Lyman-alpha Halos at high redshifts with MUSE

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10.04.2025

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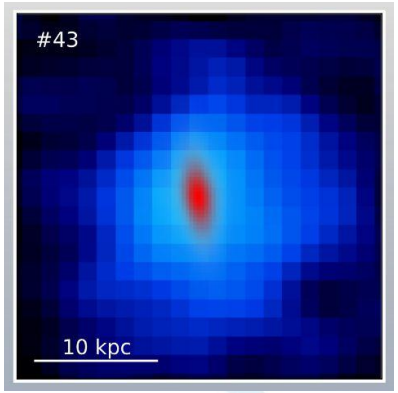
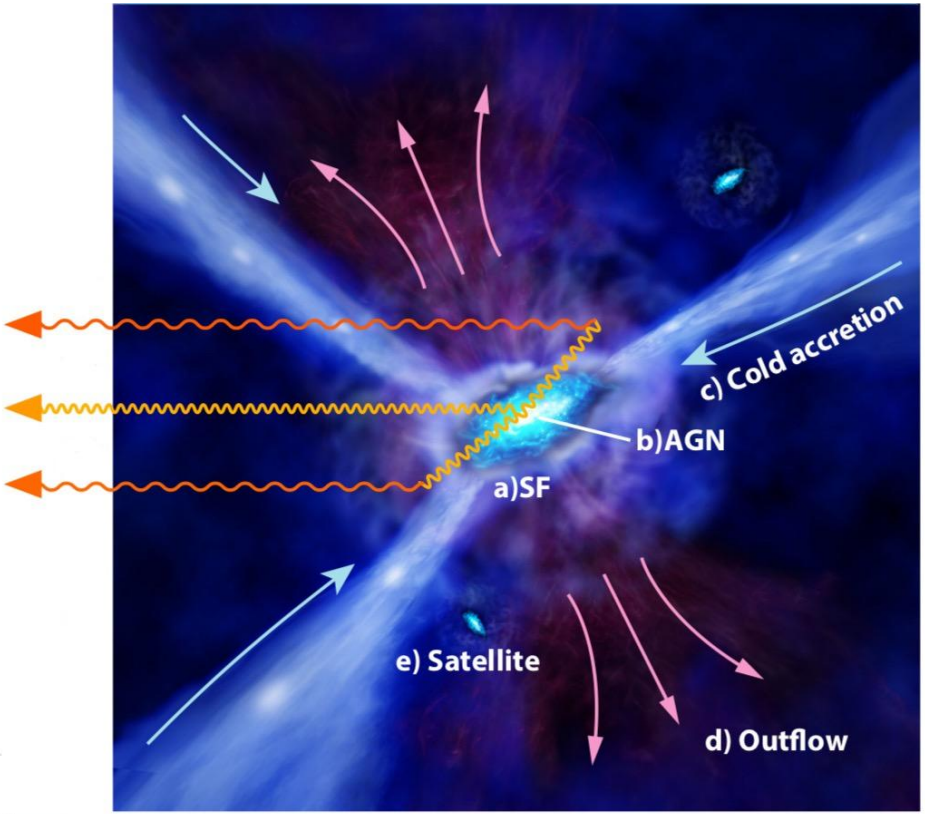
Lyman-α halo (LAH)

Wisotzki et al. 2016

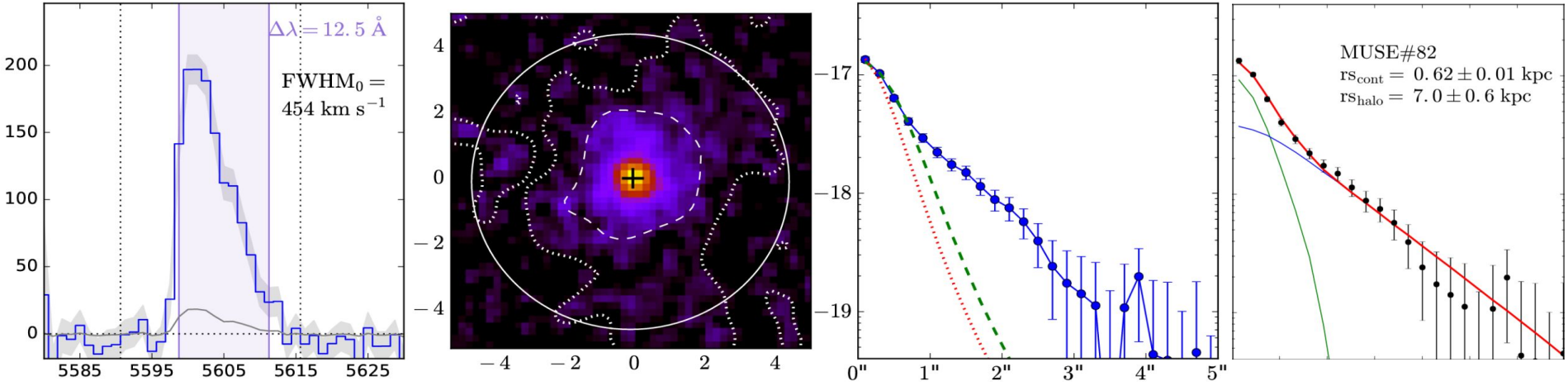


Ouchi et al. 2020



Lyman-α halo (LAH)

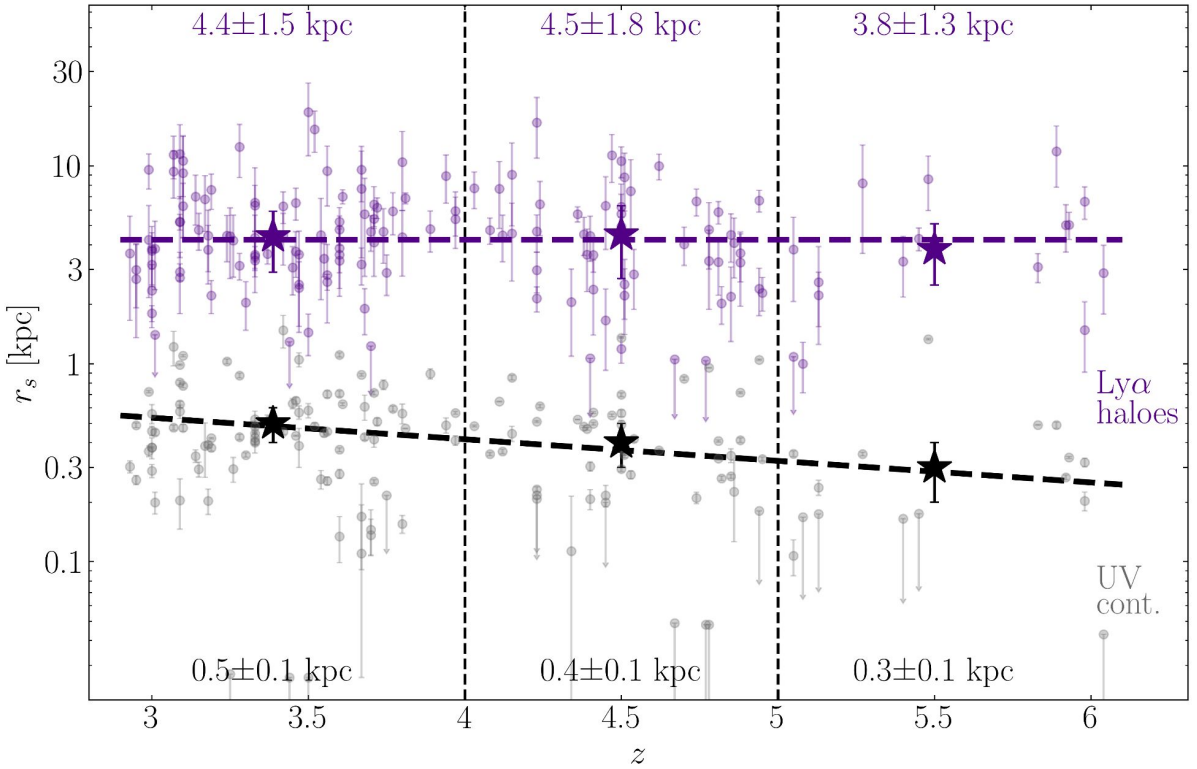
Leclercq et al. 2017



- prominent feature of LAEs
- contribute from 40-90+% of total flux
- well described by an exponential profile
- ~10 times bigger than the central galaxy

Lyman-α halos: evolution

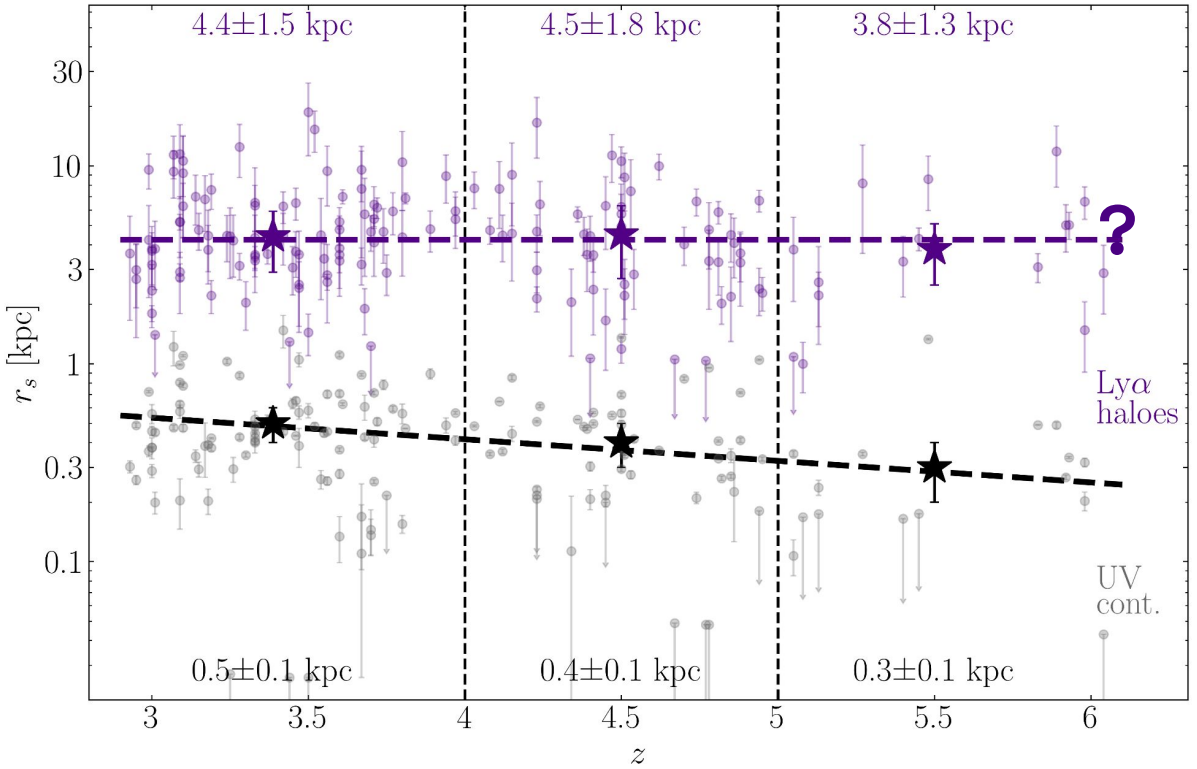
Leclercq et al. 2017



Galaxies evolve, Lyman-α halos - apparently don't!

Lyman-α halos: evolution

Leclercq et al. 2017



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Lyman-α halos: evolution

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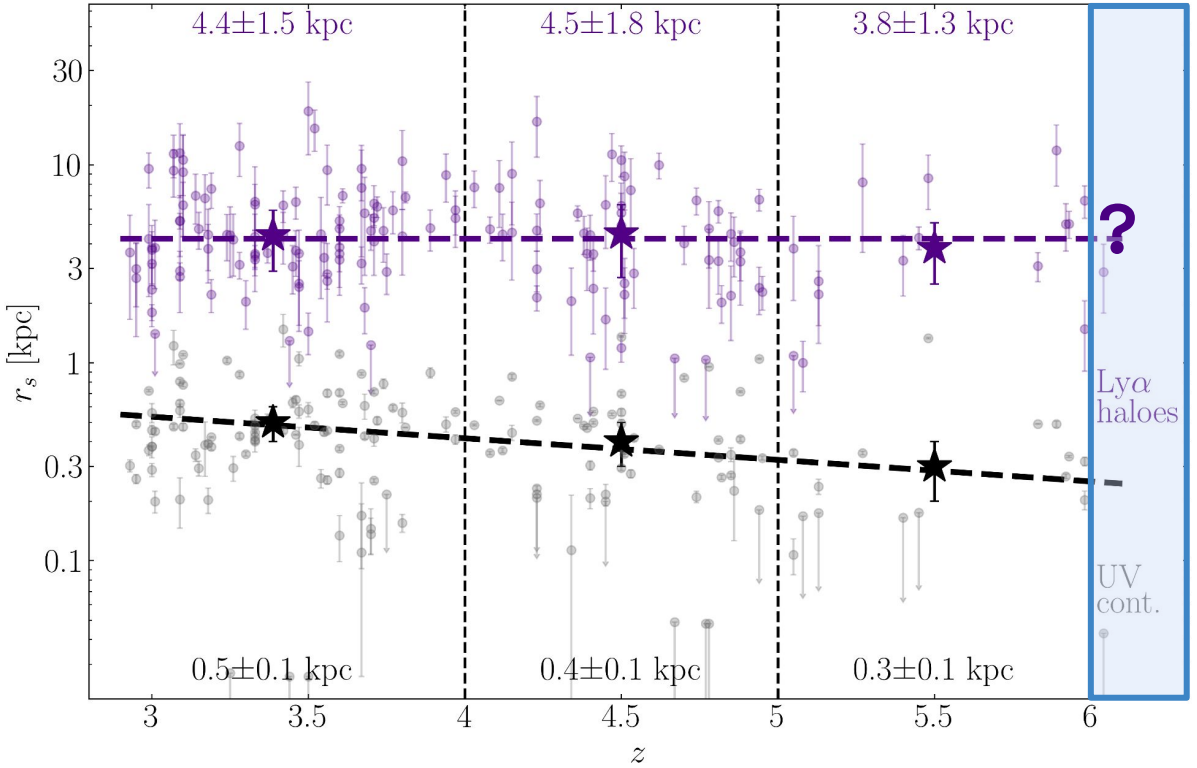

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Lyman-α halos: evolution

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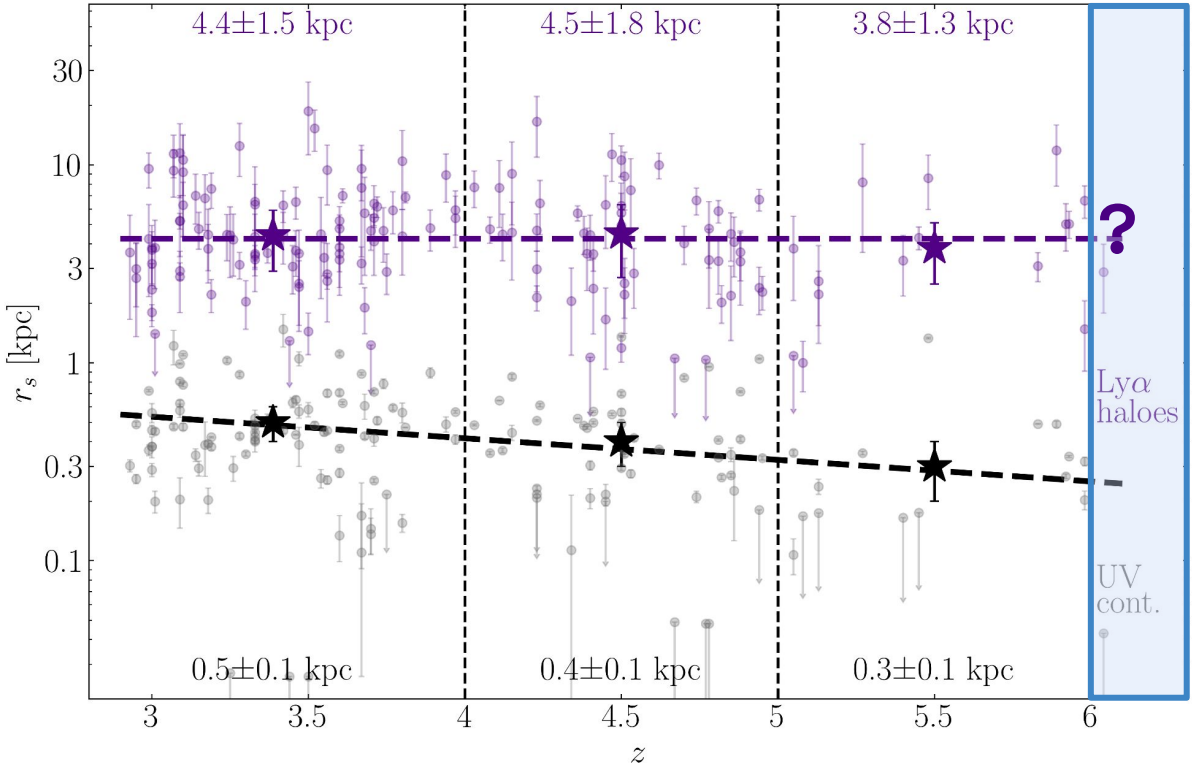
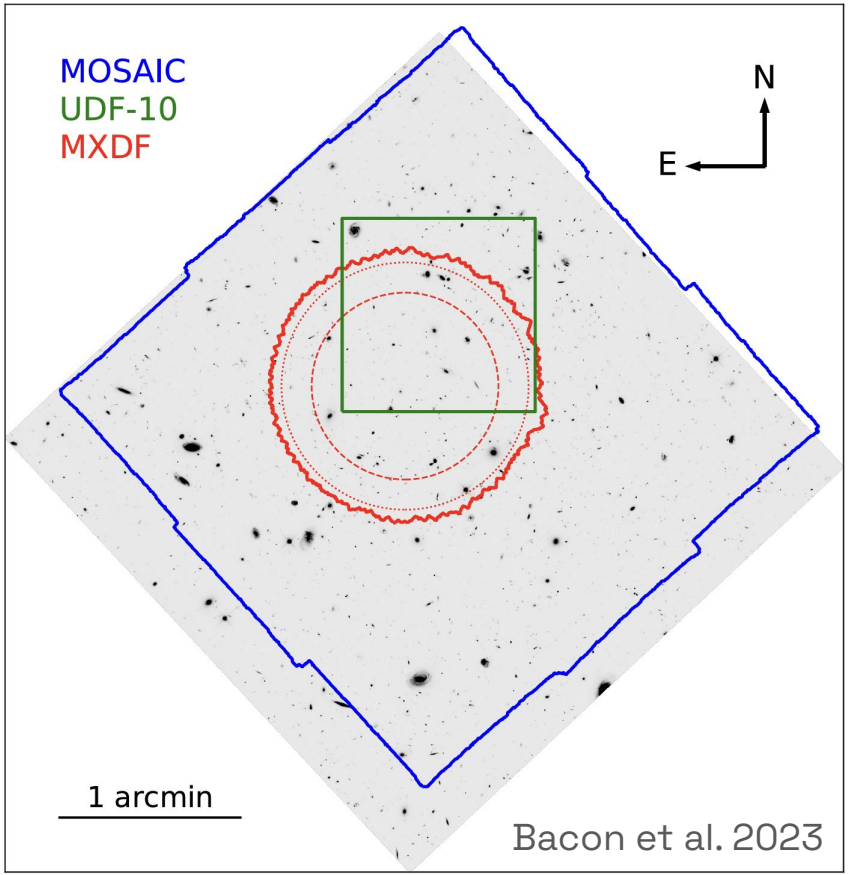
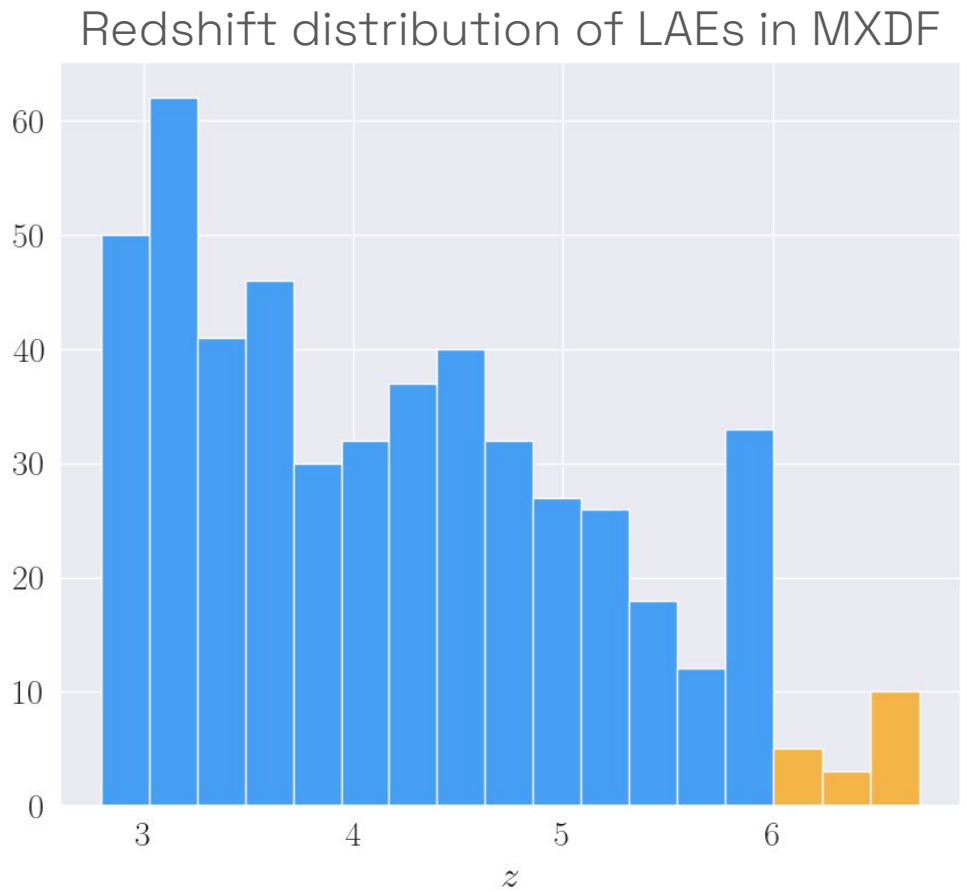


30h / 10h of exposure

Galaxies evolve, Lyman-α halos – apparently don't!

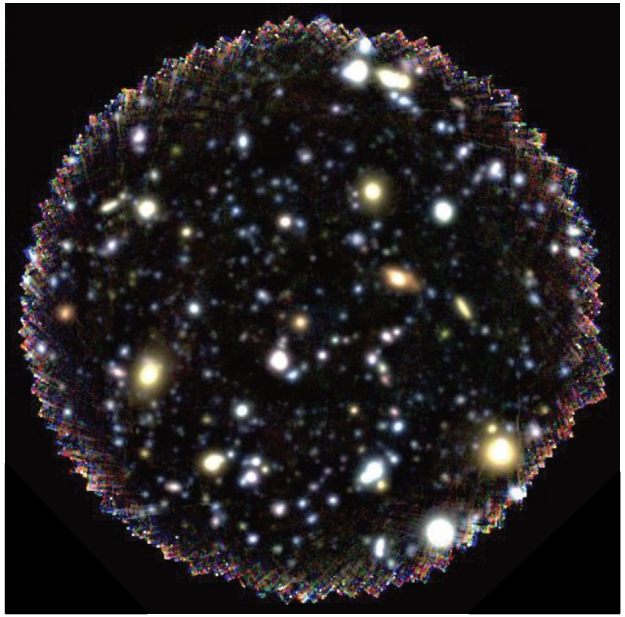
MXDF (140h) breakthrough





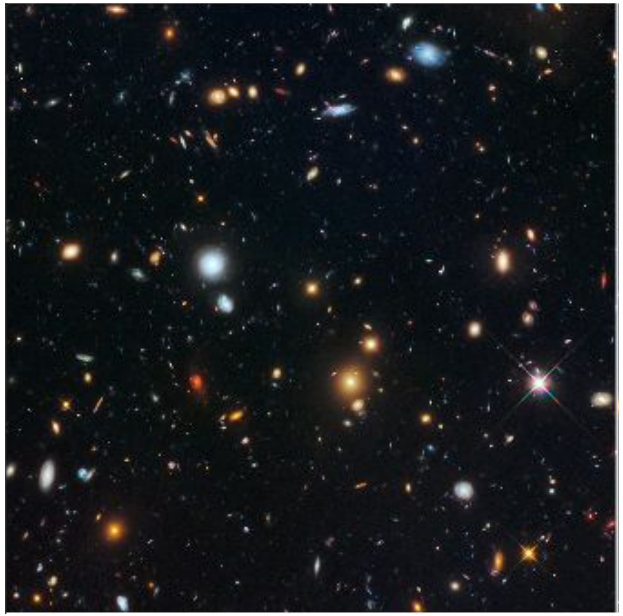
Are Lyman-α halos different beyond z=6?

MXDF: 140h



High-z

Shallow Field ~ 1.7h

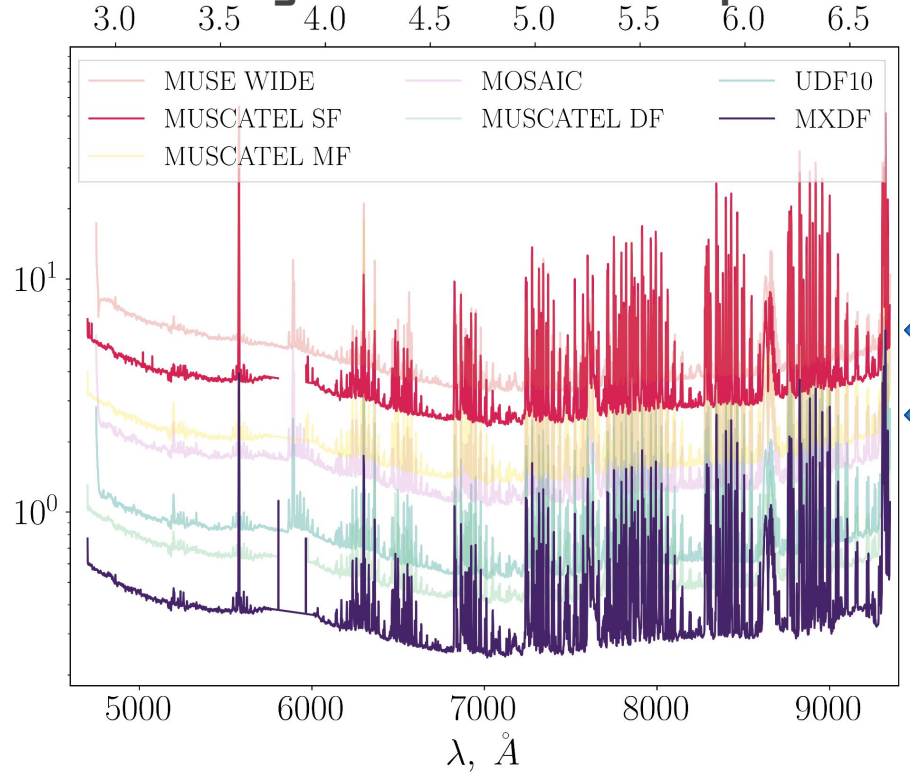


Low-z

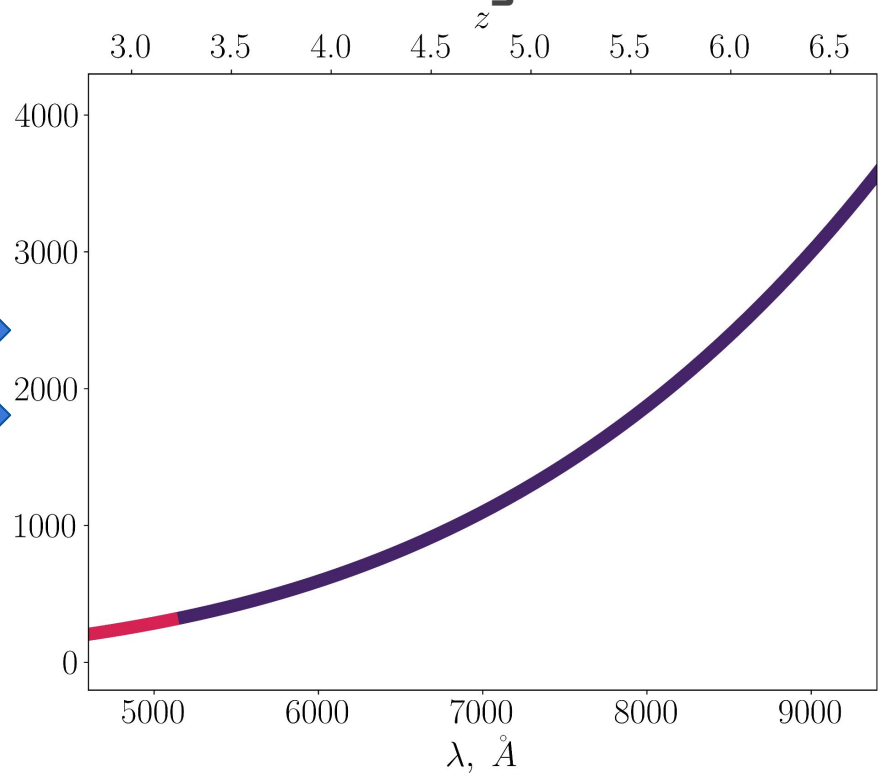
Idea: compare properties of LAHs at z~3 and z>6
at similar corrected SB sensitivity

Building the samples

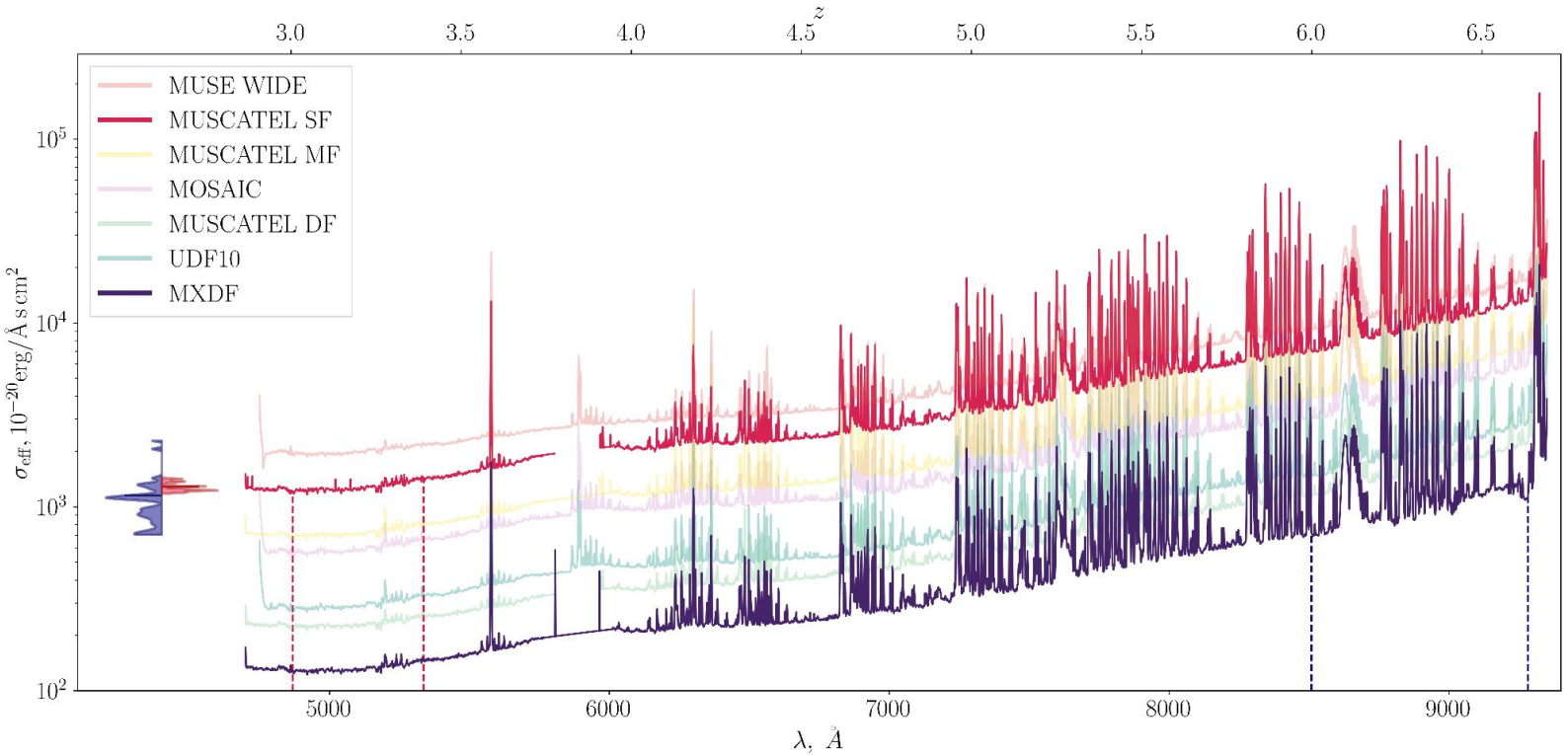
Sensitivity ~ 1σ of individual pixel



SB dimming factor

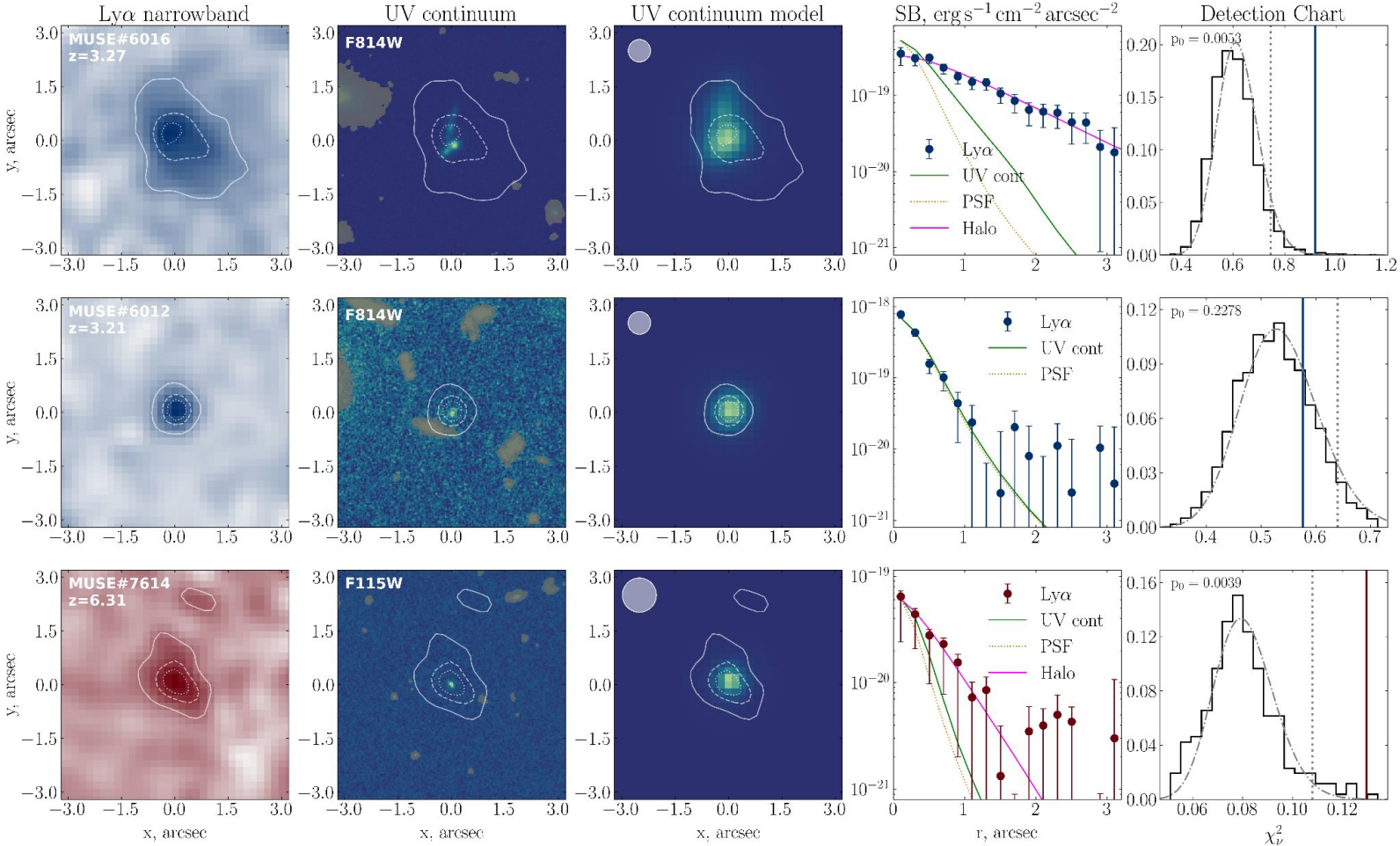


Building the samples

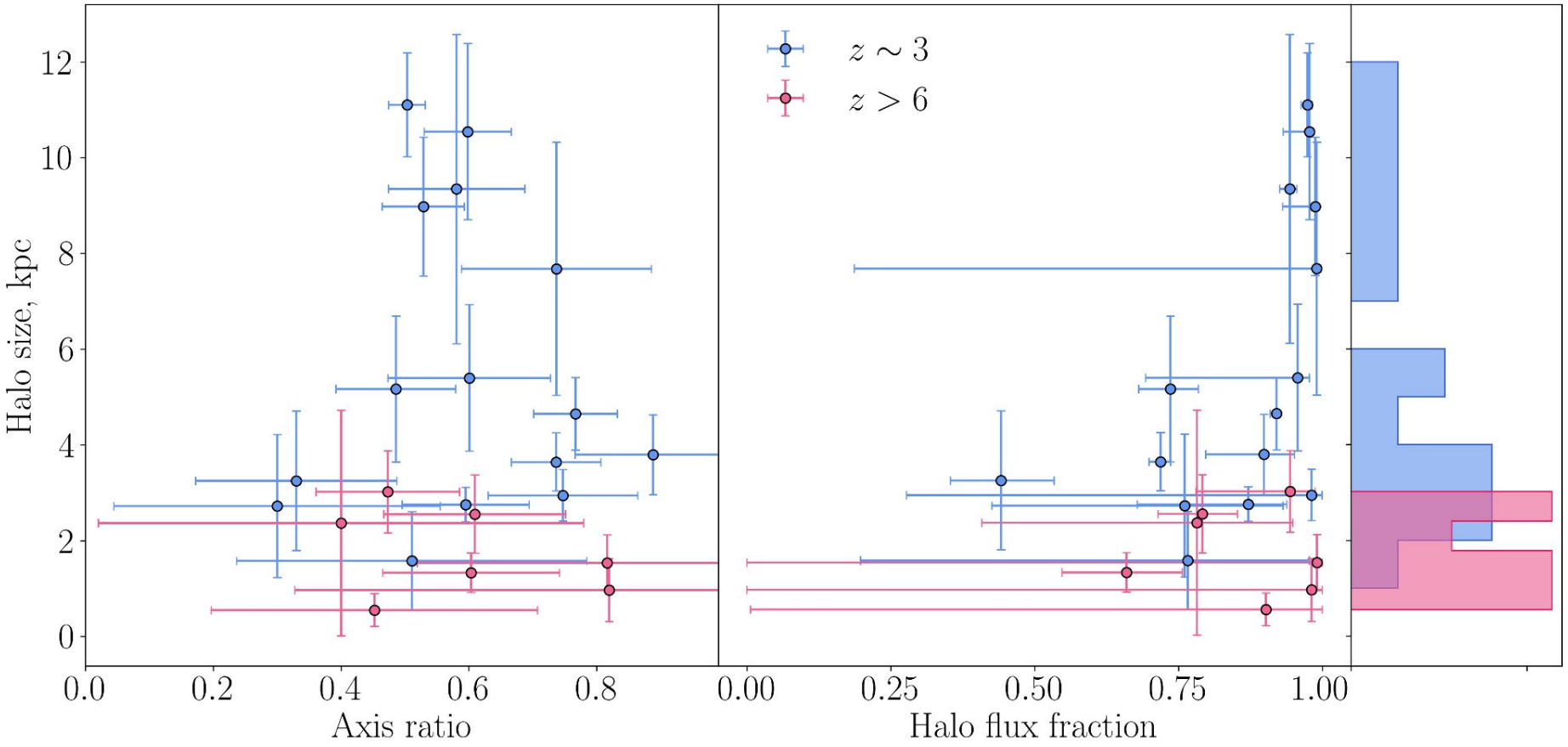


- High-z sample: 18 LAEs from MXDF
- Low-z sample: 90 LAEs from MUSCATEL-SHALLOW

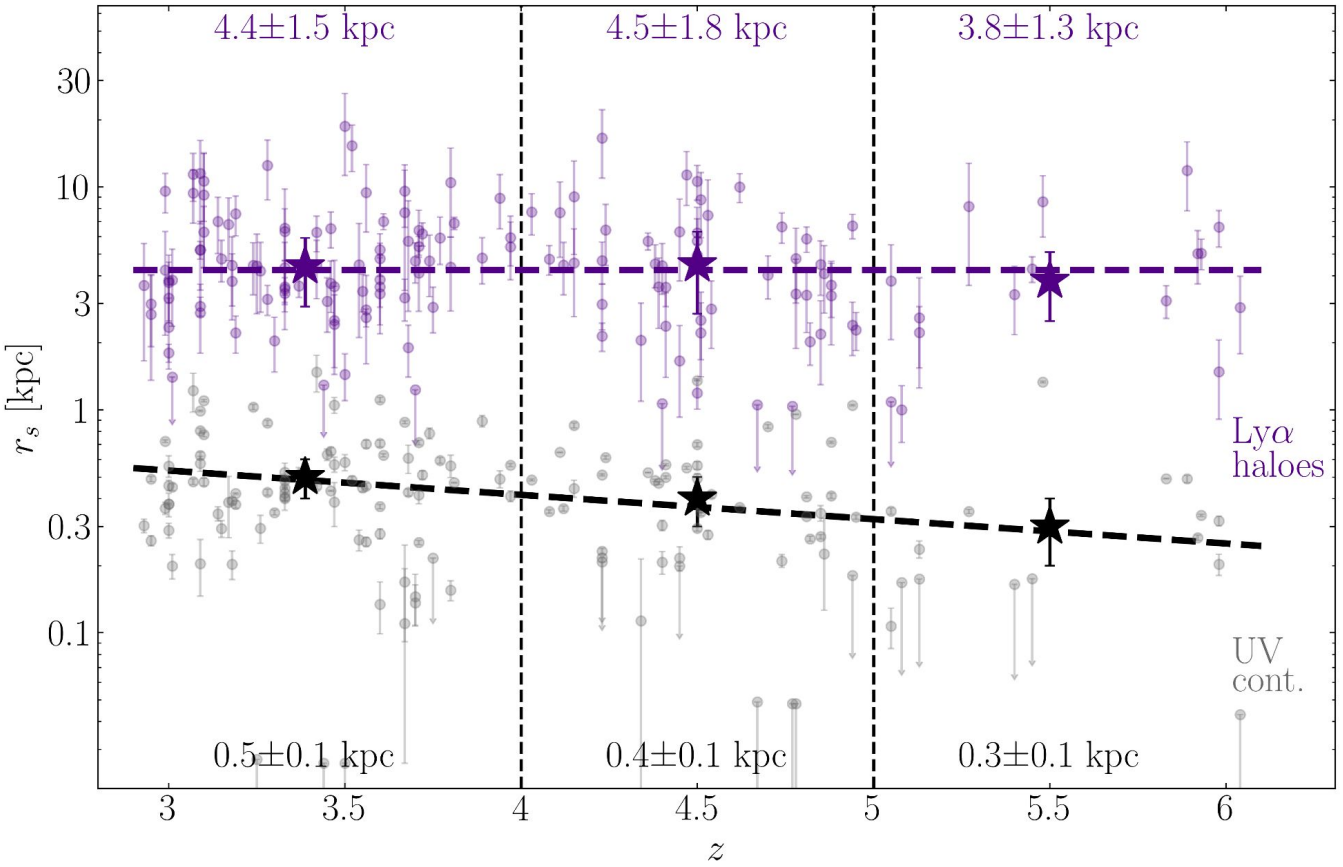
LAH detection and decomposition



Are Lyman-α halos different beyond z=6? Yes!



Implications for LAHs evolution



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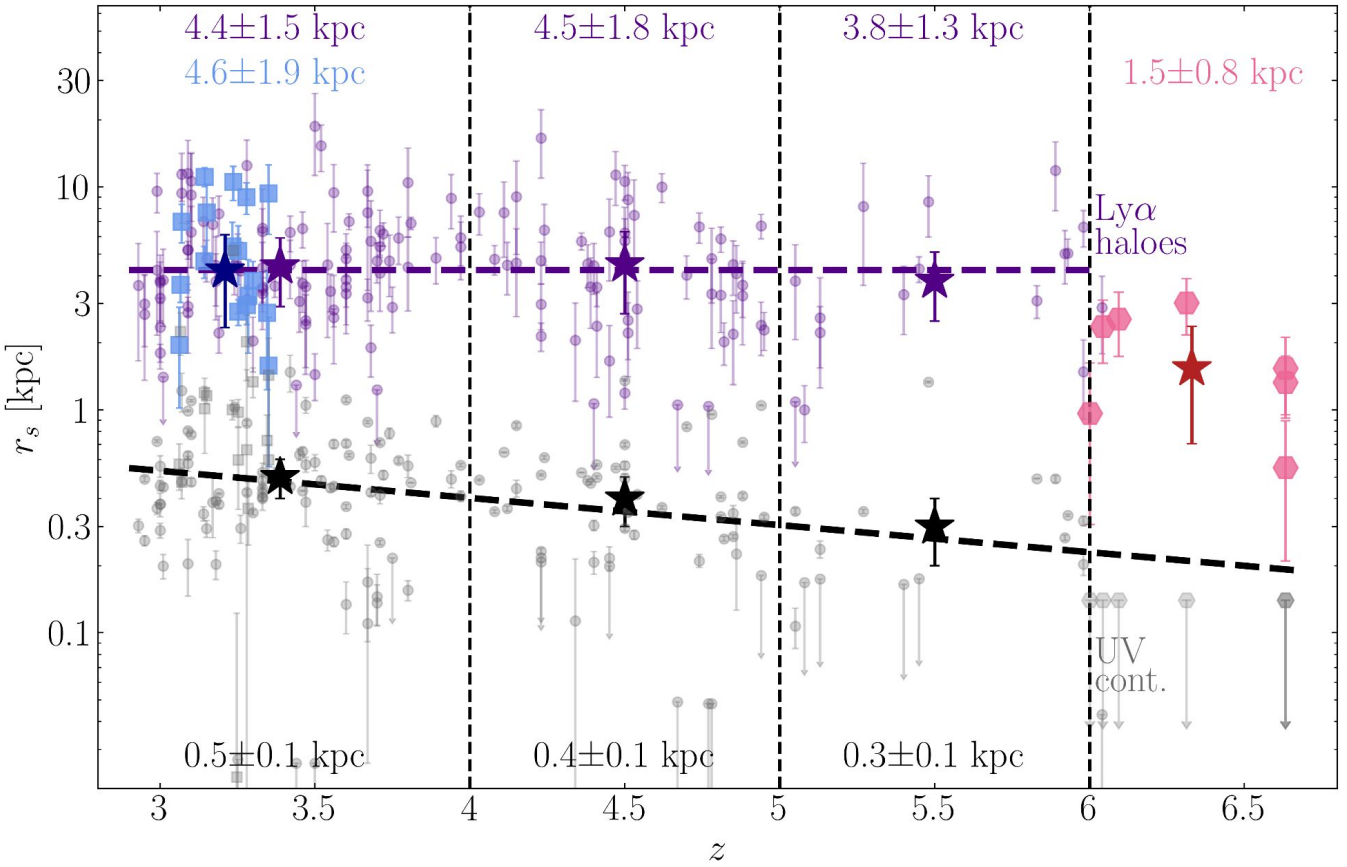

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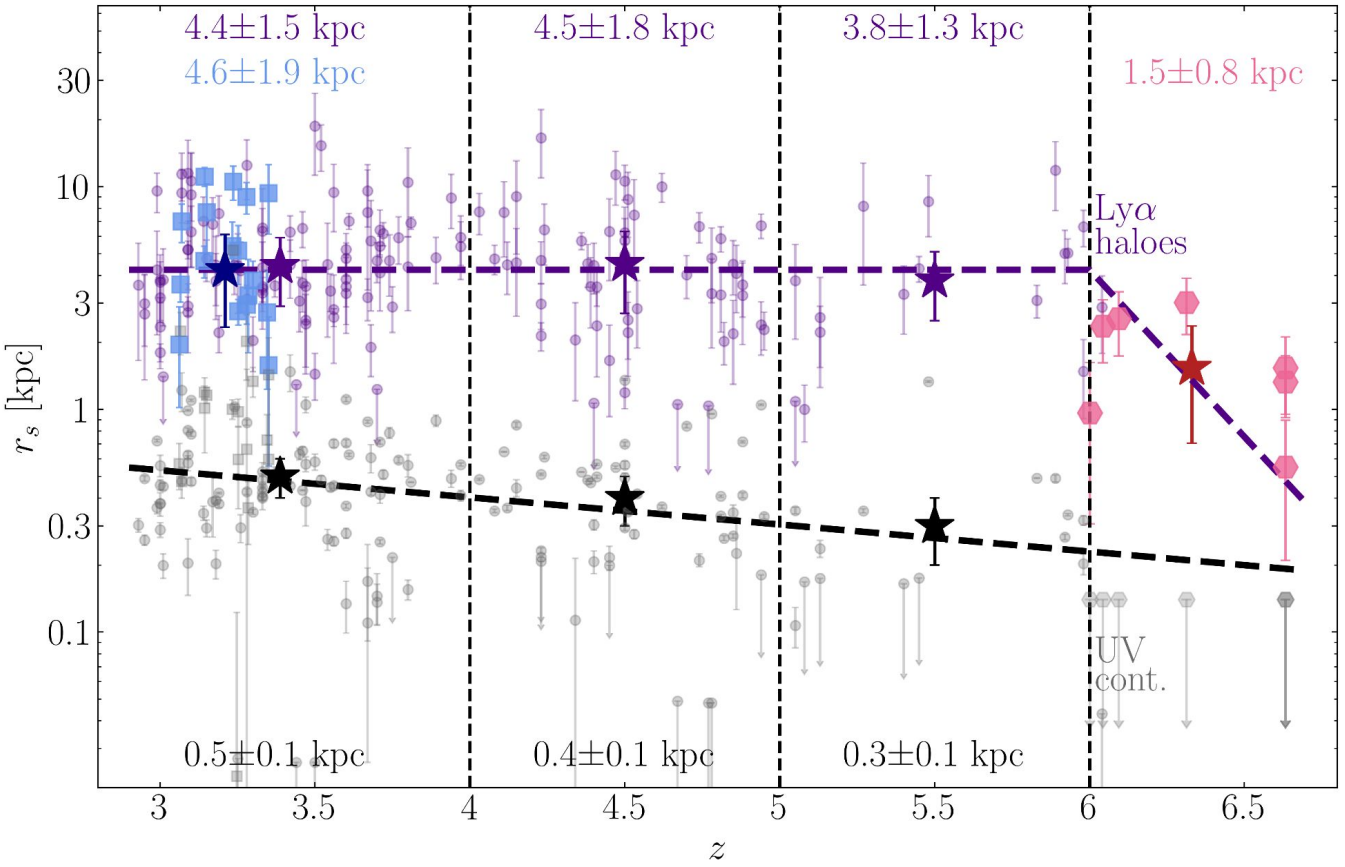

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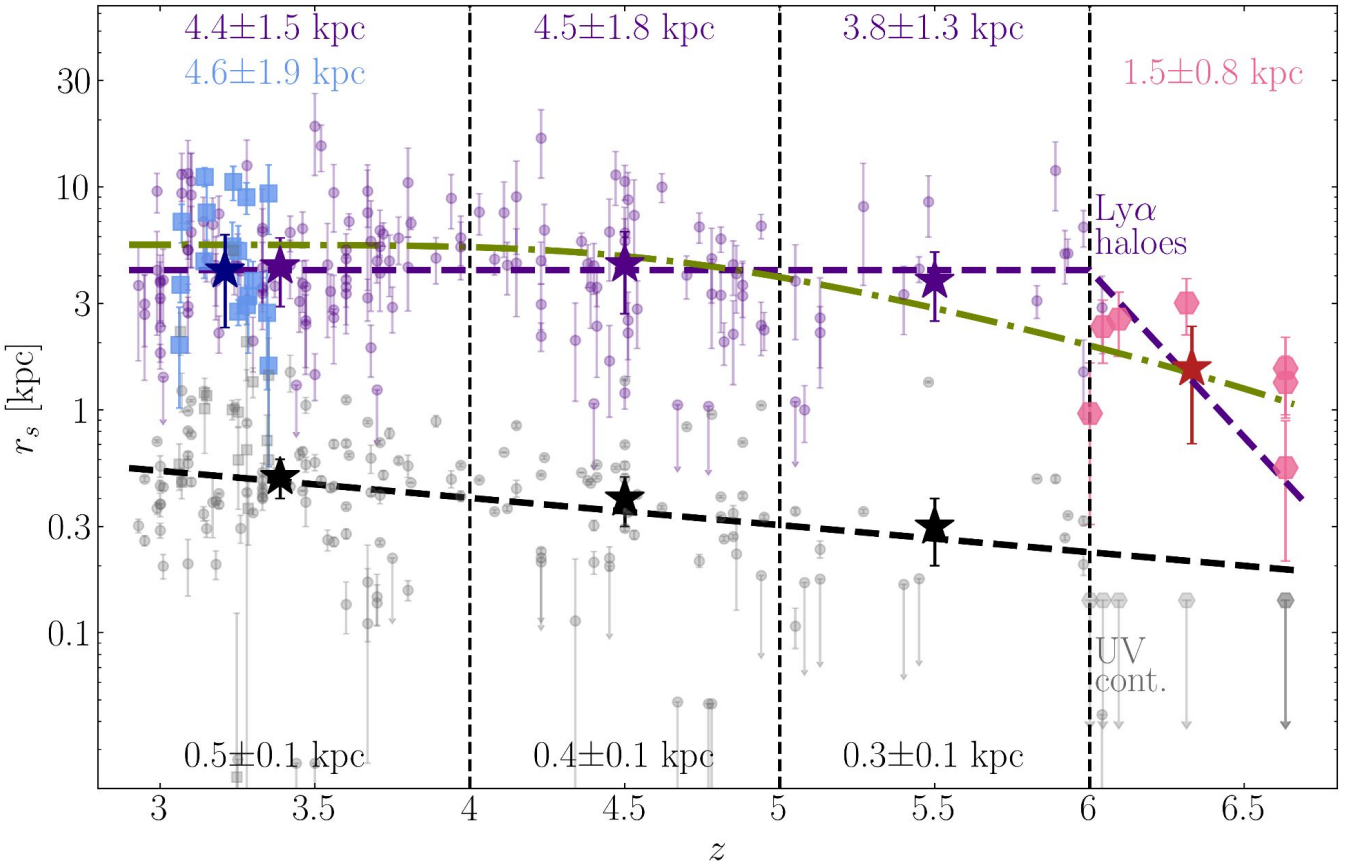

Implications for LAHs evolution

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Yes! LAHs at z>6 are more compact then at z=3

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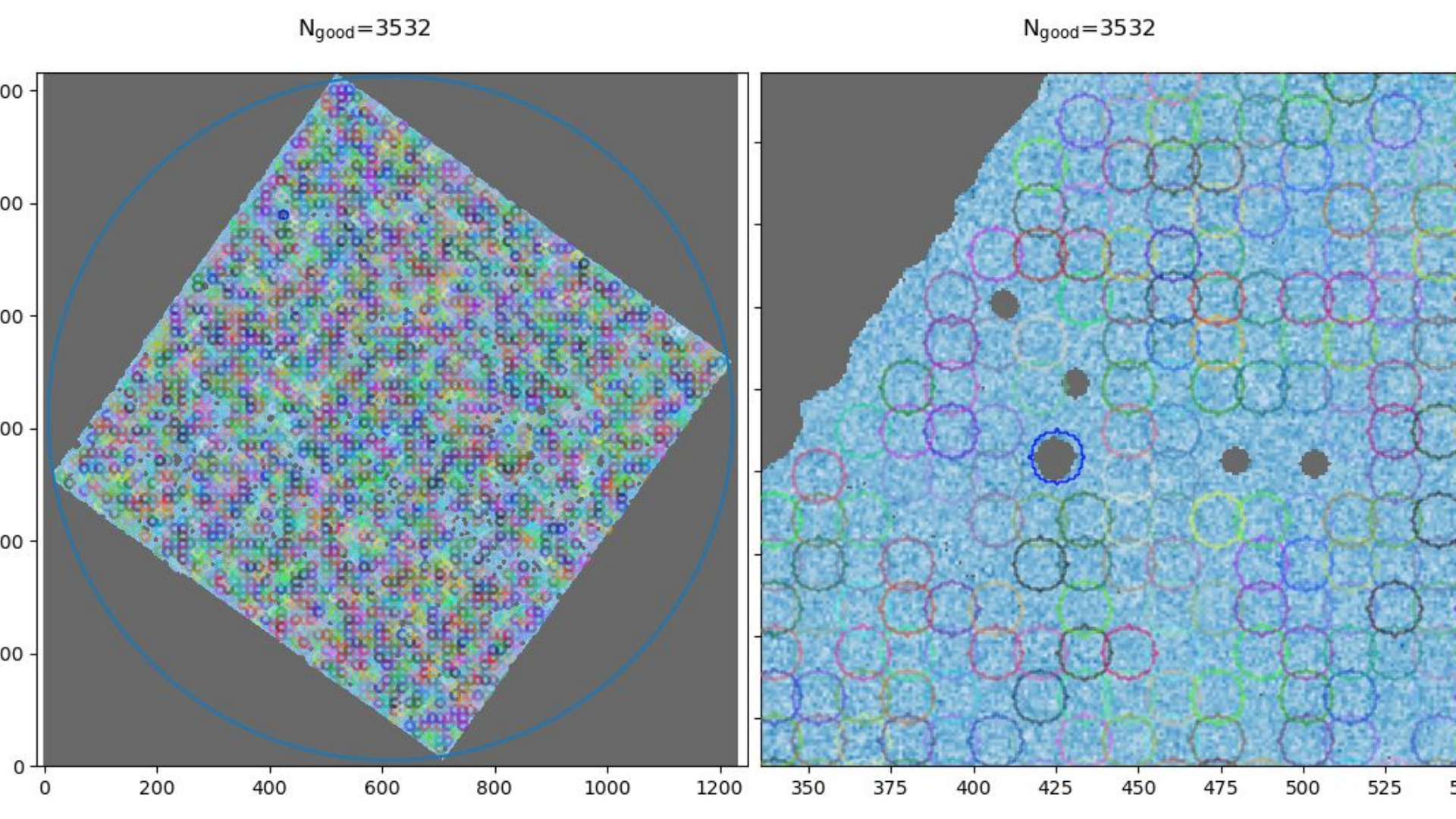
- EoR induced breakpoint vs prolonged evolution?
- Powering mechanisms?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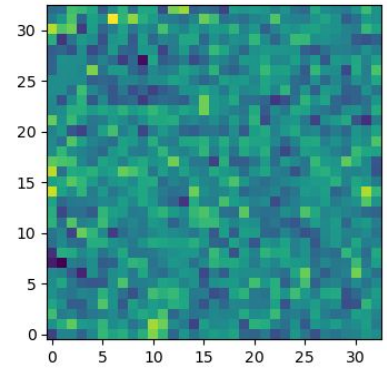
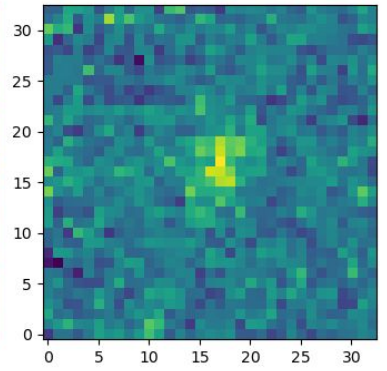
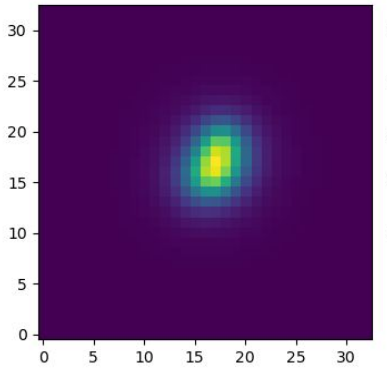


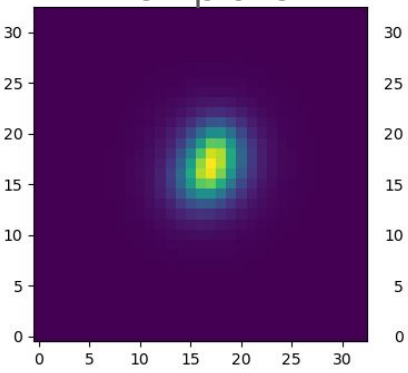
Mock LAE



Matched Template



Input Template



Residuals

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