Spectroscopic Follow-up of z~6 Galaxies

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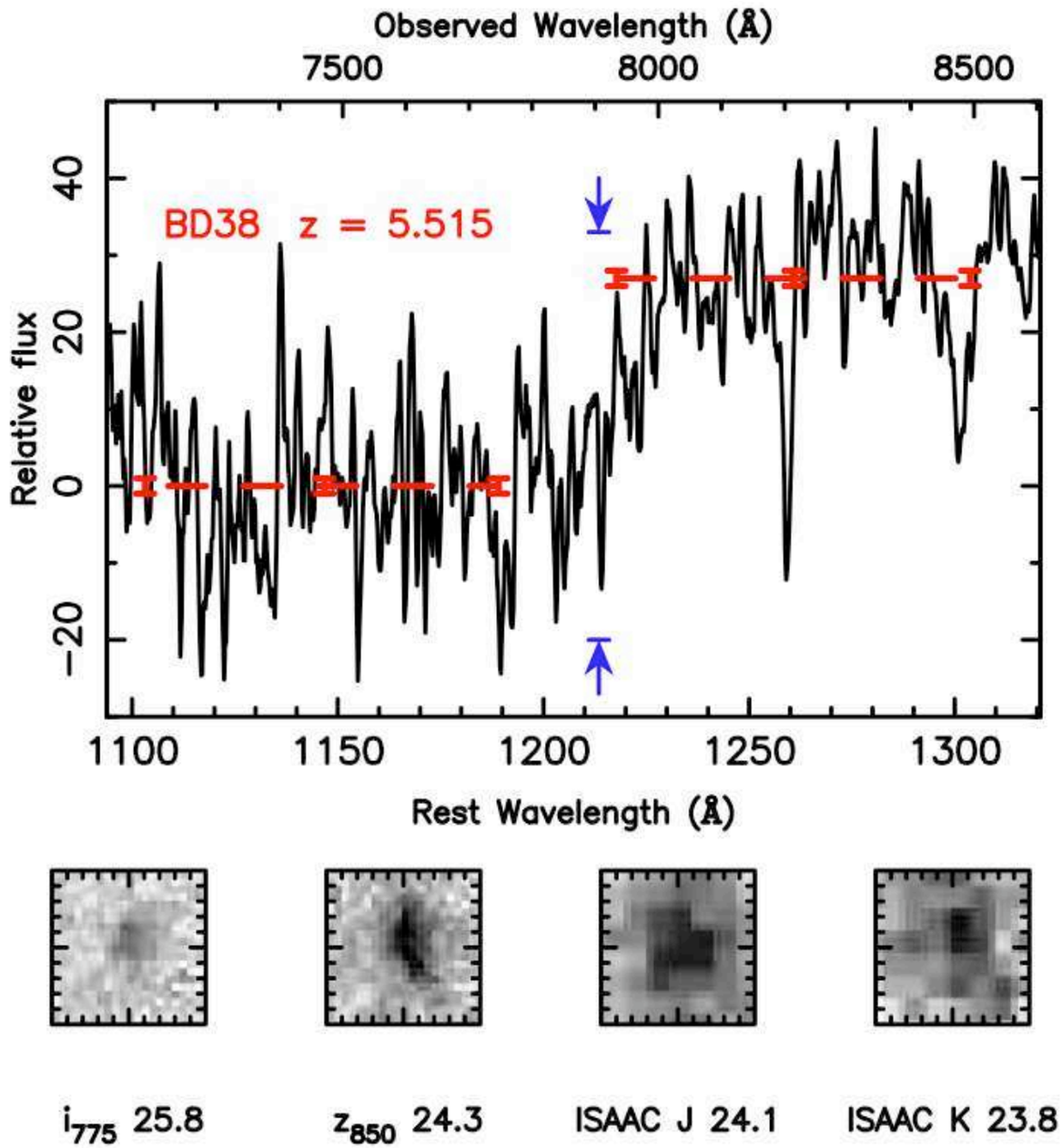
I-Dropouts



Not very photogenic.

Imaging: Flux and Size

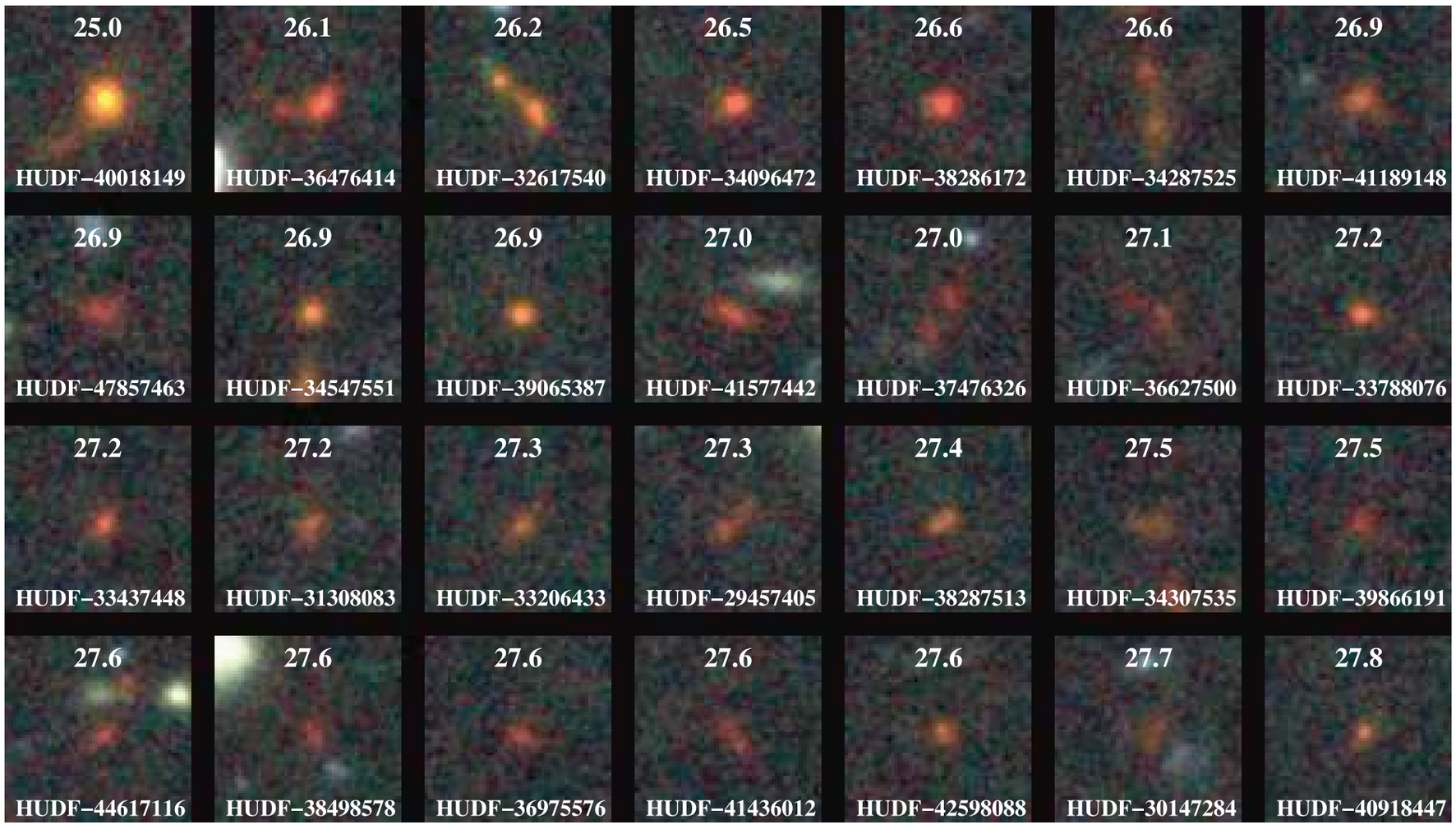
Spectra: Redshift, LyA emission

I-Dropout Spectra
What can we learn?

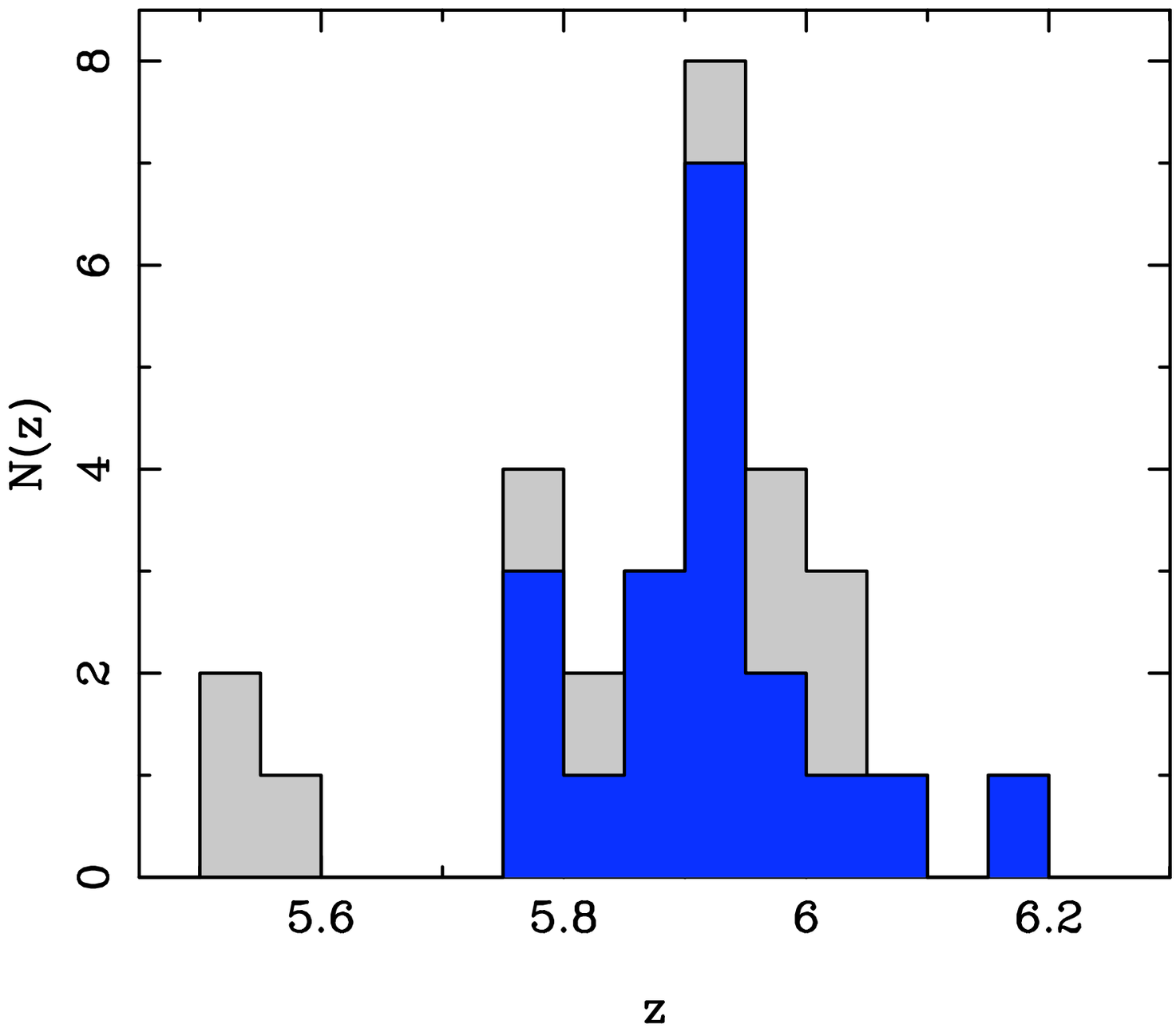
- Redshift Distribution
- Fraction of the Star-forming Population with Lyman alpha emission (LAEs)
- Is there a physical difference between star-forming galaxies with different spectral properties?

I-Dropouts

Parent Sample: Bouwens et al. 03, 07
CDFS and CL1252-2927



I-Drop Redshift Distribution



Blue - LyA Emitters

Grey - Everything else

Sources of Spectra:

Stanway et al. 06,07

Vanzella et al. 06,07,08

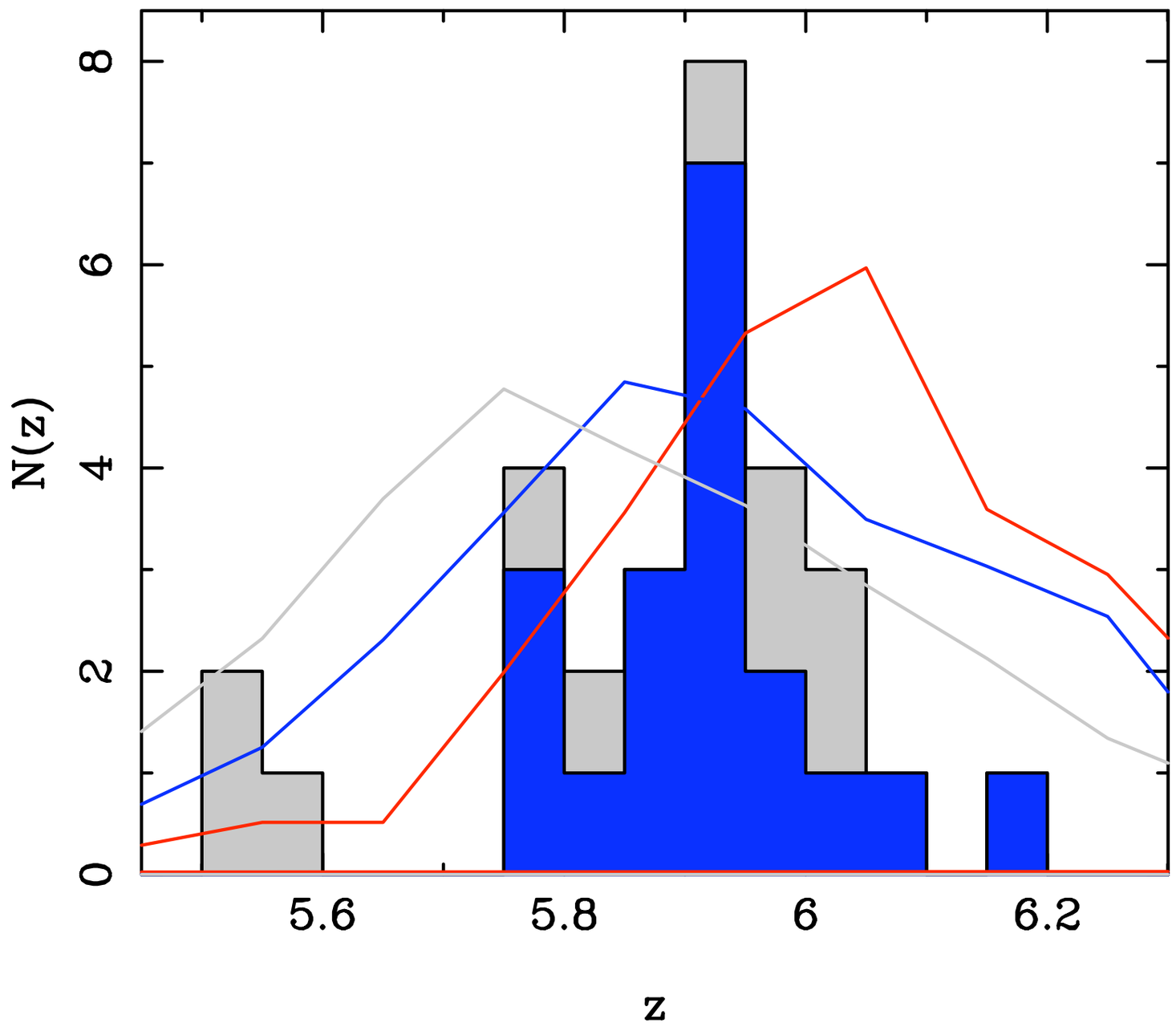
Malhotra et al. 05

Dow-Hyeglund et al.07

Holden et al. 08?

31 zs versus ~600 candidates

I-Drop Redshift Distribution



Blue - LyA Emitters

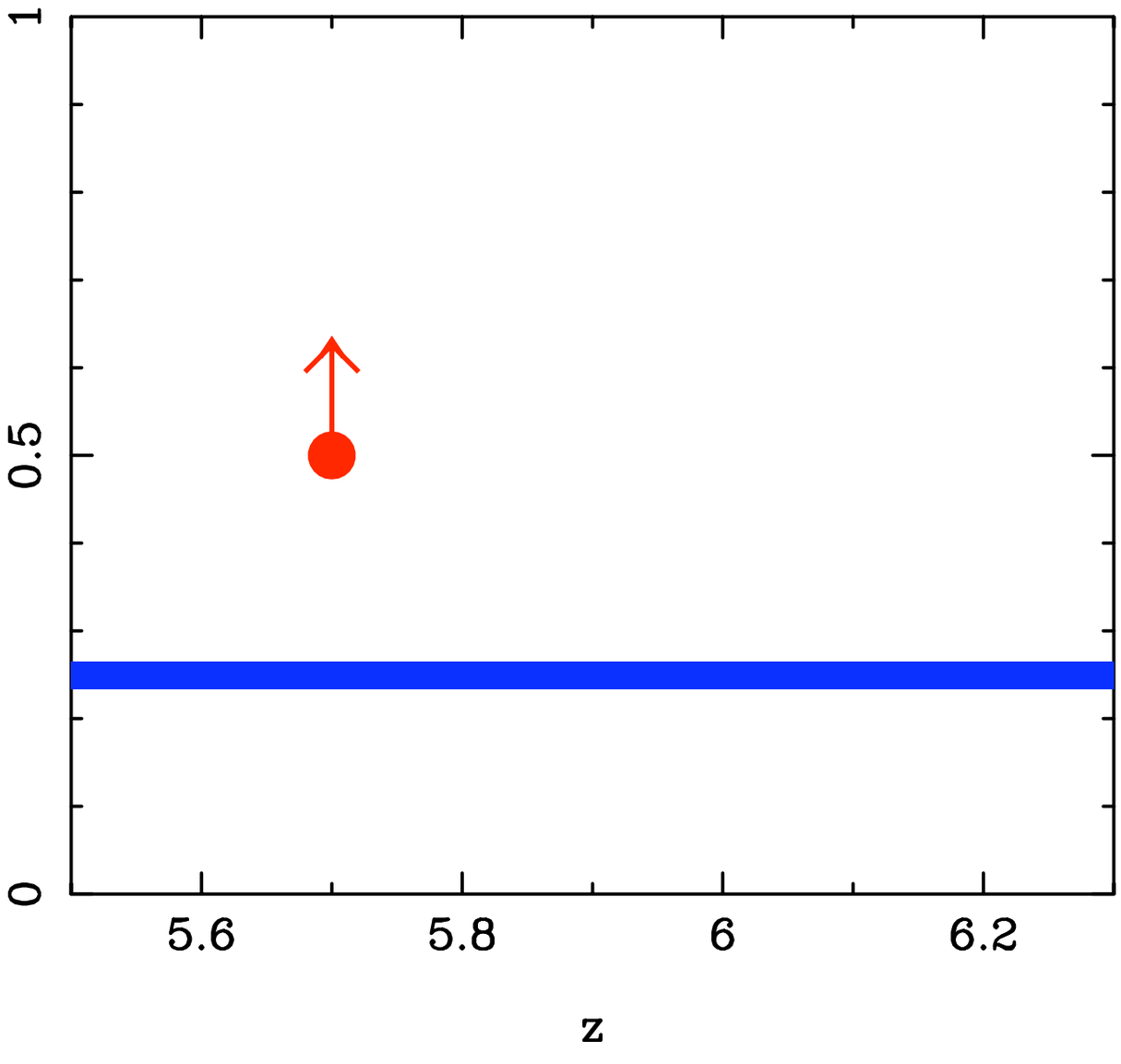
Grey - Everything else

Red - LyA EW = 50

Blue - LyA EW = 25

Grey - LyA EW = 0

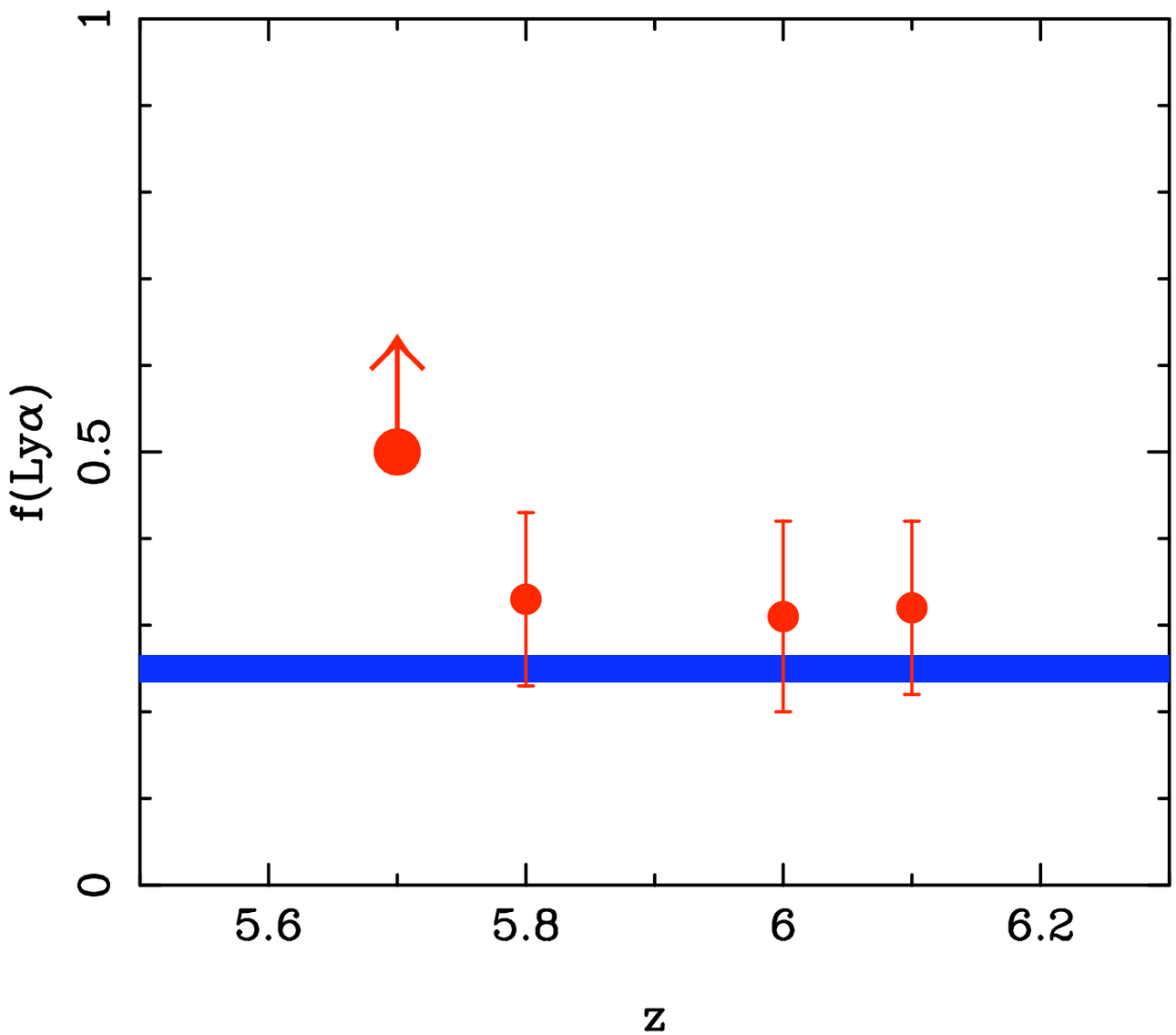
Fraction of LAEs in the I-Drop Population



Red Arrow - fraction of emitters from LyA surveys Ouchi et al. 08

Blue - Shapley 03, z=3 LAE fraction of LBG population

Fraction of LAEs in the I-Drop Population

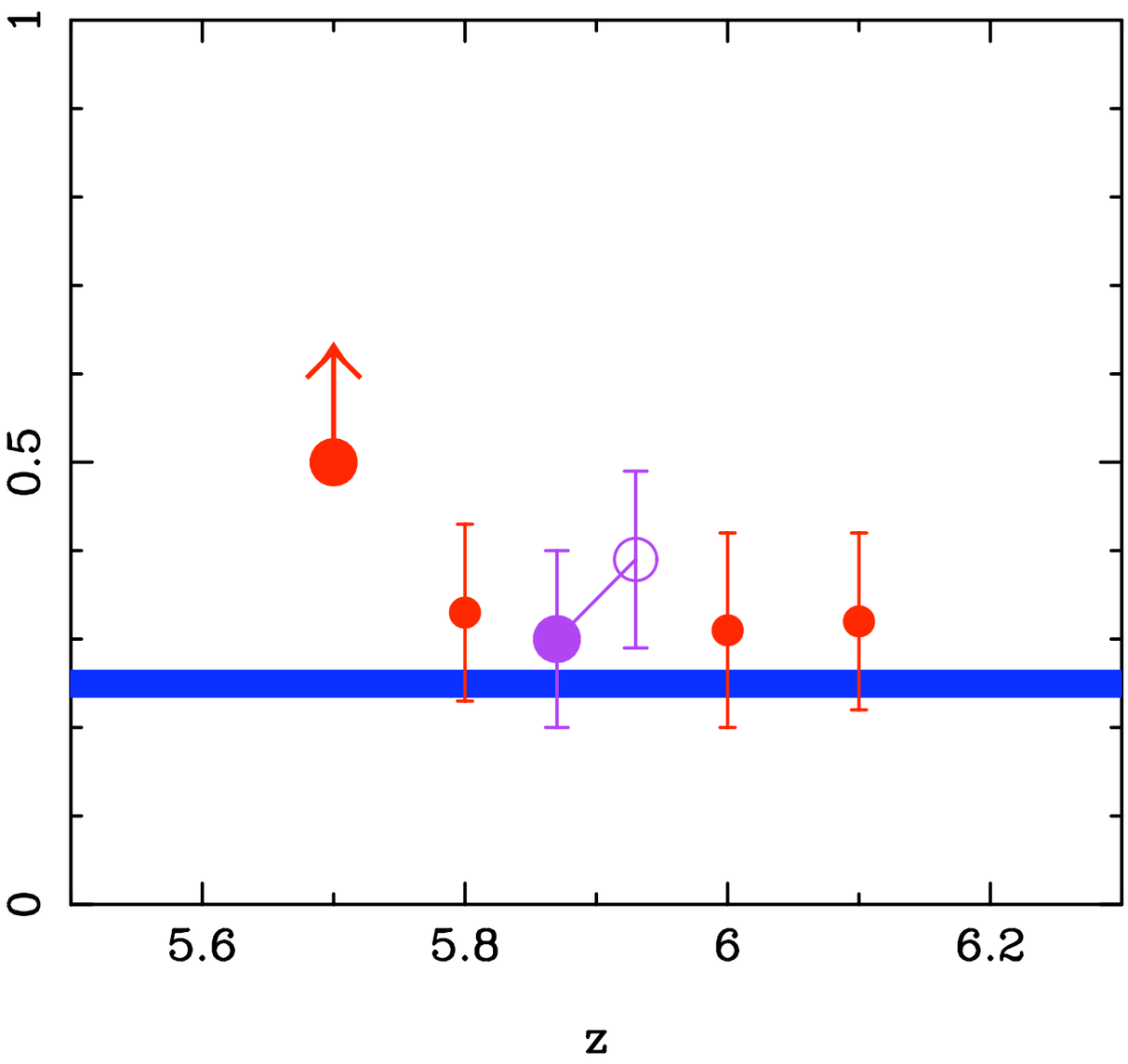


Red Arrow -
Ouchi et al. 08

Blue - Shapley 03

Red Points -
Stanway et al. 06, 07
Vanzella et al. 06
Dow-Hygelund 07

Fraction of LAEs in the I-Drop Population



Purple - Our New Data and Analysis

Red Arrow - Ouchi et al. 08

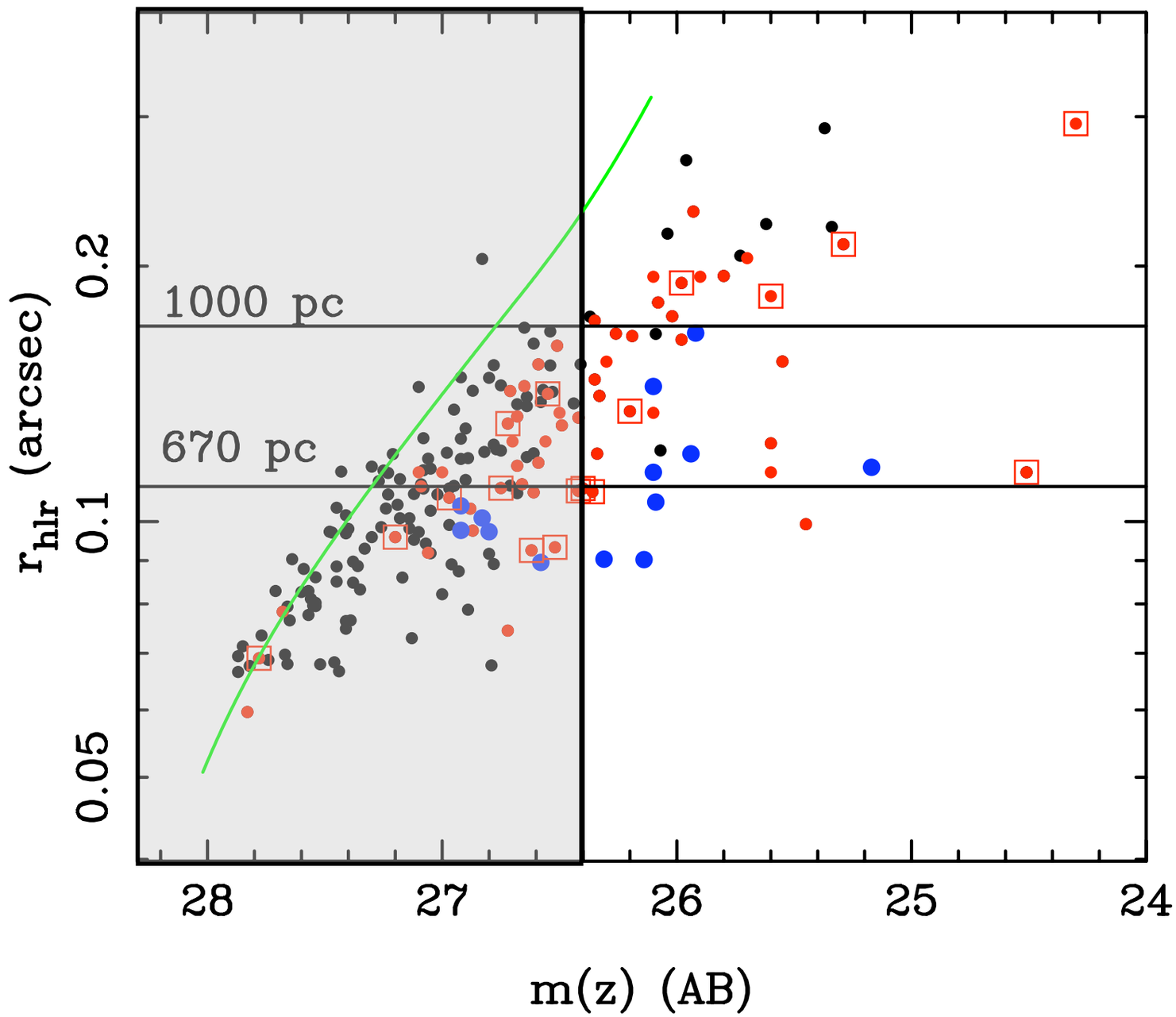
Blue - Shapley 03

Red Points - Stanway et al. 06, 07
Vanzella et al. 06
Dow-Hygelund 07

Can we reconcile these results?

- Large error bars
- Cosmic Variance - But two different fields 130 degrees apart have the same fraction
- Clumpiness in the IGM or ISM (cf. Brenda's talk or Simona's talk)

Beyond A Flux and a z....



Black - I-Dropout Galaxies

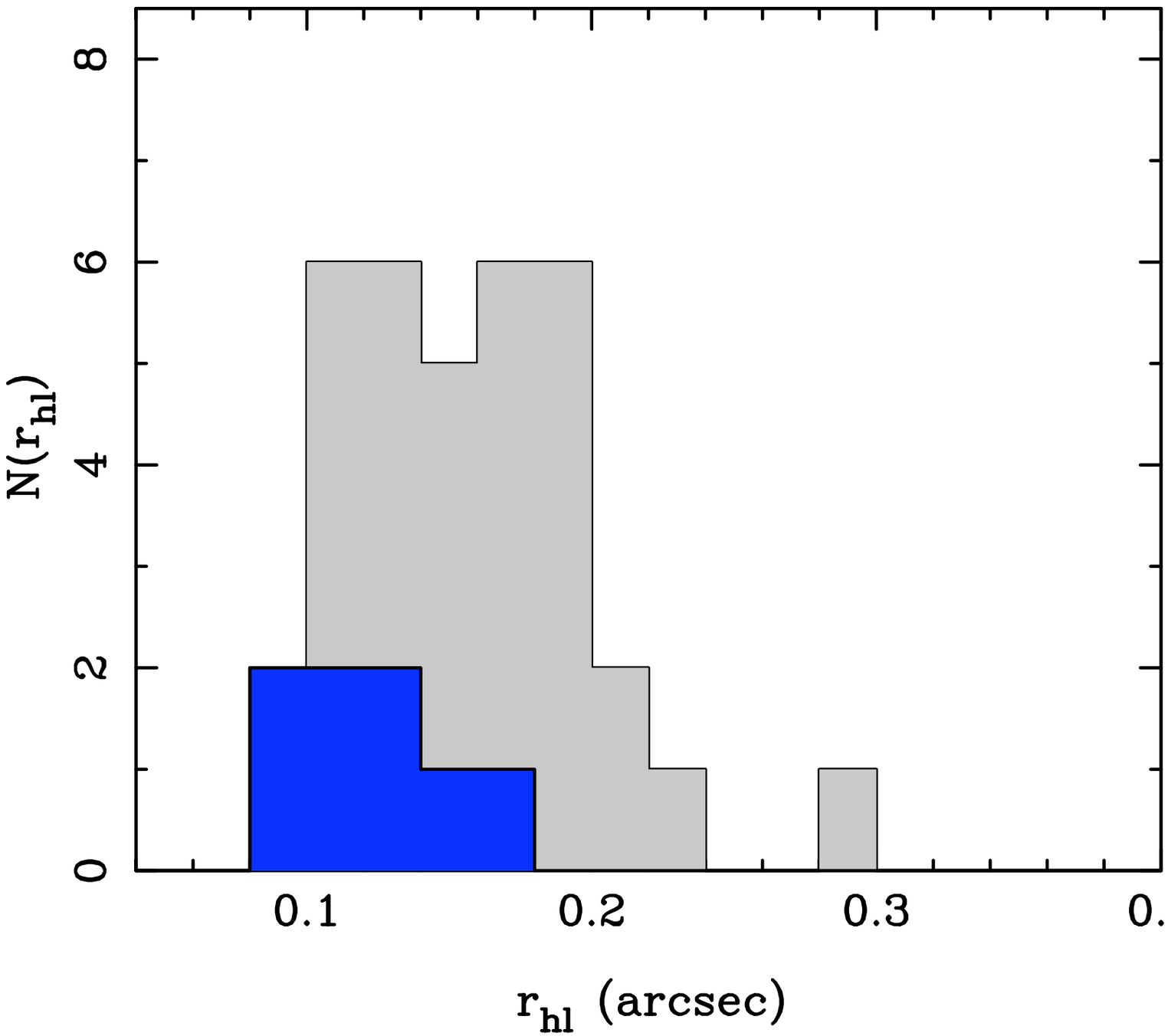
Red - I-Dropout Galaxies with spectra

Red Square - I-Dropout with z

Blue - z with LyA > 20

~65% complete z<26.4 or M(UV) ~ -20.7

A Physical Difference?



Blue - LyA Emitters

Grey - Everything else

A 3 sigma difference, honest!

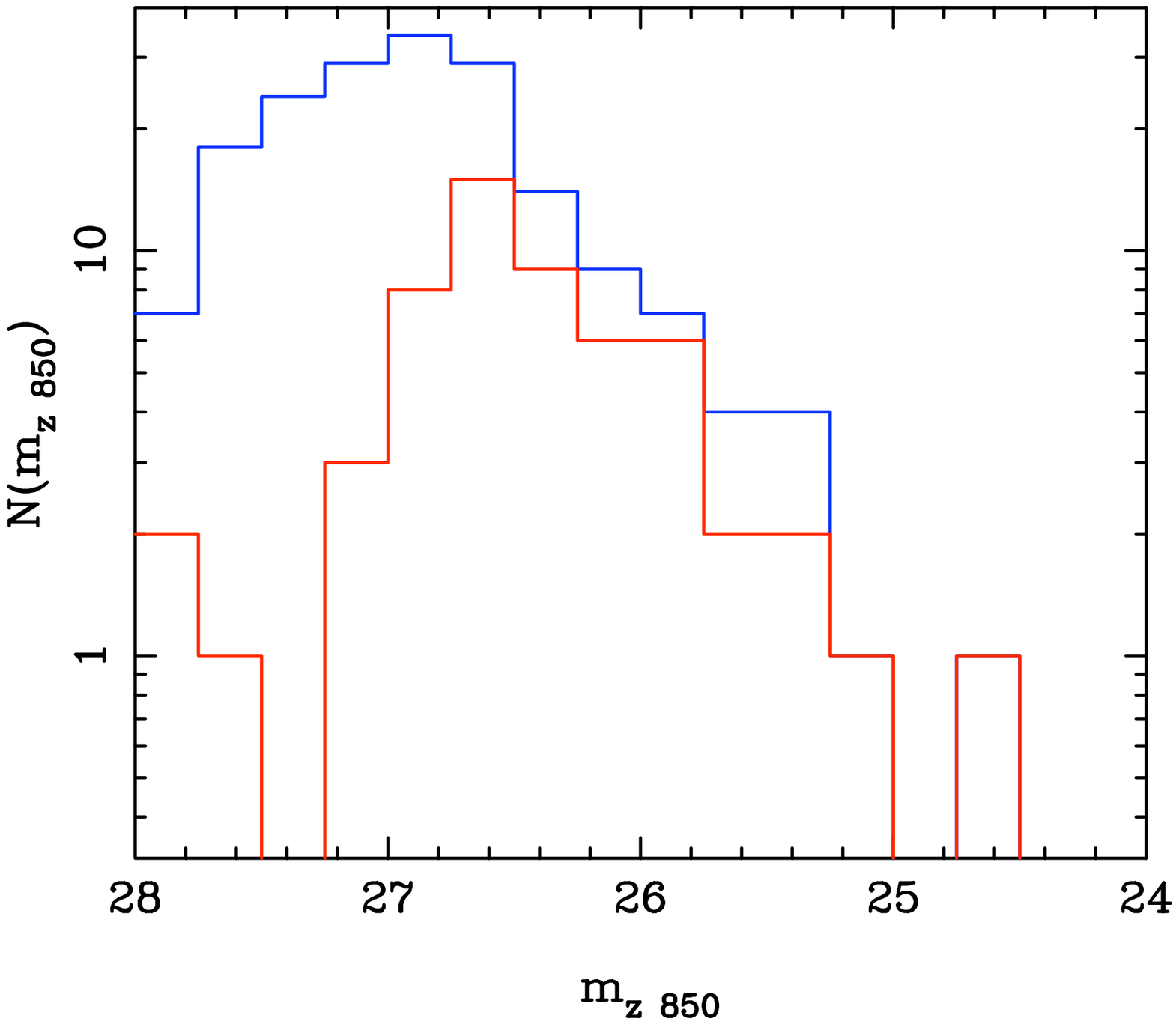
LBGs without emission are 50% larger in radius

See Ravindranath's Talk

Summary

- I-Dropout galaxies are z~6 star forming systems
- The fraction of strong LAEs does not seem to change strongly in the LBG population, 5-15 +/- 10% increase between z~3 and z~6
- The LAE population of LBGs appears physically smaller, - see possibly reflecting lower masses or compact star-forming regions

Completeness of Sample



Fraction of Emitters: The Issues

- Apples to apples comparison (not grapes to pairs) - Must compare objects with same UV luminosity
- Must compare same EW
- Must include the same redshift range