Connecting absorbers & emitters along high-z quasar sightlines

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on behalf of Manuela Bischetti

RECAP meeting

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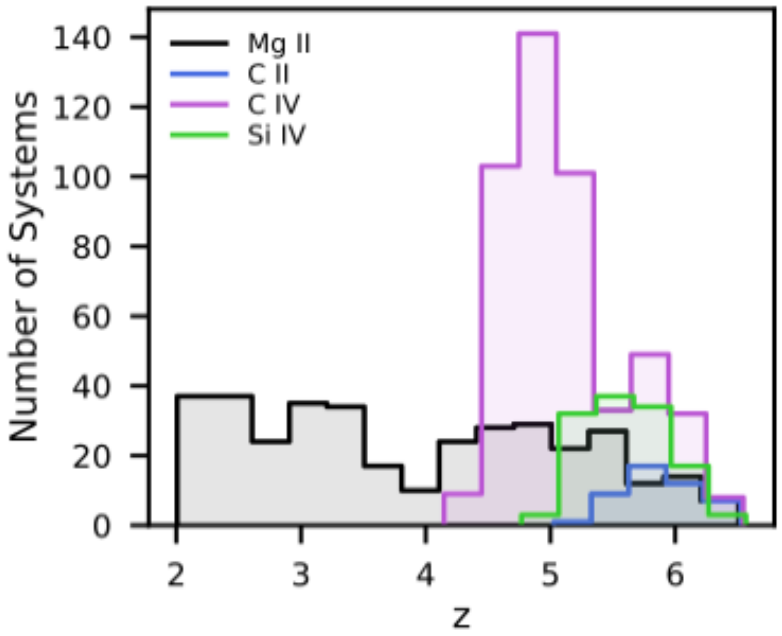
Emitters-absorbers connection along quasar los

E-XQR30 sample (D'Odorico+2023, Davies+2023, Sebastian+2024)

Absorbers



JWST

AETHER

34 quasars with JWST/NIRSpec IFU spectroscopy
+ 10 with NIRCam slitless spectroscopy

VLT

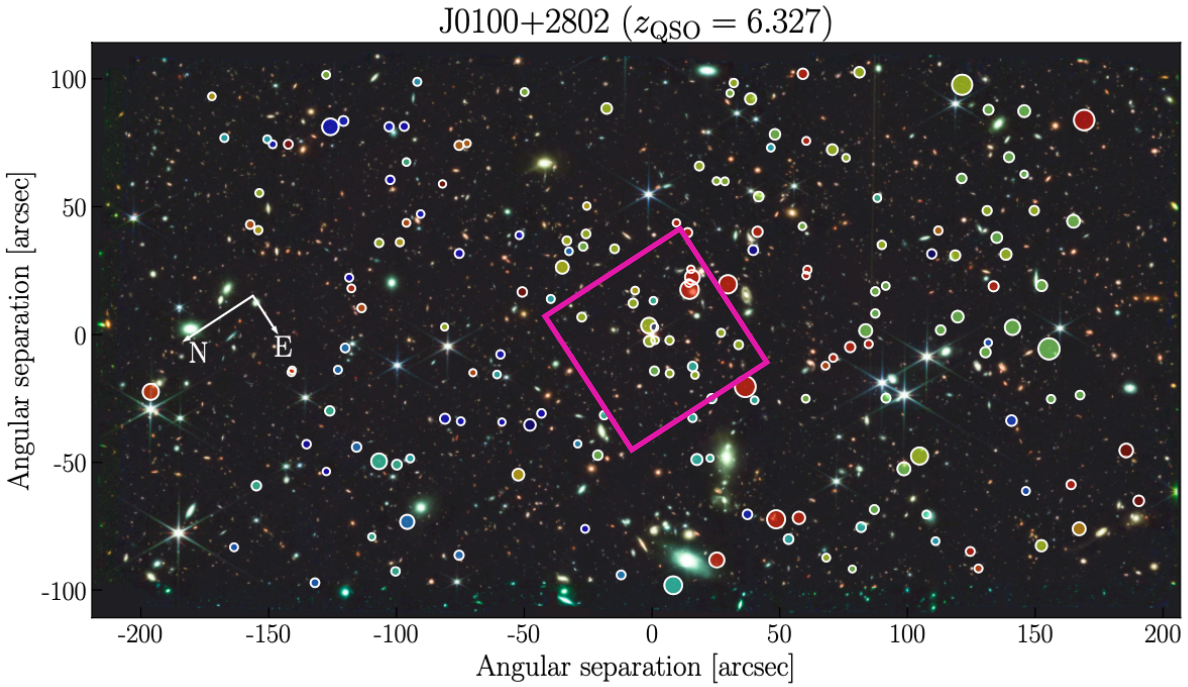
REQUIEM

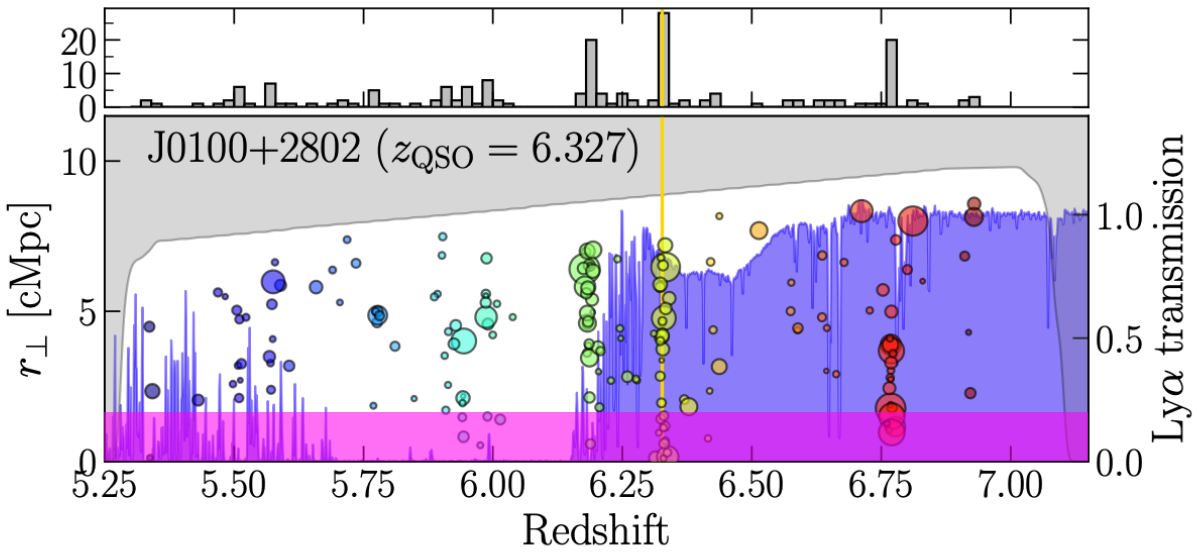
35 quasars with MUSE IFU spectroscopy

PI E. Farina (GEMINI)

RECAP
erc synergy grant

Emitters-absorbers connection with NIRCam + MUSE





NIRCAM

[OIII] + $H\beta$ emitters 5.3< z <7

:

$H\alpha$ + [NII] emitters 4 < z <5.1

HeI + [SIII] + $Pa\gamma$ emitters 2.3 < z < 2.7

MUSE

$Ly\alpha$ emitters 2.82< z <6.65

:

CIV emitters 2.0 < z < 5.0

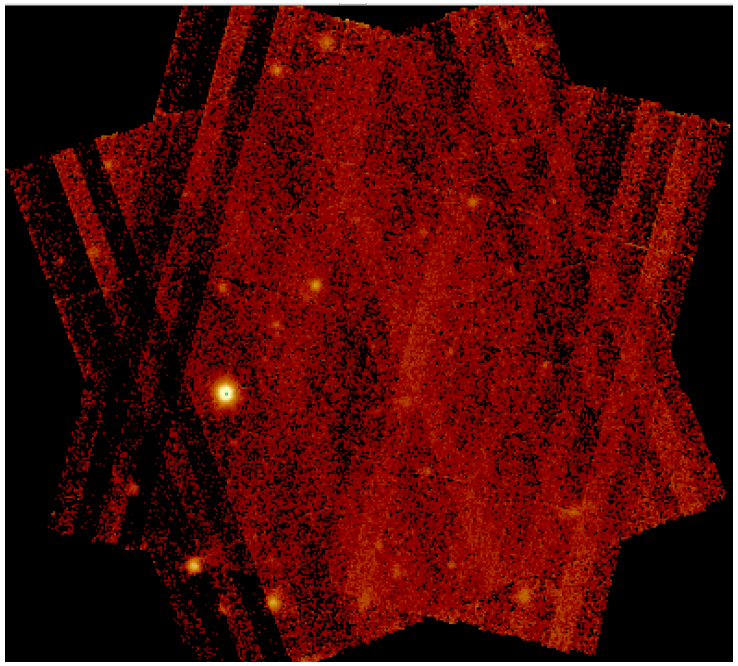
CIII] emitters 1.3 < z < 3.9

[MgII] emitters 0.7 < z < 2.3

Current view of Lyα emitters toward J0100+2802

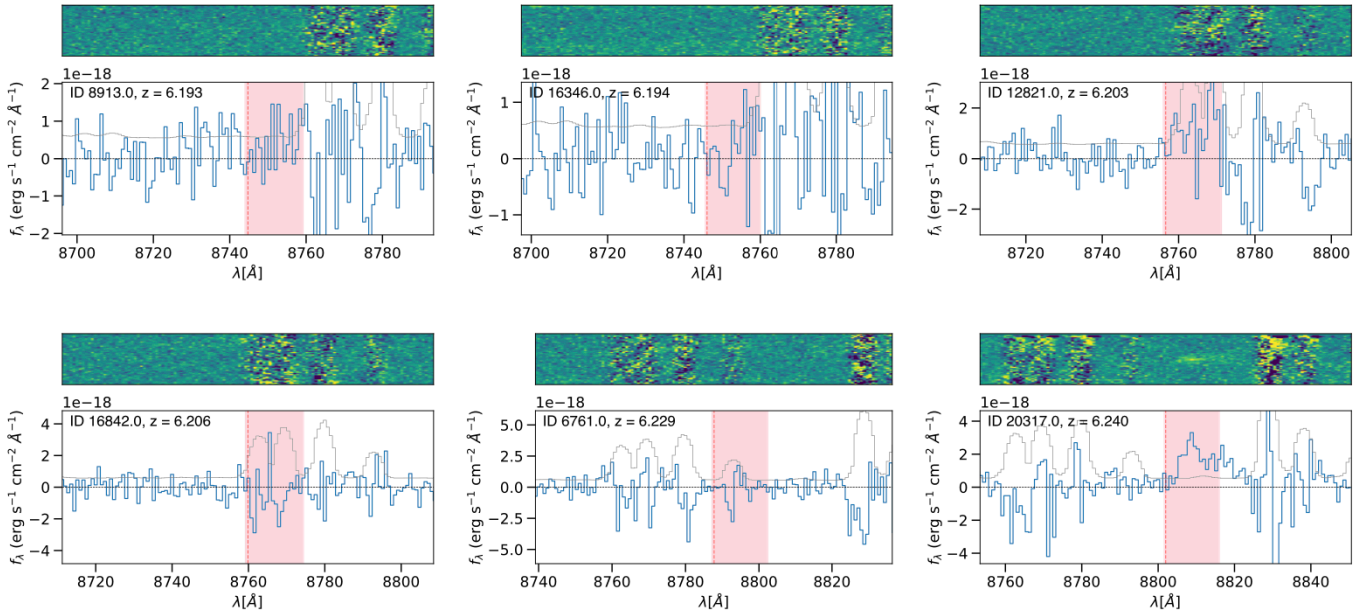
Previous obs: ~3000s MUSE (Farina+2019)

This work ~ 26000s



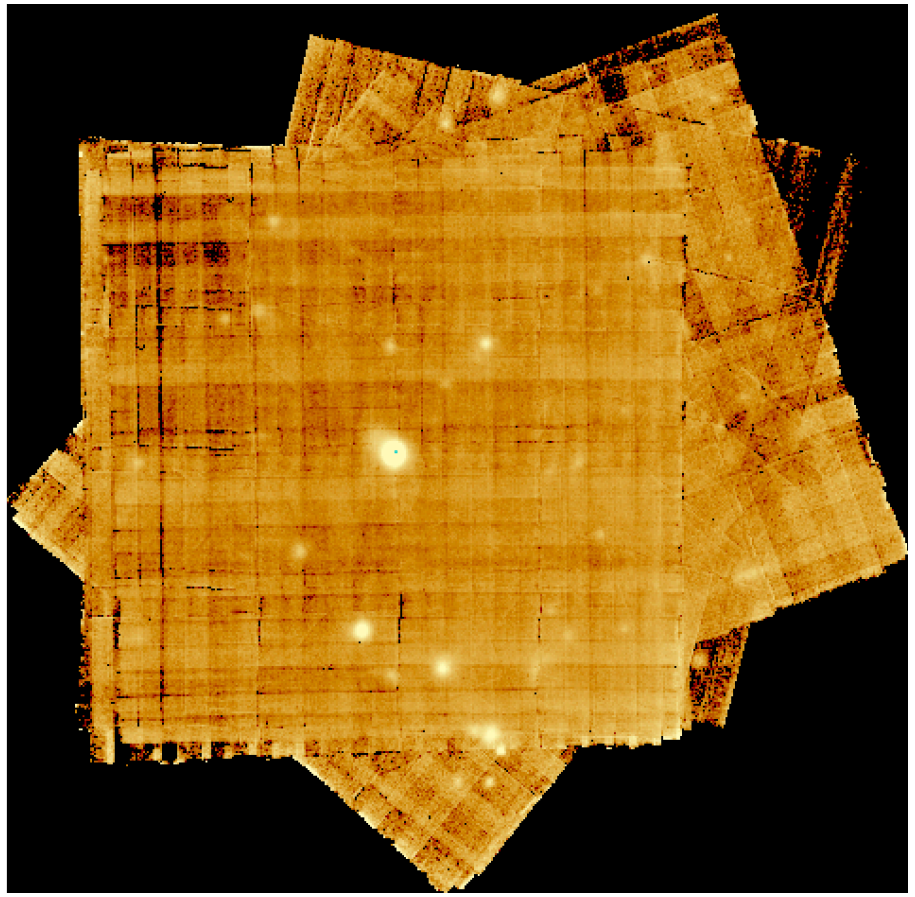
slit Keck LRIS of 46 [OIII] emitters at 5.3 < z < 6.2 (Hashemi+2025)

$\Delta v = 150 - 200 \mathrm{km/s}$

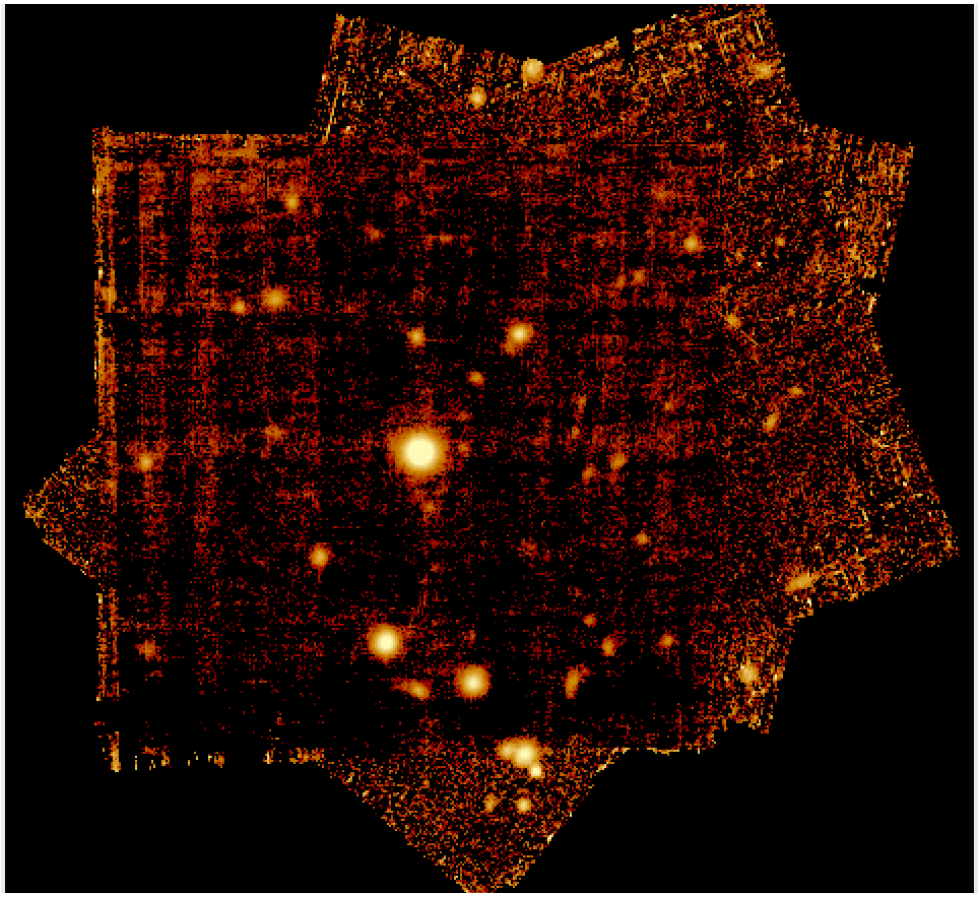


Optimizing MUSE data reduction

Esorex



Esorex + Cubex (Cantalupo+2019)

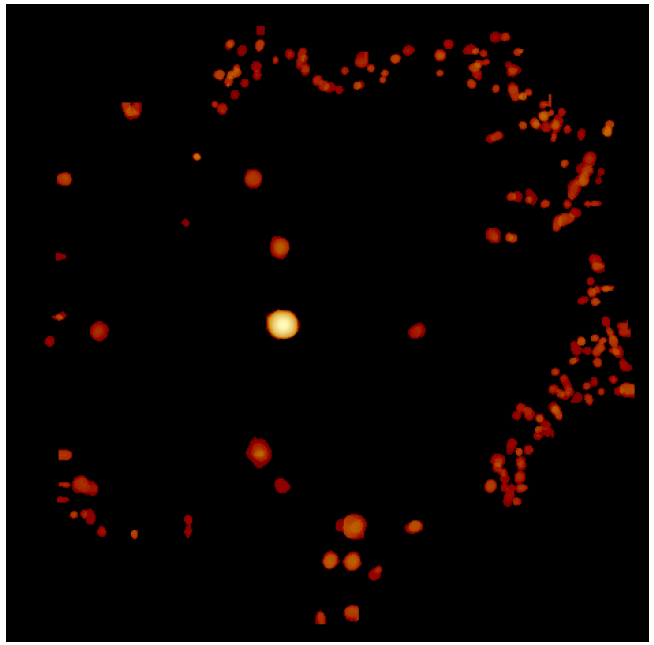


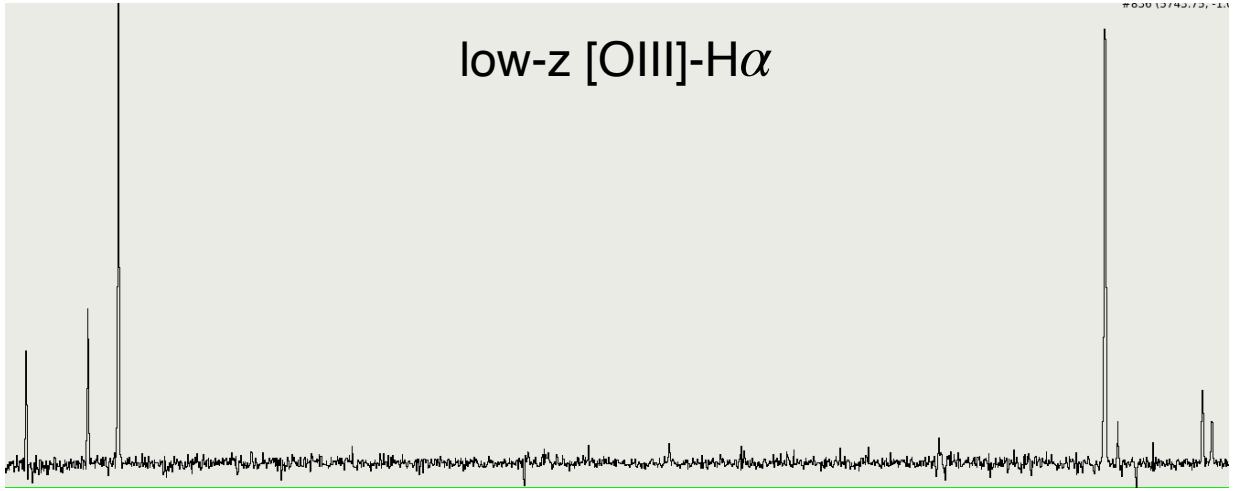
Improved flat and sky subtraction

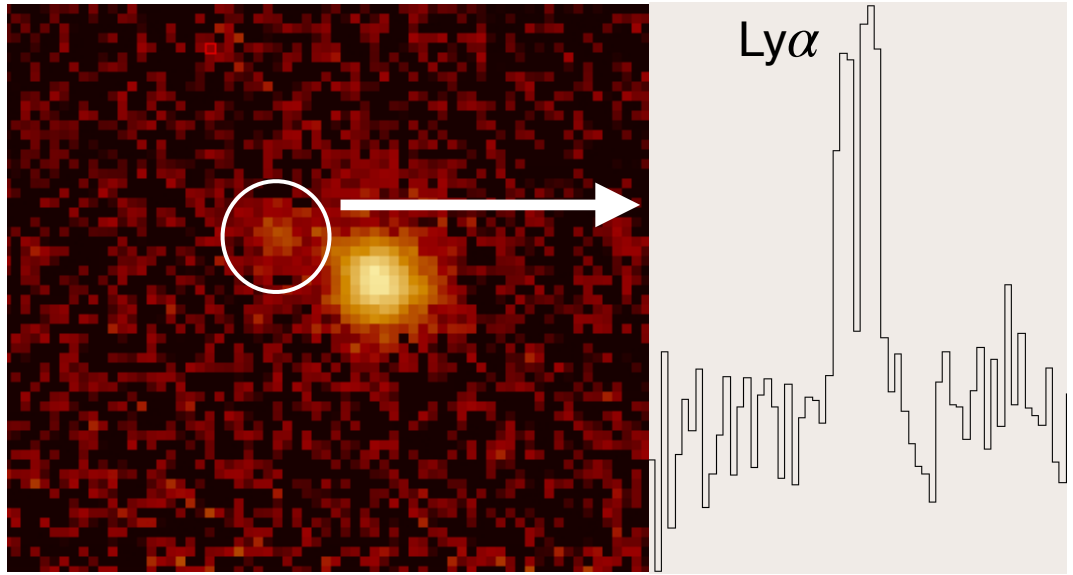
Optimizing the extraction of Lyα emitters and removing contaminants

Adaptive SNR threshold + spectral + morphology information

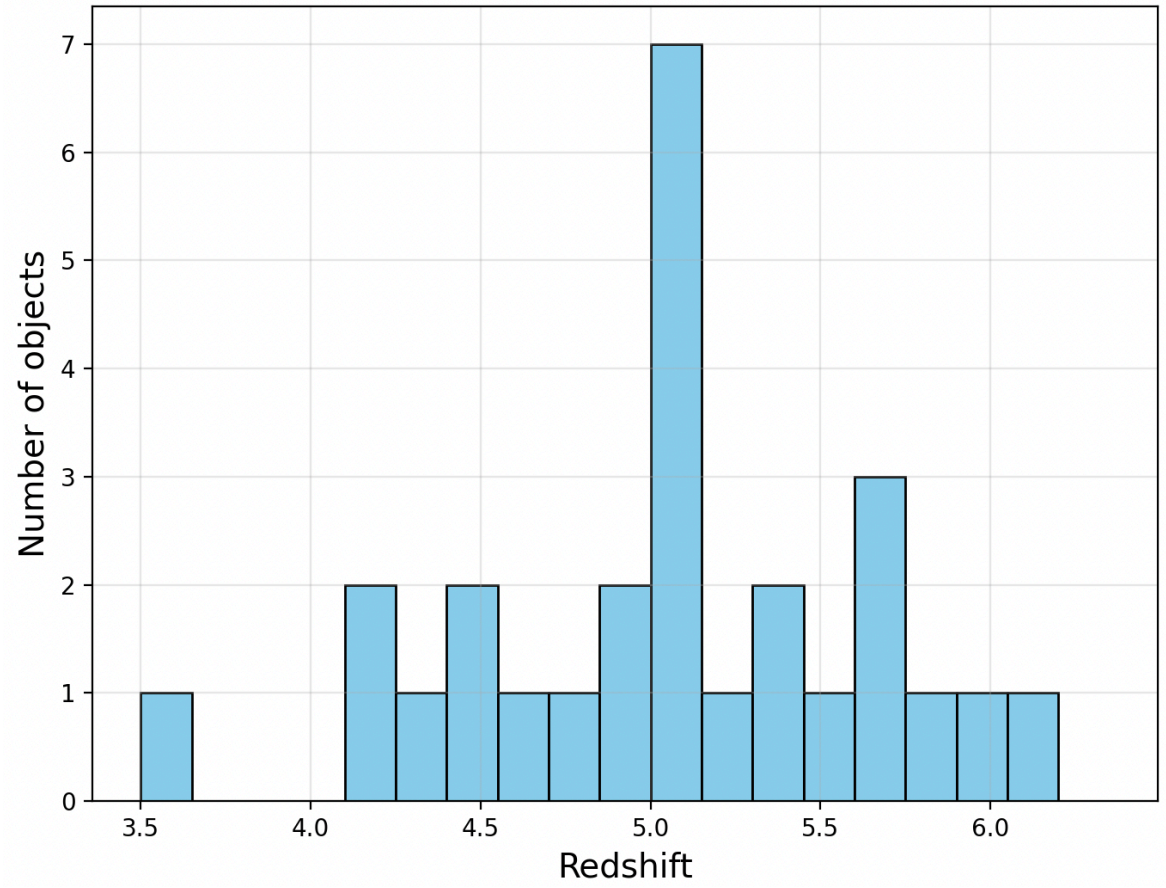
source mask z~5, SNR>5

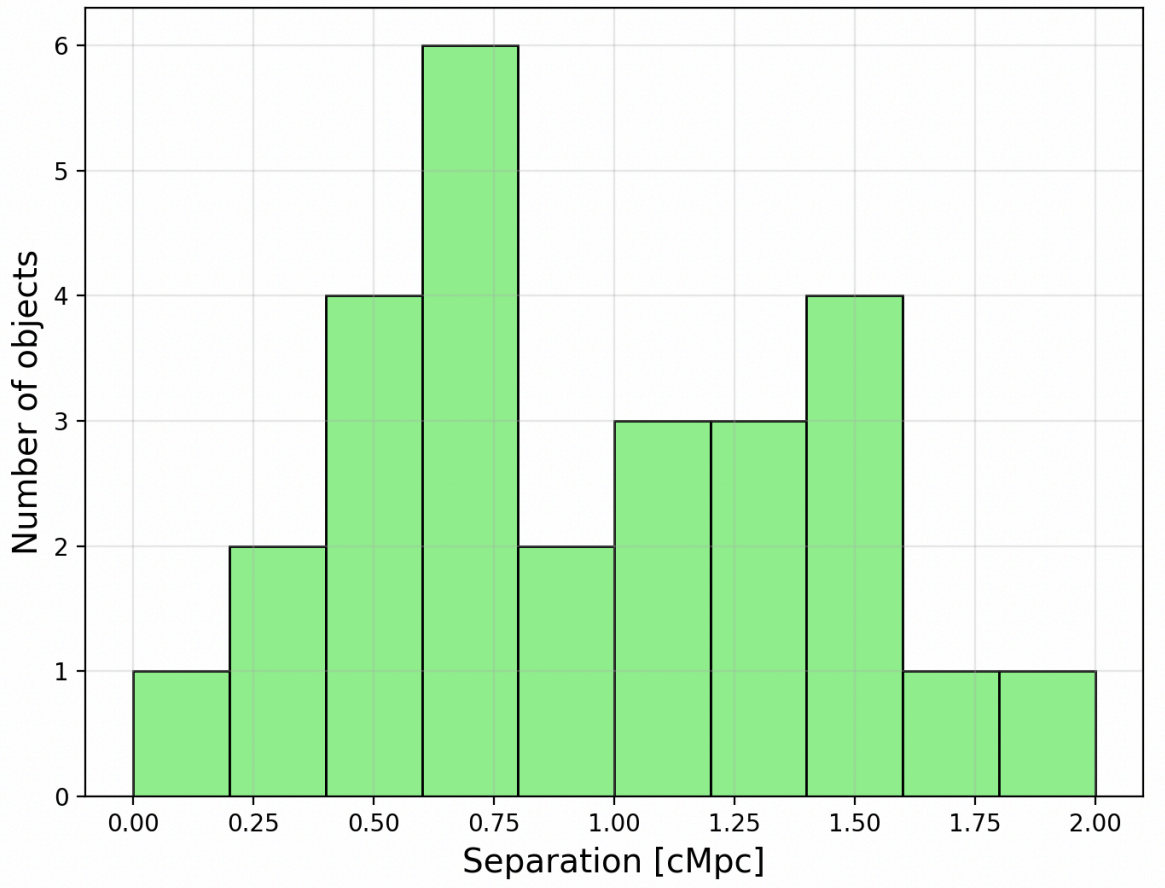




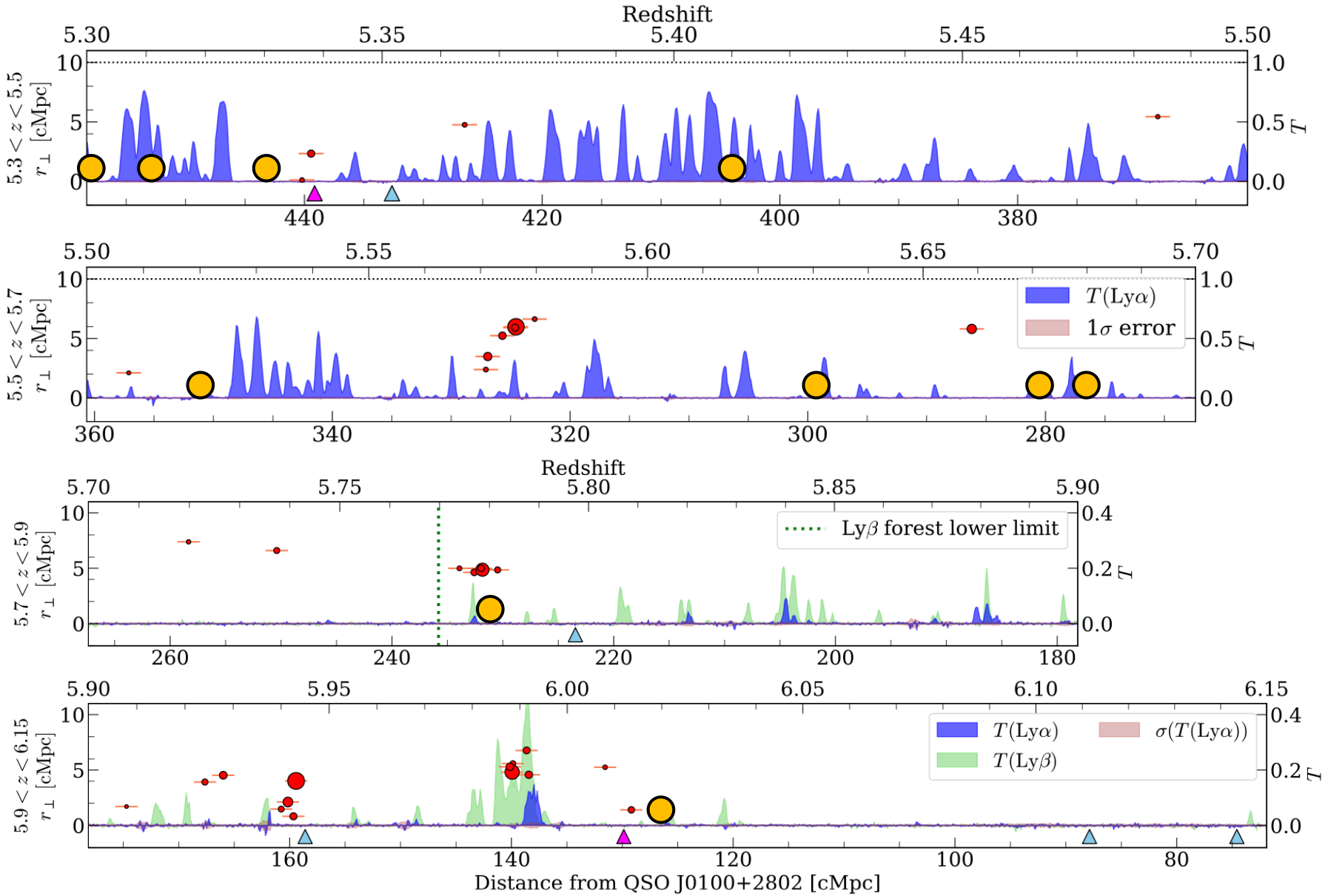


Sample of detected $Ly\alpha$ emitters





Comparison with [OIII] emitters and Ly transmission



Comparison with absorbers close to the los

✦31 absorbers at 3.3 < z< 6.2

✦13(17) show $Ly\alpha$ emitters within ± 1000 km/s (± 2000 km/s)

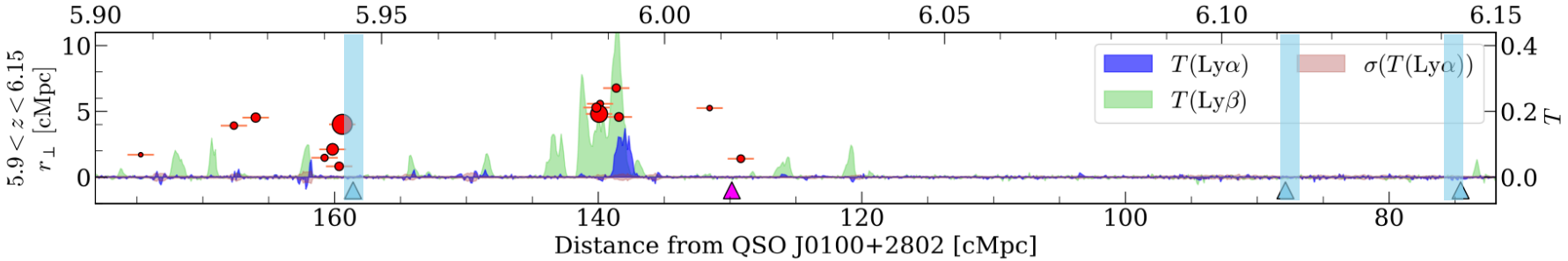
✦At z > 5, $Ly\alpha$ emitters detected only around high-ionization systems (CIV)

✦At z < 5, $Ly\alpha$ emitters detected around both high- and low- ionization systems (CIV, MgII)

✦Overdense region with three absorbers and 6 $Ly\alpha$ emitters at z~5.08

✦No $Ly\alpha$ emitting counterparts of OI systems at z~6

Comparison with absorbers close to the los



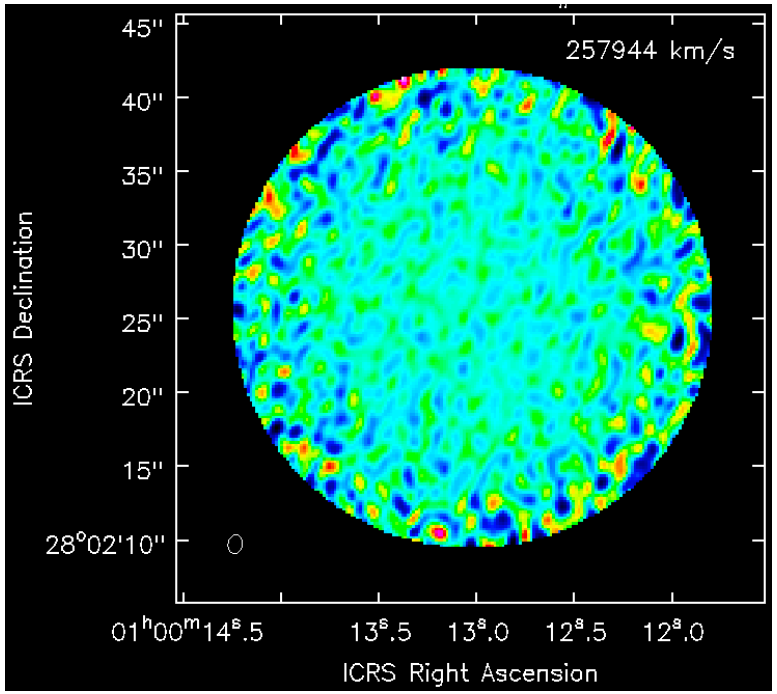
- No $Ly\alpha$ emitting counterparts of OI systems at z~6

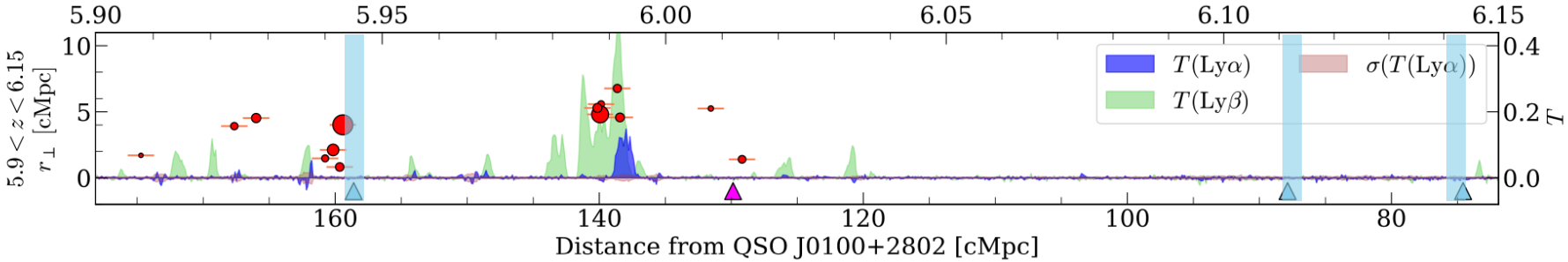
Comparison with absorbers close to the los

ALMA Archival data covering [CII] at the redshift of the absorbers

2.5 hours, 1.3” resolution

No detections: SFR < 5-10 $M_\odot/\mathrm{yr}$
(Wu et al. 2023)





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Thank you for your attention

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