Extreme Emission line galaxies at 1<z<2 in CANDELS-UDS

...is it possible to estimate spectroscopic quantities just from broadband photometry?

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Introduction

6 visible+NIR bands: R, i, z, J, H, K (avoid restframe UV dust effects)

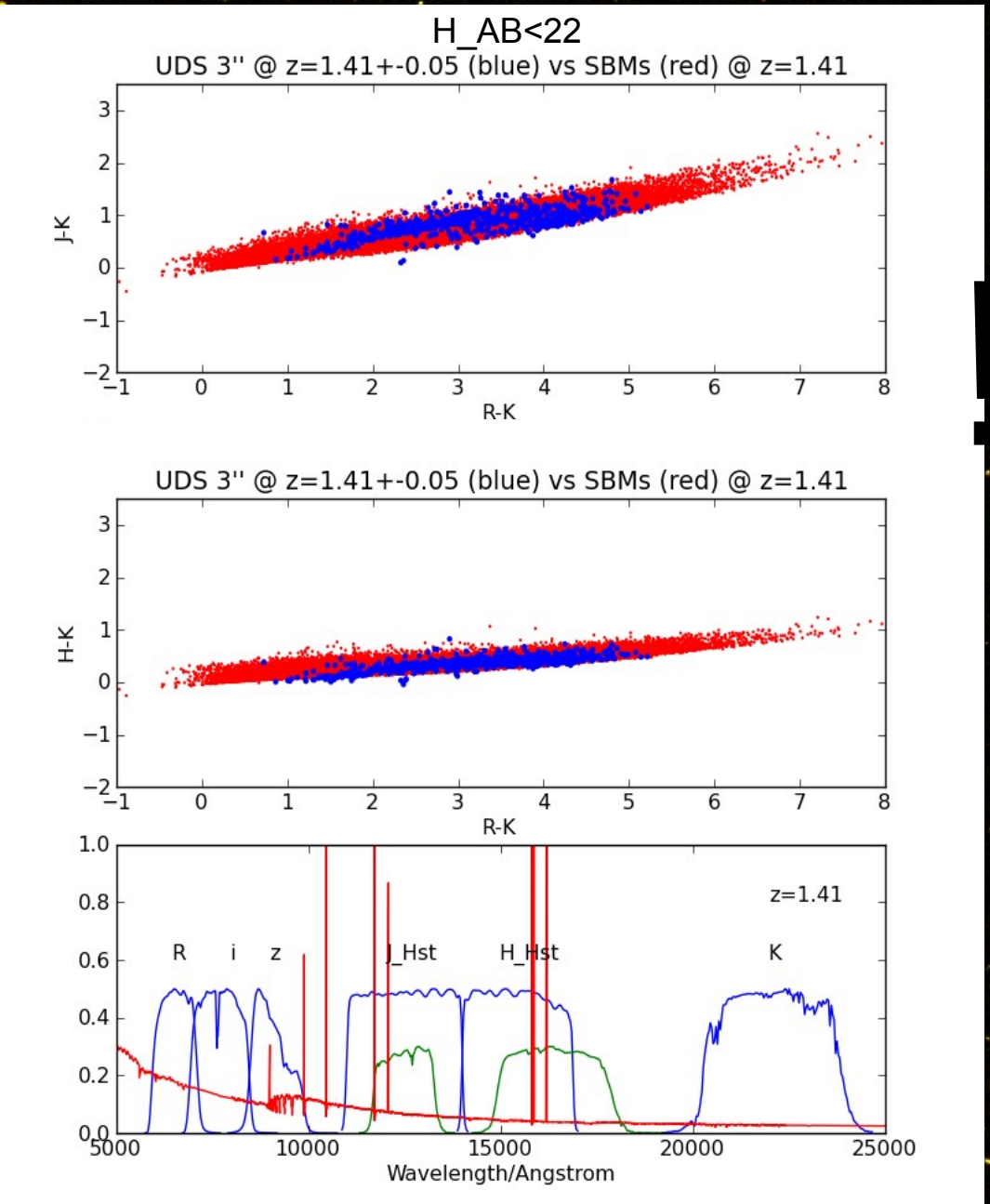
1<z<2 for largest number of galaxies over wide mass range at the peak of star formation.

Photo-z's obtained from fitting to a wider range of filters.

Uses:

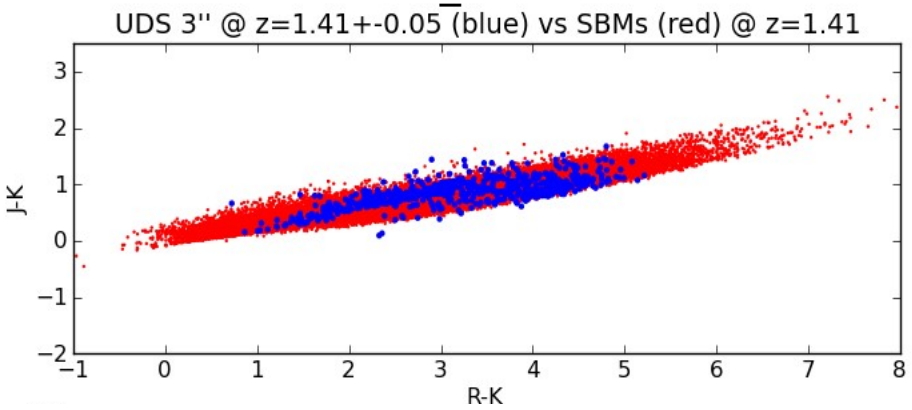
Luminosity Functions
Morphologies
SED fitting: indirect quantities.
BB Colours: main features of underlying spectra at minimum expense
...

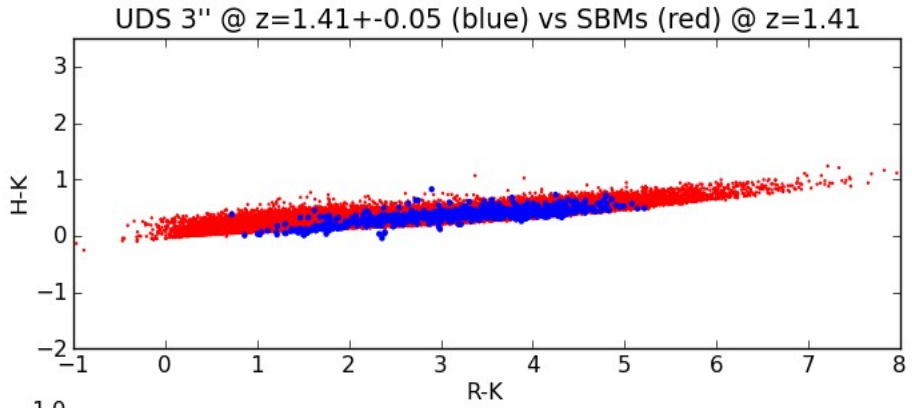
Motivation

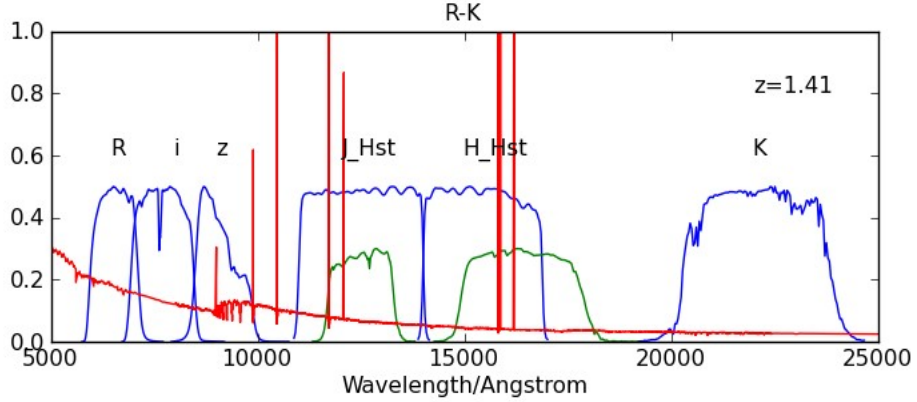

H_AB<22
UDS 3'' @ z=1.41+-0.05 (blue) vs SBMs (red) @ z=1.41
J-K
R-K
UDS 3'' @ z=1.41+-0.05 (blue) vs SBMs (red) @ z=1.41
H-K
R-K
z=1.41
R
i
z
J_Hst
H_Hst
K
Wavelength/Angstrom

Motivation

H_AB<22

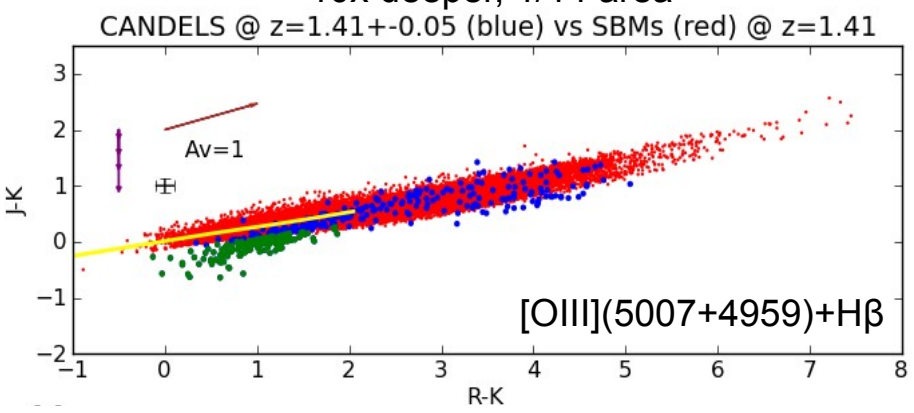


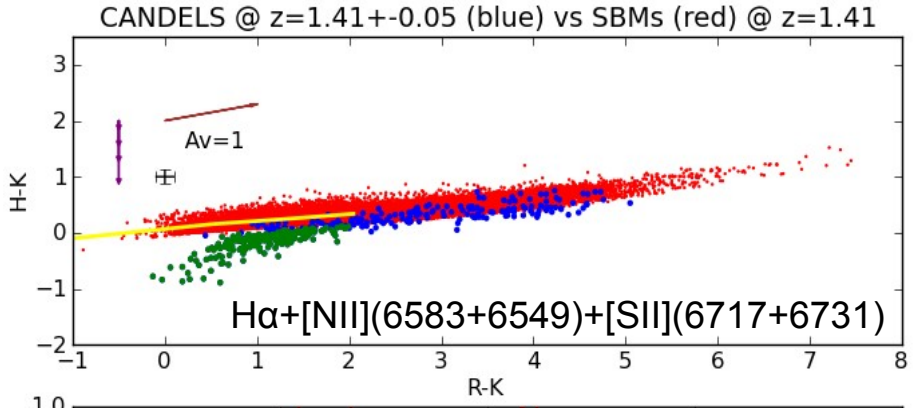




!

10x deeper, 1/14 area

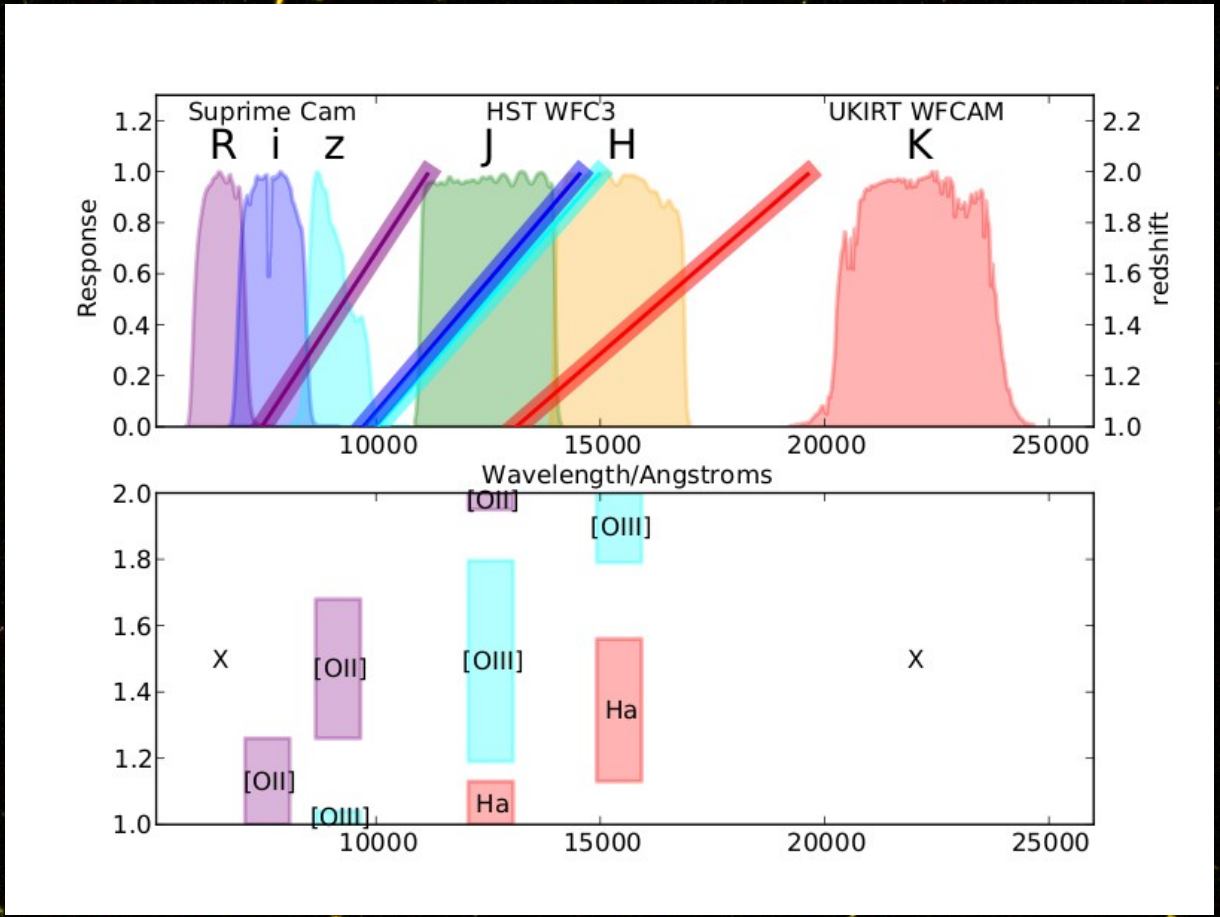




Method

Systematic search for emission lines in this sample:

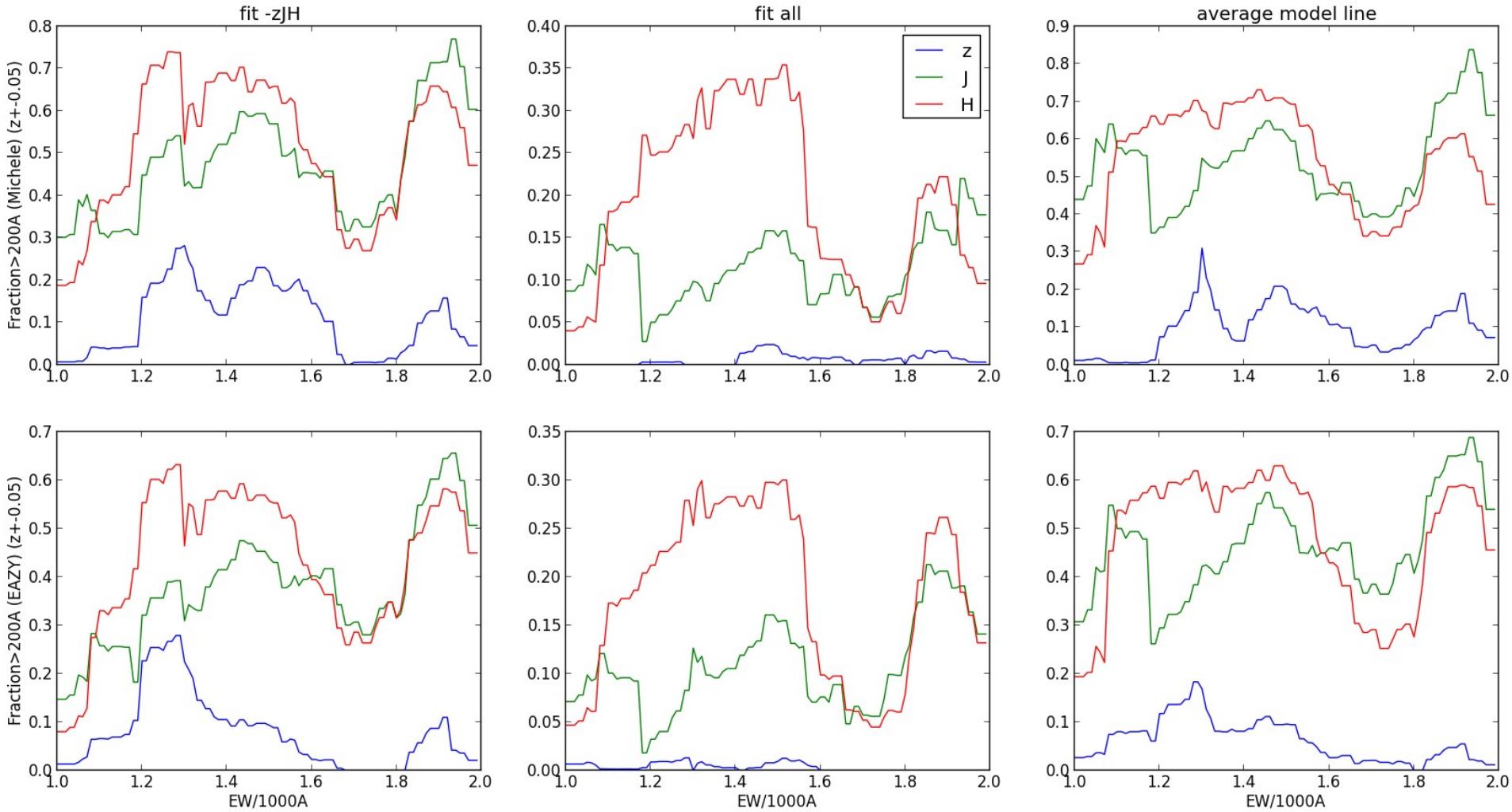
Essential:
set of line-free models to estimate fiducial colours.



...from z=1 to z=2:

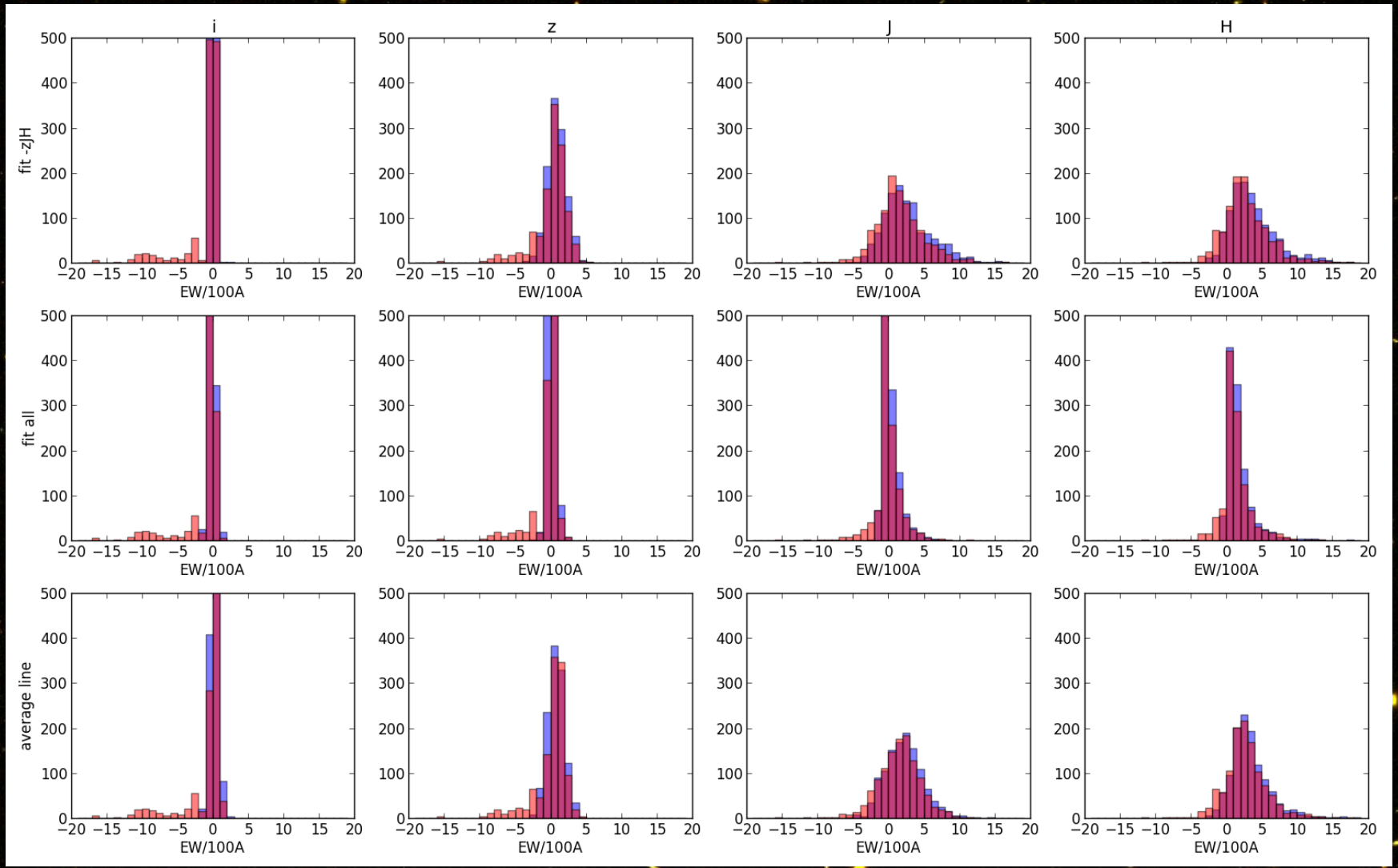
These were the results: (show .gif)

Fractions over z

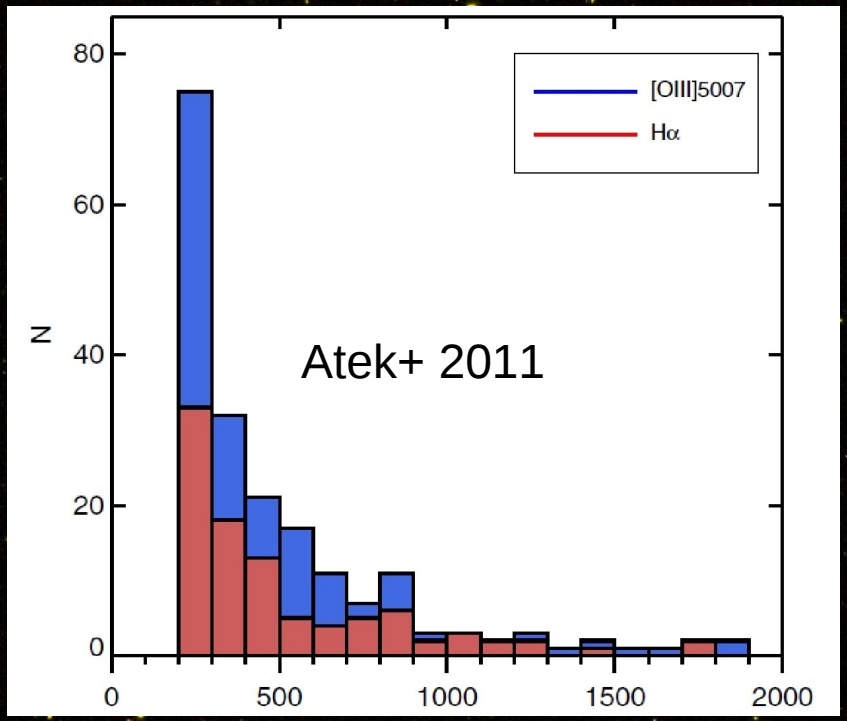


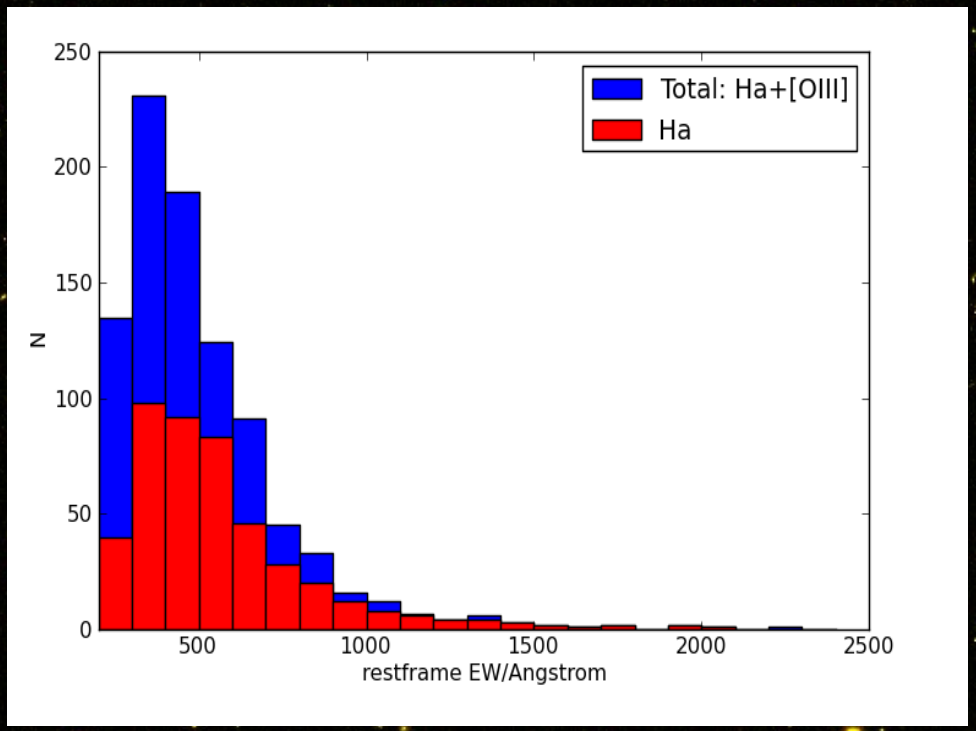
Equivalent Widths!

… estimated EWs are unusually high!

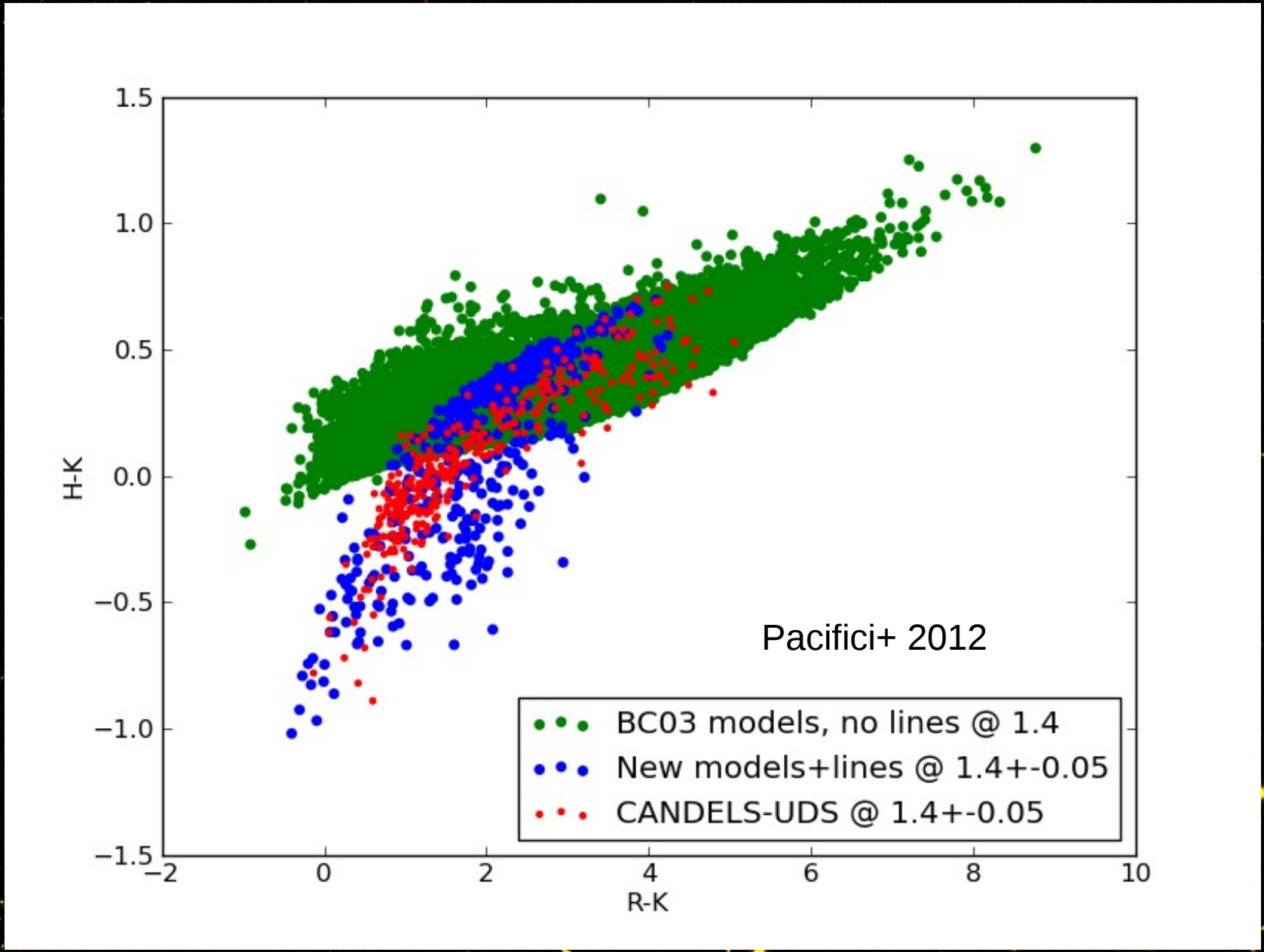


Grism spectra

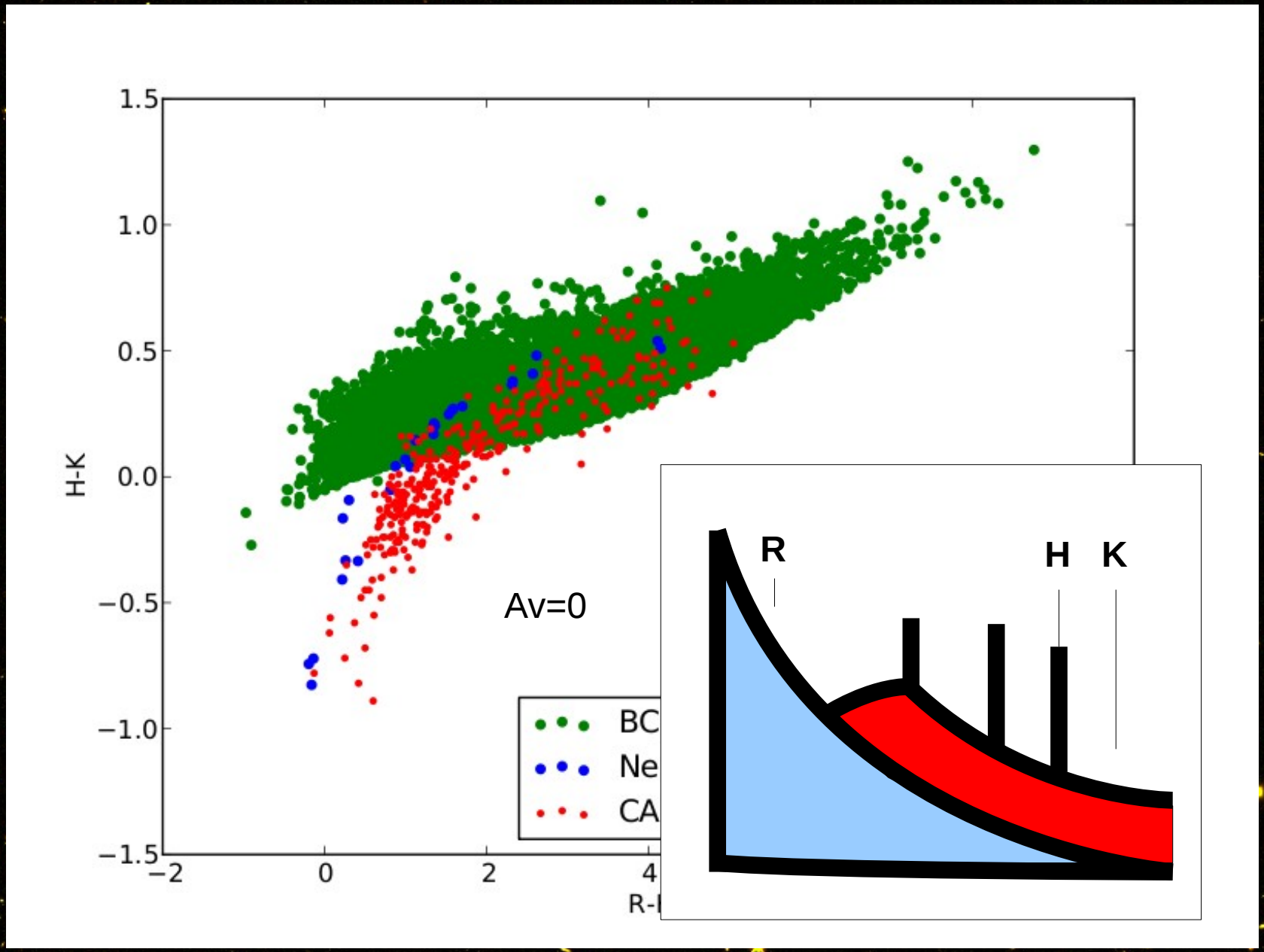




Nebular emission models



Nebular emission



Is this new?

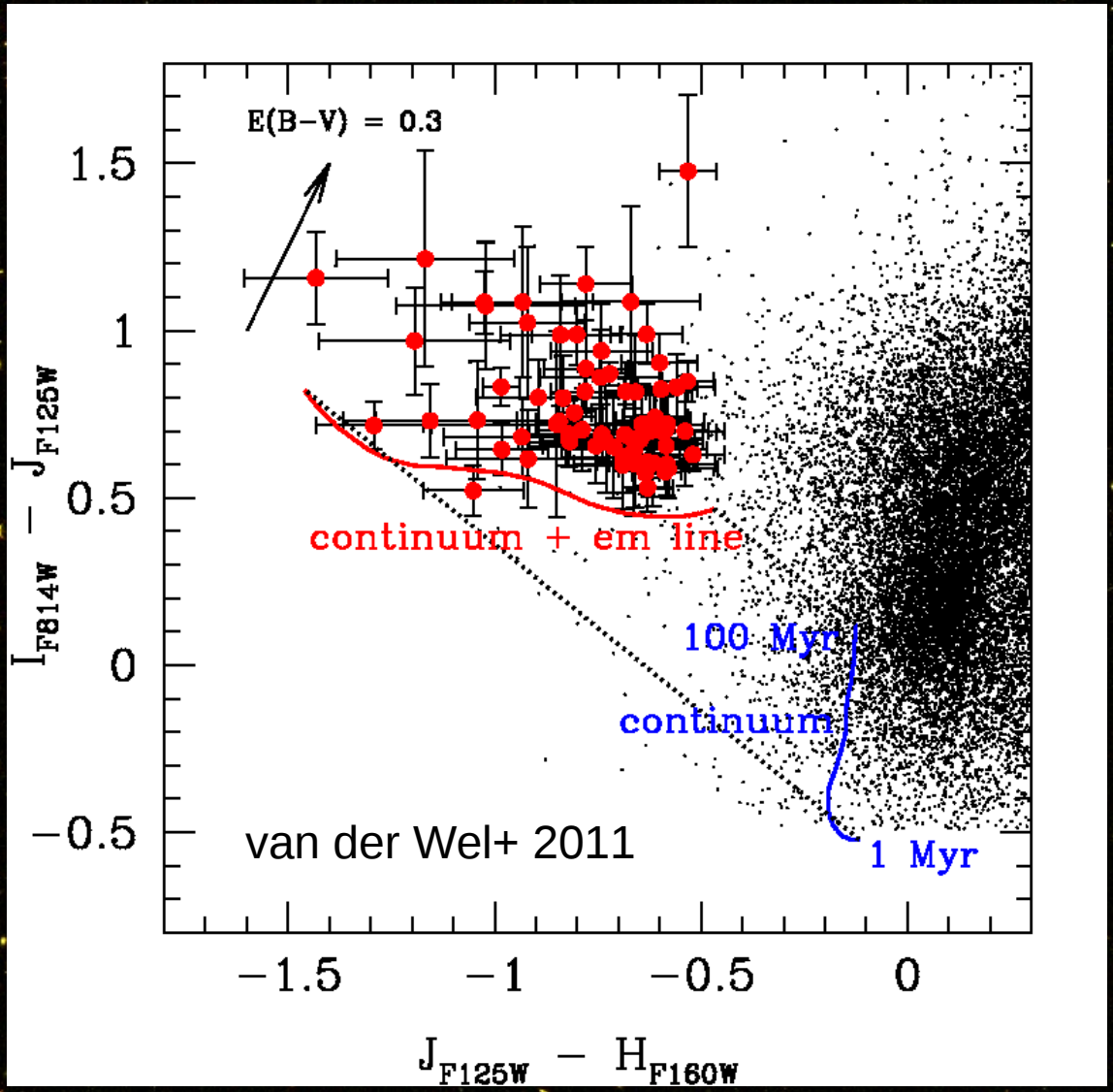
No.

HII galaxies known at local redshifts (green peas)

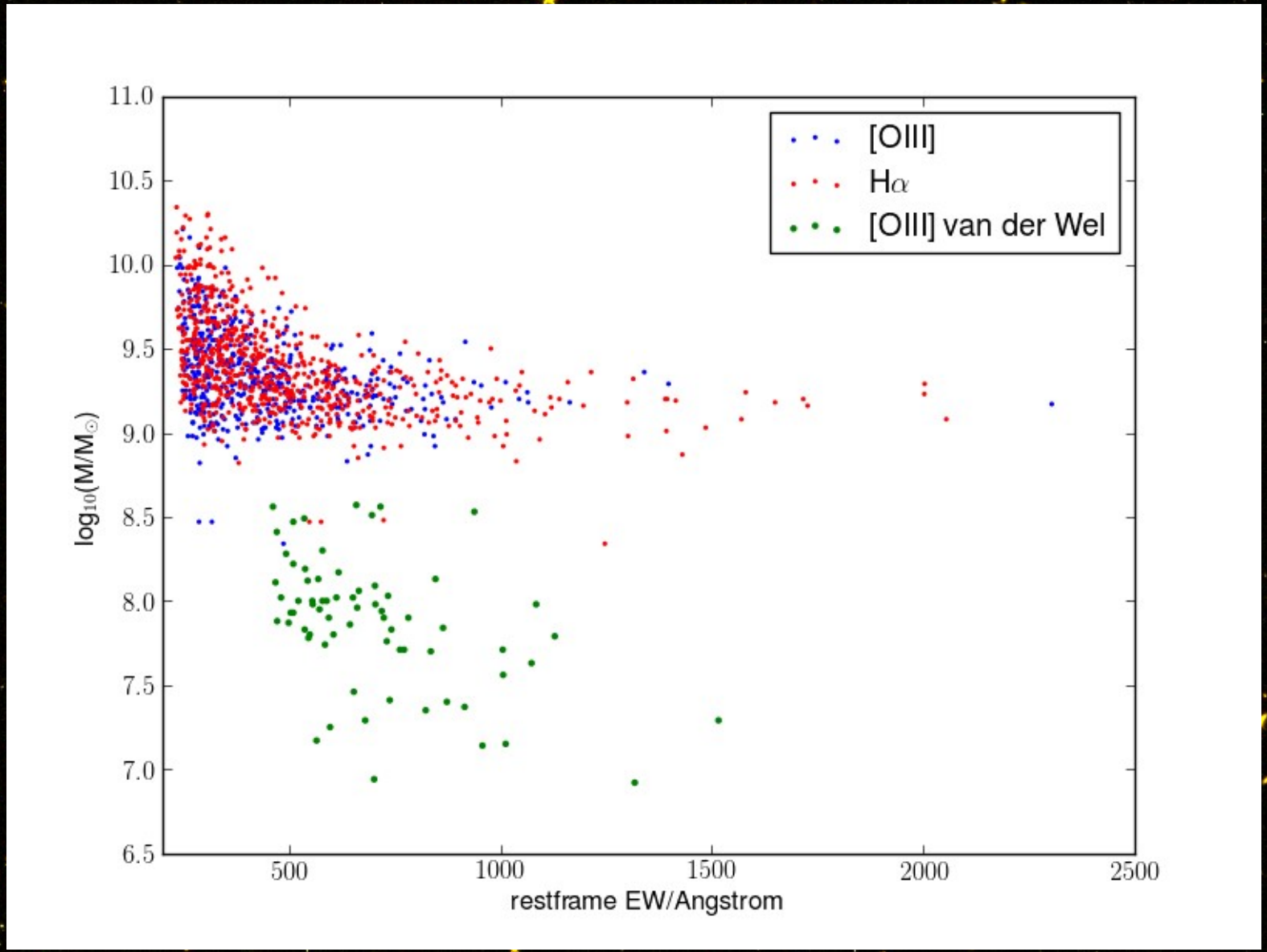
At z>3.5 this has been done using IRAC filters, observed EW ~ (1+z).

At z=1.7 ELG population already identified in CANDELS by van der Wel+ 2011

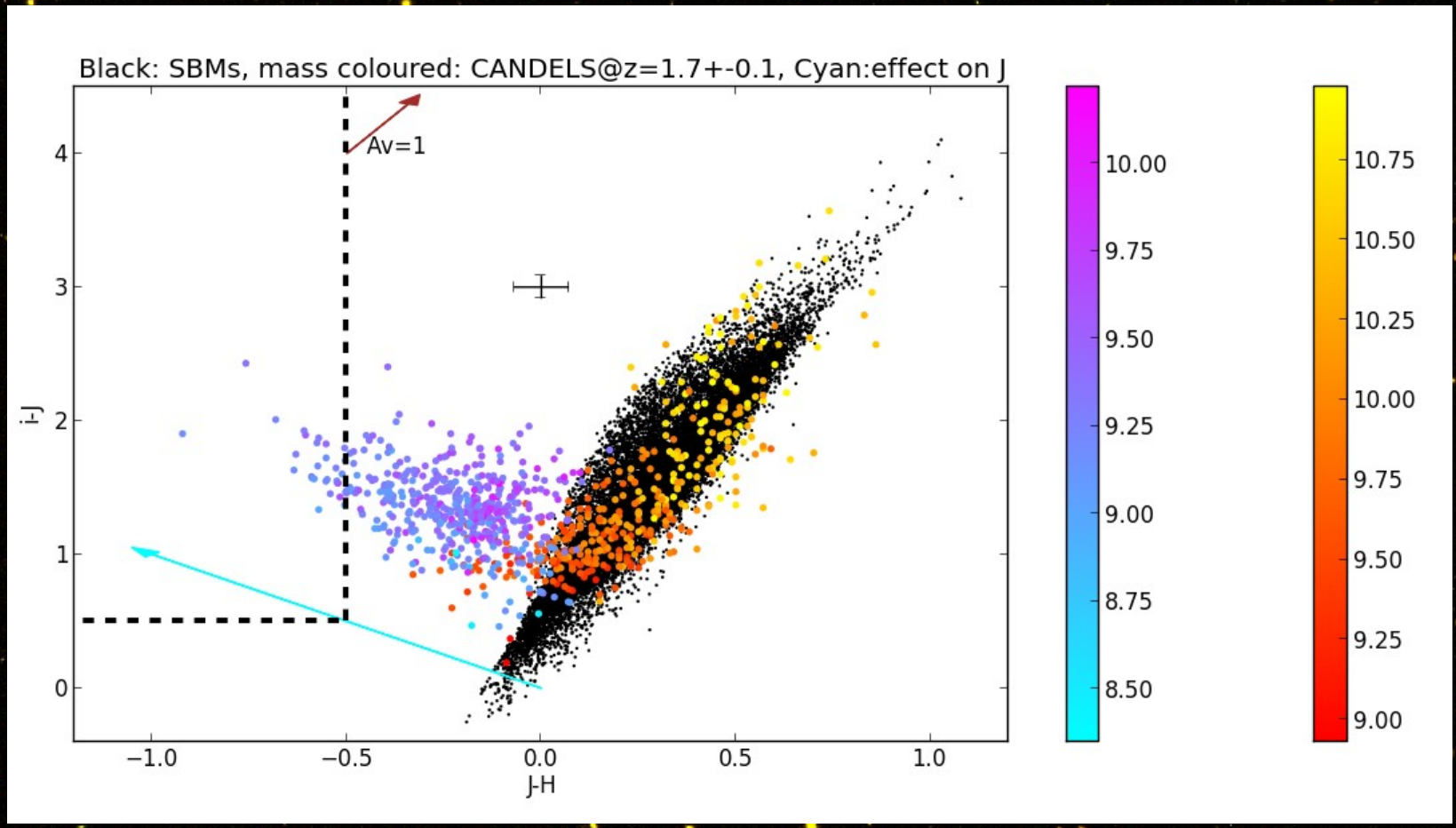
Are these just the same objects?



Comparing masses



High(er) mass EELGs?



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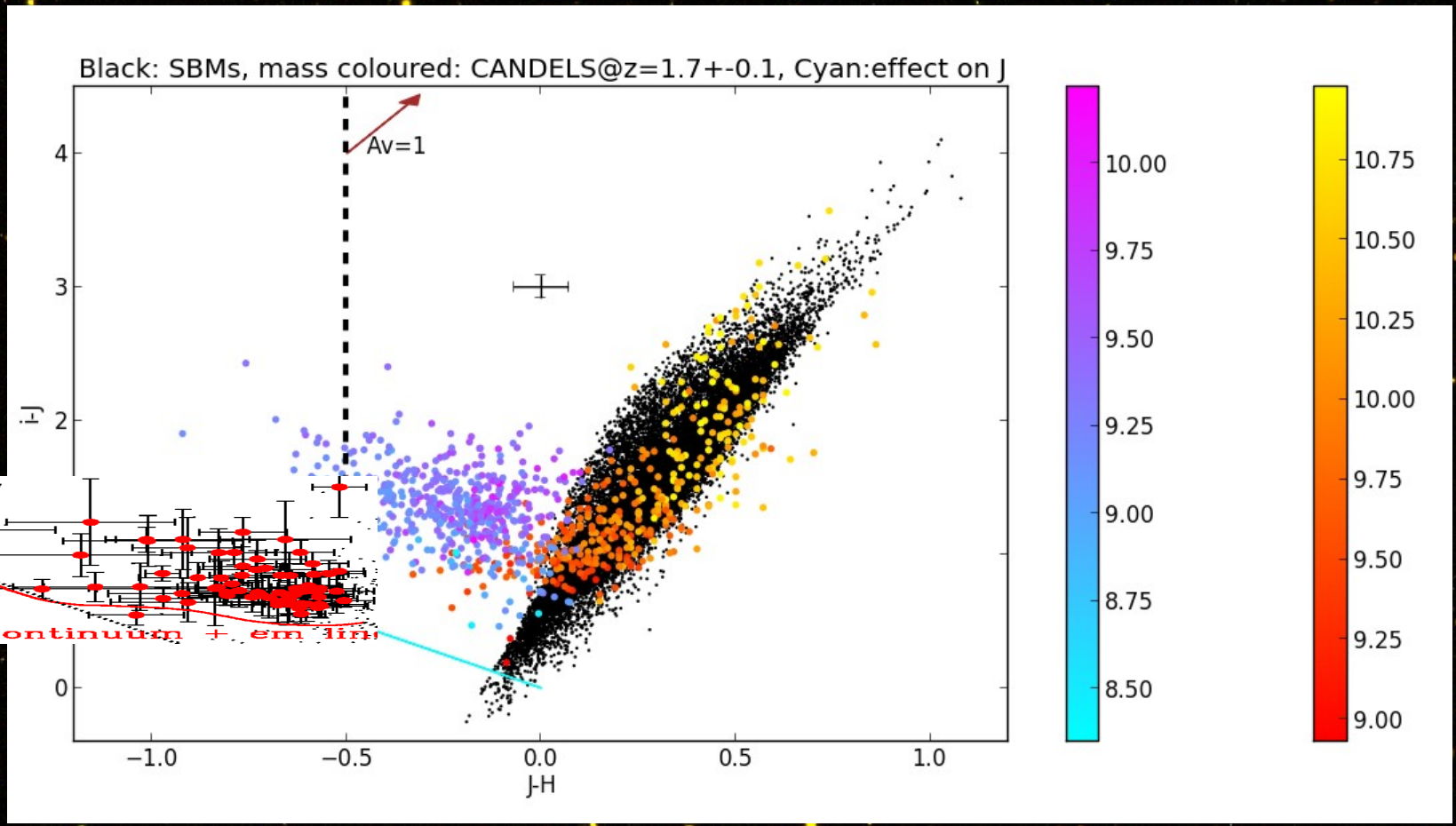

Conclusions

Method:

- Extra depth of CANDELS field unveiled ELG population
- Identified (E)ELGs in [OII], [OIII], [Ha] in z, J and H at z 1 to 2.
- Broadband ELG selection = large volumes and completeness
- EW estimates for more galaxies than grism or NB surveys

Results:

- ELG fraction with logM<10 above 30%
- Restframe EWs as high as 1500A measured
- ELG masses between 1E9 and 1E10.5
- Frequent EELGs with M>1E9