



Observing Application

Date: Aug 11, 2007
 Proposal ID: VLA/07C-242
Legacy ID: AG777
 PI: Jenny Greene
 Type: Rapid Response
 Exploratory Time
 Category: Extragalactic
 Total time: 5.0 hour

Radio Emission from 10 Intermediate-Mass Black Holes: VLBA Preparation

Abstract:

Greene & Ho (2007) present a sample of over 200 intermediate-mass black holes (IMBHs) in galactic nuclei. These IMBHs each have a mass < 2 million Solar masses and may be local analogs of the starting conditions, or seeds, for supermassive black holes. Eleven of these IMBHs are detected as FIRST sources with 20cm powers in the range $10^{(21-23)}$ W/Hz. This emission is unresolved at a resolution of 5" (~10 kpc) and may be dominated either by accretion onto the central black holes or by star formation in the host galaxies. VLBA imaging at a resolution of 0.005" (~10 pc) at 20cm will provide structural information to help constrain the energy source, and we will propose it at the October deadline to ensure nighttime phase-referencing in 2008. To prepare for that proposal, we request short VLA observations of 10 of these 11 IMBHs in the A configuration to localize the 20cm emission and measure its strength at a resolution of 1" (~2 kpc). We have recently observed the eleventh IMBH, GH 10, in the current A configuration and found it to be suitably compact and strong for VLBA follow-up.

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Related proposals:

AG 670, AG 745

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Single Pointing(s), *

Resources:

Resource name	Tele. Conf.	Frontend & Backend	Set up
Aconfig20cm	VLA A	L Band 20 cm 1200 - 2000 MHz VLA Correlator - Single Channel Continuum	Bandwidth: 50 MHz Rest frequencies: 1364.9,1435.1 MHz

Sources:

Source name	RA / RA Range	DEC / DEC Range	System	Velocity/z	Group name
GH 047	08:24:43.3 00:00:00.0	+29:59:23 00:00:00	J2000	z = 0.025	IMBHs
GH 069	09:14:49.5 00:00:00.0	+08:53:21 00:00:00	J2000	z = 0.140	IMBHs
GH 087	10:12:46.6 00:00:00.0	+06:16:04 00:00:00	J2000	z = 0.078	IMBHs
GH 101	10:51:08.8 00:00:00.0	+60:59:57 00:00:00	J2000	z = 0.082	IMBHs
GH 106	11:05:01.1 00:00:00.0	+59:41:03 00:00:00	J2000	z = 0.034	IMBHs
GH 140	12:16:29.1 00:00:00.0	+60:18:23 00:00:00	J2000	z = 0.060	IMBHs
GH 158	13:16:59.4 00:00:00.0	+03:53:19 00:00:00	J2000	z = 0.045	IMBHs
GH 163	13:24:28.2 00:00:00.0	+04:46:29 00:00:00	J2000	z = 0.021	IMBHs
GH 174	14:08:29.3 00:00:00.0	+56:28:23 00:00:00	J2000	z = 0.134	IMBHs
GH 203	15:59:09.6 00:00:00.0	+35:01:47 00:00:00	J2000	z = 0.031	IMBHs

Sessions:

Session Name	Session Time	Repeat	Separation	LST Minimum	LST Maximum	Elevation Minimum
VLBA preparation	5.0 hours	1	0 day	09:30:00	14:30:00	0

Session Constraints:

Session Name	Constraint	Comments
VLBA preparation	Dynamic scheduling is preferred, likely split as one 0.5-hour scheduling block per source.	A configuration is strongly preferred.

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit
VLBA preparation	GH 047/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm
VLBA preparation	GH 069/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm
VLBA preparation	GH 087/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm
VLBA preparation	GH 101/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm
VLBA preparation	GH 106/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm
VLBA preparation	GH 140/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm
VLBA preparation	GH 158/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm
VLBA preparation	GH 163/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm
VLBA preparation	GH 174/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm
VLBA preparation	GH 203/IMBHs	Aconfig20cm	0.5 hour	0.043mJy/bm

Total Time per Configuration:

Configuration	Total Time
A	5.0

Present for observation: no Staff support: None