MAD Deep Field

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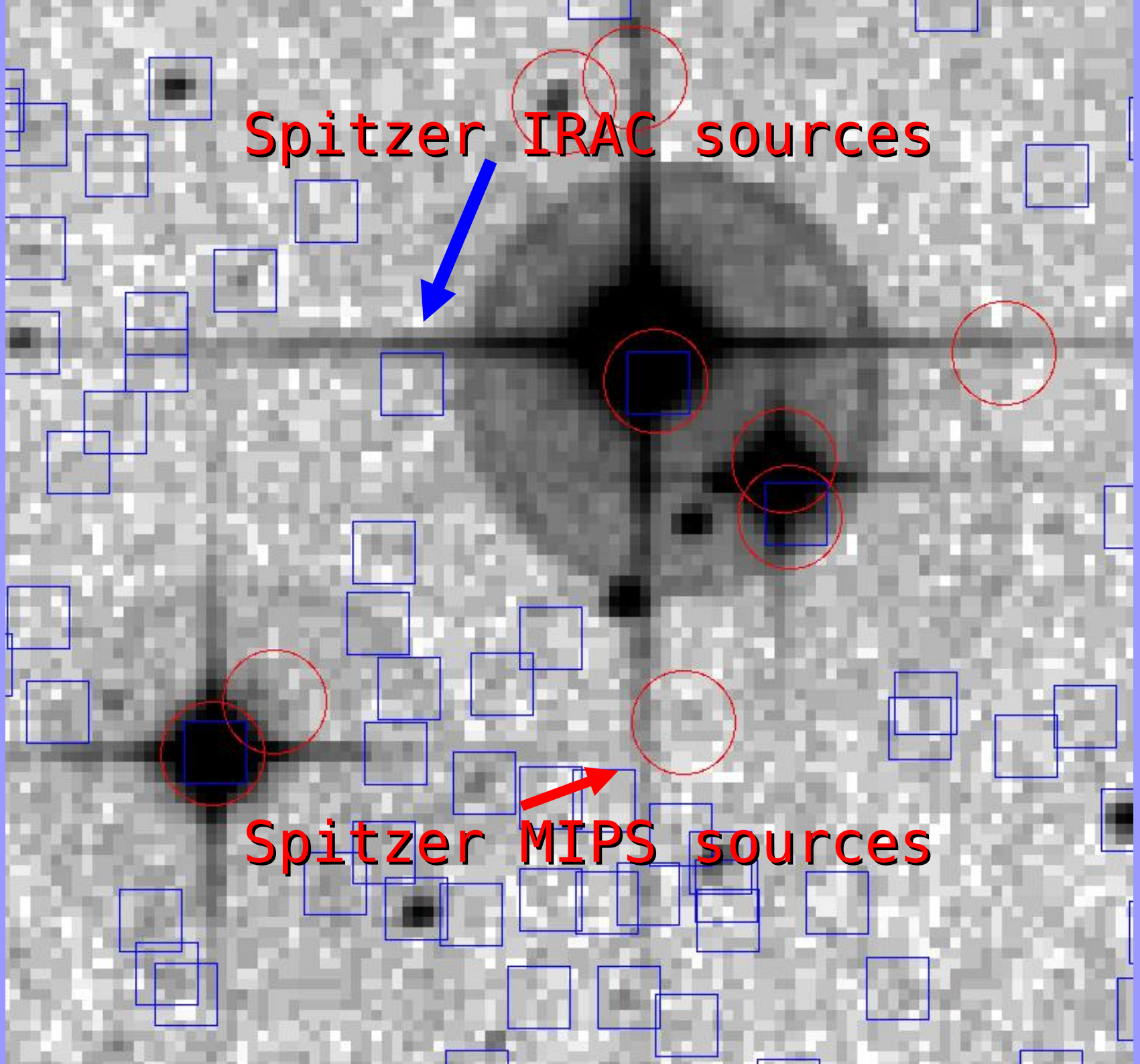
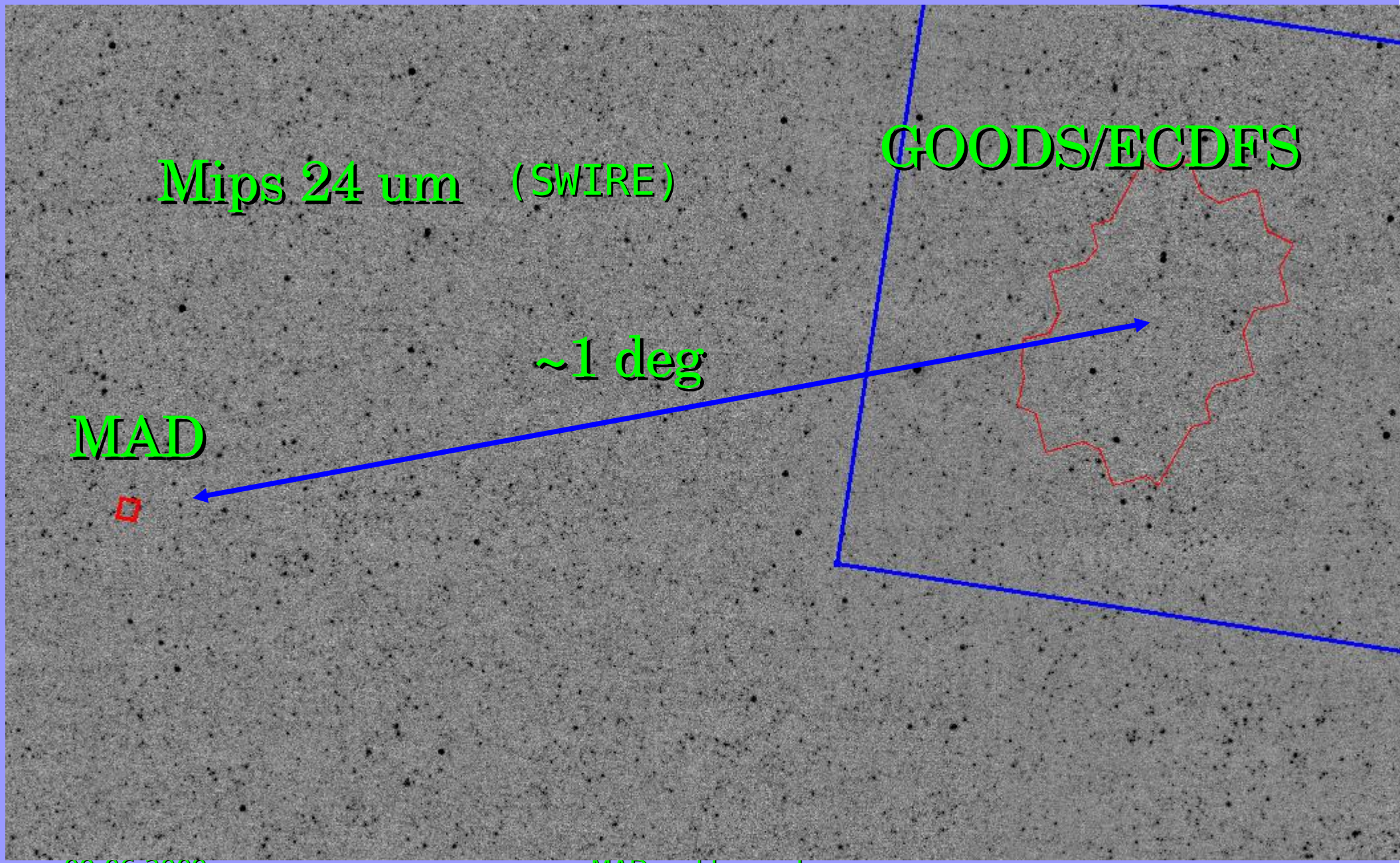
- Goals: test case for AO-assisted imaging of extragalactic fields in near-IR.
- Science case: e.g. morphology of z~>1 galaxies in the “old” star/dustier component of galaxies (HST observe the UV rest frame...)

Field selection

- 3 bright very close and very bright stars (orthogonal to usual selection of extragalactic fields!!).
- Found an asterism with V ~9.,11.,11. stars 1 degree from Extended Chandra Deep Field South (ECDFS).

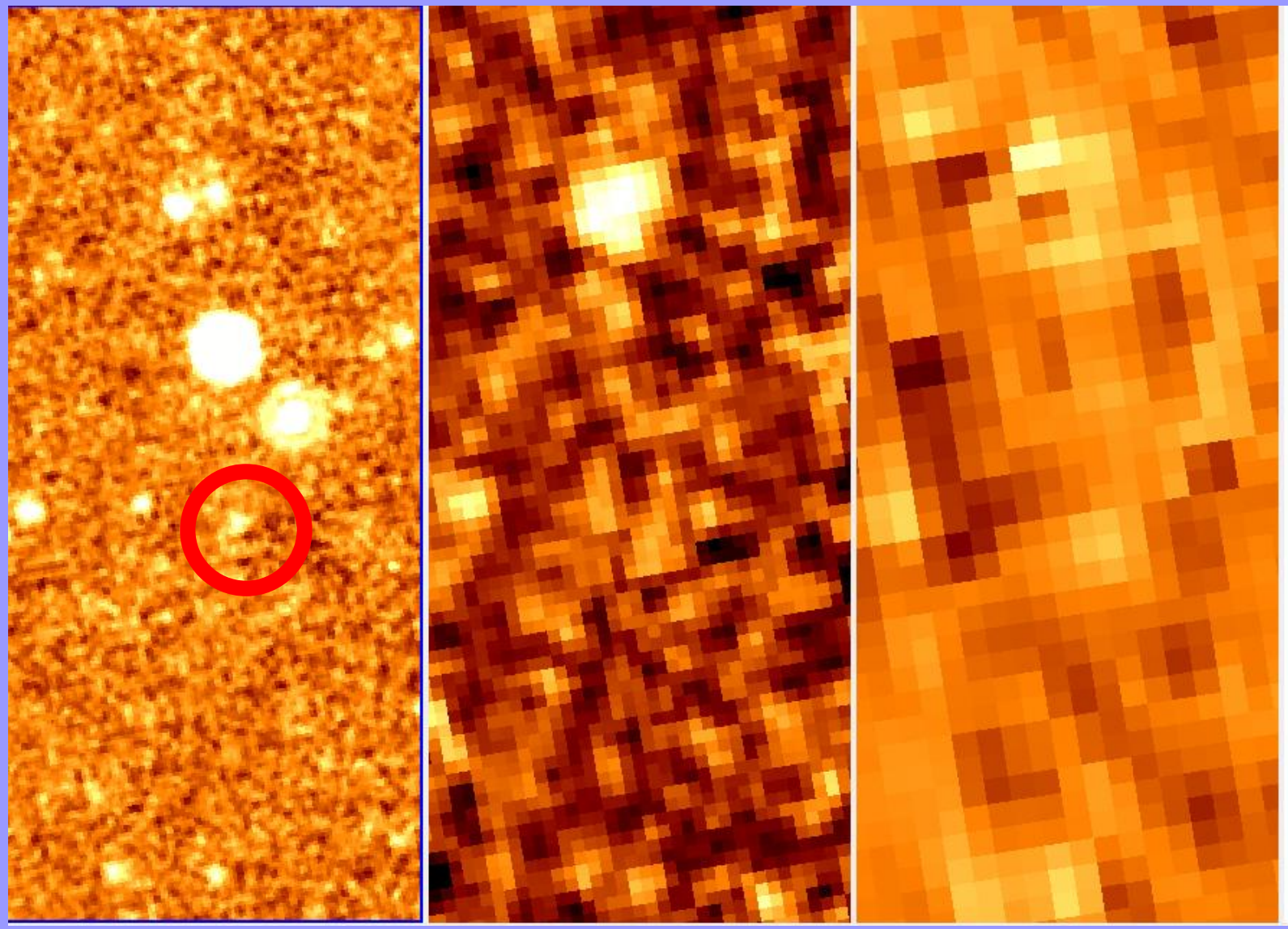

Spitzer IRAC sources
Spitzer MIPS sources


Mips 24 um (SWIRE)
GOODS/ECDFS
~1 deg
MAD

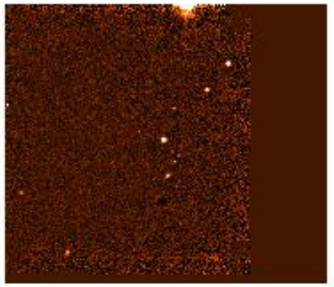
24 um

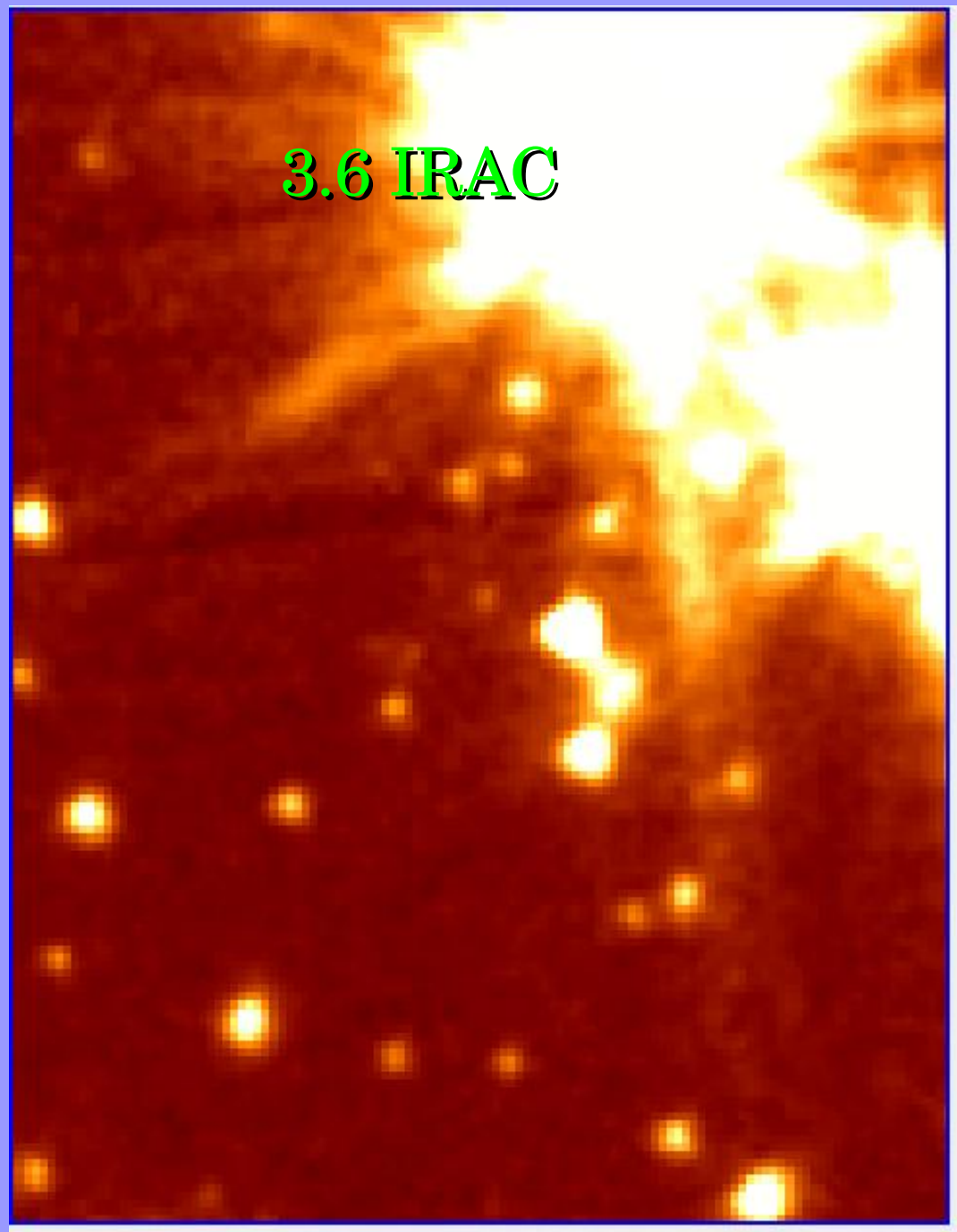
70 um

160 um

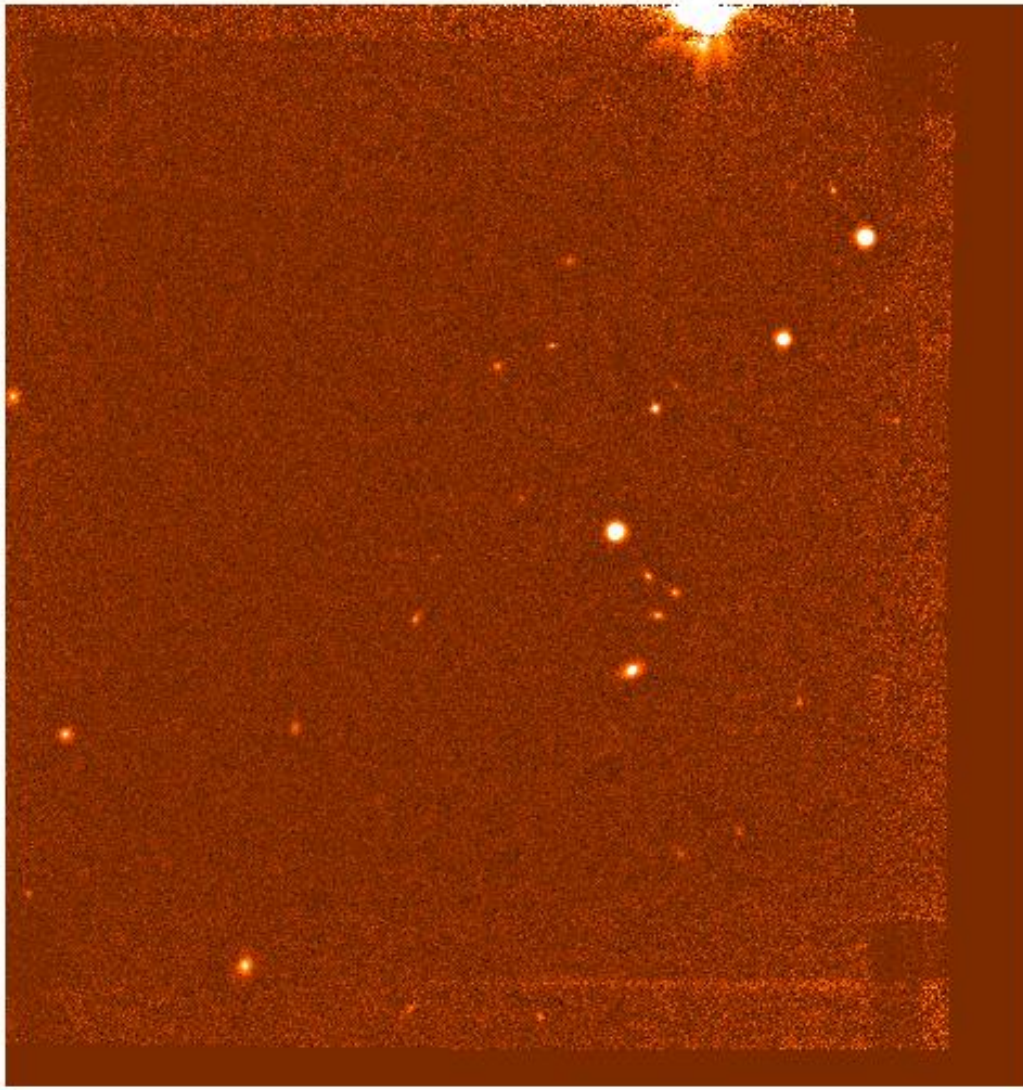


MAD





MAD



Observations

- MAD :
- Js: 6hrs (25 AB,~24.2 Vega) (NOT executed)
- H: 5hrs (24 AB,~22.5 Vega) (NOT executed)
- Ks: ~7hrs (24 AB,~22 Vega) + ~7hrs for sky
- HAWKI
- Js: 3hrs (PSF ~ 0”.45)
- Ks: 2hrs (PSF ~ 0”.6)

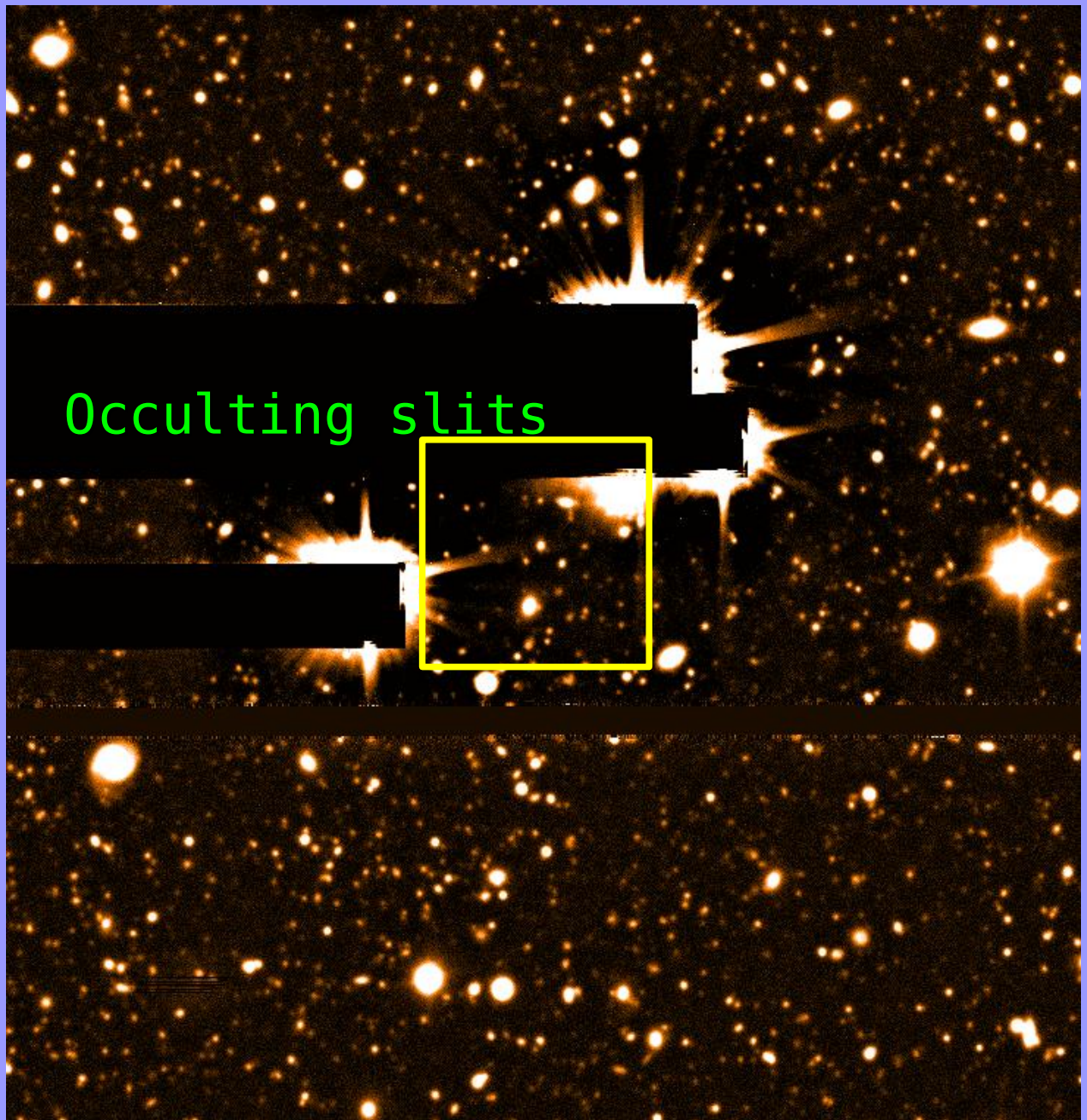
Observations

FORS1 b_HIGH (3 hrs, PSF ~1”.2)

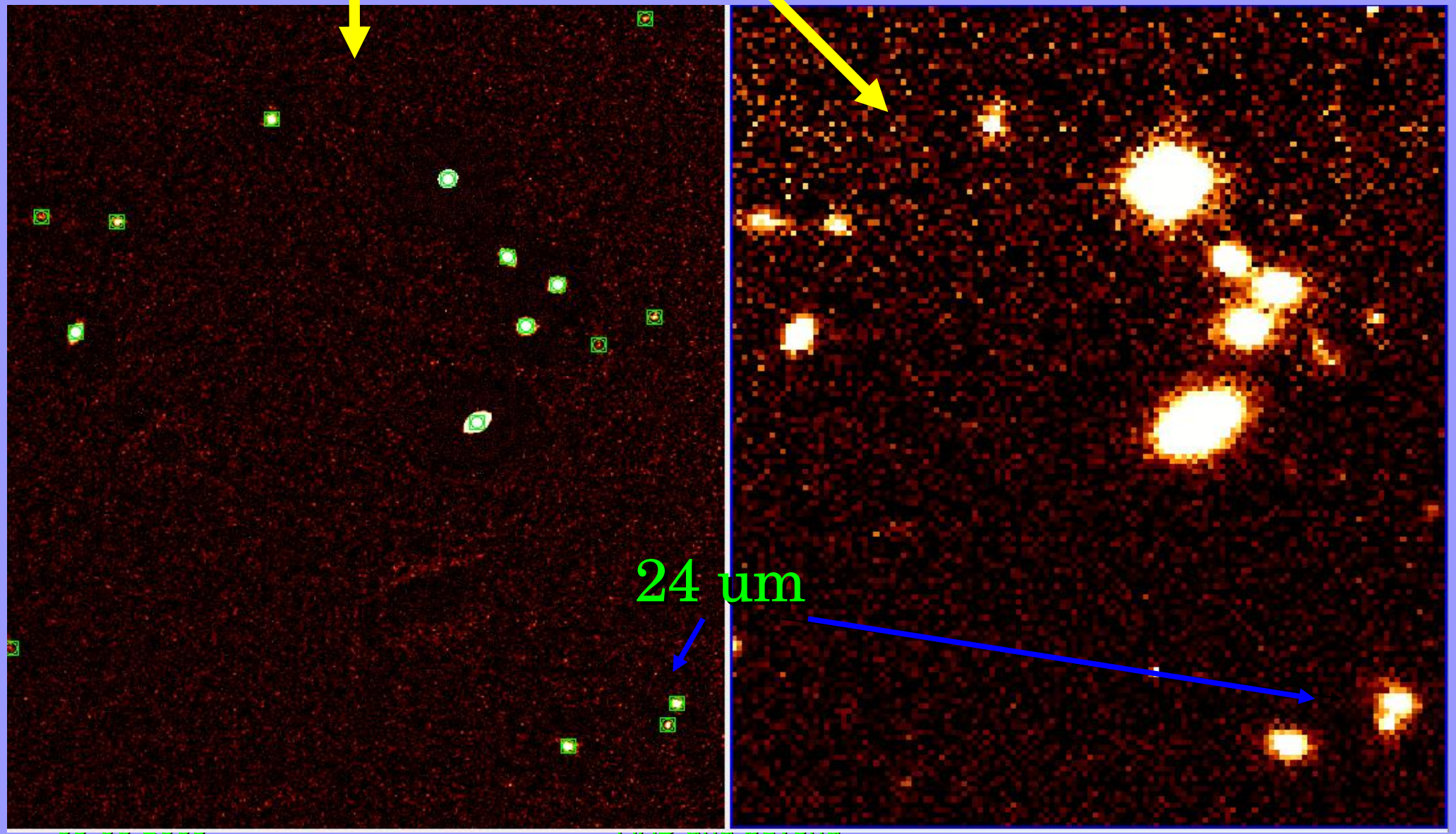
FORS2 I_BESSEL (2.5 hrs, PSF ~ 0”.9)

FORS2 spectroscopy, grism 150I , 1 single mask, 2.5 hrs

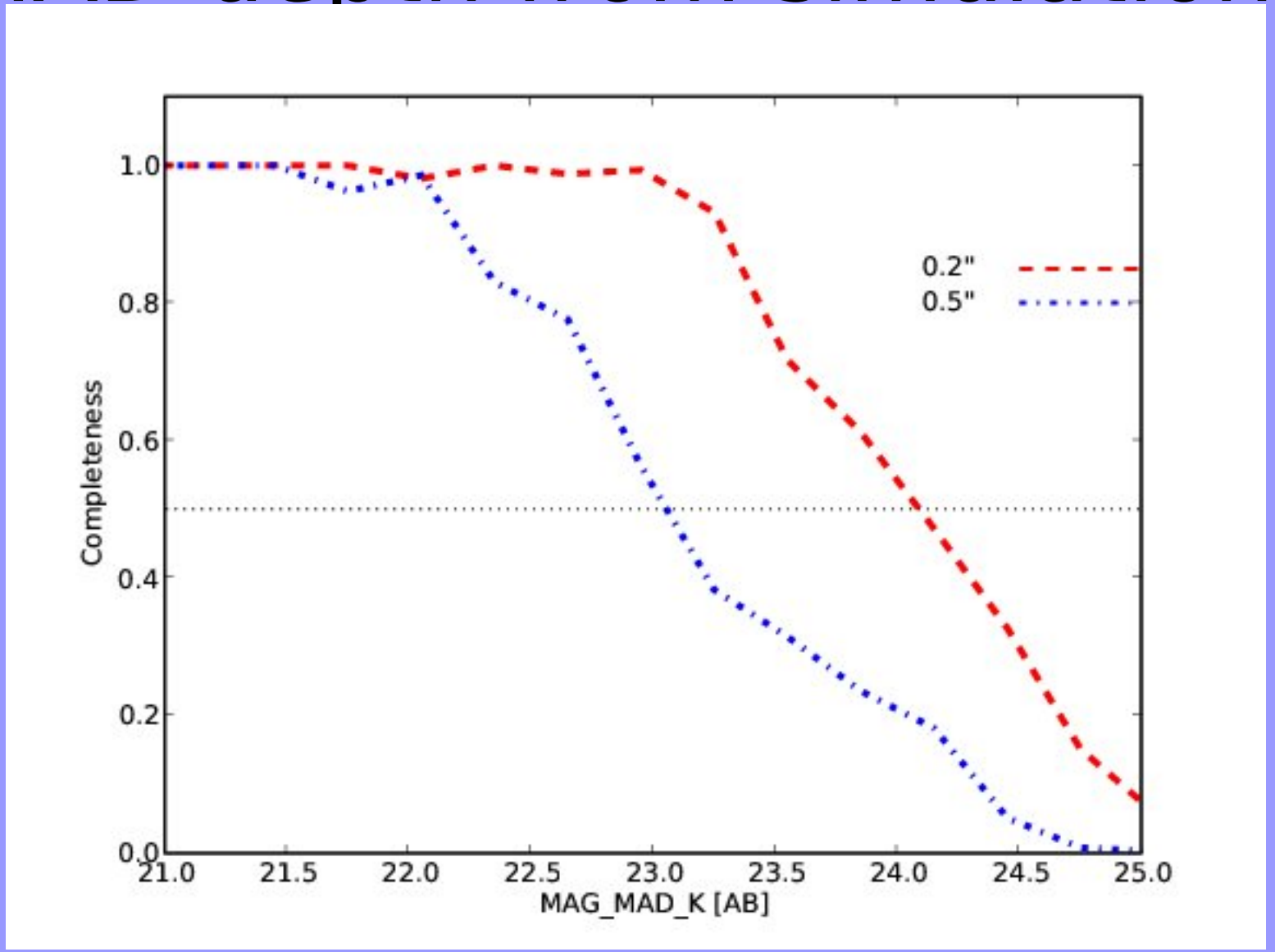
FORS1 & FORS2 imaging



MAD vs HAWKI (~0”.7)



MAD depth from simulations



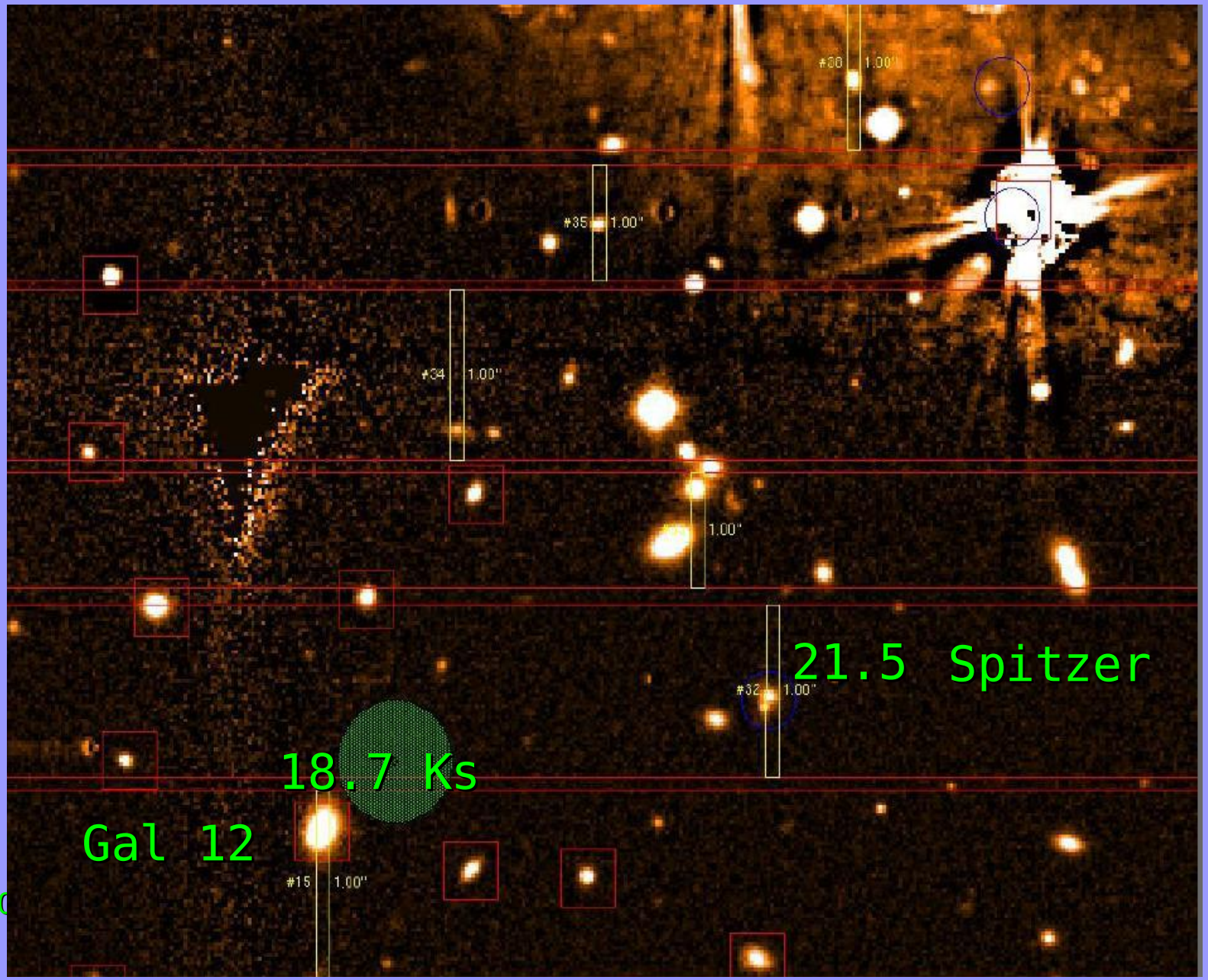
Depth

MAD Ks images less deep than expected (at least 1 mag). BUT:

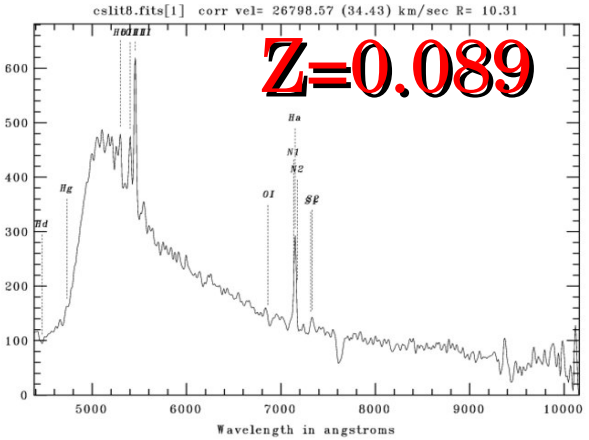
Data taken in SD1, with all the poblems listed by Paola (cfr. her talk).

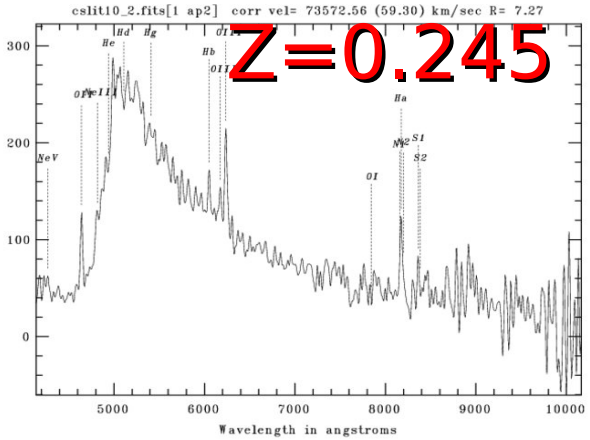
Possible filter leak problem.

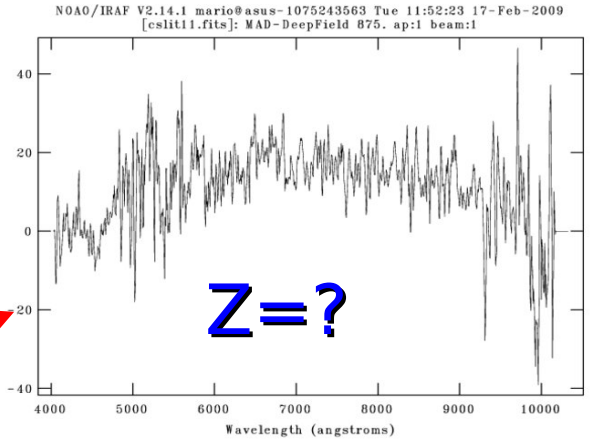
FORS2 spectroscopy

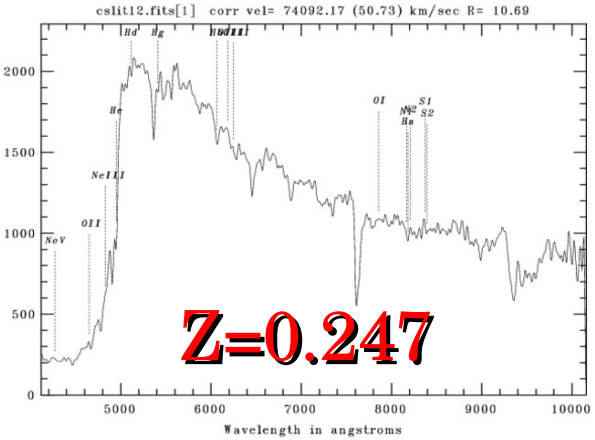


FORS2 spec. results







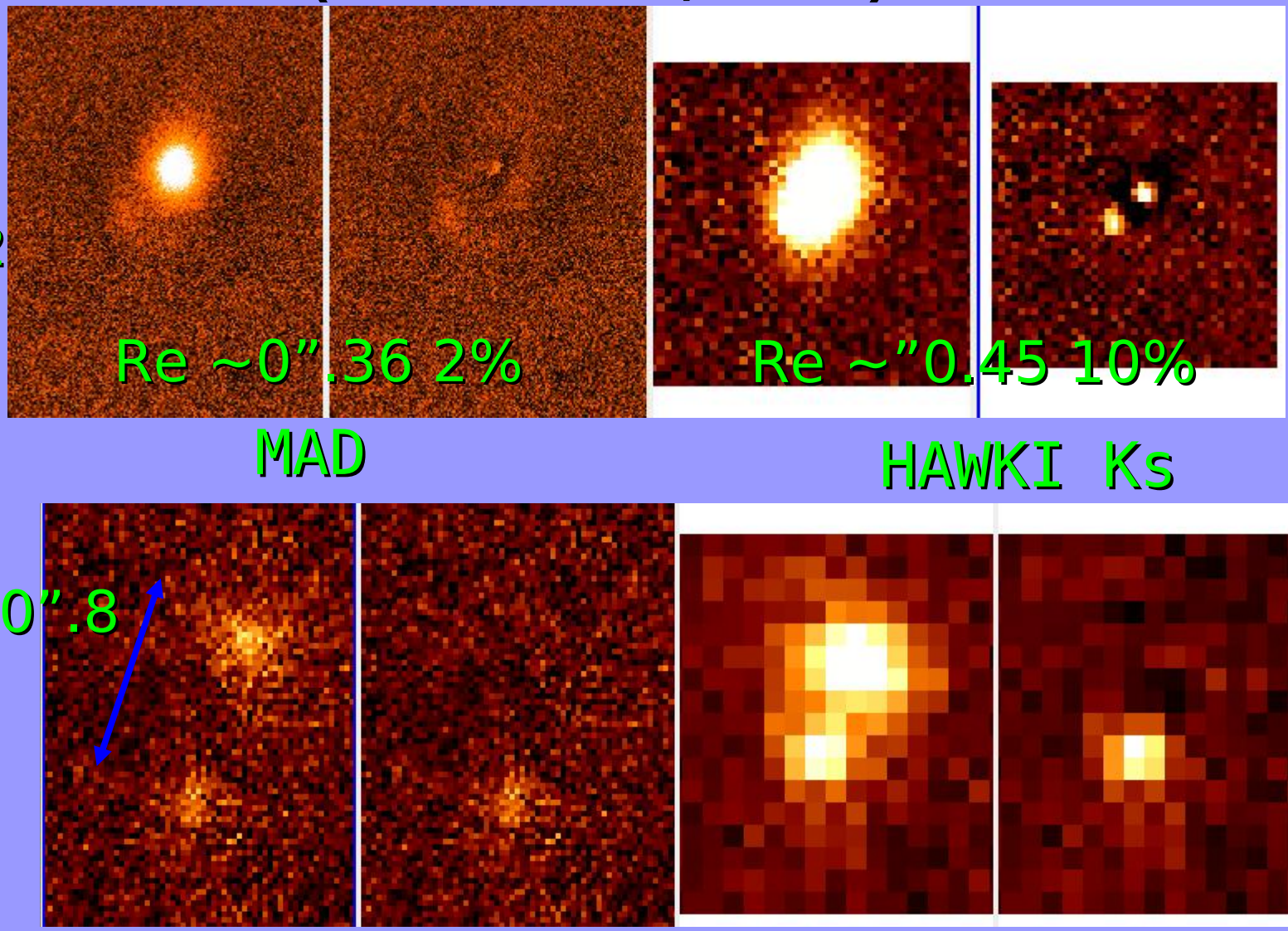


Gal 12

09-06-20

Spitzer 24 um

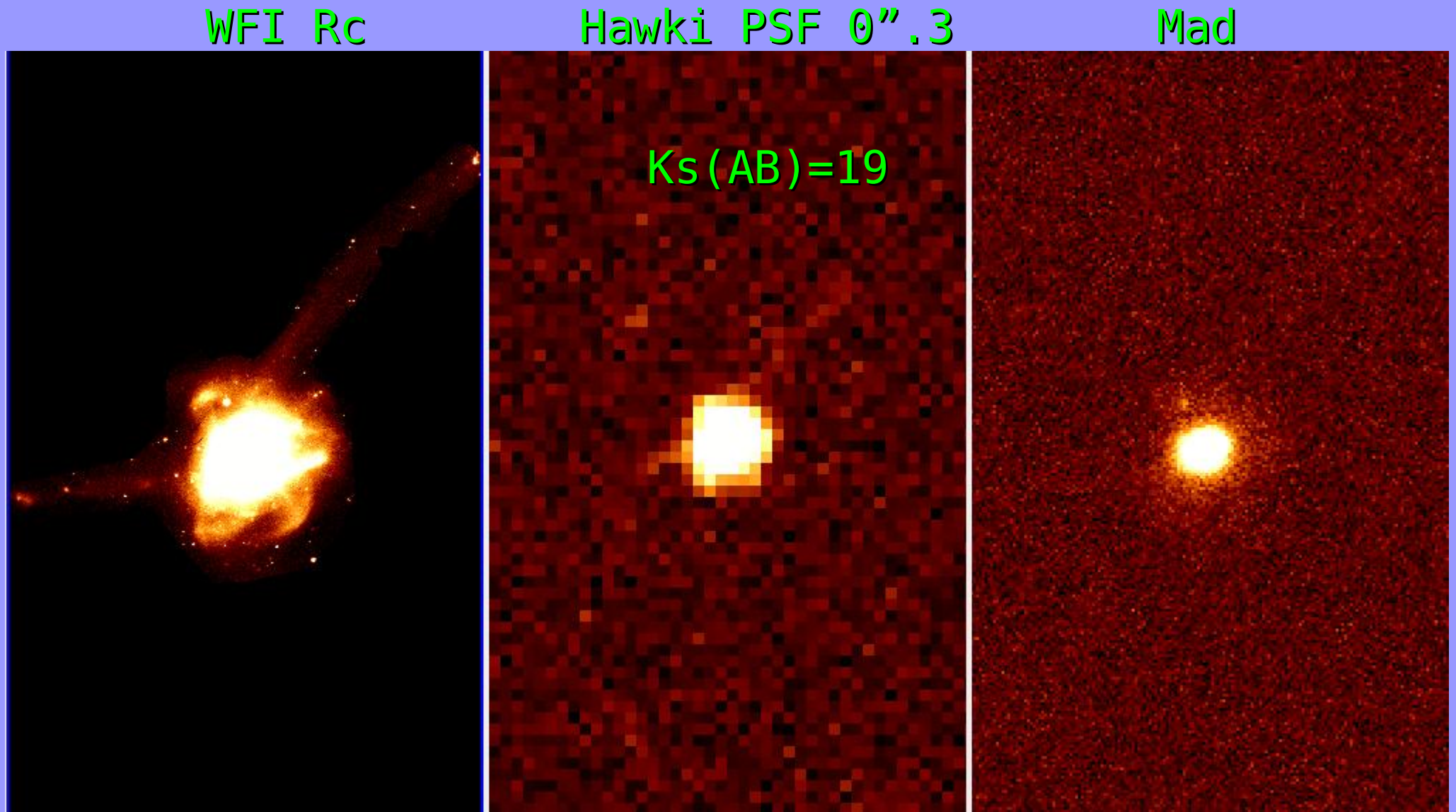
MAD vs HAWKI morphology (GALFIT, 2d)



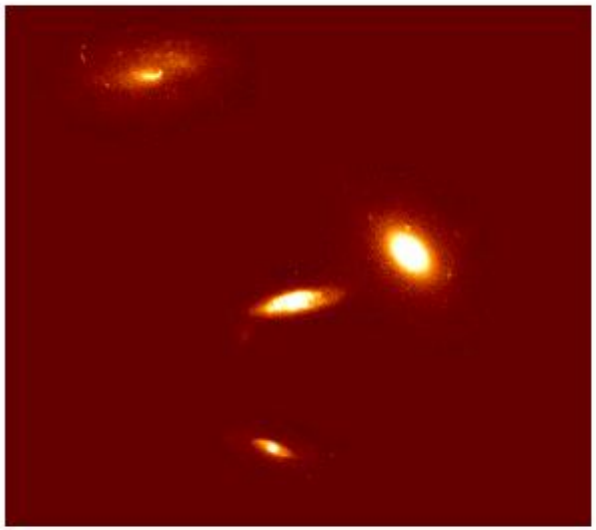
Motivations for high resolution IR imaging

- Morphology as evolutionary probe: currently mostly limited for high (z>~2) galaxies to UV rest frame.
- Much better photometry=> more robust e.g. stellar mass estimation.
- Discrete merger event(s) vs gas accretion to build up massive galaxies.

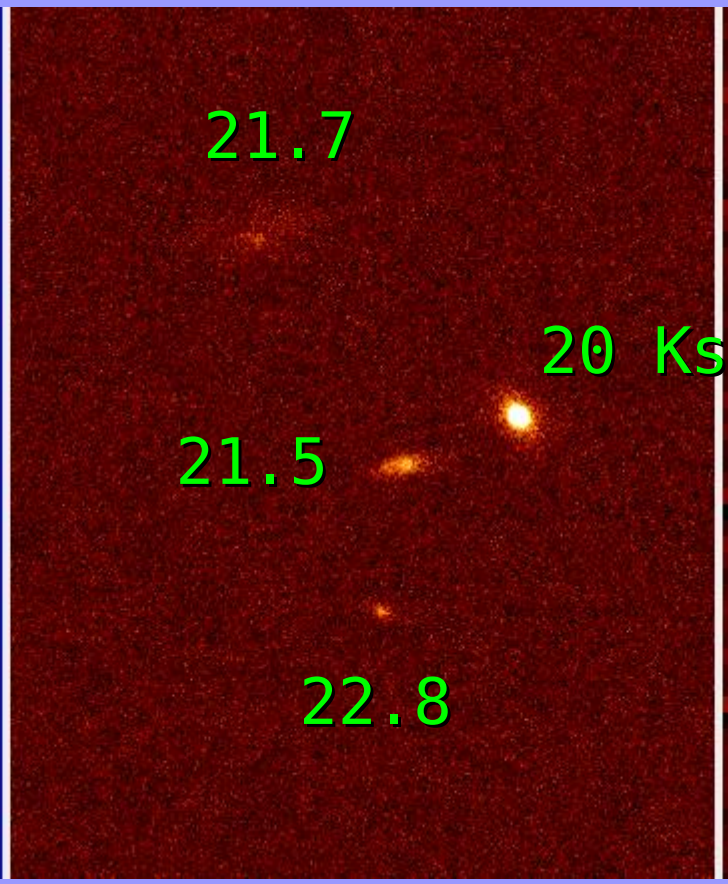
Example: cloning at z=3 (NGC 7252)



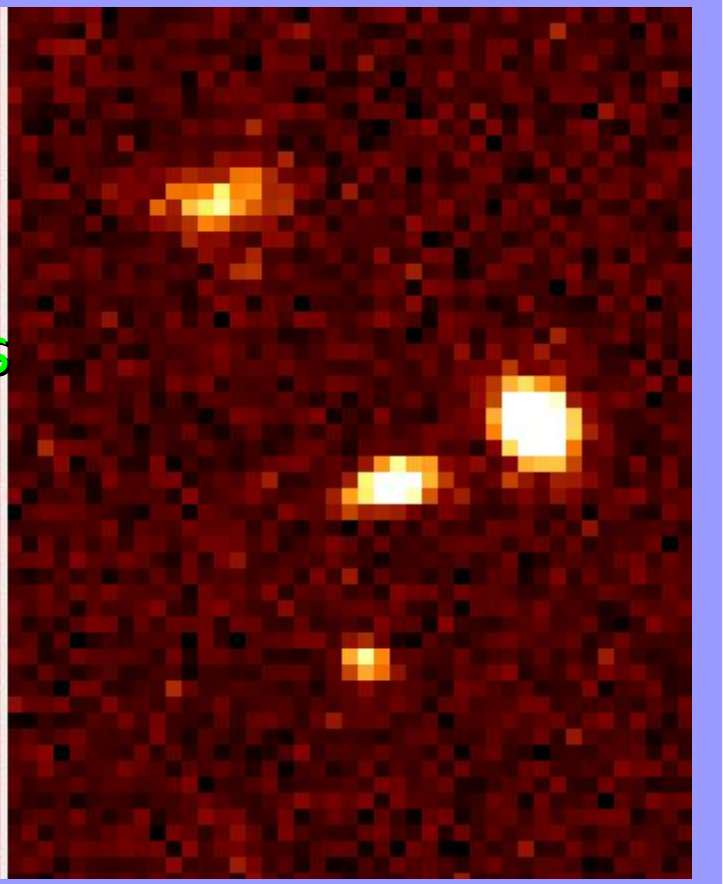
Example: cloning HCG19 at z=2



WFI Rc



MAD Ks



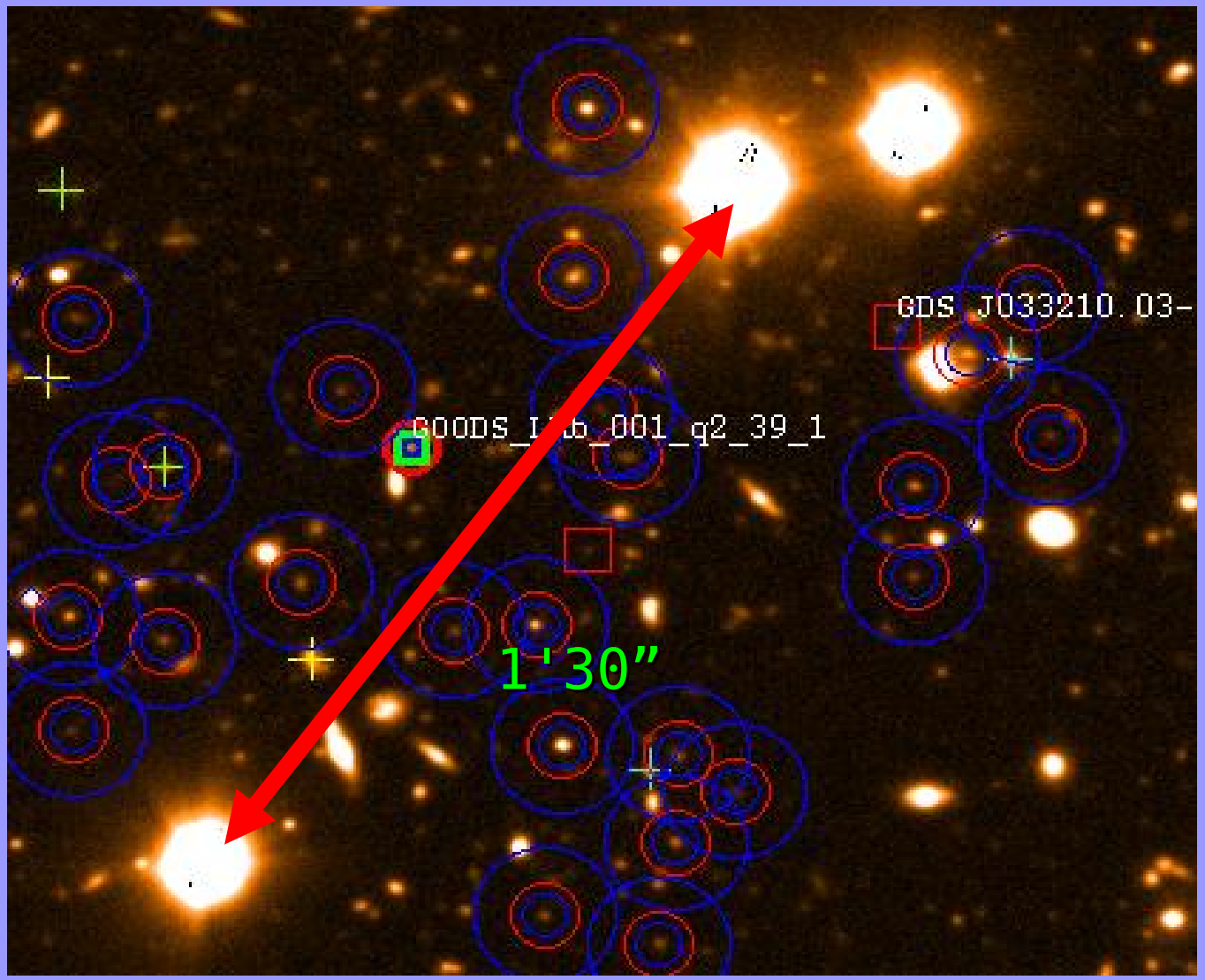
HAWKI Ks

Example: cloning HCG19 at z=2 high freq. only

MAD Ks

HAWKI Ks

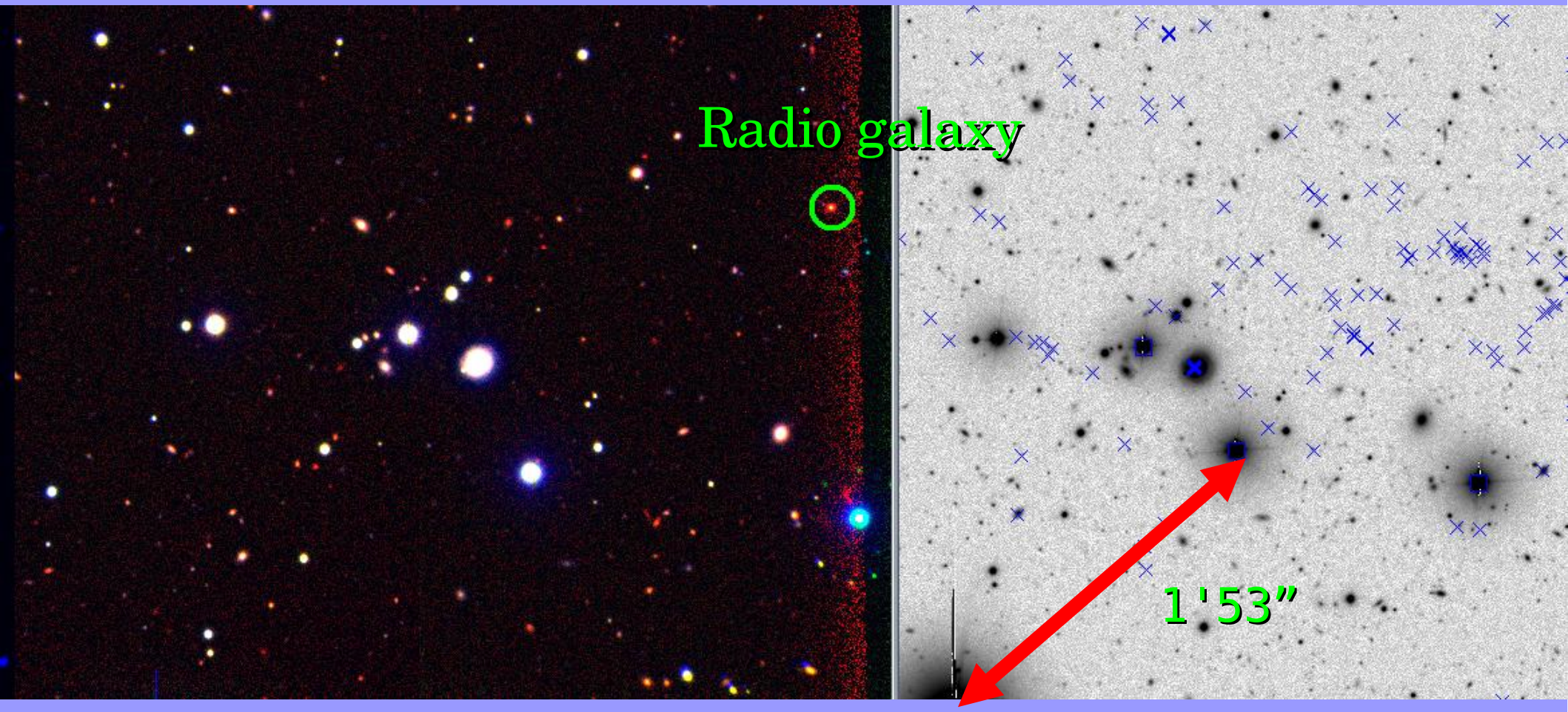
MAD-MAX (GOODS-South)



z>~4

Z~3 cand
Ks >21 AB

MAD-MAX (PKS1138)



MOIRCS (Ks,J)+FORS2 I

FORS2 I

Conclusions

MAX-MAD needed for e.g.

Morphology (incl. merging), mass estimation

(Much) better depth wrt. SD1 data set: real data toward ELT.