



## Brunthaler

# G10A001

## An intriguing new radio source in M82: The first extragalactic microquasar?

## Abstract

A new radio source in M82, first seen in late April 2009, is very puzzling. At discovery it possessed a steep spectrum and showed little variability during the last few months, both very unusual for a young transient source. Most surprising, our latest VLBI observation in December 2009 (seven months after the detection) showed two distinct components, separated by ~1 lightyear. At least one component is clearly resorted, resembling a small bubble. This seems to rule out the hypothesis of anothe radio supernova, and it could be a micro-quasar which is inflating a bubble in the very dense ISM of M82. This would be the first extragalactic micro-quasar to be discovered and would allow to study the inflation of radio lobes, which takes millions of years in radio galaxies, on short timescales. Alternative, but highly speculative explanations, are a supermassive black hole or two unrelated events.

We propose to observe the sourc with a global VLBI array in the next two EVN sessions at 6cm to measure the proper motion and expansion velocities of the two components and one observation at 18cm to determine spectral indices. This will allow us to reveal the nature of this enigmatic object.

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### Applicants

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### Summary of Observations

Observation number	Number of targets	Network	Hours requested	Waveband	Number of epochs	Aggregate bitrate	Correlator
1	1	EVN, VLBA	12.0, 12.0	6 cm	2	1024	Socorro
2	1	EVN, VLBA	12.0, 12.0	18 cm	1	1024	Socorro

*Observation Dependencies:* 6 cm observations in March and June 2010 sessions. 18 cm in June 2010 session.

Scientific Category: Extragalactic

Scheduling Assistance Required: Consultation

Rapid Response Science: Target of Opportunity

No PhD Students involved

Linked proposal submitted to this TAC: No

Linked proposal submitted to other TACs: No

Relevant previous Allocations: Yes

2 eVLBI observation of SN2008iz in (RB003A&B) in April and May 2009. We are currently following the evolution of SN2008iz with the VLBA + Effelsberg every two months.

No additional remarks