# VLA OBSERVING APPLICATION

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|---|
| A |
| rcvd: |

DEADLINES: 1st of Feb., June., Oct. for next configuration following review
INSTRUCTIONS: Each numbered item must have an entry or N/A
E-MAIL TO: propsoc@nrao.edu (different for some Rapid Response Science)
OR MAIL TO: Director NRAO, 520 Edgemont Rd., Charlottesville, VA 22903-2475

**(1)** Date Prepared: 2004 August 30

**(2)** Title of Proposal: A new microquasar with unprecedented massive outflows

| **(3)** AUTHORS (Add * for new location) | INSTITUTION | E-mail | G/U | Students Only: For Thesis? | Students Only: Ph.D. Year |
|---|---|---|---|---|---|
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**(4)** Related VLA previous proposal number(s):

**(5)** Contact author
for scheduling: M. Ribó
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**(7)** Scientific Category: ◯ solar system ⊗ galactic ◯ extragalactic ◯ other:
Rapid Response Science: ◯ Known Transient ⊗ Exploratory ◯ Target of Opportunity

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|---|---|---|---|---|---|
| **(8)** Configurations (one per column) (A+Pt, A, B, C, D, BnA, CnB, DnC, Any) | A | | | | |
| **(9)** Wavelength(s) (400, 90, 20, 6, 3.5, 2, 1.3, 0.7 cm) | 2, 3.5, 6, 20 | | | | |
| **(10)** Time requested (hours) | 4 | | | | |

**(11)** Type of observation: ⊗ continuum ◯ spectroscopy ◯ multichannel continuum ◯ polarimetry ◯ solar
(check all that apply) ◯ pulsar ◯ high-time resolution ◯ Pie Town link ◯ other:

**(12)** Suitable for dynamic scheduling? ⊗ Suitable ◯ Unsuitable

**(13)** ABSTRACT (do not write outside this space)

The INTEGRAL satellite has recently discovered a new hard X-ray source in the Galactic plane: IGR J21247+5058. Our multiwavelength study shows that this source is coincident with the core of the double radio source 4C 50.55, which in the past had been considered to be an extragalactic object. Very recent spectroscopic observations reveal that the optical counterpart of the radio core has the spectrum of a F9V star, displaying absorption lines with velocity shifts greater than 100 km $s^{-1}$, typical of an X-ray binary. The unprecedented property of this microquasar is the presence of a highly variable massive outflow of several thousands of km $s^{-1}$ detected in our optical monitoring next to H$\alpha$ (at $\lambda \simeq$6700Å). Interestingly, the source appears to be closer than 1 kpc, a fact that would explain the huge size and brightness of the radio source. We propose to conduct multi-epoch observations of the source to (1) look for short-term variability of the core, (2) look for short-term changes in the inner structure of the jets, (3) definitely exclude the possibility of a coincidental superposition of the radio core with the X-ray binary. The use of the A configuration is mandatory to properly isolate the core from the extended emission.

NRAO use only
(08/03)

**(14)** Observer present for observations? ◯ Yes ⊗ No Data analysis at? ⊗ Home ◯ AOC or CV (2 weeks notice)

**(15)** Help required: ⊗ None ◯ Consultation ◯ Friend (extensive help)

| **(16)** Spectroscopy only | line 1 | line 2 | line 3 | line 4 |
|---|---|---|---|---|
| Transition (HI, OH, etc.) | | | | |
| Rest Frequency (MHz) | | | | |
| Velocity (km/s) | | | | |
| Observing frequency (MHz) | | | | |
| Correlator mode | | | | |
| IF bandwidth(s) (MHz) | | | | |
| Hanning smoothing (y/n) | | | | |
| Number of channels per IF | | | | |
| Frequency Resolution (kHz/channel) | | | | |
| Rms noise (mJy/bm, nat. weight., 1 hr) | | | | |
| Rms noise (K, nat. weight., 1 hr) | | | | |

| **(17)** Number of sources: | **1** |
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(If more than 10 please attach list. If more than 30 give only selection criteria and LST range(s).)

| **(18)** NAME | Coordinates 1950 ◯ 2000 ⊗ RA hh mm Dec. ± xx.x° | Conf. | $\lambda$ (cm) | Corr. mode | Band-width per IF (MHz) | Total Flux (Jy)* | LAS | Required rms (mJy/bm) | Required dynamic range | Time request (hr) |
|---|---|---|---|---|---|---|---|---|---|---|
| IGR J21247+5058 | 21 24, +50.9 | A | 2, 3.5, 6, 20 | | 50 | ∼0.1 | ∼1″ | 0.1 | 1000 | 4×1 |
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*For spectral line, this should be the total flux at the peak of the line

Notes to the table (if any):

**(19)** Restrictions to elevation (other than hardware limits) or HA range (give reason):

**(20)** Preferred range of dates for scheduling (give reason): During the upcoming A configuration to be able to isolate the extended emission to estimate the flux density of the core with the maximum possible accuracy.

**(21)** Dates which are not acceptable:

**(22)** Special hardware, software, or operating requirements:

**(23)** Please attach a self-contained Scientific Justification **not in excess of 1000 words.** (Preprints or reprints will be ignored.)

Please include the full addresses (postal and e-mail) for first-time users or for those that have moved (if not contact author).

When your proposal is scheduled, the contents of the cover sheets become public information (Any supporting pages are for refereeing only).

v4.2 8/03