



In collaboration with: J.M. Rodriguez-Espinoza, C. Muñoz-Tuñon, M. Más-Hesse, P. Arrabal Haro







ESO/GTC Large Program (2010-2011)

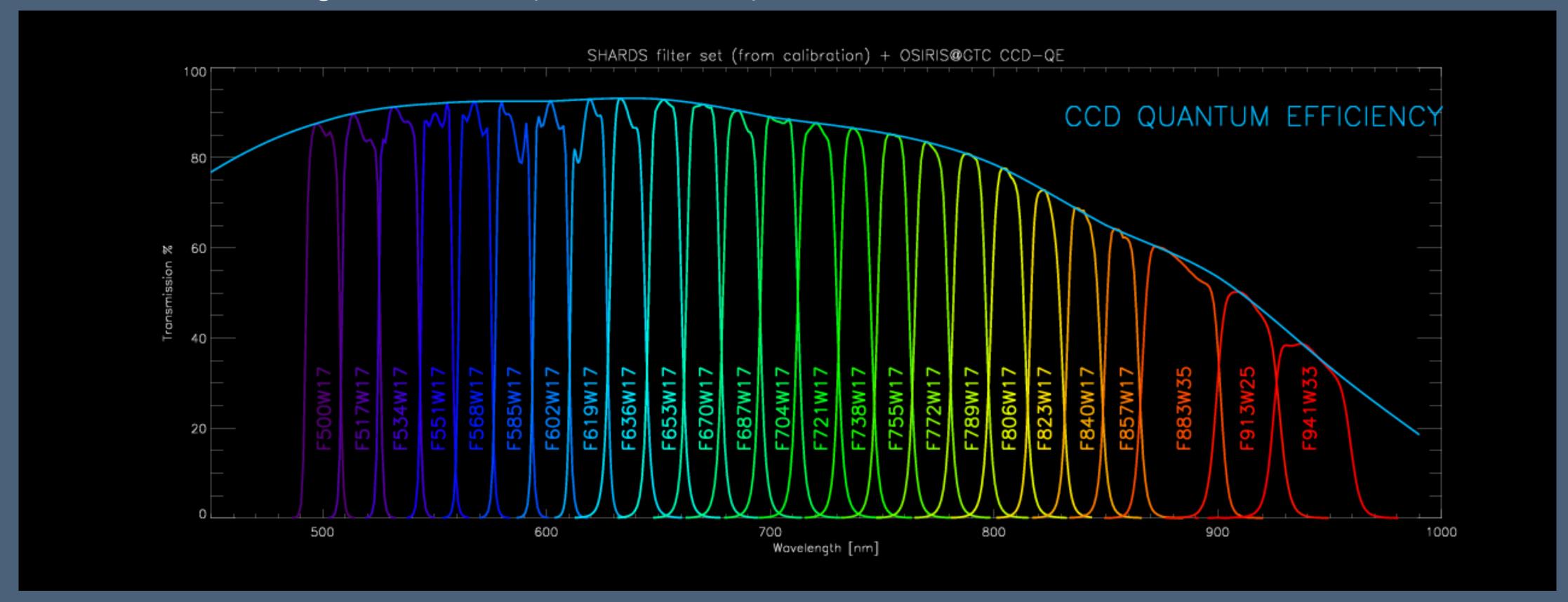
20 Observing night with OSIRIS

25 medium-band contiguous filters (5000-9500 A)

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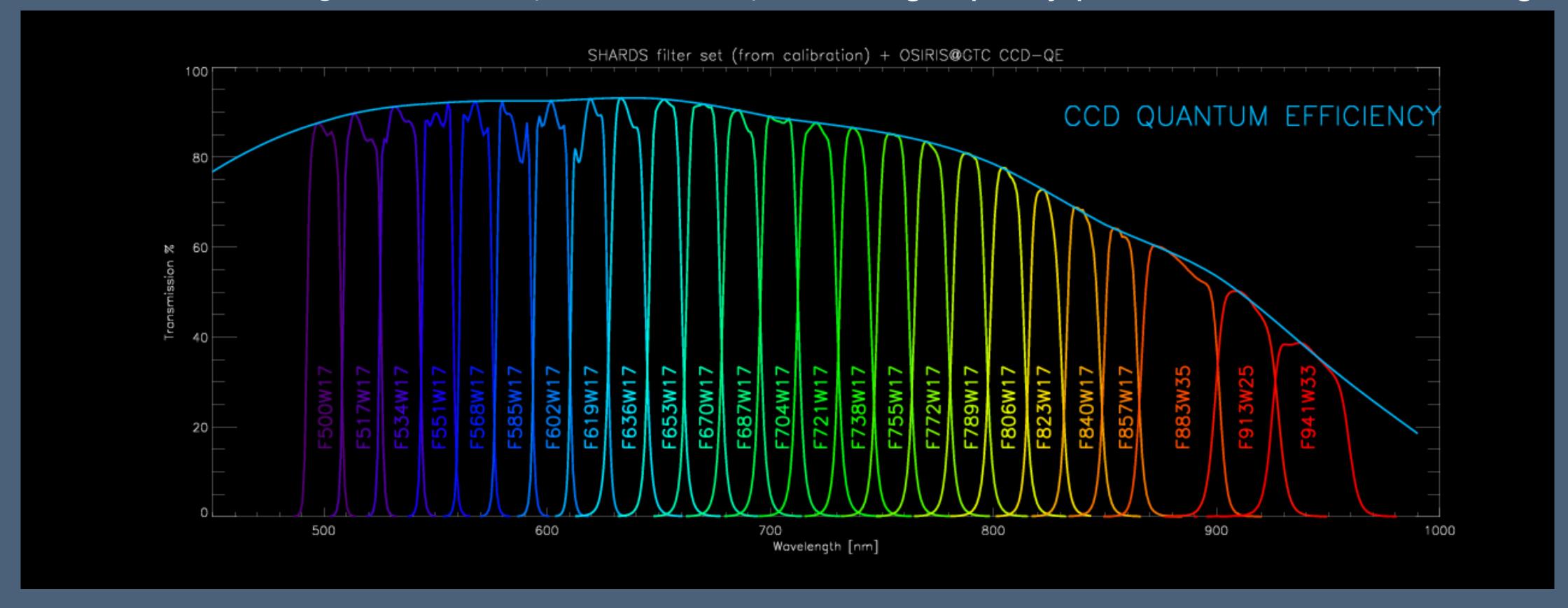
ESO/GTC Large Program (2010-2011)

20 Observing night with OSIRIS

25 medium-band contiguous filters (5000-9500 A)

Scientific goal: spectro-photometric survey of passive galaxies at 1 < z < 2.5 in the GOODS-N field

High-qualtiy photozs down to I = 26 mag



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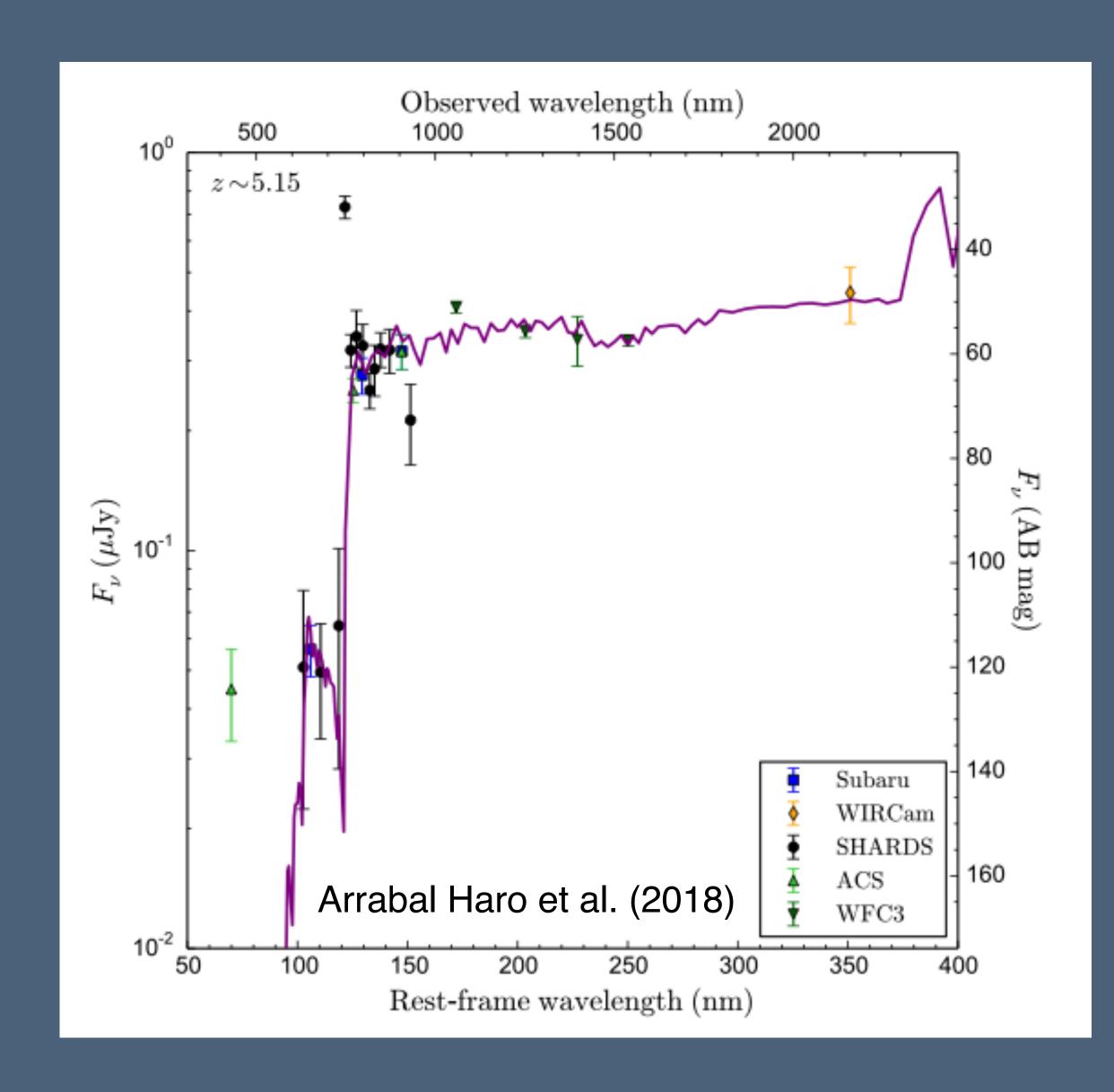
This was done by Arrabal Haro et al. (2018):

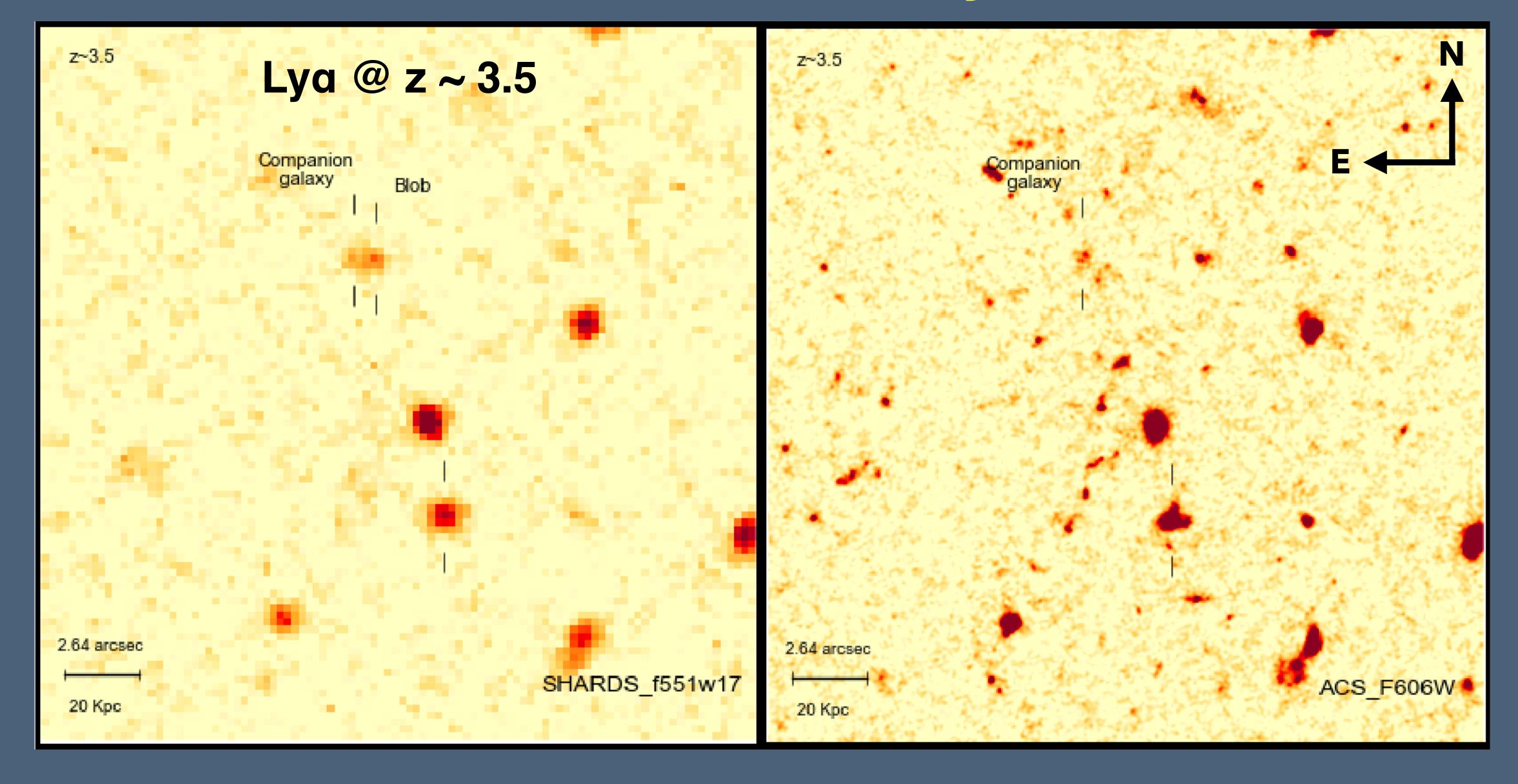
- 1558 sources
  - 528 are Lyman-Alpha emitters
    - 124 are pure emitters, with no continum

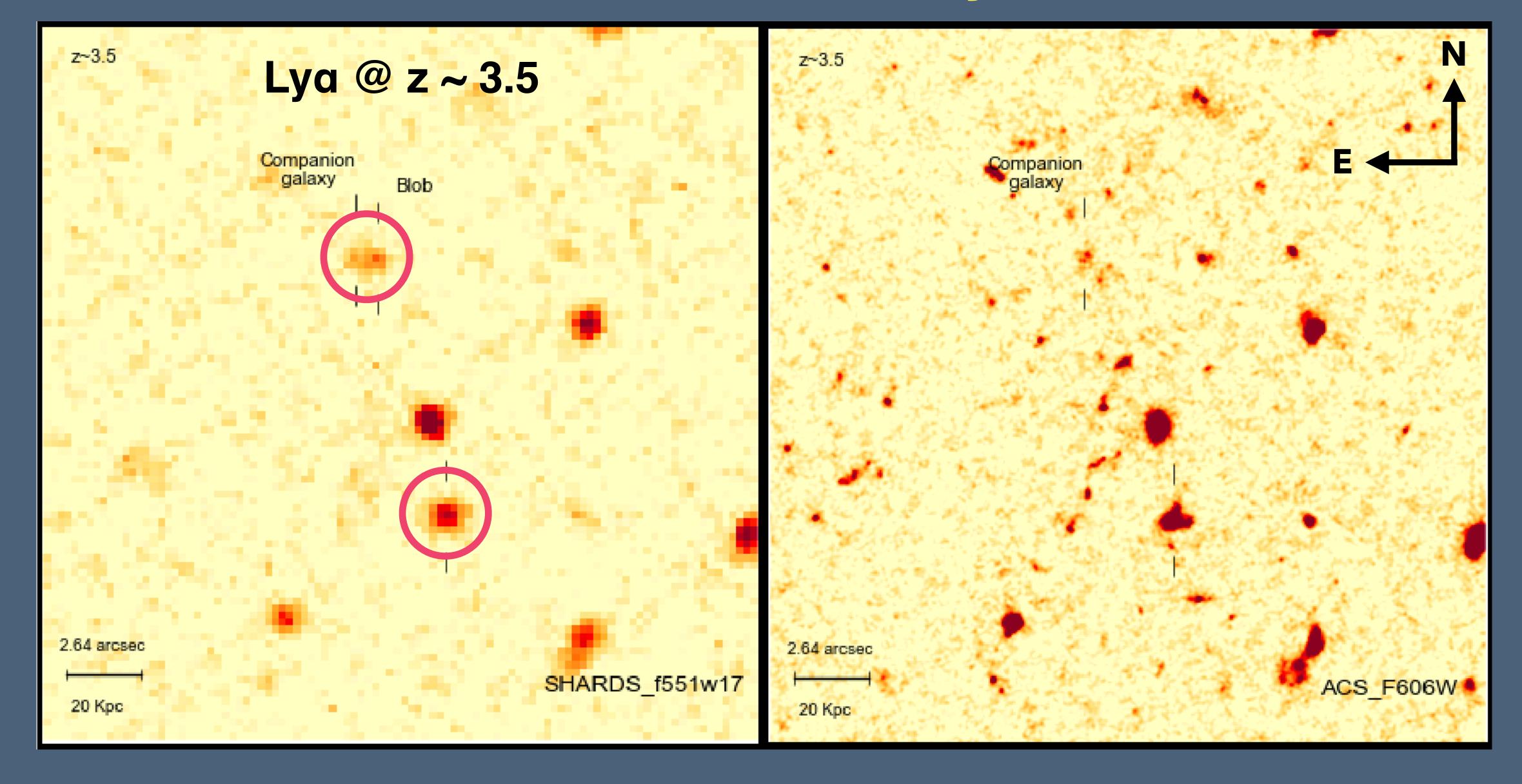
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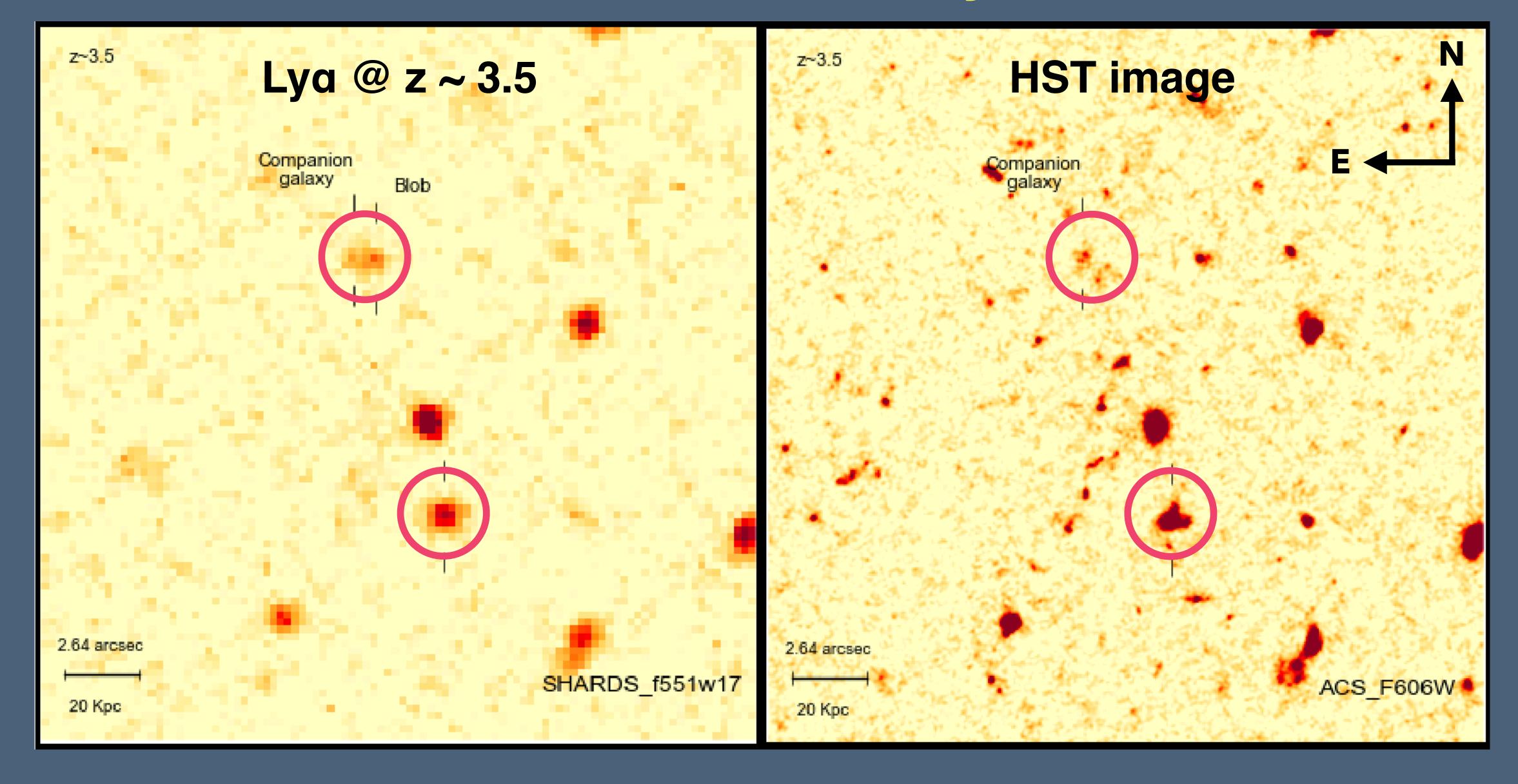
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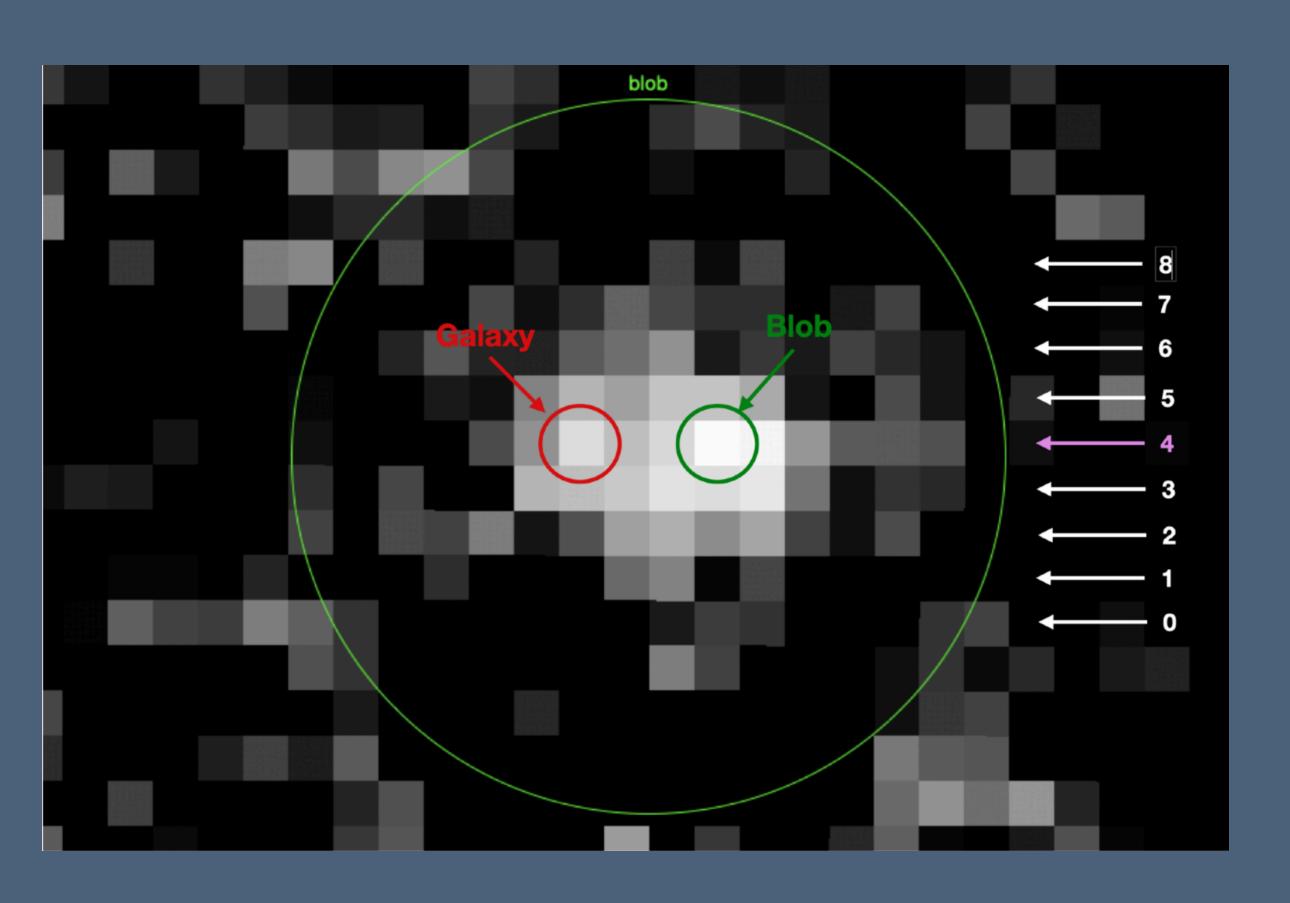
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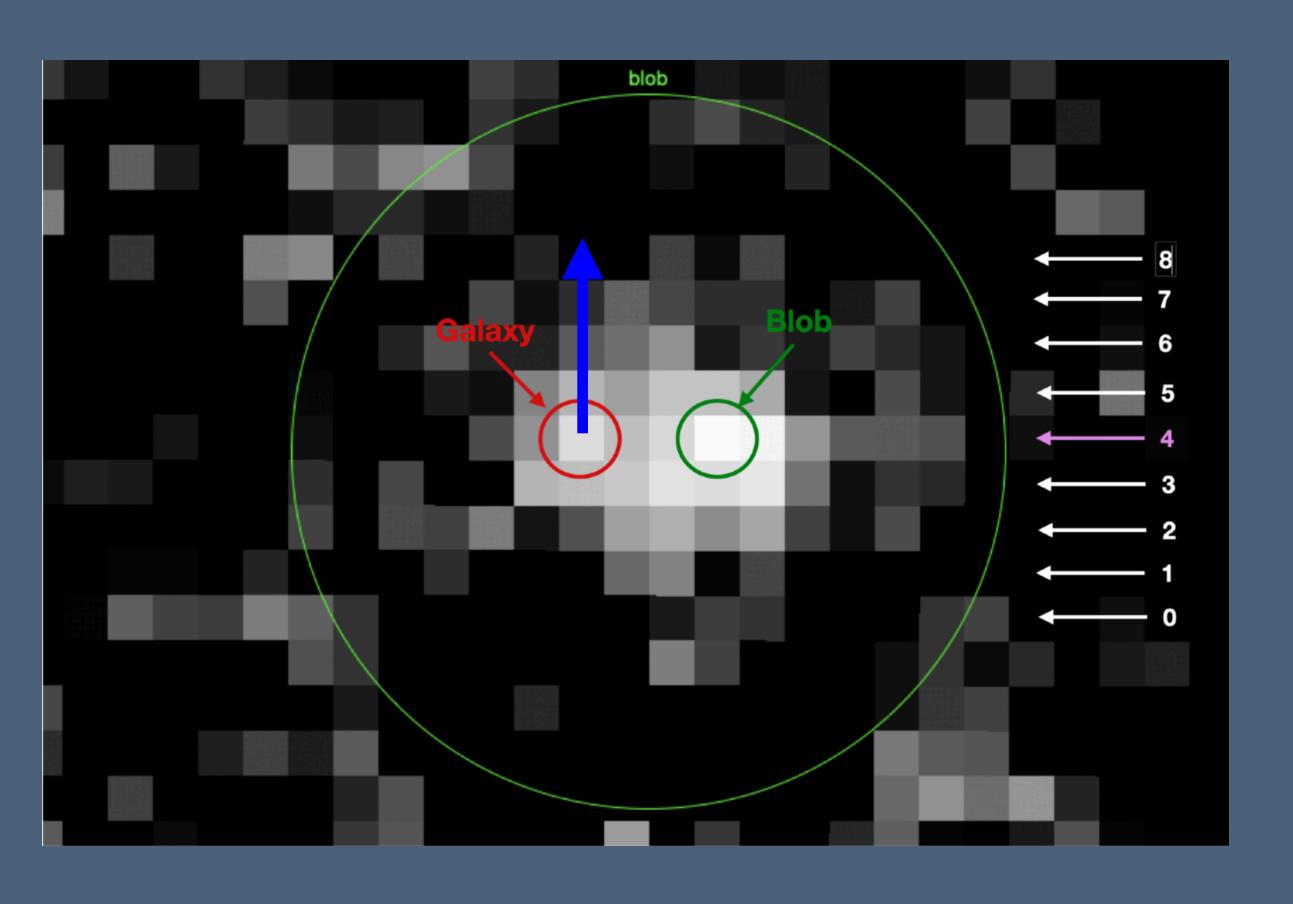


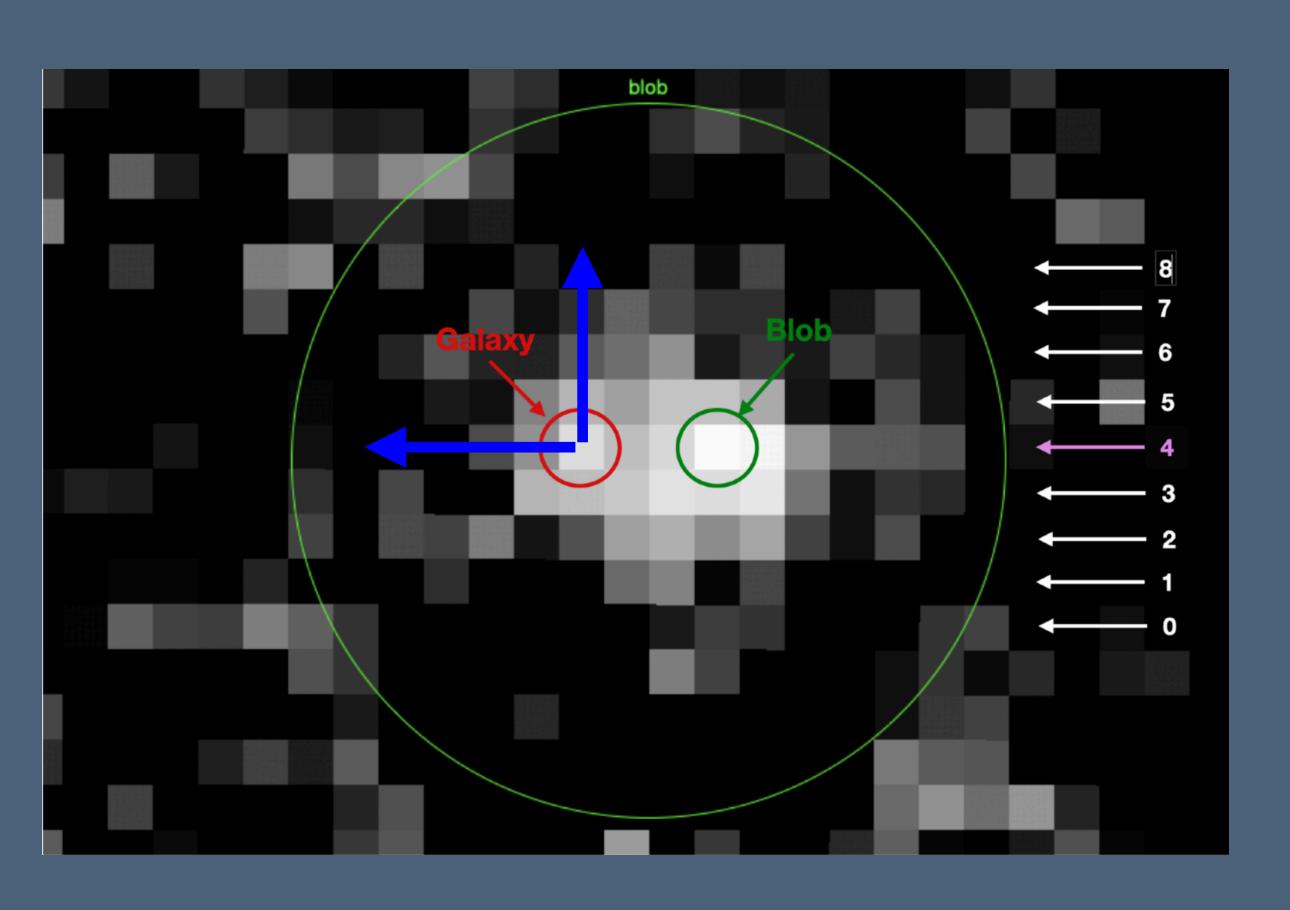


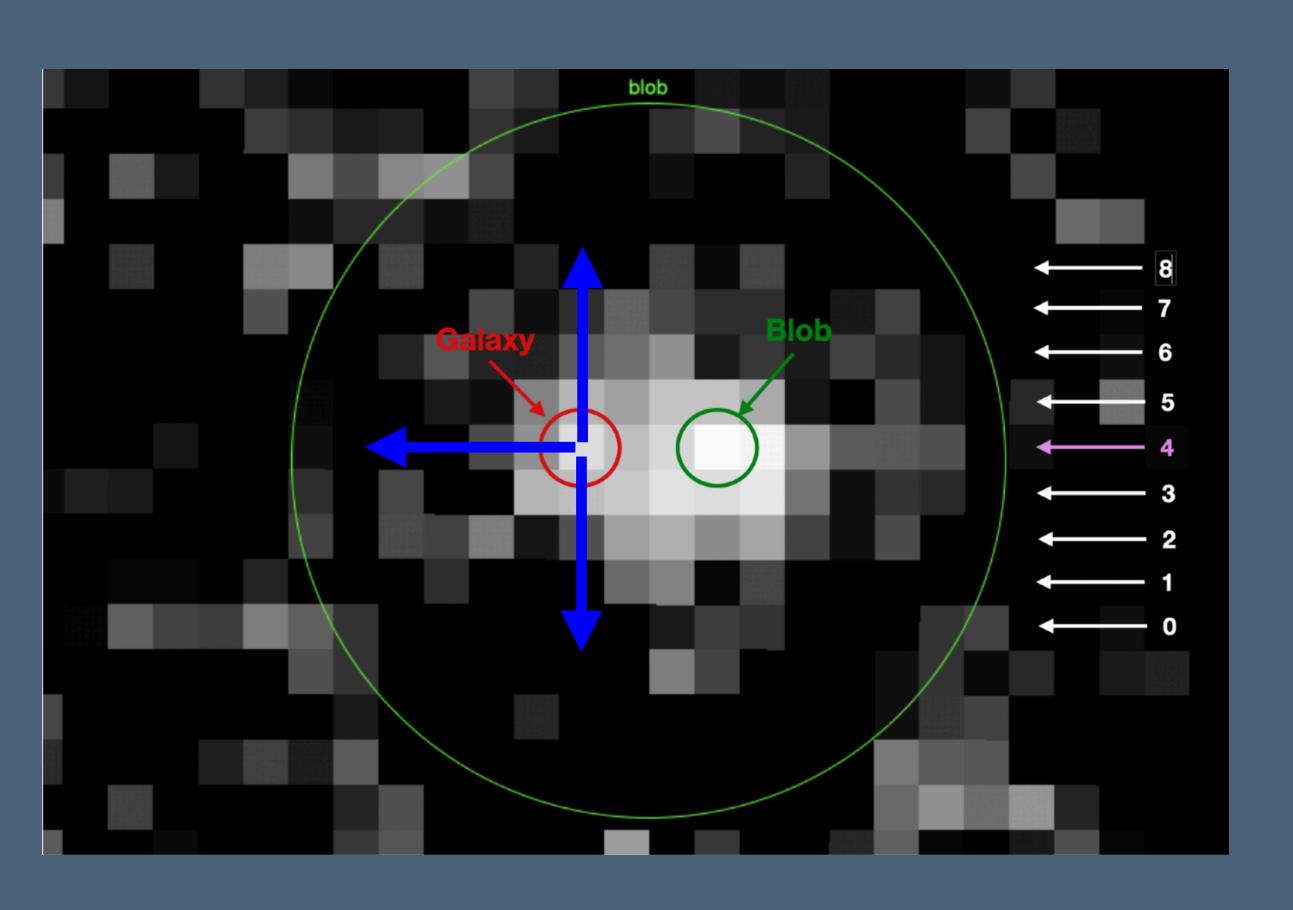


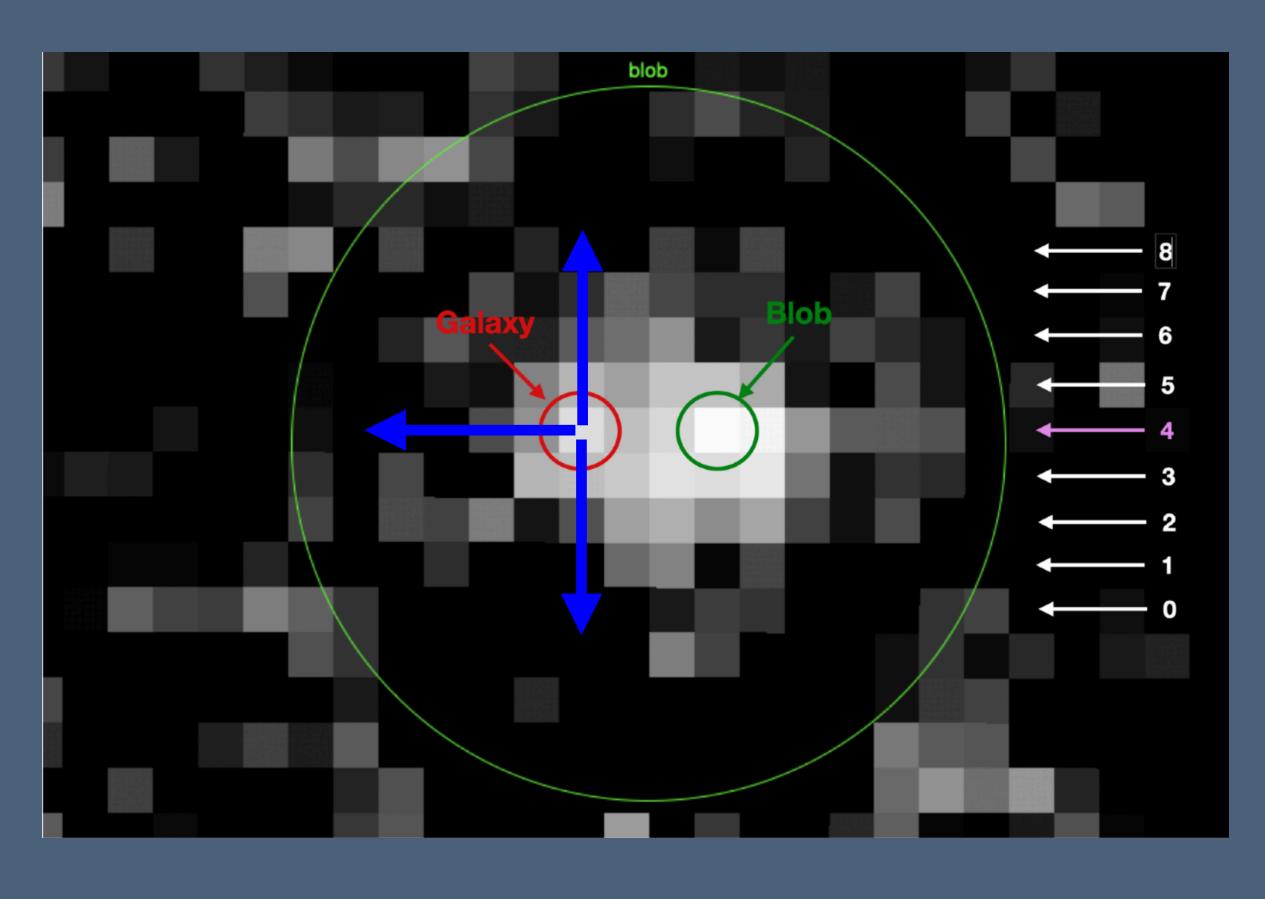


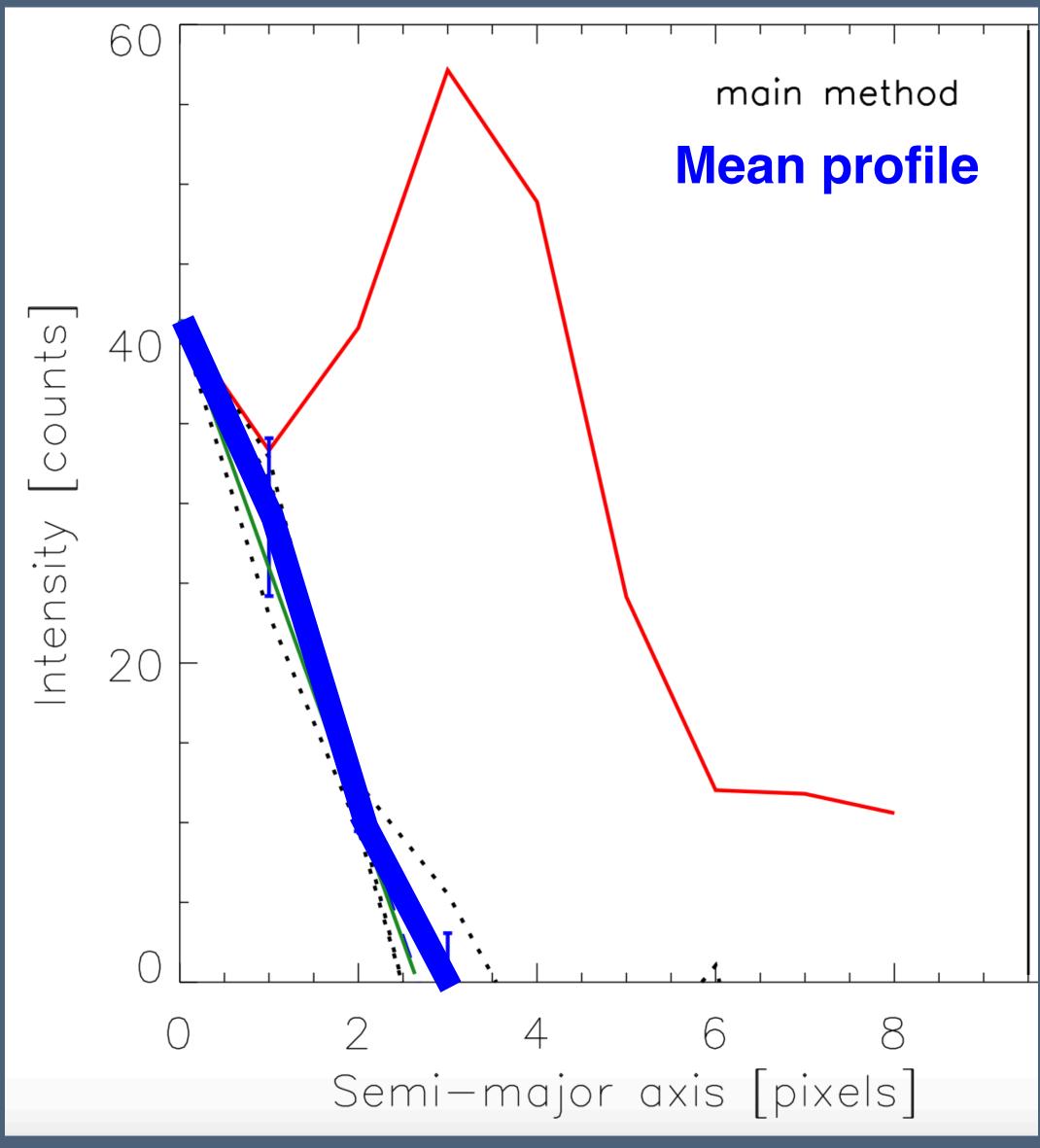


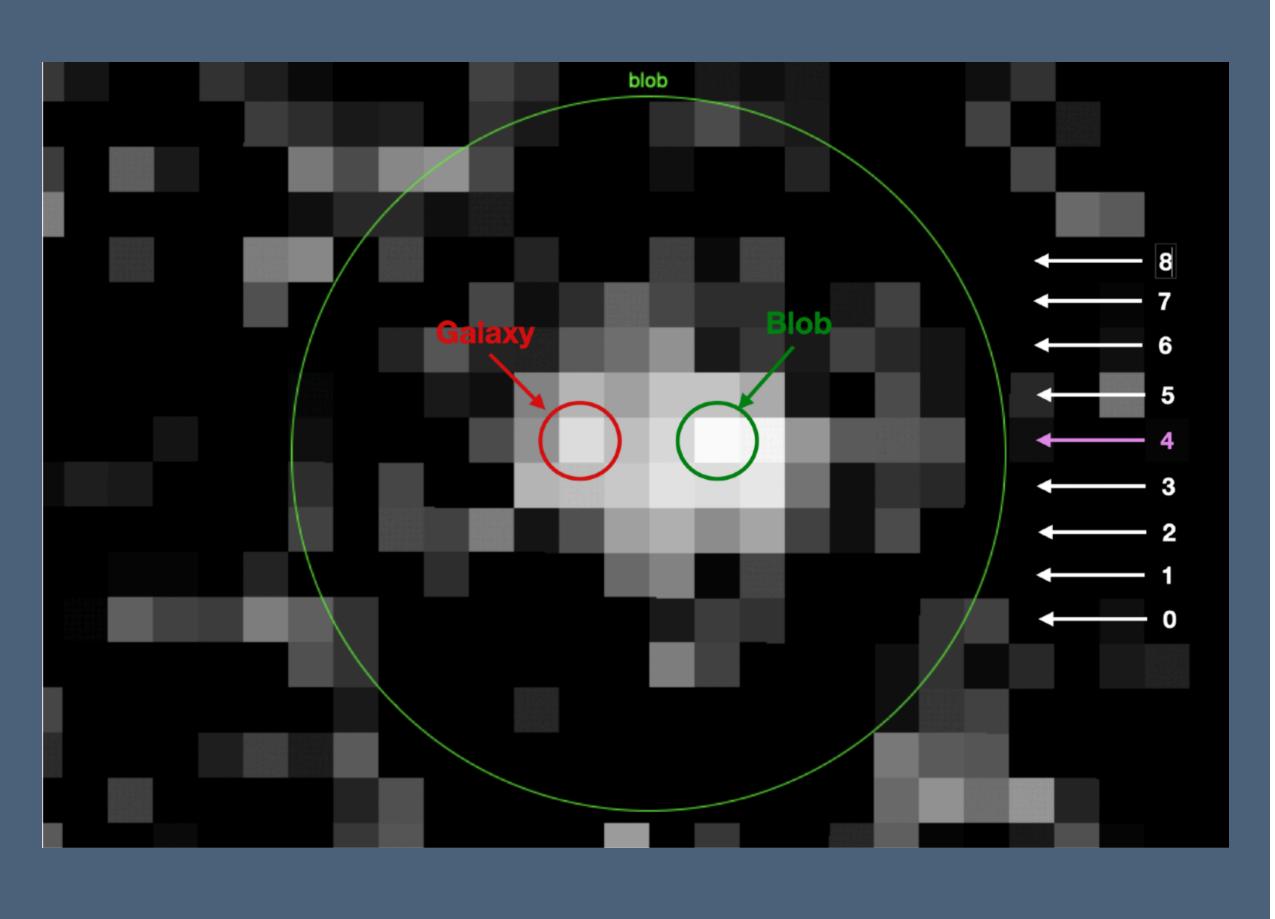


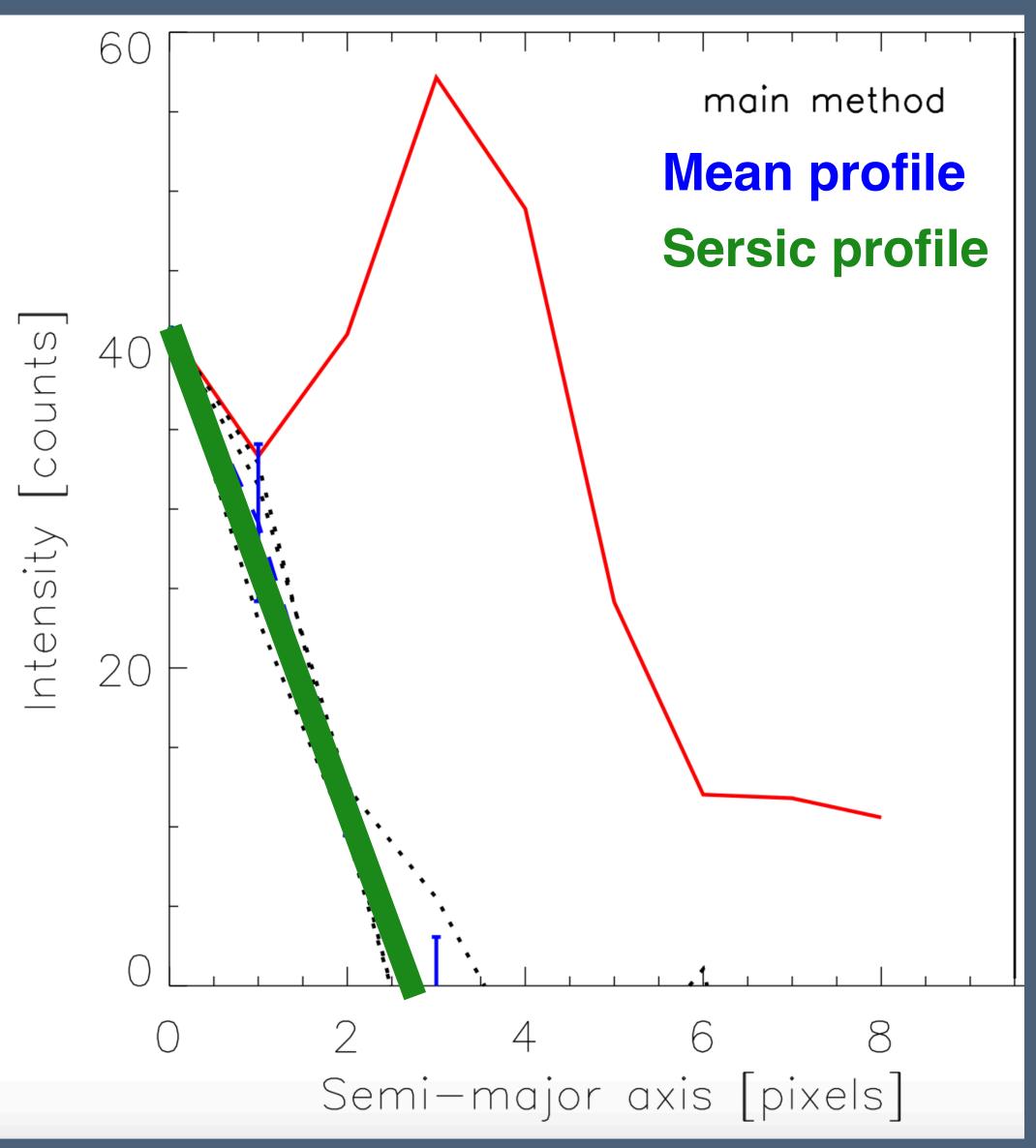


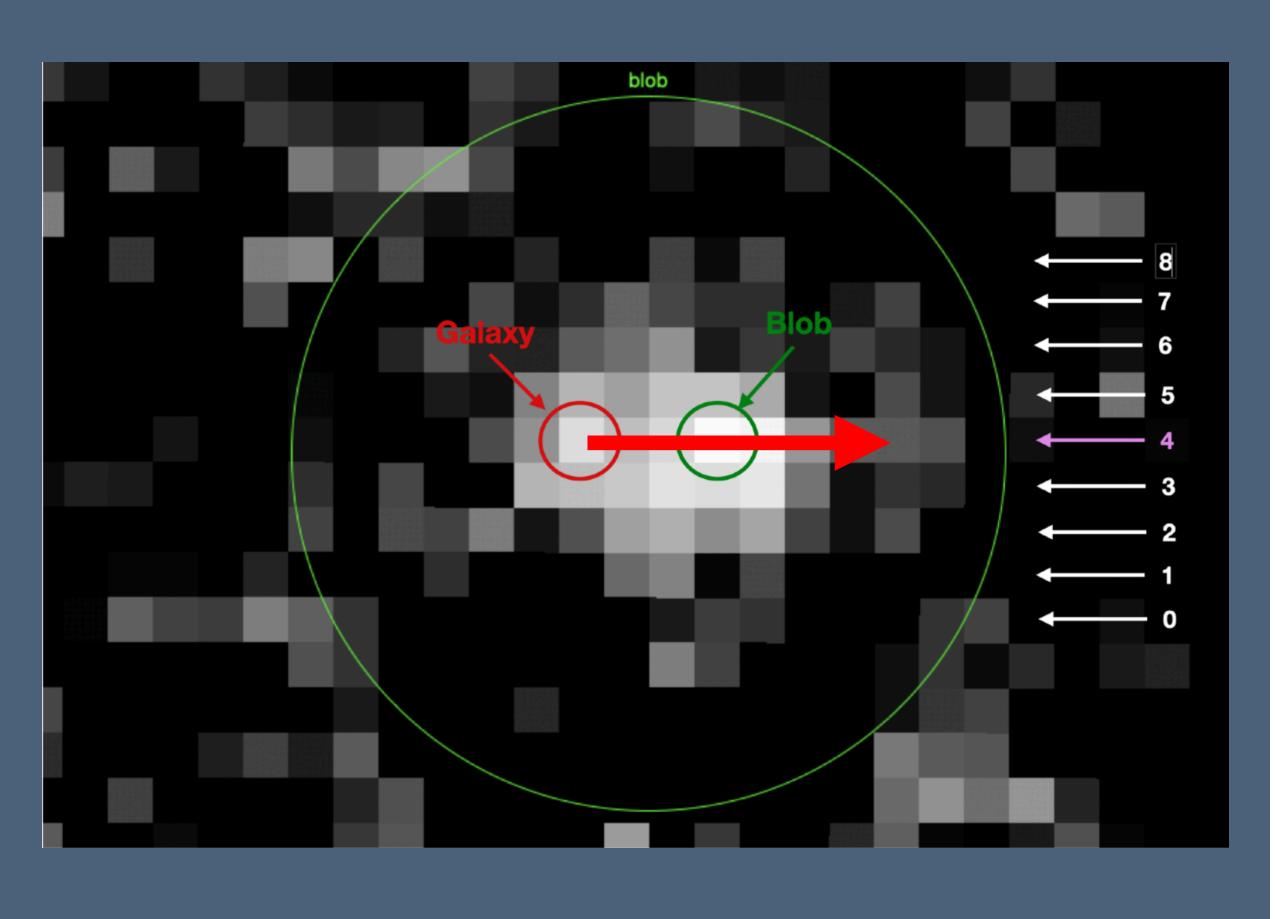


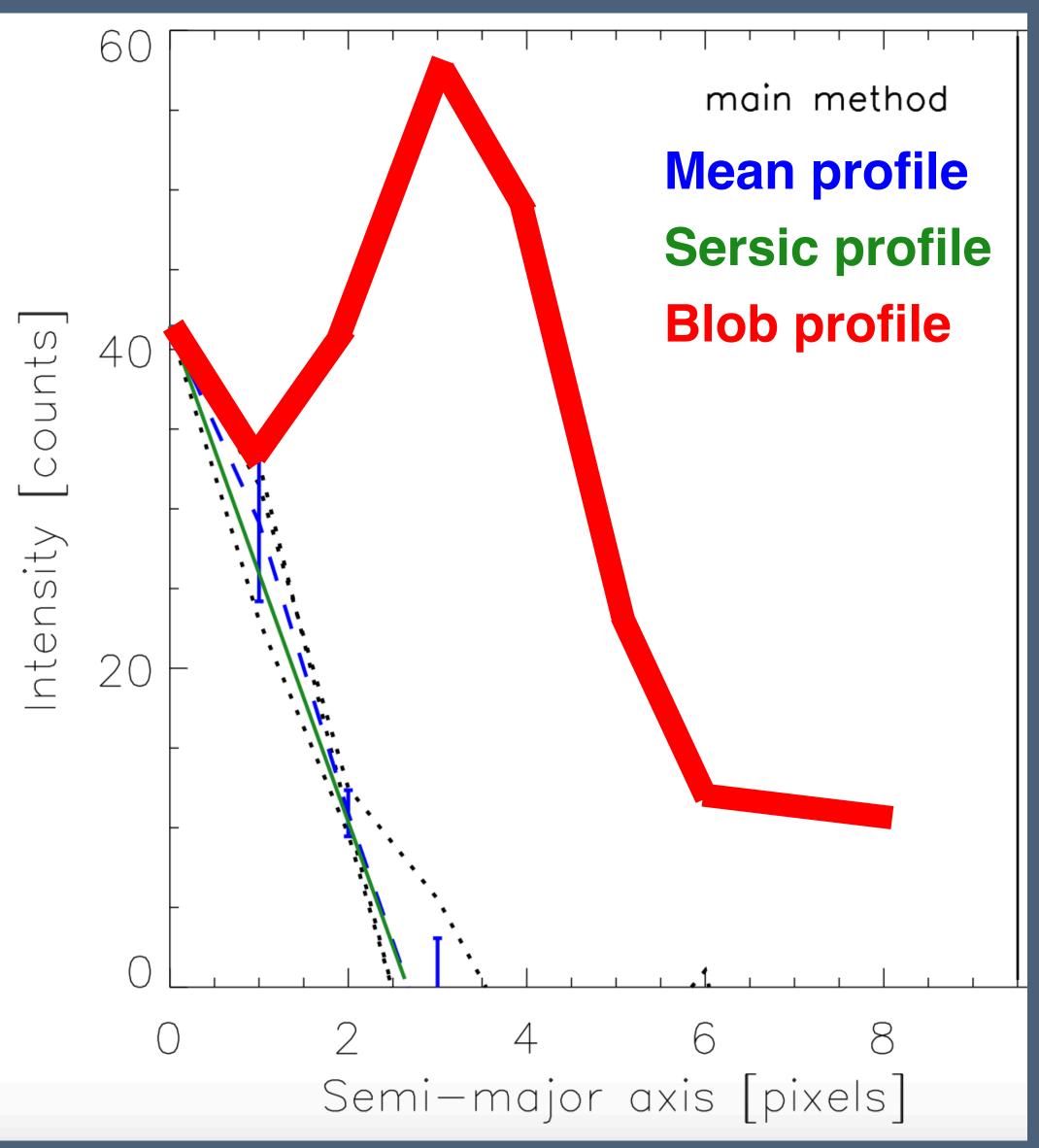


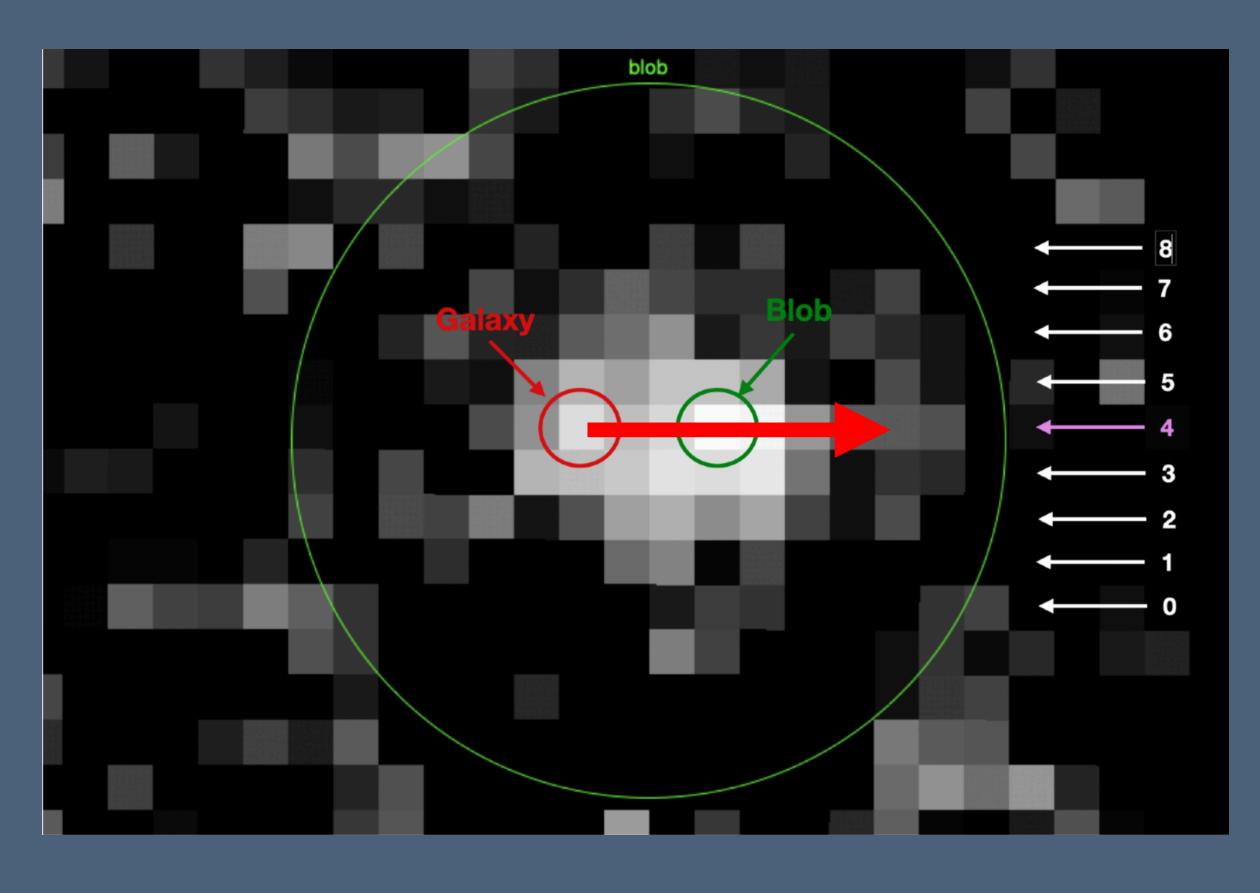




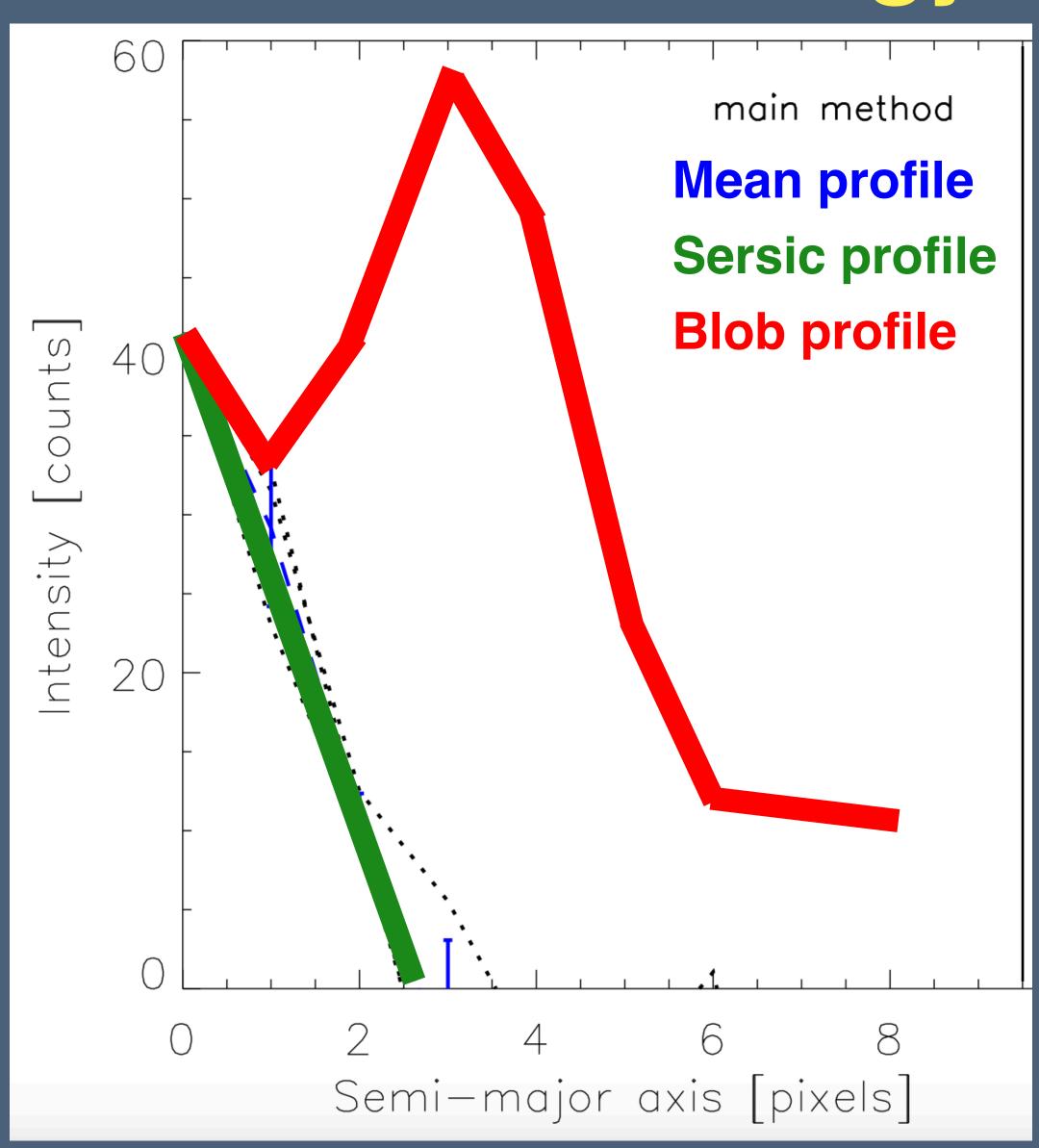


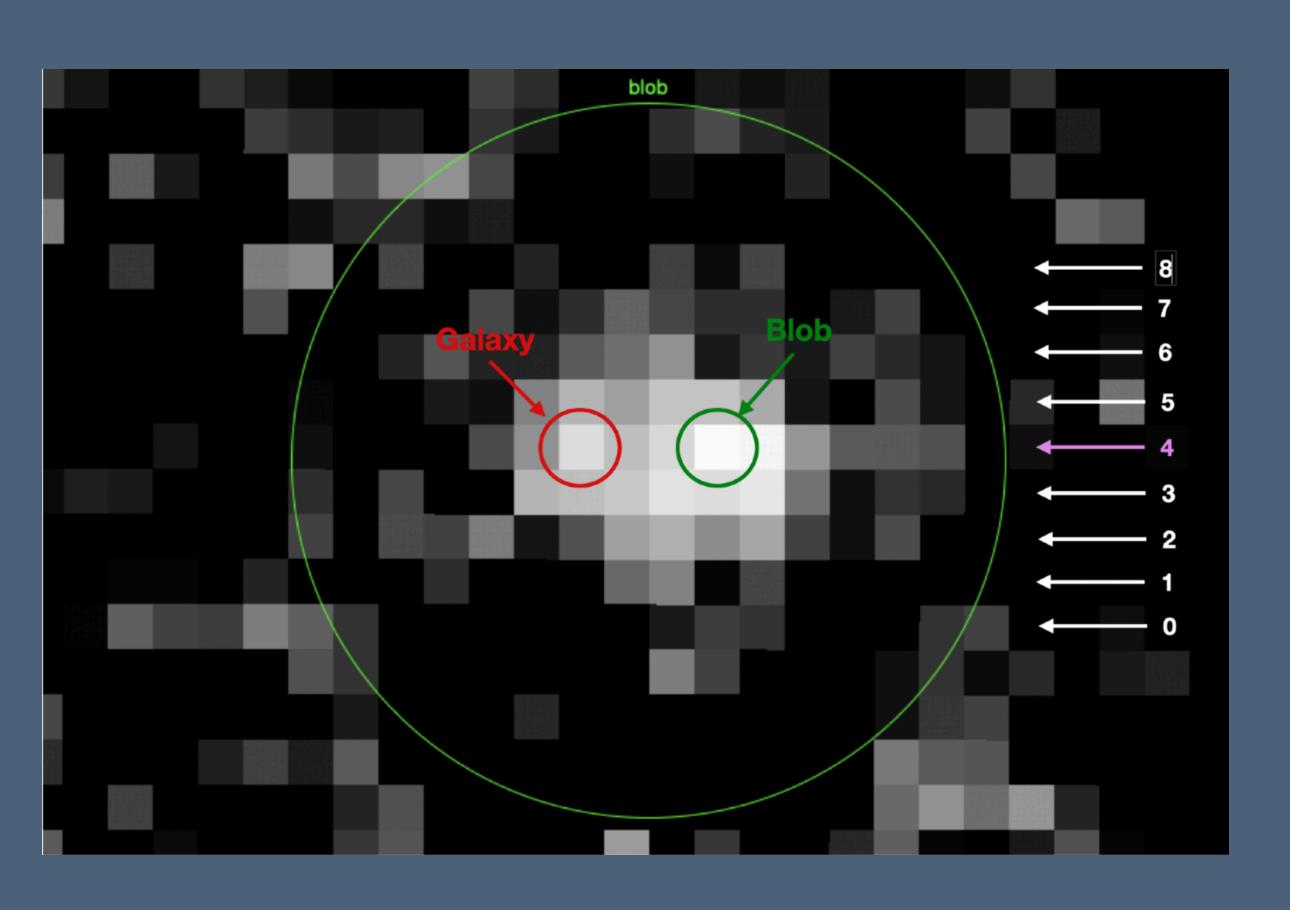


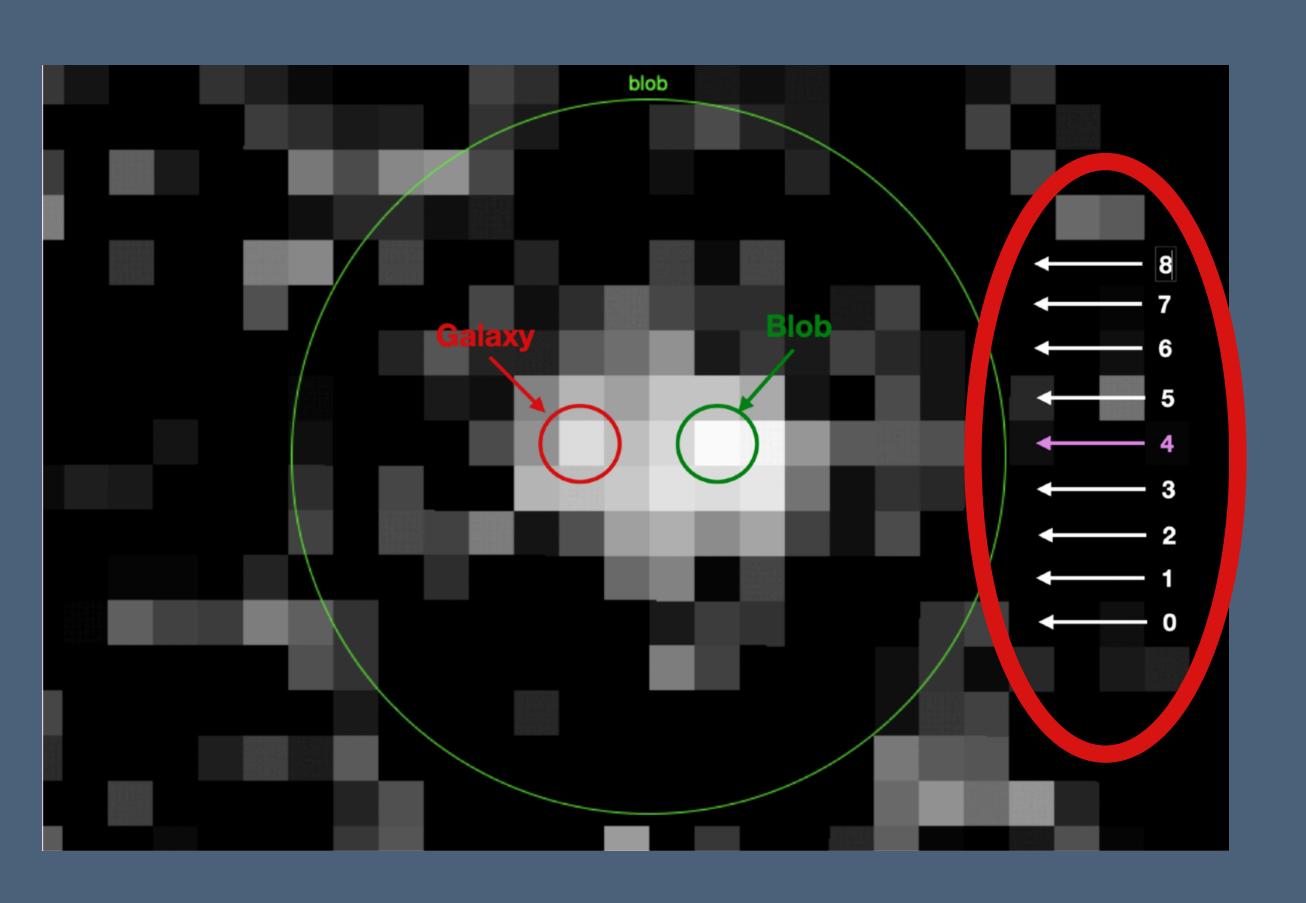


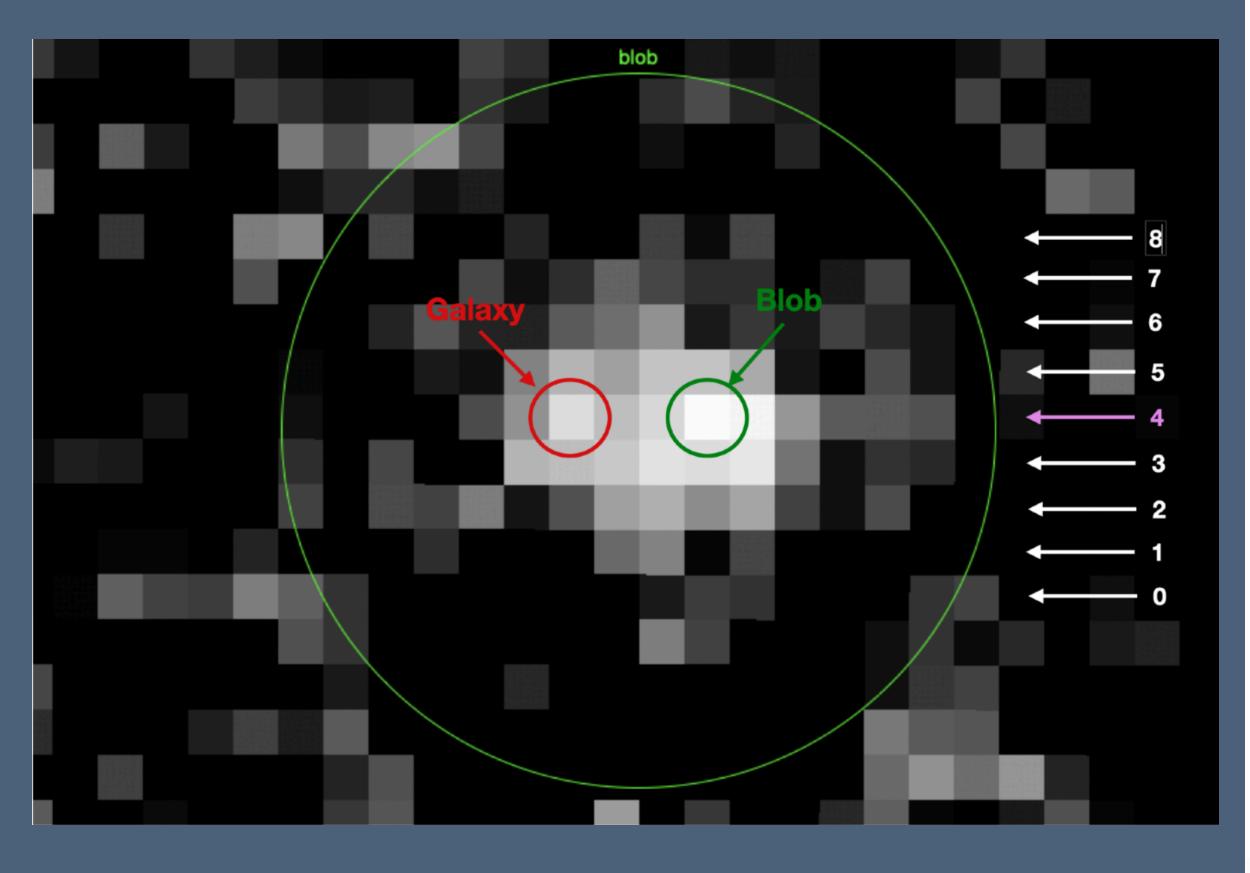


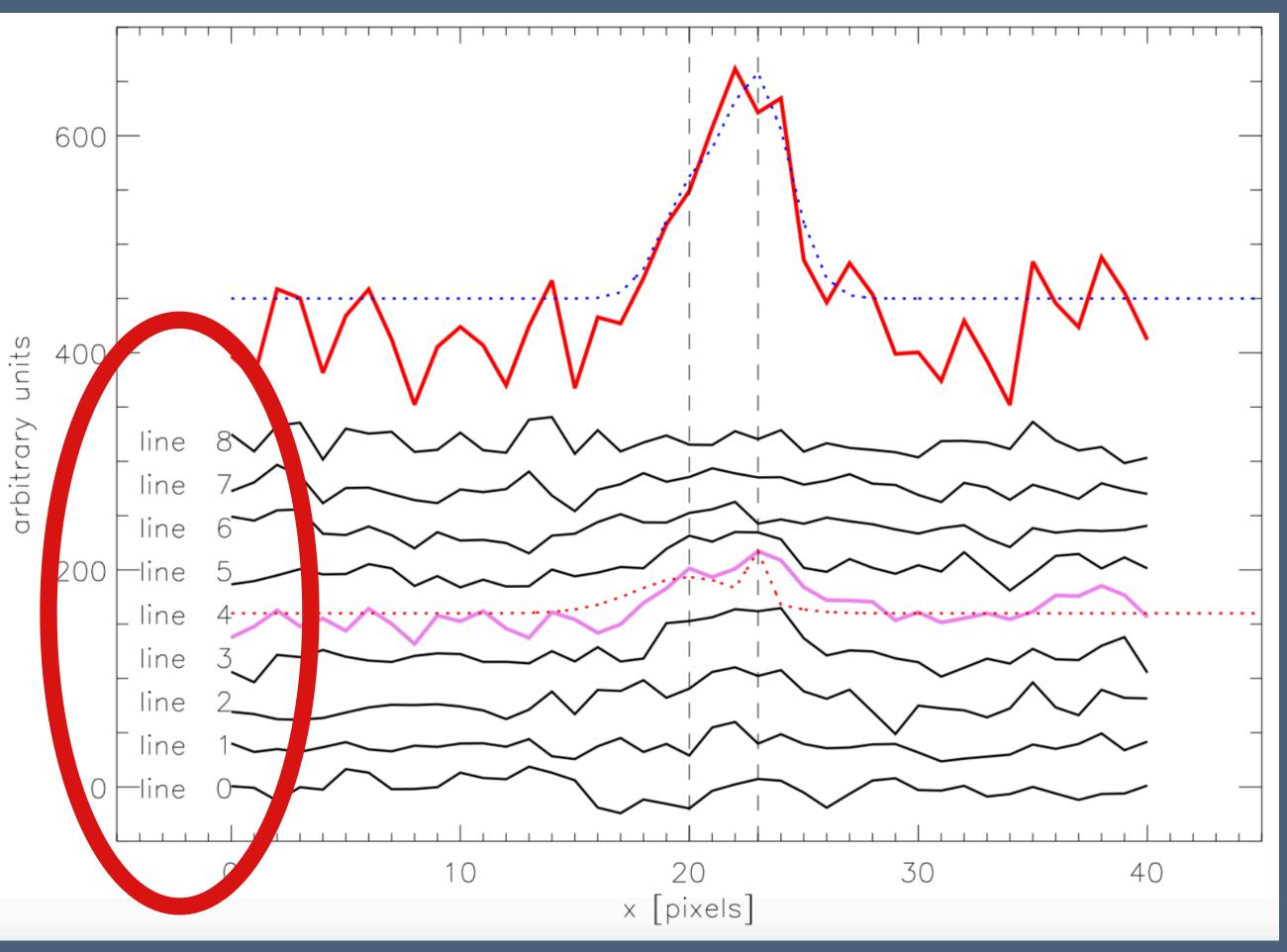
ADVANTAGE: realistic profile for the galaxy

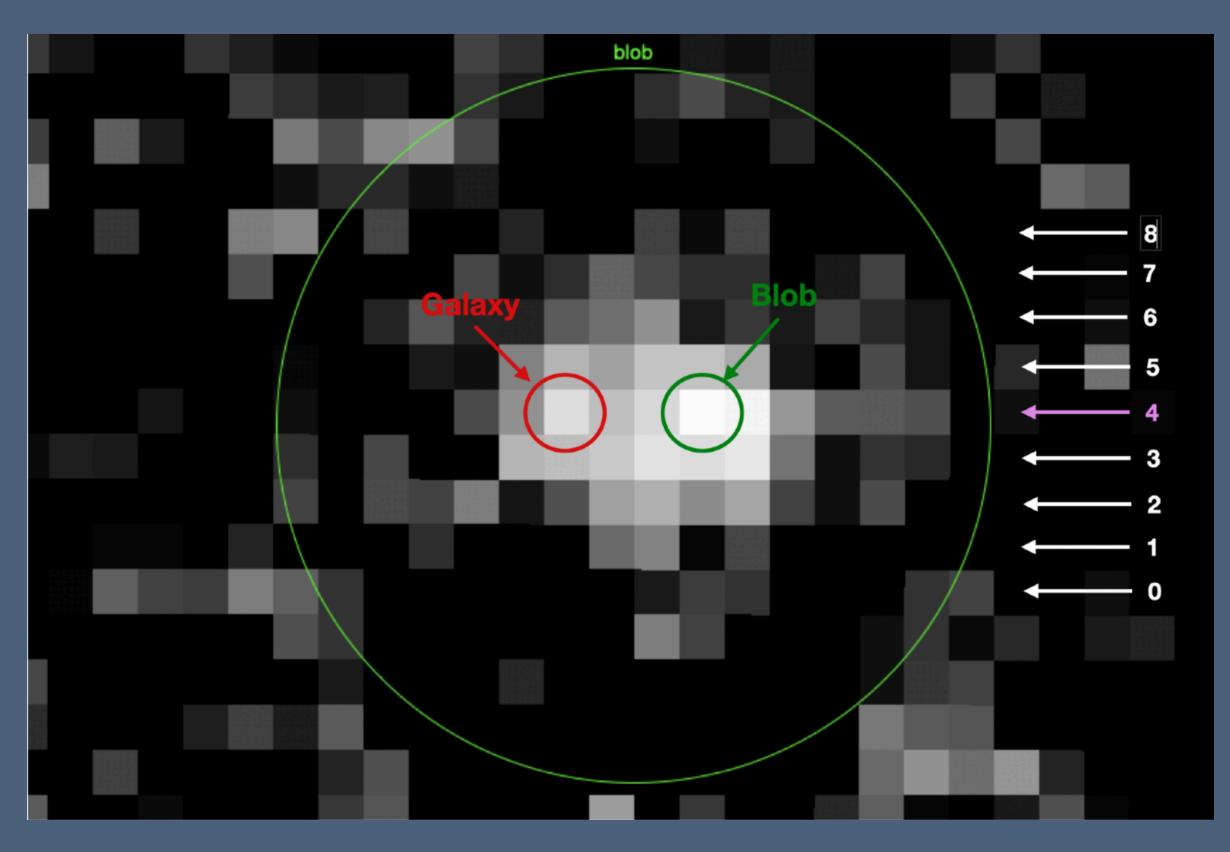


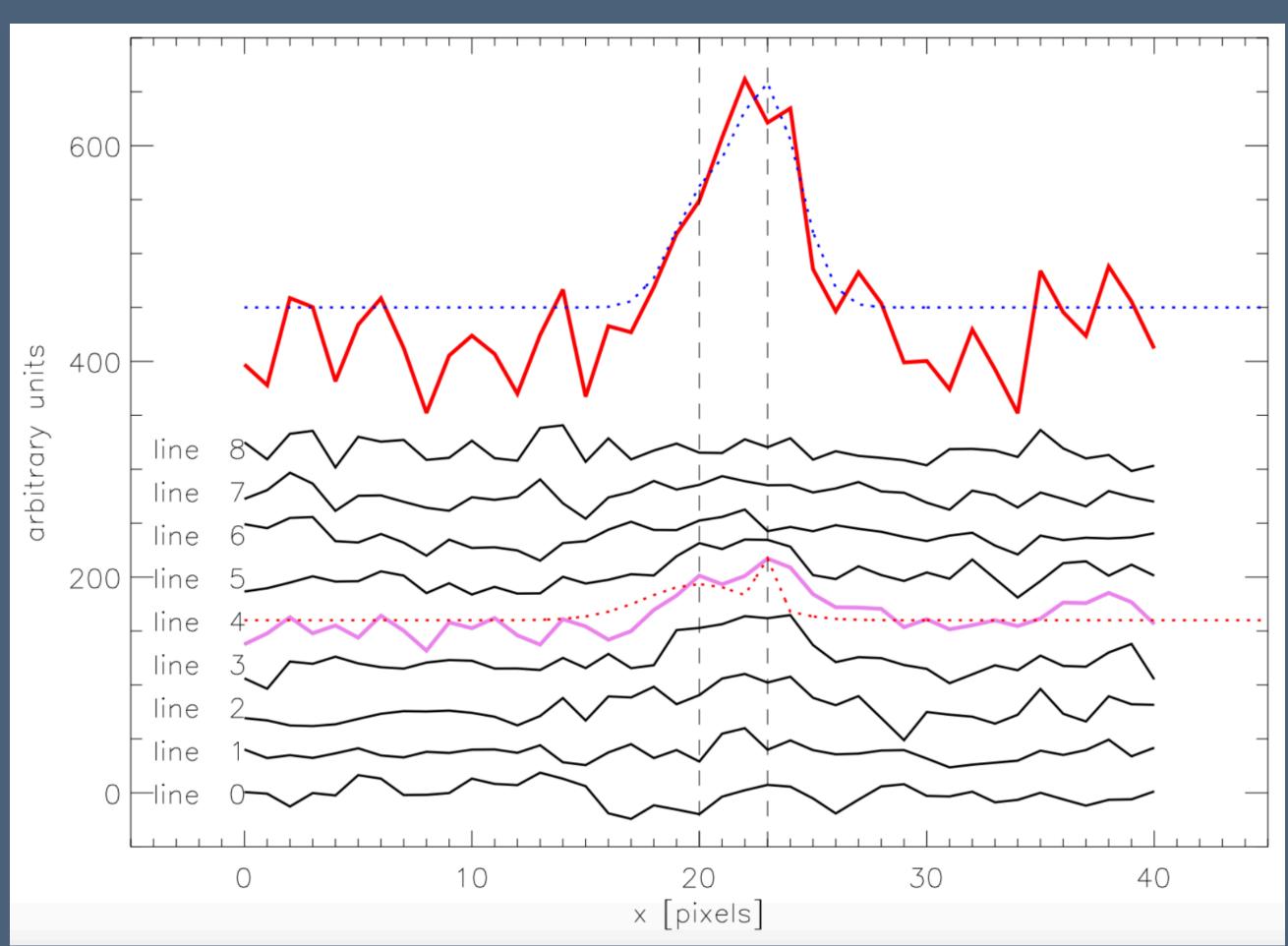




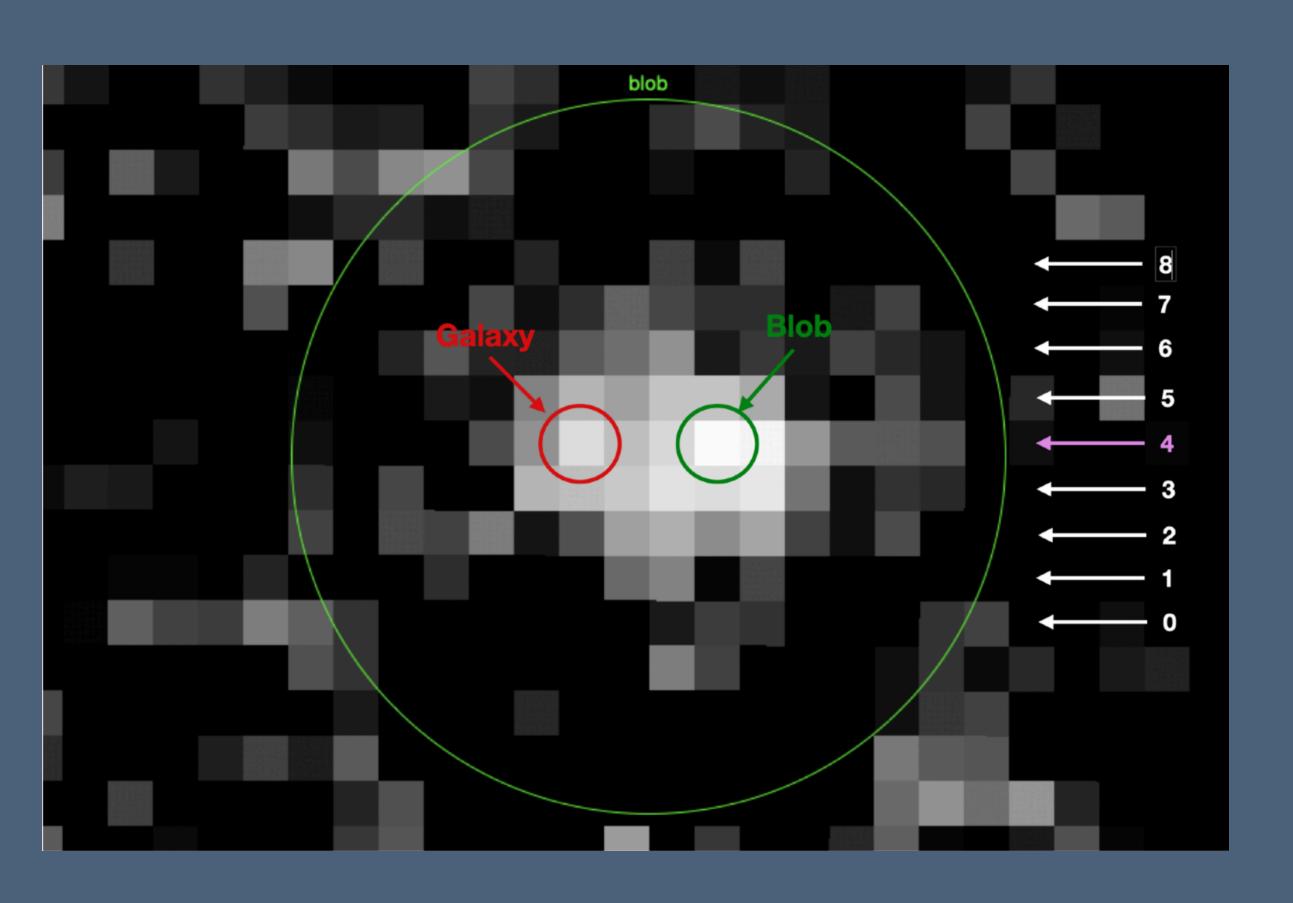


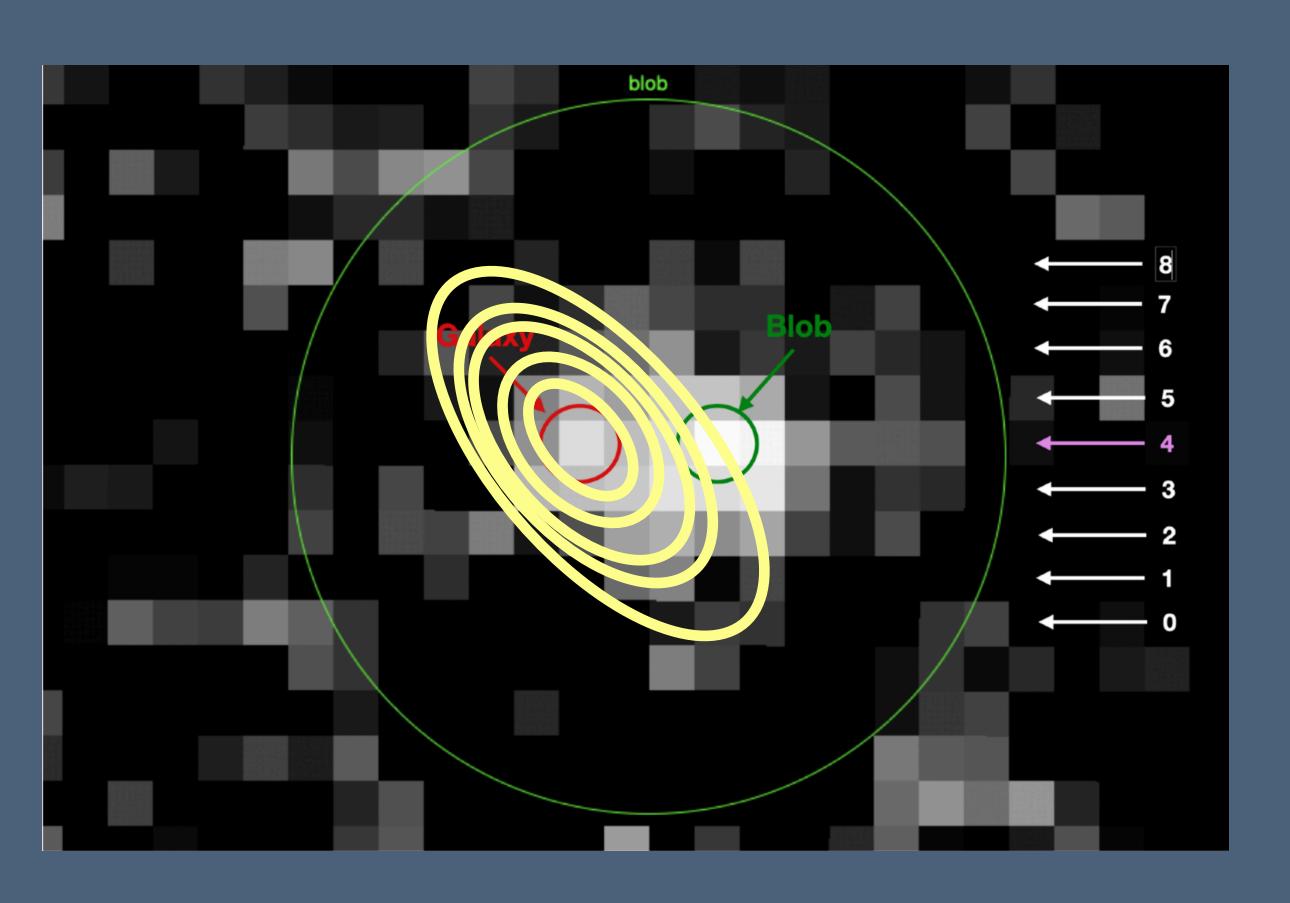


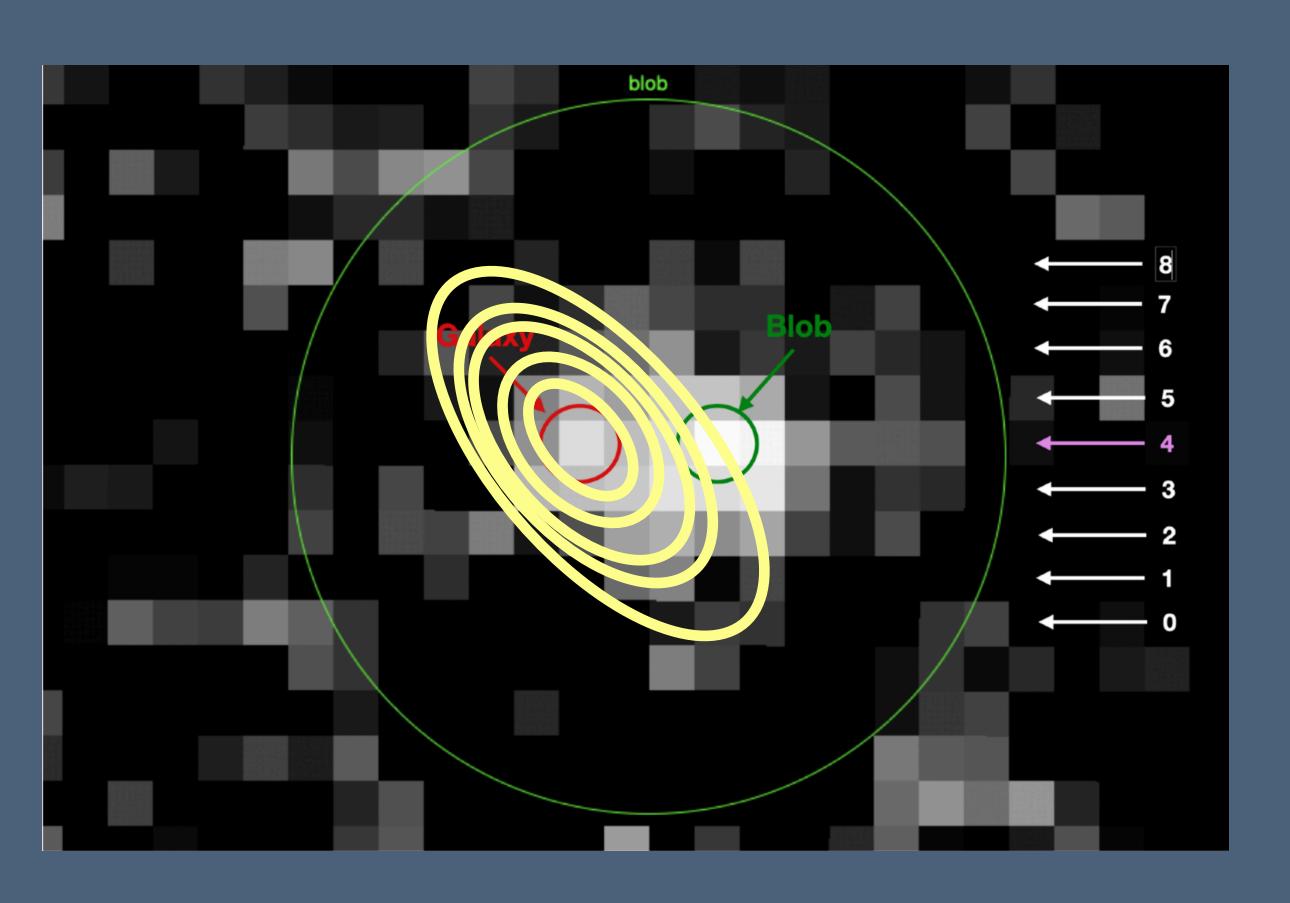




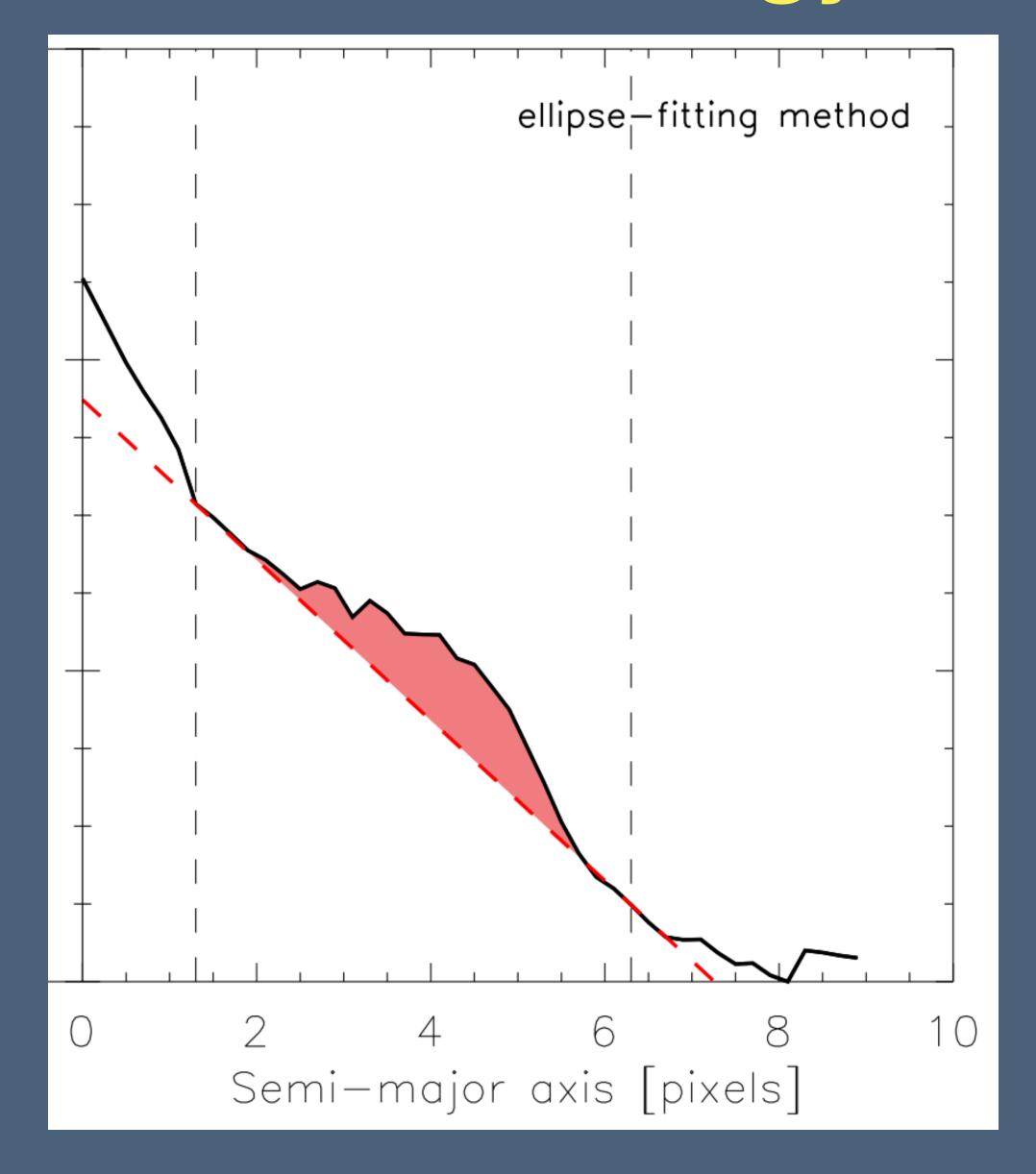
ADVANTAGE: simultaneous fit of galaxy and blob







ADVANTAGE: lower limit to the blob's luminosity



ID	R.A.	Dec.	L	$L_{\lambda}$	EW (Lyα)	$EW_0(Ly\alpha)$	$\overline{F_{\nu}}$		
			$[erg s^{-1}]$	[erg s <sup><math>-1</math></sup> Å $^{-1}$ ]	Å	Å	[AB mag]		
Sextractor global properties (galaxy+blob)									
SHARDS20018464	189.28	62.23	$3.5 \times 10^{42}$	-	-	-	25.35		
T-1	.1 1	C	1: 1 · · · · · · · · · · · · · · · · · ·	C1 C		. (1			
	method: e	xcess of		profile after re	moving a Ser	sic profile			
blob (Ly $\alpha$ )	-	-	$1.04 \times 10^{43}$	-	-	-	24.35		
gal (continuum)	-	-	$2.87 \times 10^{42}$	$2.08 \times 10^{40}$	500	111	25.75		
tot	-	-	$1.33 \times 10^{43}$	-	-	-	24.09		
		_							
		Sec	ond method: d	louble Gaussian	fit				
blob (Ly $\alpha$ )	-	-	$2.34 \times 10^{42}$	-	-	-	25.97		
gal (continuum)	-	-	$2.40 \times 10^{42}$	$1.74 \times 10^{40}$	134	30	25.94		
tot	-	-	$3.34 \times 10^{42}$	-	-	-	25.59		
		7D1 * 1	.1 1	C1: 1	<b>C1</b>				
		Third me		of light in the SE	3 profile				
blob (Ly $\alpha$ )	-	-	$1.65 \times 10^{42}$	-	-	-	26.35		
gal (continuum)	-	-	$6.26 \times 10^{42}$	$4.53 \times 10^{40}$	36	8	24.90		
tot	-	-	$8.17 \times 10^{42}$	-	-	-	24.61		
UV continuum estimated using the F606W HST/ACS filter									
HST/ACS F606W	189.28	62.23	$1.08 \times 10^{43}$	$5.78 \times 10^{39}$	-	-	26.99		
Combined SHARDS F551W17 and HST/ACS F606W filters									
$\mathrm{Ly}lpha$	-	-	$2.7 \times 10^{42}$	$5.78 \times 10^{39}$	467	104	-		

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	memod: e	excess of		prome after re	moving a ser	sic prome	24.25			
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- Blob with clear Lya emission
- Galaxy with strong Lya continuum (estimated from the HST image)

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• Assuming semi-empirical calibration by Sobral & Matthee (2019) (  $f_{esc,Ly\alpha} = 0.0048 \times EW(Ly\alpha) \pm 0.05$ )

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- The responsible of the blob re-ionisation is a massive (1-2 10<sup>7</sup> M<sub>sun</sub>) super cluster of stars that can be:
  - coeval of ~ 2.5 Myr
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#### ...MOREOVER:

- The blob is ~ 5-8 kpc, much smaller than those found in the literature!
- The blob is not aligned with the galaxy: there could be an ionising cone?

#### Conclusions

- We discover a blob that is emitting in Lyα only at z ~ 3.5:
  - Its luminosity is ~ 10<sup>43</sup> erg s<sup>-1</sup>
  - It is small (r ~ 5-8 kpc) and not alligned (apparently) with the galaxy
- The ionisation could be due to a massive super-cluster with:
  - $f_{esc,Lya} \sim 0.53 \pm 0.05$
  - Mass of about 1-2 107 M<sub>sun</sub>
  - Coeval age (2.5 Myr) or extended burst up to 4 Myr