DoubleBlind

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1. Survey overview
2. Volume averaged properties
3. Individual targets
4. Summary

DoubleBlind :: Motivation

- Lya is powerful tracer of galaxy evolution at highest-z

- Lya is resonant line. Undergoes complicated RT
  Cannot use Lya straight out of the box
  !!! READ THE MANUAL !!!

- Fluxes EASY but escape fractions are HARD
  Theory & (limited) observation :: 0 (and less) to 100%
  SFR(Lya) vs. SFR(Alternative) // RT modeling
  !!! Lya vs. non-resonant recombination line !!!

- Little common Lya and Ha data ----- surprisingly little?

  z ~ 0 :: ~20 galaxies
  z ~ 0.3 :: ~50 / 100 GALEX selected
  z ~ 2 :: some

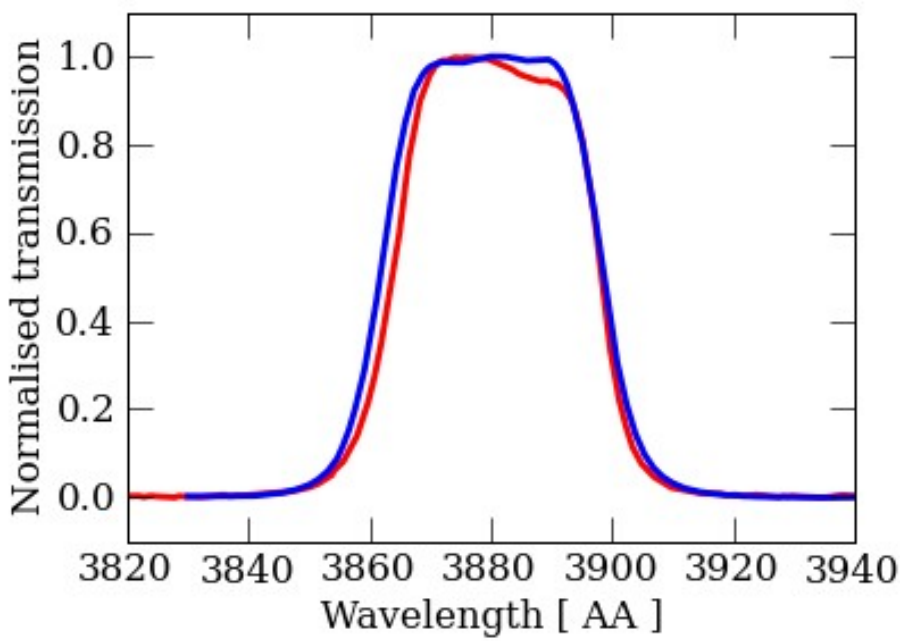
DoubleBlind :: Survey Overview

- Blind survey for H-alpha and Lyman-alpha emitting galaxies at z=2.2

- Ha : VLT/HAWK-I NB2090
- Lya : VLT/FORS1 Custom

- GOODS-S centered on UDF
  7.5 x 7.5 arcmin

- Both probe the same volume.
  Any sample average properties not subject to cosmic variance

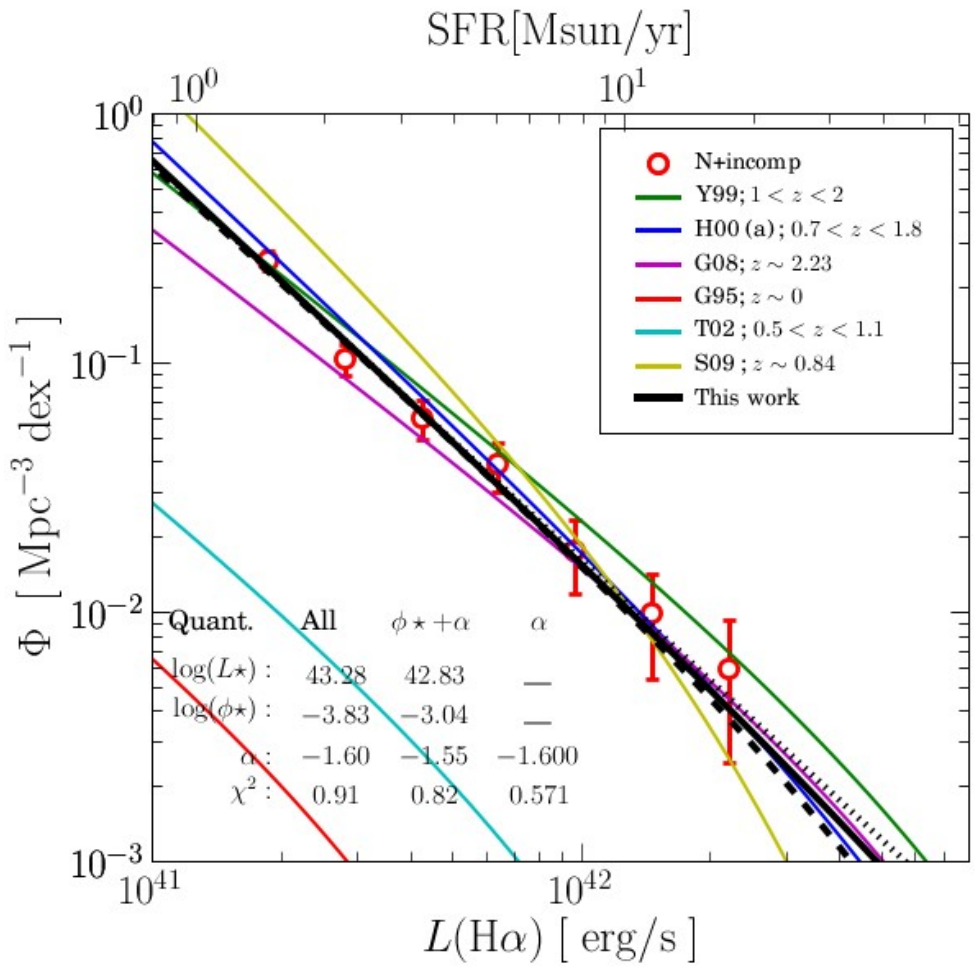


- Deep!
  Ha :: 16 hours online :: SFR=1.8 Mo/yr @ 5 sig
  Lya :: 16 hours online :: SFR=1.8 Mo/yr @ fesc=0.1

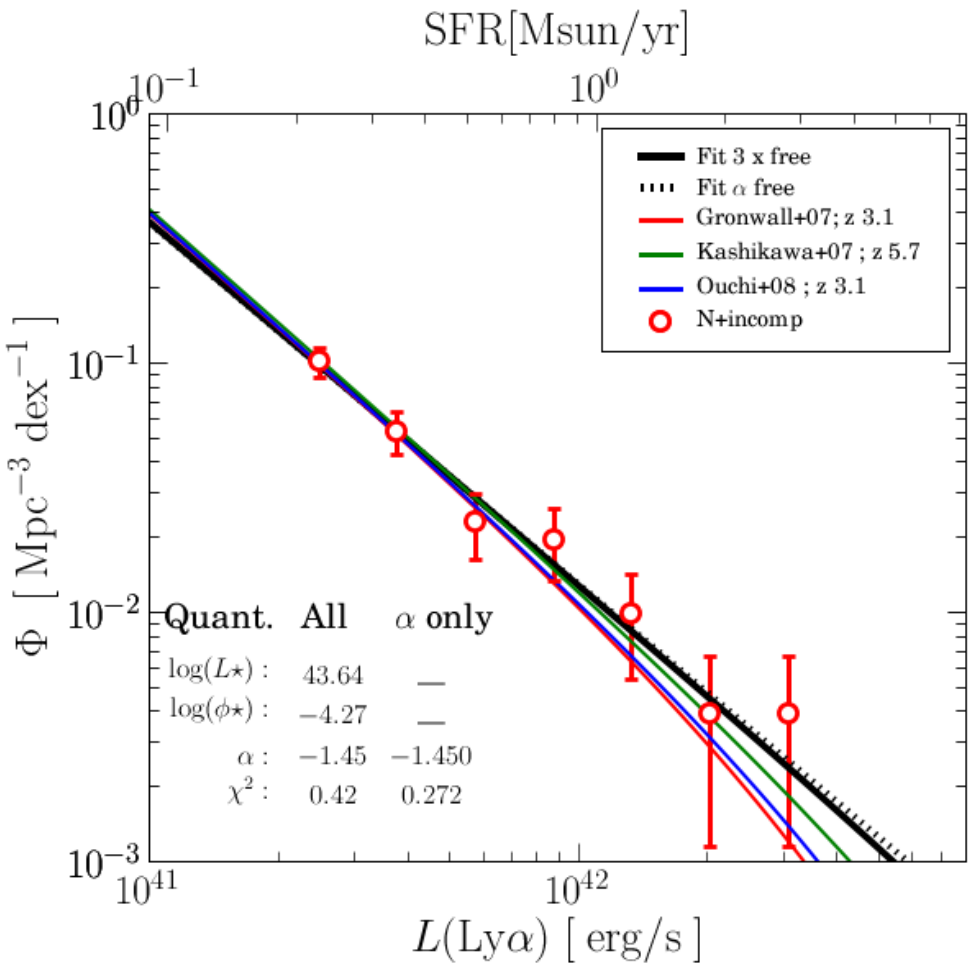
- X-corr with GOODS-MUSIC
  U to 24 mum SEDs // phot-z = 2.2

Luminosity Functions

LF(Ha)

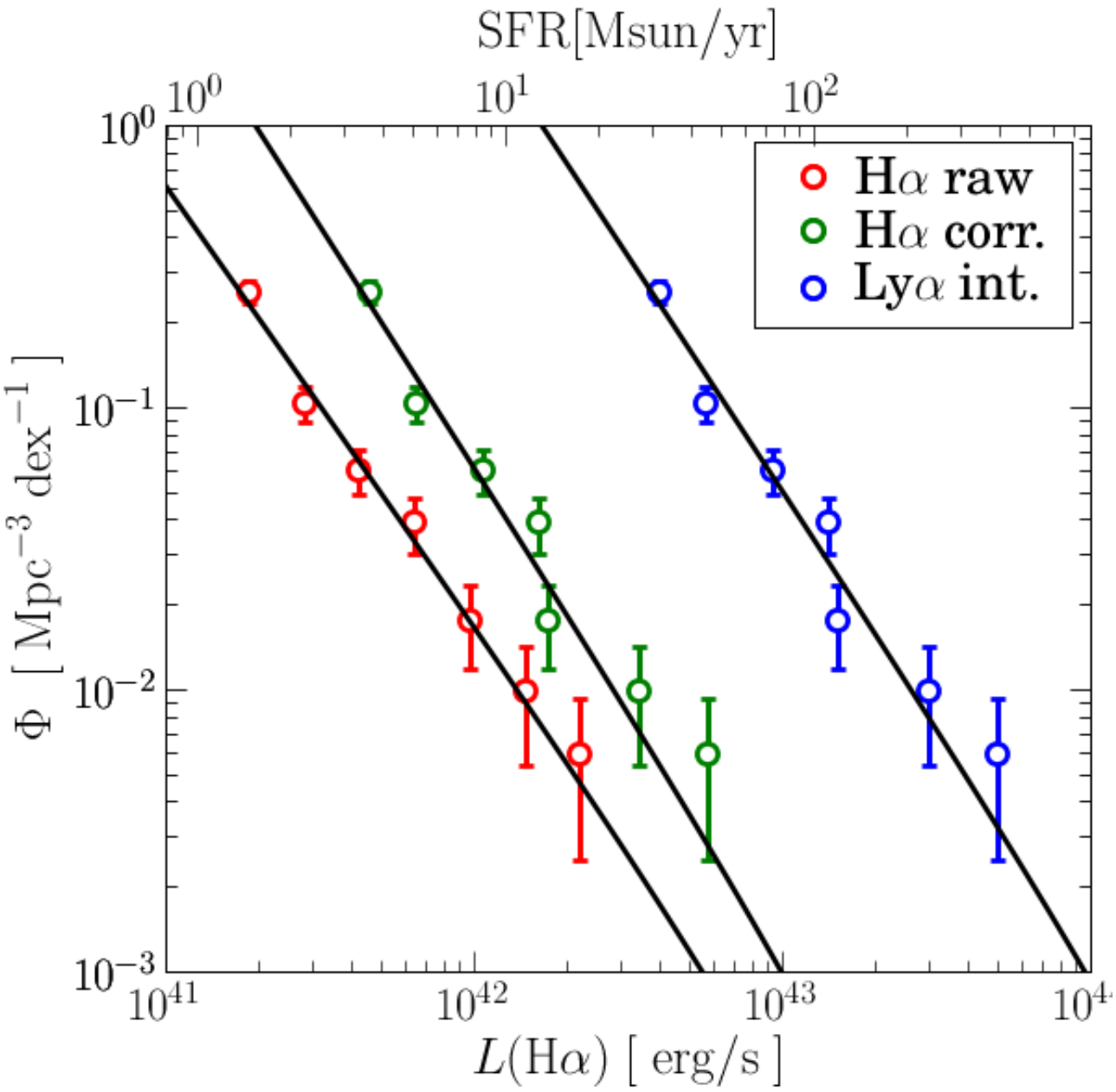


LF(Lya)



Merging the Luminosity Functions

- LF(Lya) = LF(Ha) x 8.7



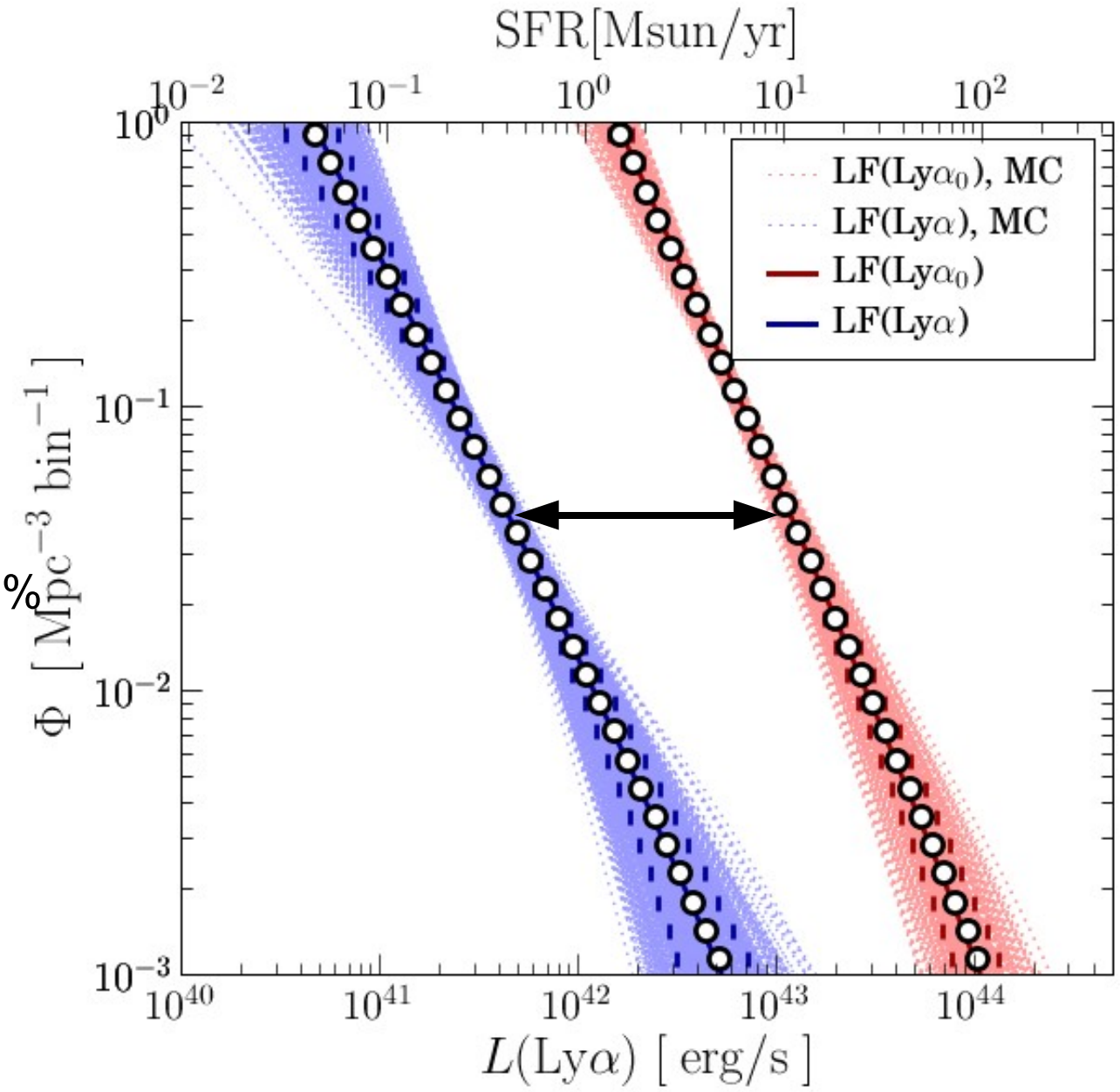
Merging the Luminosity Functions

- LF(Lya) = LF(Ha) x 8.7
- Monte Carlo
  Statistical error on L
- Fit global f_esc

  le Delliou+06 z=3
  sem.analyt f_esc=2%

  .

  Nagamine+08 z=3
  cosmol. SPH f_esc=10%



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  Nagamine+08 z=3
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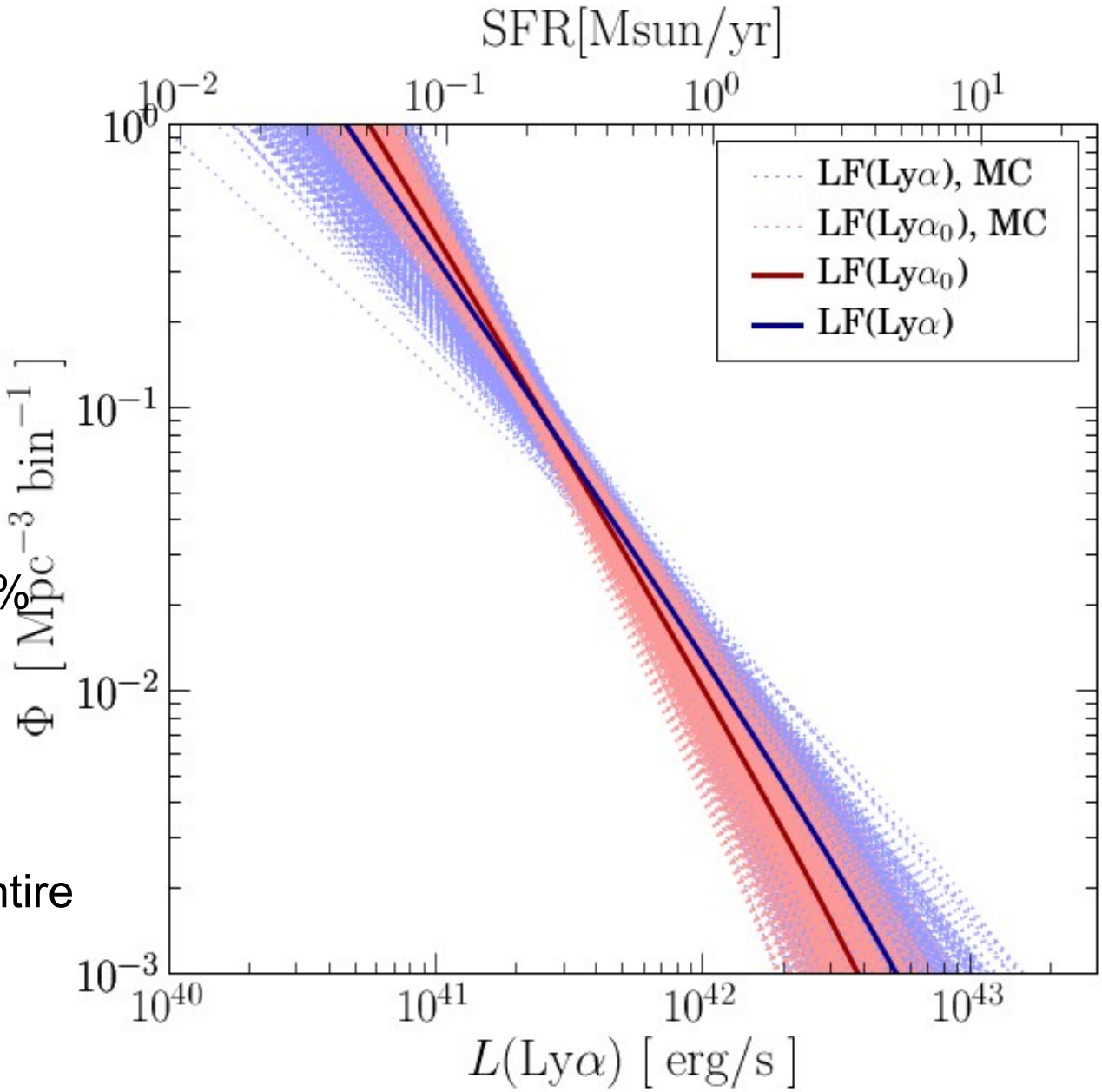
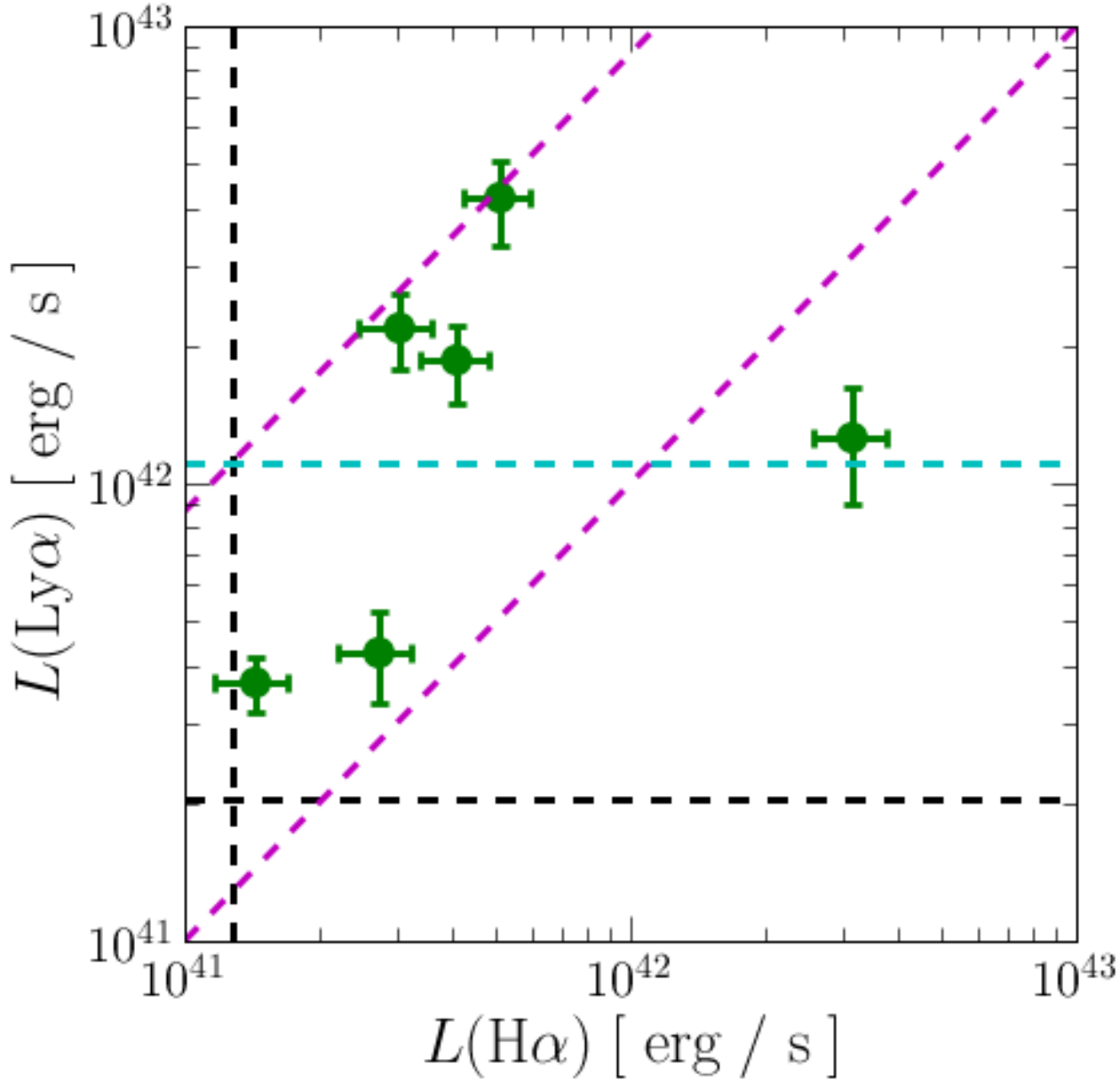
(4.5 +/- 1) %

- Sample averaged based on entire luminosity density in both lines



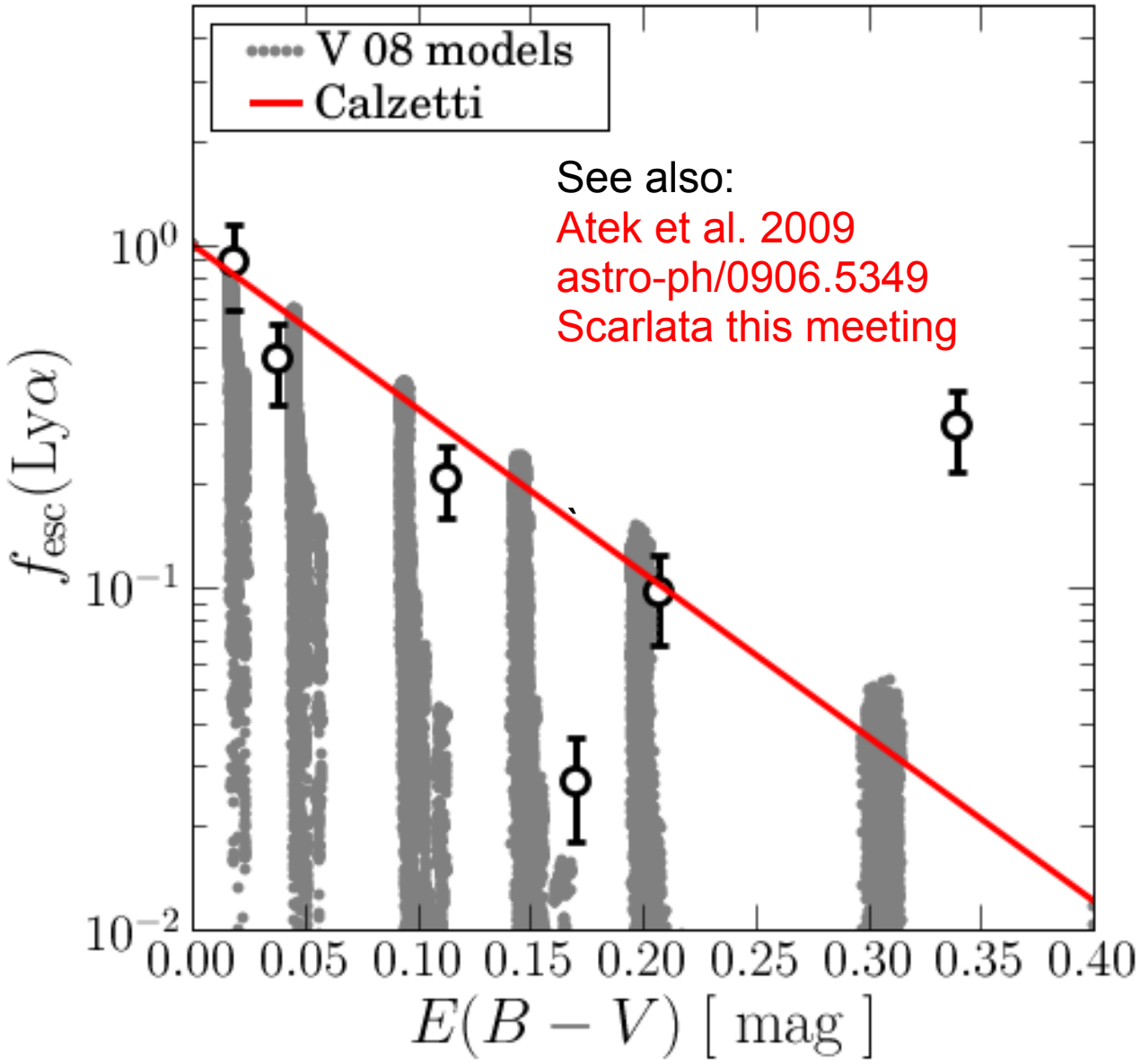
Individual Objects

- objects in Ha & Lya? 6
- Lya/Ha ~ case B? 2



Individual Objects

- objects in Ha & Lya? 6
- Lya/Ha ~ case B? 2
- f_esc ~ *E(B—V)*? 4
  significant RT attenuation 1
  10 x too bright in Lya 1



SEDFIT *E(B—V)* --- NOT nebular

Individual Objects

- objects in Ha & Lya? 6
- Lya/Ha ~ case B? 2
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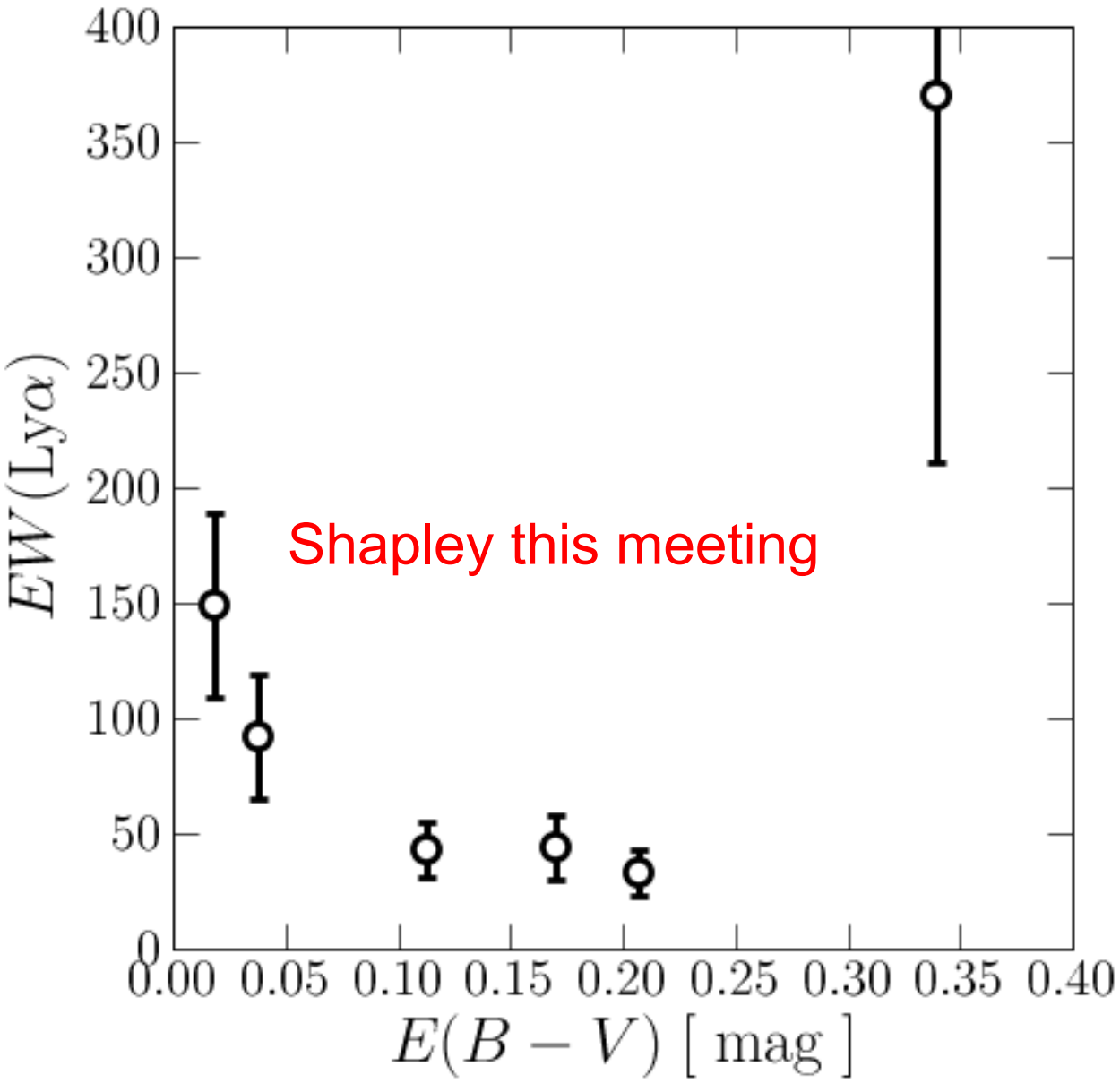
  significant RT attenuation 1
  10 x too bright in Lya 1
- EW(Lya) simple with dust? 5
  10 x too high in EW(Lya) 1



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Individual Objects

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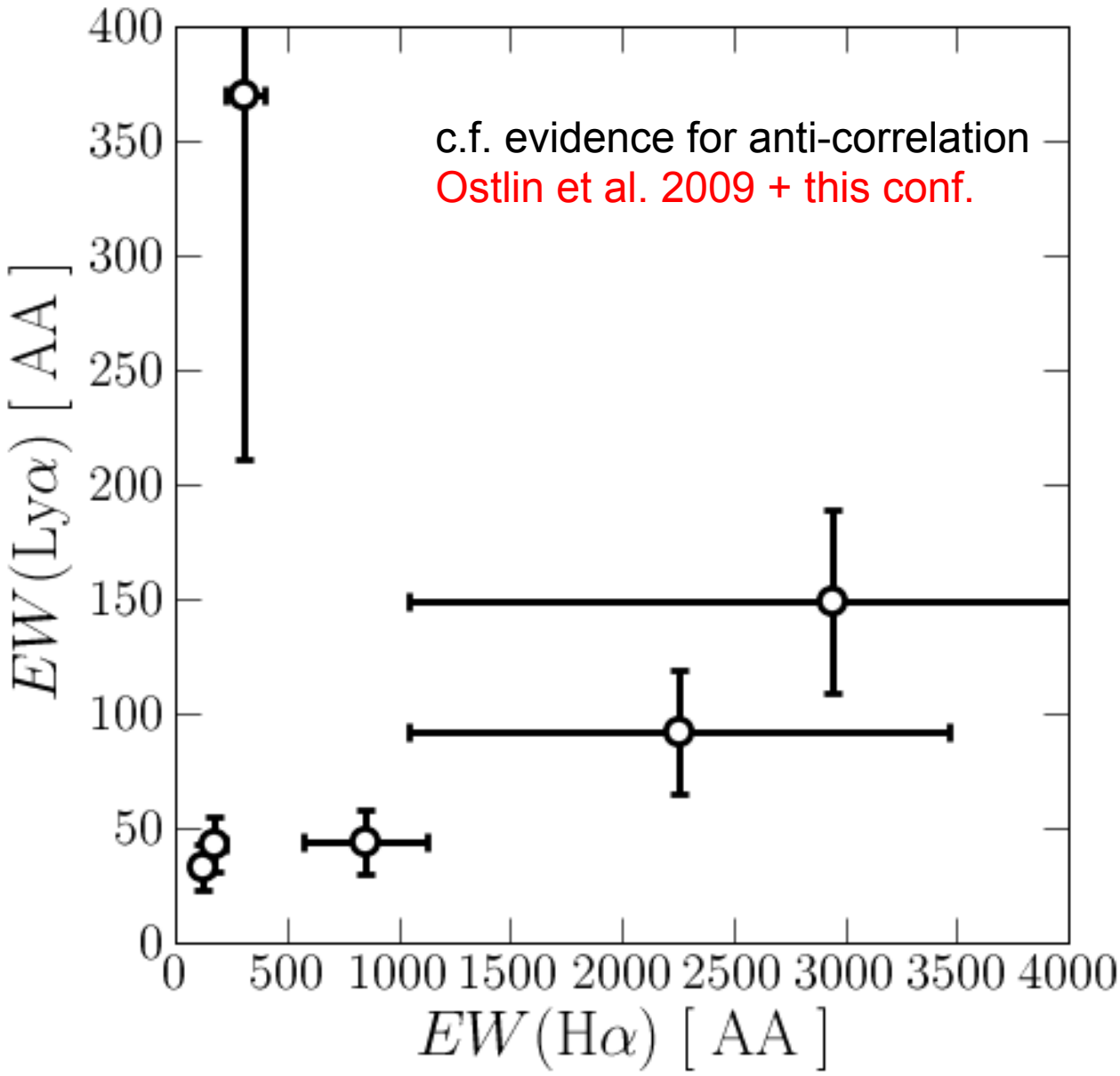
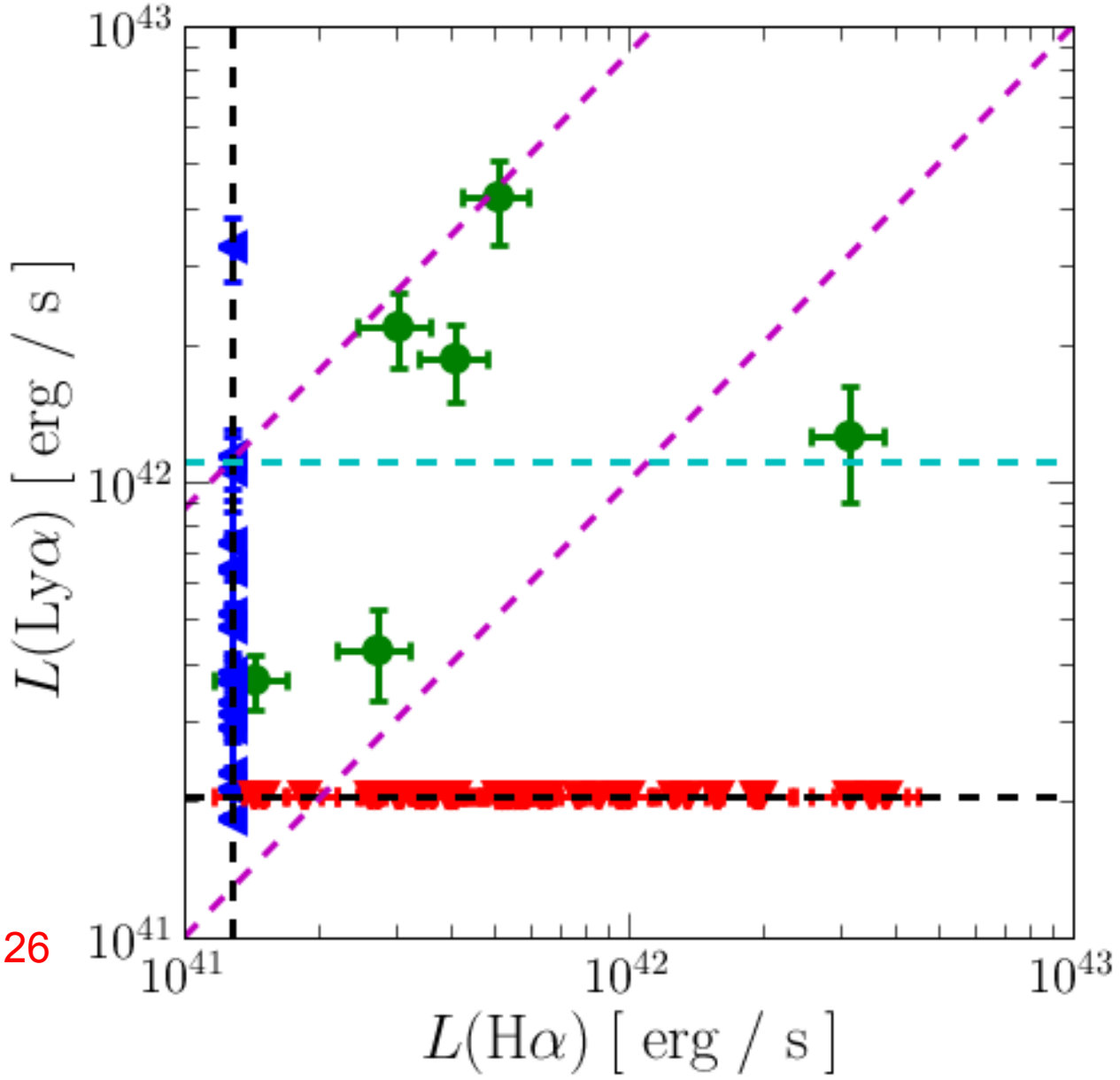
  10 x too high in EW(Lya) 1
- EW(Lya) ~ EW(Ha)? 5
  extreme outlier? 1



Individual Objects

- objects in Ha & Lya? 6
- Lya/Ha ~ case B? 2
- f_esc ~ *E(B—V)*? 4
  significant RT attenuation 1
  10 x too bright in Lya 1
- EW(Lya) simple with dust? 5
  10 x too high in EW(Lya) 1
- EW(Lya) ~ EW(Ha)? 5
  extreme outlier? 1
- non-detections 36 & 26



DoubleVision

Super deep narrowband Ha and Lya observations obtained in GOODS-S

~ 80 emission line candidates found

Only 6 in both lines

4 objects have f_esc vs E(B-V) on simple dust attenuation curve
- 1 significantly below
- 1 significantly above

LF comparison finds sample-averaged f_esc (Lya) = 4.5%