cm	325.0	16.0				5.2	0	10
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	RXJ0522+28	05 22 45.39	+28 06 45.1	2000	F	No	90 cm	325.0	16.0				5.2	23	11

Group Name	Source Name	RA (hh mm ss.sss)	DEC (dd mm ss.sss)	Epoch	GMRT Array	Short Spacing Critical	Waveband	Freq (MHz)	Baseband BW (MHz)	Flux Density - Line (mJy)	Flux Density - Cont (mJy)	Req RMS (mJy/beam)	Time Req (hrs)	LST Start	LST Stop
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	CIZAJ0632+25	06 32 1.12	+25 21 1.1	2000	F	No	90 cm	325.0	16.0				5.2	0	12
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	Abell 566	7 4 29.873	63 17 31.560	2000	F	No	90 cm	325.0	16.0			0.0	5.2	1	13
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	RXJ0729+24	07 29 28.02	+24 36 20.3	2000	F	No	90 cm	325.0	16.0				5.2	1	13
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	Abell 590	7 37 29.011	35 16 13.044	2000	F	No	90 cm	325.0	16.0				5.2	1	13
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	MS0735+74	07 41 45.93	+74 15 14.9	2000	F	No	90 cm	325.0	16.0				5.2	0	14
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	Abell 795	9 24 2.518	14 10 4.872	2000	F	No	90 cm	325.0	16.0				5.2	3	15

Group Name	Source Name	RA (hh mm ss.sss)	DEC (dd mm ss.sss)	Epoch	GMRT Array	Short Spacing Critical	Waveband	Freq (MHz)	Baseband BW (MHz)	Flux Density - Line (mJy)	Flux Density - Cont (mJy)	Req RMS (mJy/beam)	Time Req (hrs)	LST Start	LST Stop
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	Zw2701	09 52 49.53	+51 53 4.8	2000	F	No	90 cm	325.0	16.0				5.2	3	15
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	Abell 980	10 22 25.404	50 6 50.292	2000	F	No	90 cm	325.0	16.0				5.2	4	16
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	RXJ1144-05	11 44 7.70	-05 48 39.8	2000	F	No	90 cm	325.0	16.0				5.2	6	18
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	RXJ1206-08	12 06 12.06	-08 48 04.1	2000	F	No	90 cm	325.0	16.0				5.2	6	18
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	MKW8	14 40 40.47	+03 29 19.6	2000	F	No	90 cm	325.0	16.0				5.2	9	20
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	MKW3s	15 21 50.54	+07 41 35.3	2000	F	No	90 cm	325.0	16.0				5.2	9	21

Group Name	Source Name	RA (hh mm ss.sss)	DEC (dd mm ss.sss)	Epoch	GMRT Array	Short Spacing Critical	Waveband	Freq (MHz)	Baseband BW (MHz)	Flux Density - Line (mJy)	Flux Density - Cont (mJy)	Req RMS (mJy/beam)	Time Req (hrs)	LST Start	LST Stop
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	RXJ2216-17	22 16 57.73	-17 25 21.2	2000	F	No	90 cm	325.0	16.0				5.2	18	02
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												
G1	Abell 2443	22 26 7.428	17 20 17.160	2000	F	No	90 cm	325.0	16.0				5.2	16	04
	Obs Types:		continuum, imaging												
	Other config options:		Correlator - 0 Sideband												

Comments related to source list: Four of the targets are in common with the proposal by Raychaudhury that proposes a sample of cavity systems selected from X-ray observations. If both proposals are successful then these observations will not be duplicated.