Observing Application

Date : Jul, 06 2009
Proposal ID : VLA/09B-201
Legacy ID : AH1001
PI : Luis Ho
Type : Rapid Response - Exploratory Time
Category : Extragalactic
Total Time : 5.0

Radio Constraints on a Central Black Hole in the Globular Cluster M54

Abstract:

Last week, Ibata et al. announced the detection of a stellar cusp in M54, a globular cluster located in the center of the Sagittarius dwarf galaxy in the Local Group. This stellar cusp could be caused by a 9400 solar mass black hole but this interpretation, while important for black hole demographics, is not unique. Other methods of estimating a black hole mass must clearly be brought to bear on M54. A Chandra source discovered by Ramsay & Wu lies within M54's stellar cusp and might be energized by the putative 9400 solar mass black hole. If so, the Merloni et al. relation predicts that it should be detectable as a radio source with a flux density of 0.05 mJy or more. Sensitivity and resolution needs drive us to request the current C configuration to search for an 8.5 GHz counterpart to the Chandra source. A VLA detection would strengthen the case for a 9400 solar mass black hole in M54 and potentially lead to a VLBA proper motion study of this Local Group object.

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Related proposals:

AG730 AU116

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Single Pointing(s)

VLA Resources

Name	Conf.	Frontend & Backend	Setup
Cconfig4cm	C	X Band 3.6 cm 8080 - 8750 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 8435.1,8485.1 MHz Bandwidth: 50 MHz

Sources:

Name	RA / RA Range	Dec / Dec Range	Epoch	Velocity / z	Group
M54	18:55:03.3 00:00:00.0	-30:28:47 00:00:00	J2000	Velocity : 0.00	Sgr/M54

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
Mine	5.00	1	0 day	00:00:00	24:00:00	0

Session Constraints:

Name	Constraints	Comments
Mine		Dynamic scheduling is acceptable.

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
Mine	M54	Cconfig4cm	5.0 hour	0.01 mJy/bm	

Present for observation: no   Staff support: None   Plan of Dissertation: no