

The size and luminosity of the Galactic Center star GCIRS 7

Thibaut Paumard¹, Oliver Pfuhl², Joanne Breitsfelder^{1,3},
P. Kervella, L. Burtscher, JU. Pott, F. Martins, W. Brandner,
G. Perrin, S. Lacour, X. Haubois, JB. Le Bouquin, JP.
Berger, B. Lazareff, R. Millan-Gabet

¹LESIA (Observatoire de Paris/CNRS), ²MPE, ³ESO



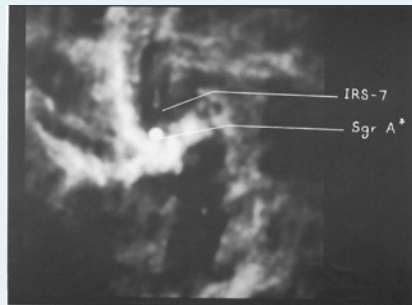
NACO HKL



- GRAVITY AO reference
- Fringe-tracker star (ATs)?

Radio 2cm

Yusef-Zadeh & Morris 1991



- M11 supergiant
- $H = 10, K = 7$
- ionised cometary tail

Previous work with AMBER/MIDI

Pott et al. 2008: GCIRS 7 would be resolved at K (2.6 mas, using 62 frames out of 2400!) and even more at N-band ($V \simeq 0.2$).

Goals

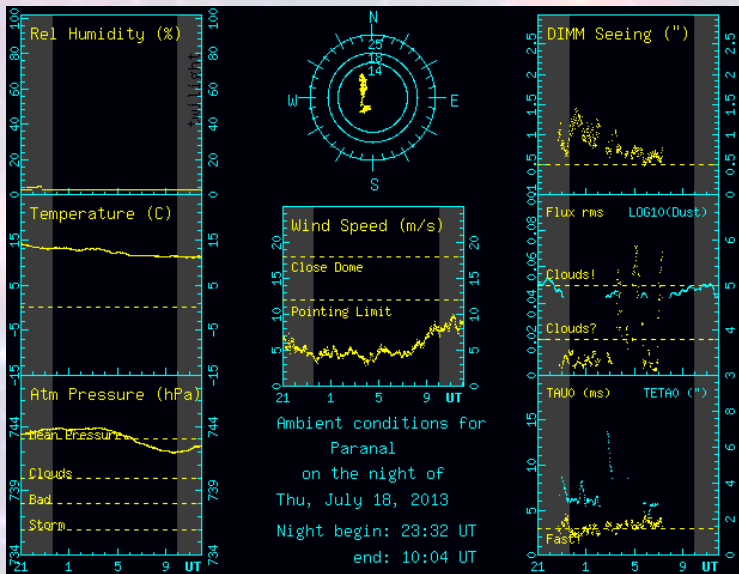
- Get size and shape of GCIRS 7
- Get size and CP of GCIRS 16*

Difficult

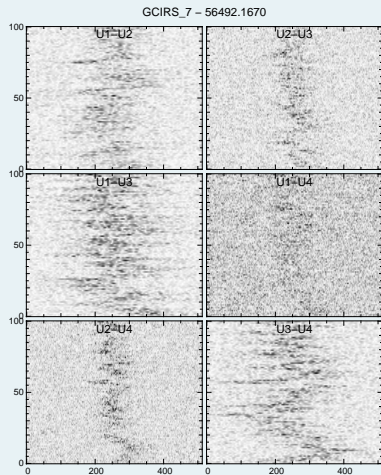
- 4-UT case
- off axis AO
- among the faintest PIONIER targets

Decided to try undispersed mode, stuck with it

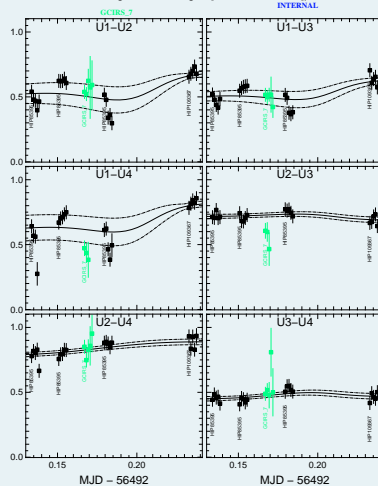
First night: bad seeing, then clouds, 3 ms coherence



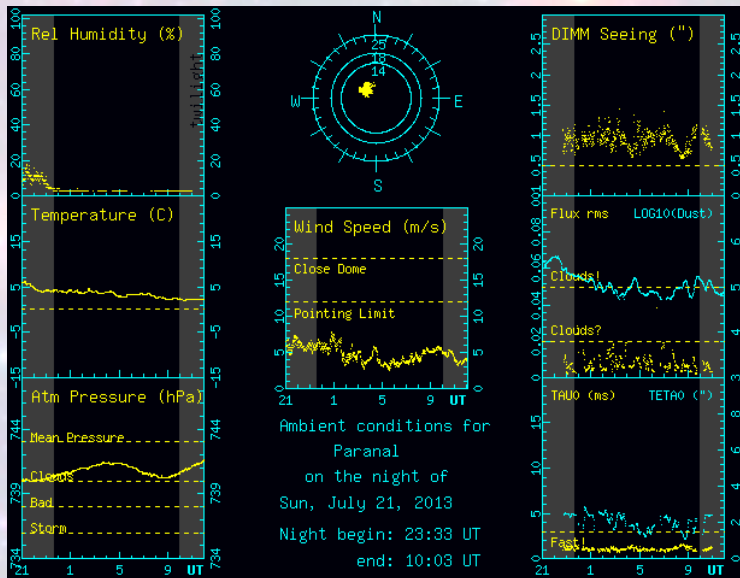
Got calibrated fringes on all 6 baselines



Transfer-Function Vis2 (black) and Scientific Obs. (colors)
averaged in the range = [1.68108, 1.68108] μm

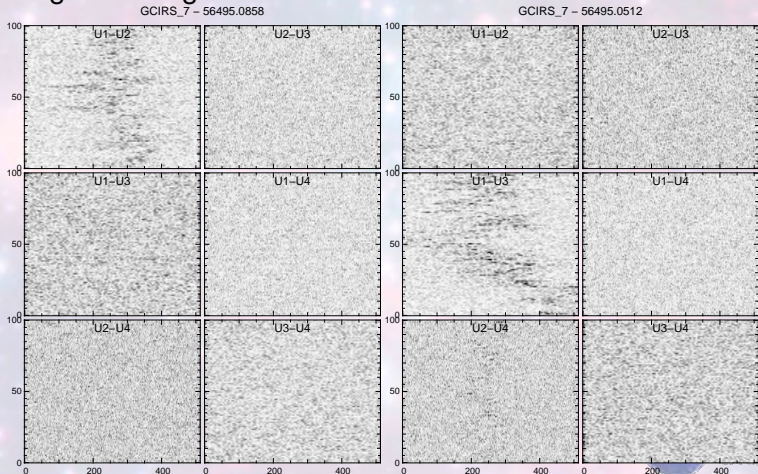


Second night: Clear; bad, fast seeing (< 1 ms!)

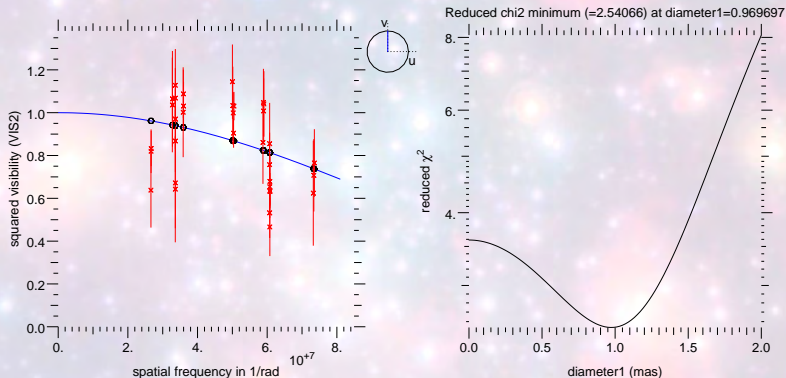


Saw fringes on UT1-UT2 and UT1-UT3

Impossible to track, but saw fringes by eye \Rightarrow decided to integrate. Fringes recovered for 2 baselines.



GCIRS 7 is unresolved at H-band



Best χ^2 diameter of $\simeq 1$ mas agrees with photometry.
 Lower visibilities at K and N could be due to environment.

Conclusion

- Poor weather conditions,
- at 15" from AO star,
- faint target
- got measurement!

Very encouraging for GRAVITY

- Infrared wave-front sensor on GCIRS 7
- K-band \Rightarrow more flux
- Sensitive fringe-tracker

GCIRS 7 is a pretty normal red supergiant with traces of a circumstellar environment.