The star formation histories of galaxies in different environments

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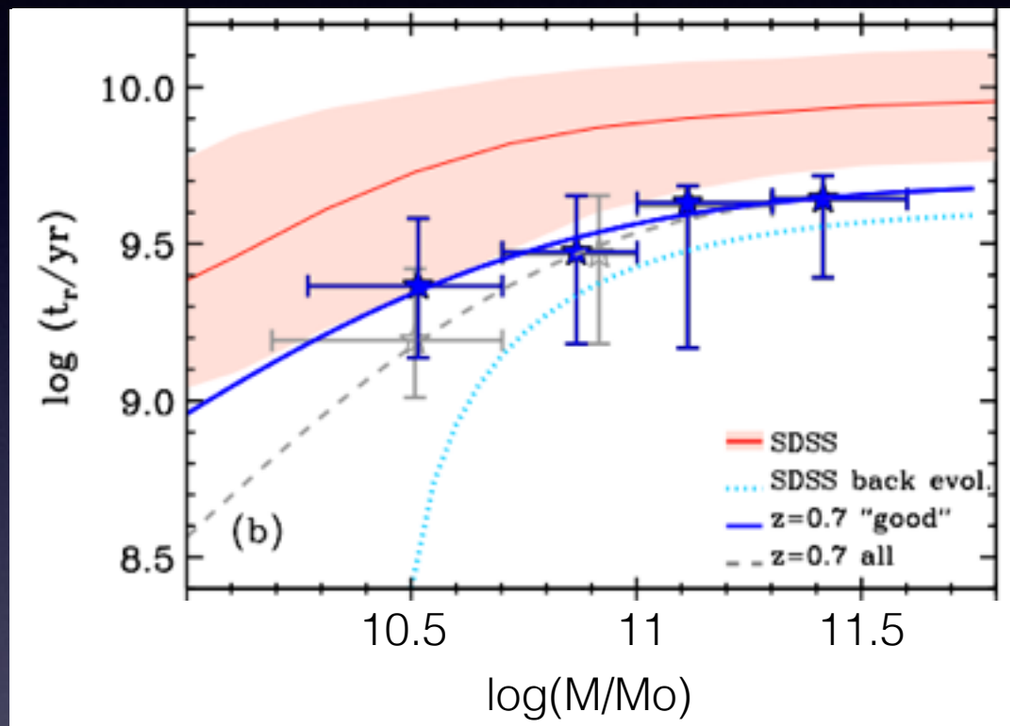
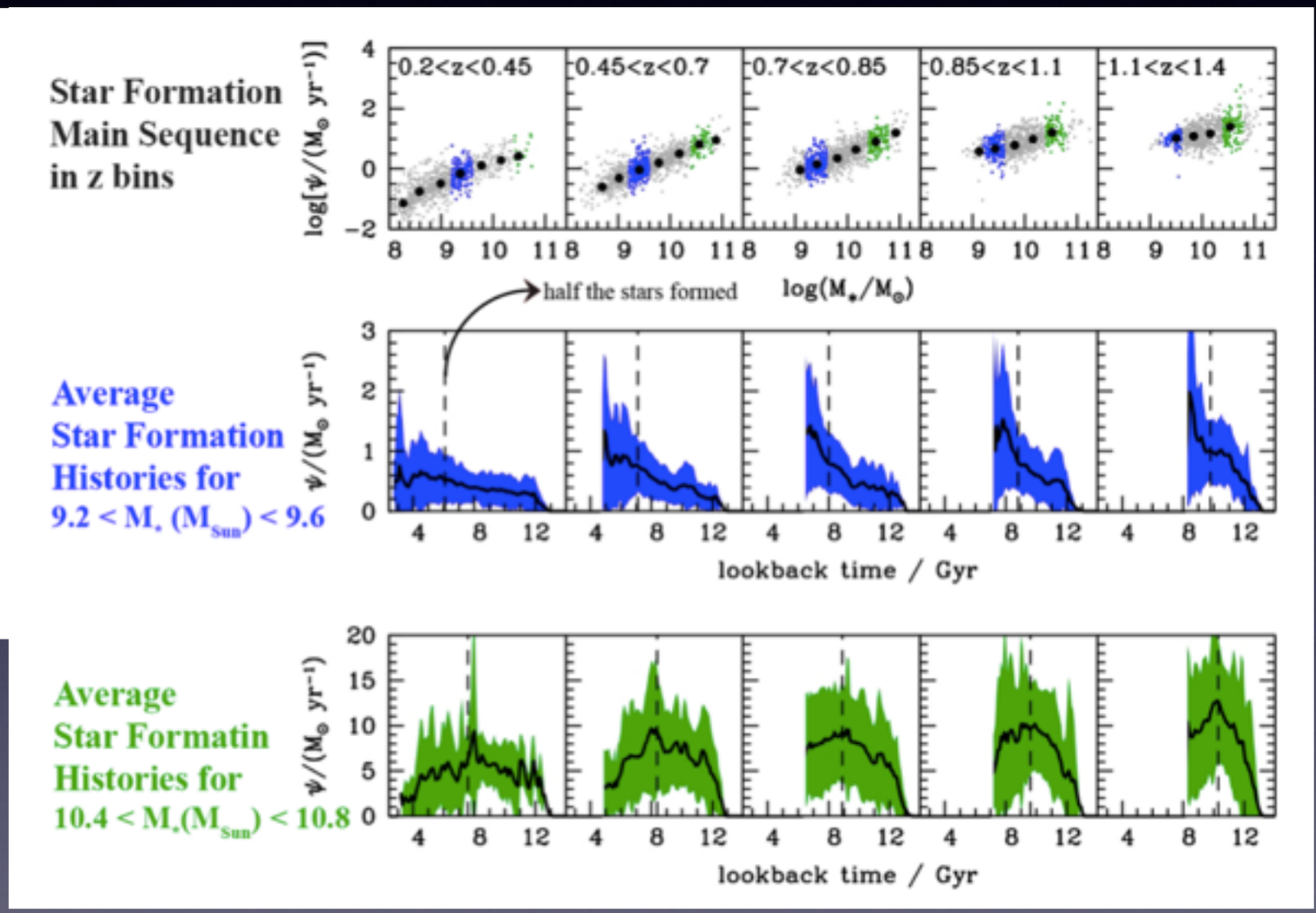
Idea and motivation

- What is the main driver of galaxy evolution?



Gallazzi et al. (2014)



Pacifici et al. (2013)

Idea and motivation

- What is the main driver of galaxy evolution?
- What drives the quenching of star-forming galaxies?

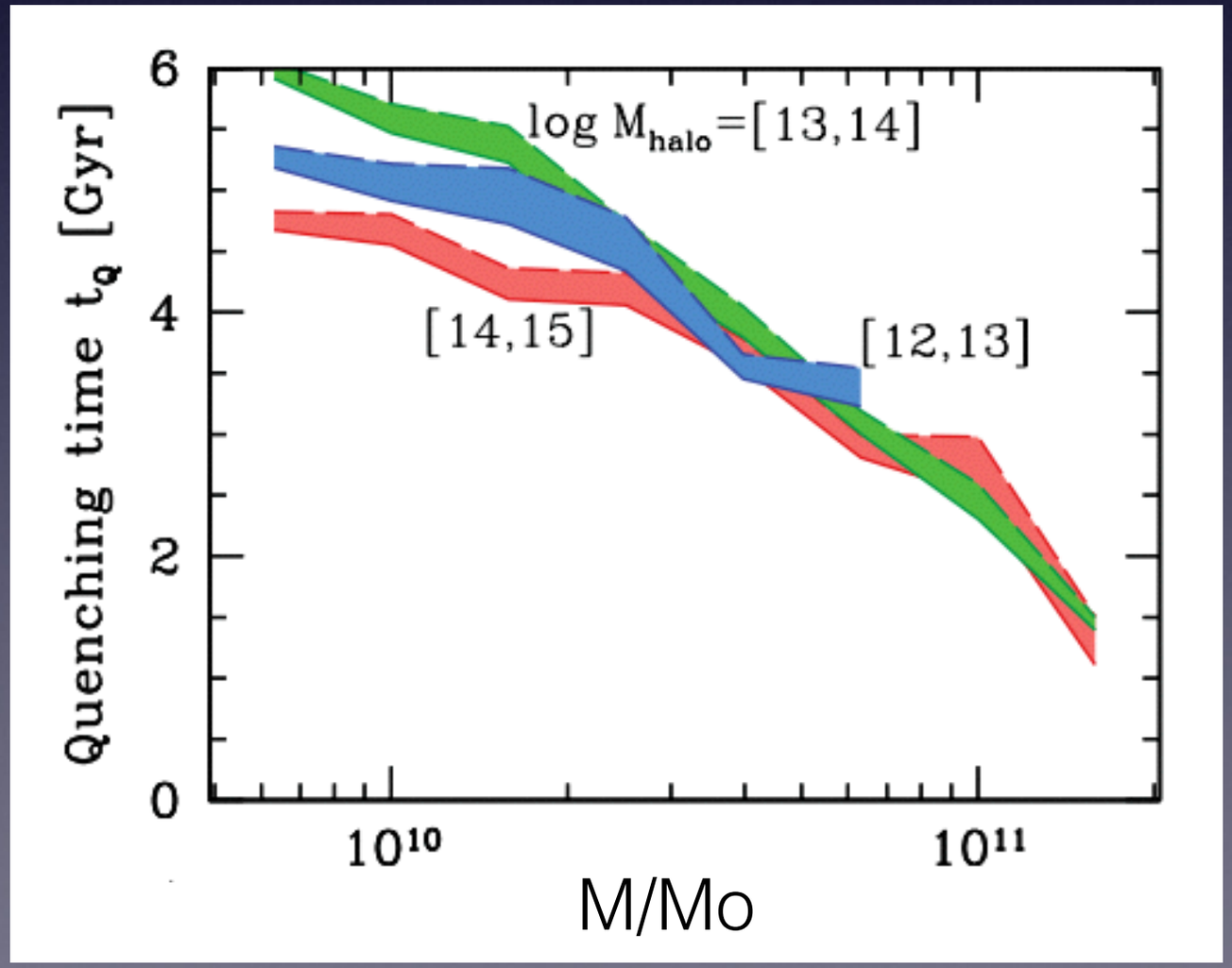
“Reproducing the observations requires a mechanisms that suppresses accretion in a fraction of galaxies but not in all galaxies, with the fraction itself increasing from intermediate to high masses”

(Keres et al. 2009)

feedback from AGNs **(Dekel & Silk 1986)**
quasar- and starburst-driven winds **(Di Matteo et al. 2005)**
major mergers **(Toomre 1977)**

Idea and motivation

- What is the main driver of galaxy evolution?
- What drives the quenching of star-forming galaxies?
- How long do they take to quench?
- Does environment play a role?



(Wetzel et al. 2013)

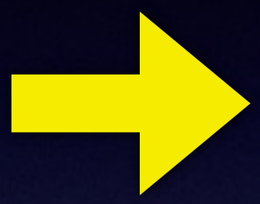
Modelling approach

models are required to relate observables to physical parameters

build library of galaxy spectra which can best reproduce a wide range of observables

Modelling approach

models are required to relate observables to physical parameters



build library of galaxy spectra which can best reproduce a wide range of observables

star formation and chemical enrichment histories

+

emission by the stars

+

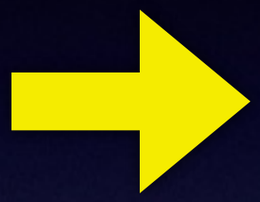
emission by the gas

+

effect of the dust

Modelling approach

models are required to relate observables to physical parameters



build library of galaxy spectra which can best reproduce a wide range of observables

Appeal to state-of-the-art models to include:

- physically motivated SF and chemical enrichment histories (from simulations)
- latest progress in the spectral modeling of stellar populations
- contamination of stellar emission by nebular emission
- more sophisticated prescriptions for attenuation by dust

(comprehensive range of parameters to account for models uncertainties)

Dataset

UV **GALEX**

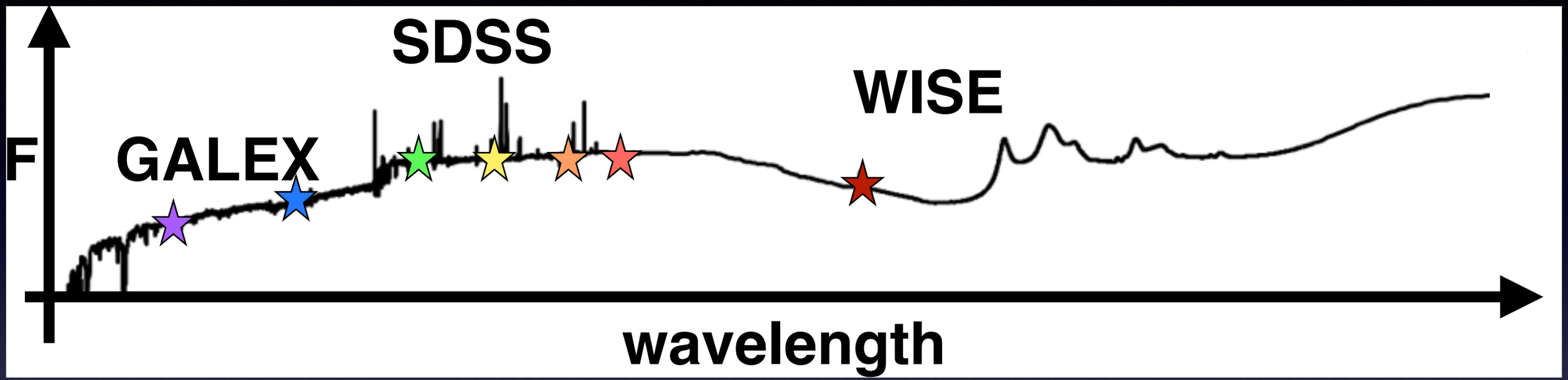
griz **SDSS**

3.6 micron **WISE**

optical **emission lines**

density informations

Dataset



UV **GALEX**

griz **SDSS**

3.6 micron **WISE**

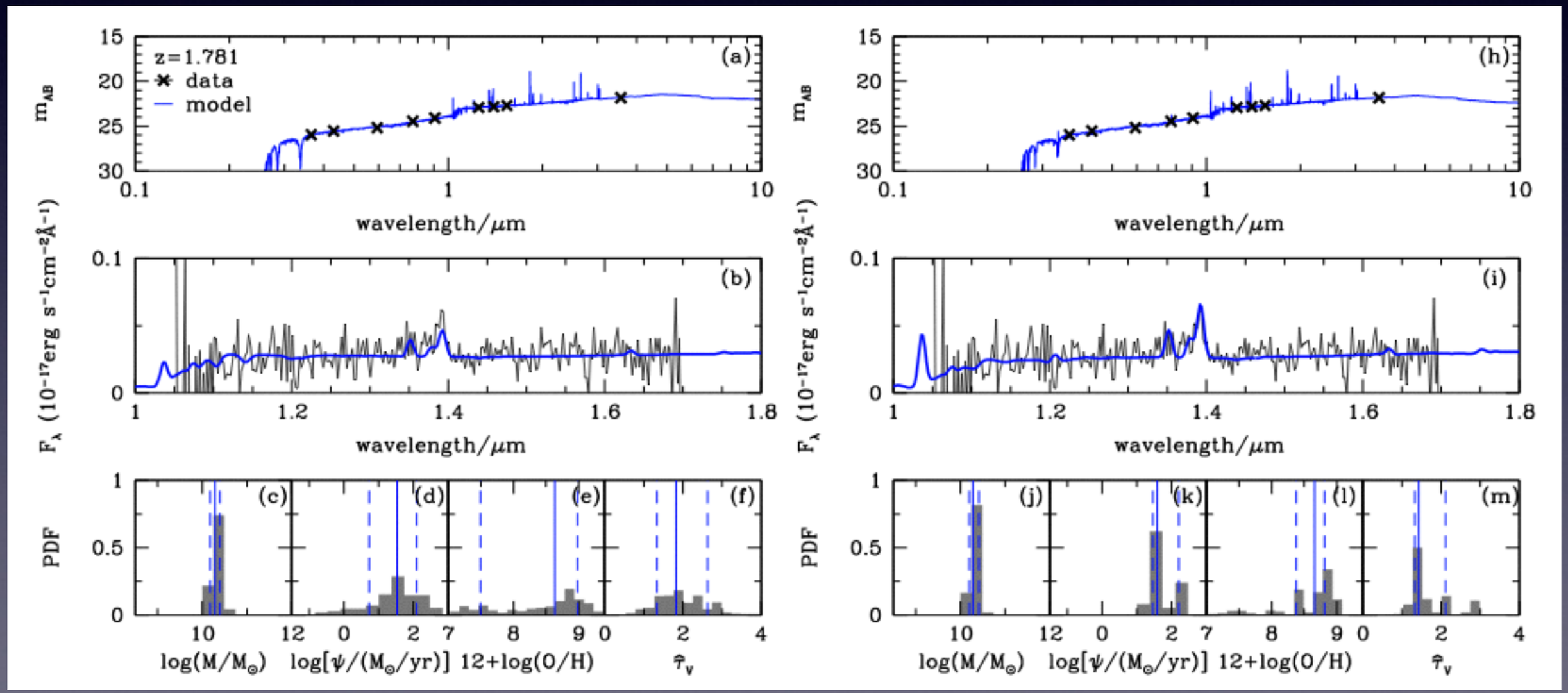
optical **emission lines**

density informations

~70,000 galaxies

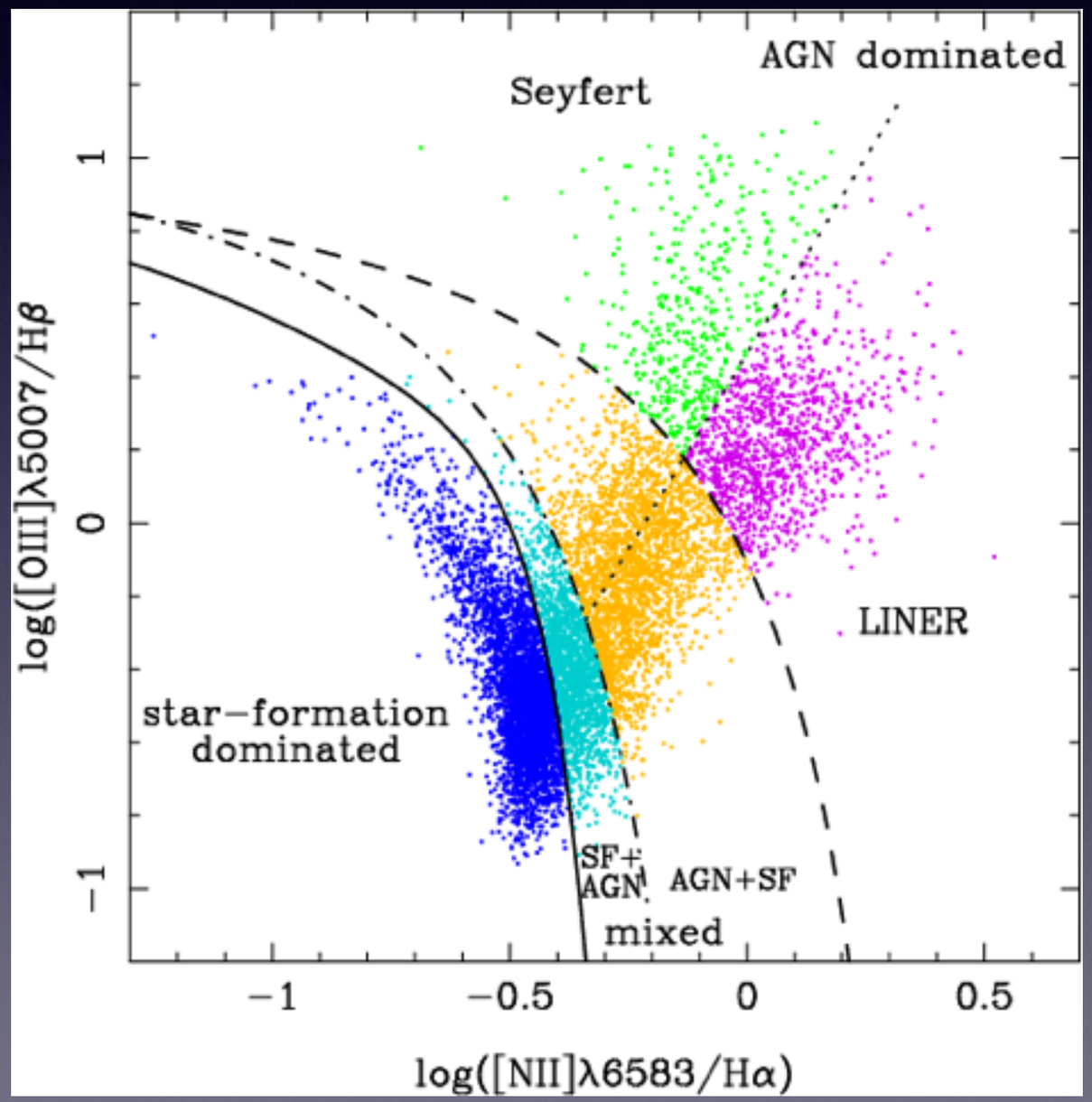
Dataset

the importance of emission lines



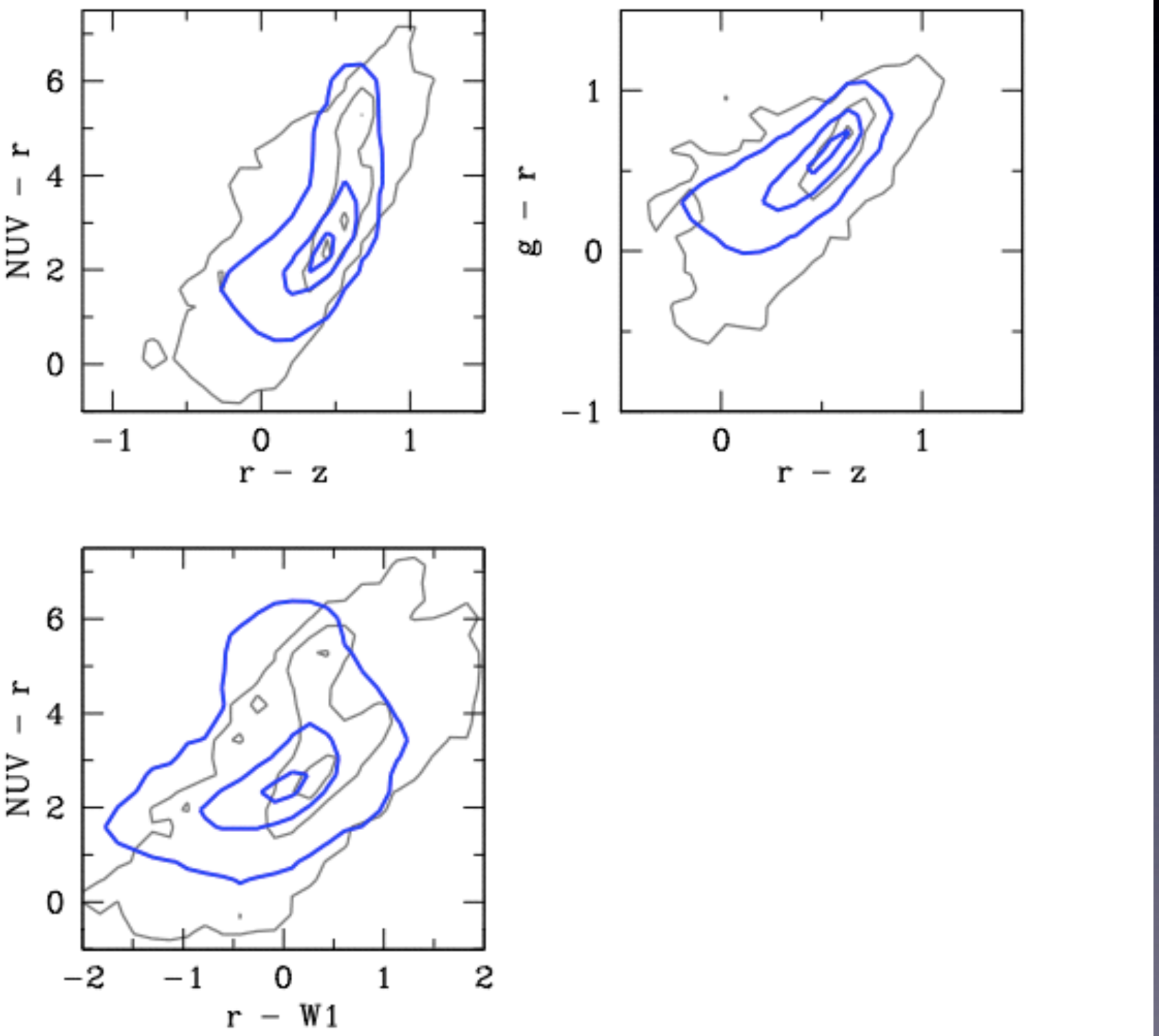
Dataset

the importance of emission lines

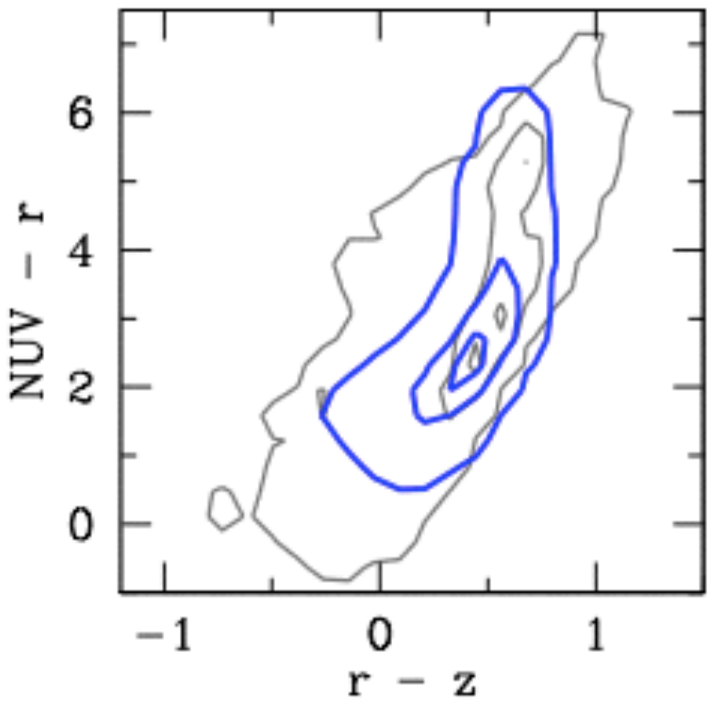


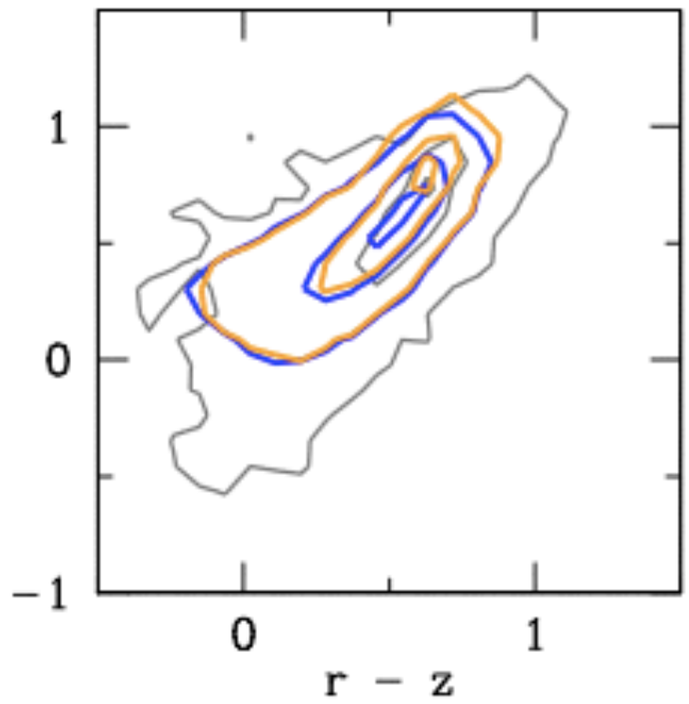
Model + Dataset

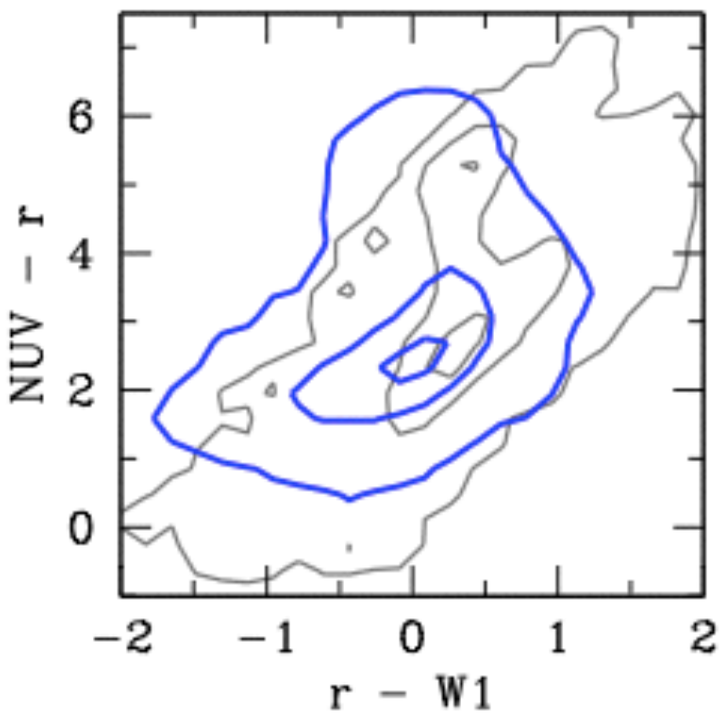
Model + Dataset



Model + Dataset







~ 240,000 galaxies without GALEX

Preliminary results

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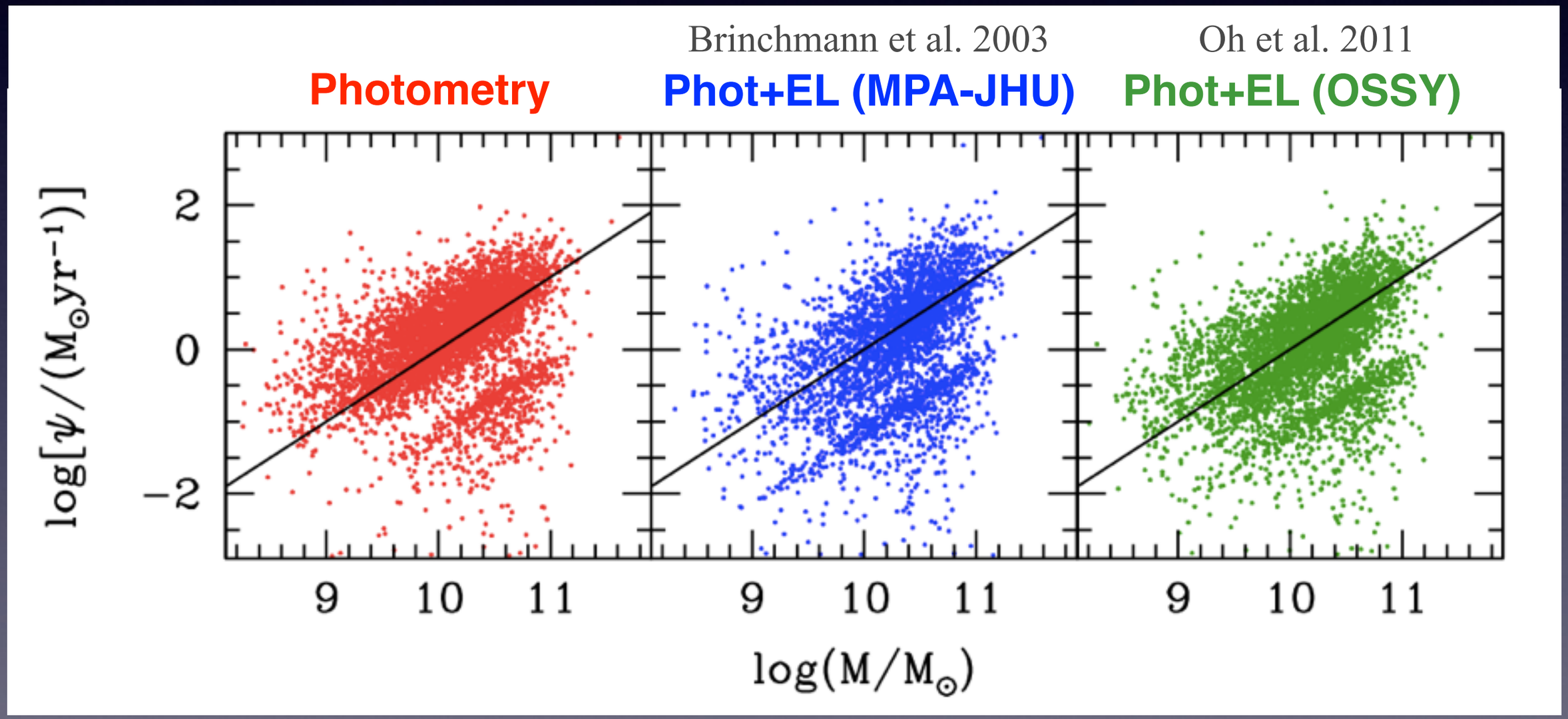
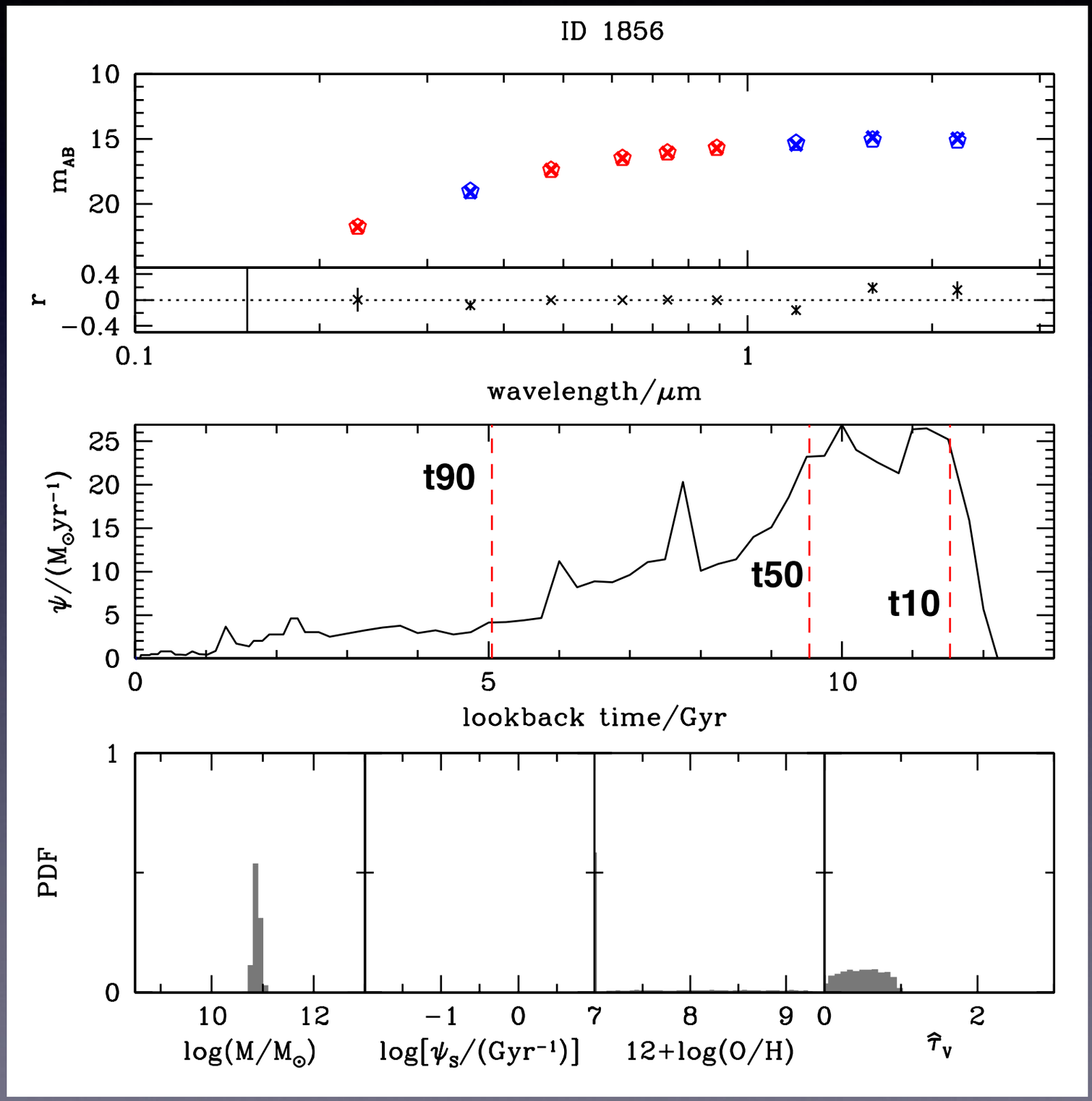
Diagnostics: the star-formation main sequence



Preliminary results



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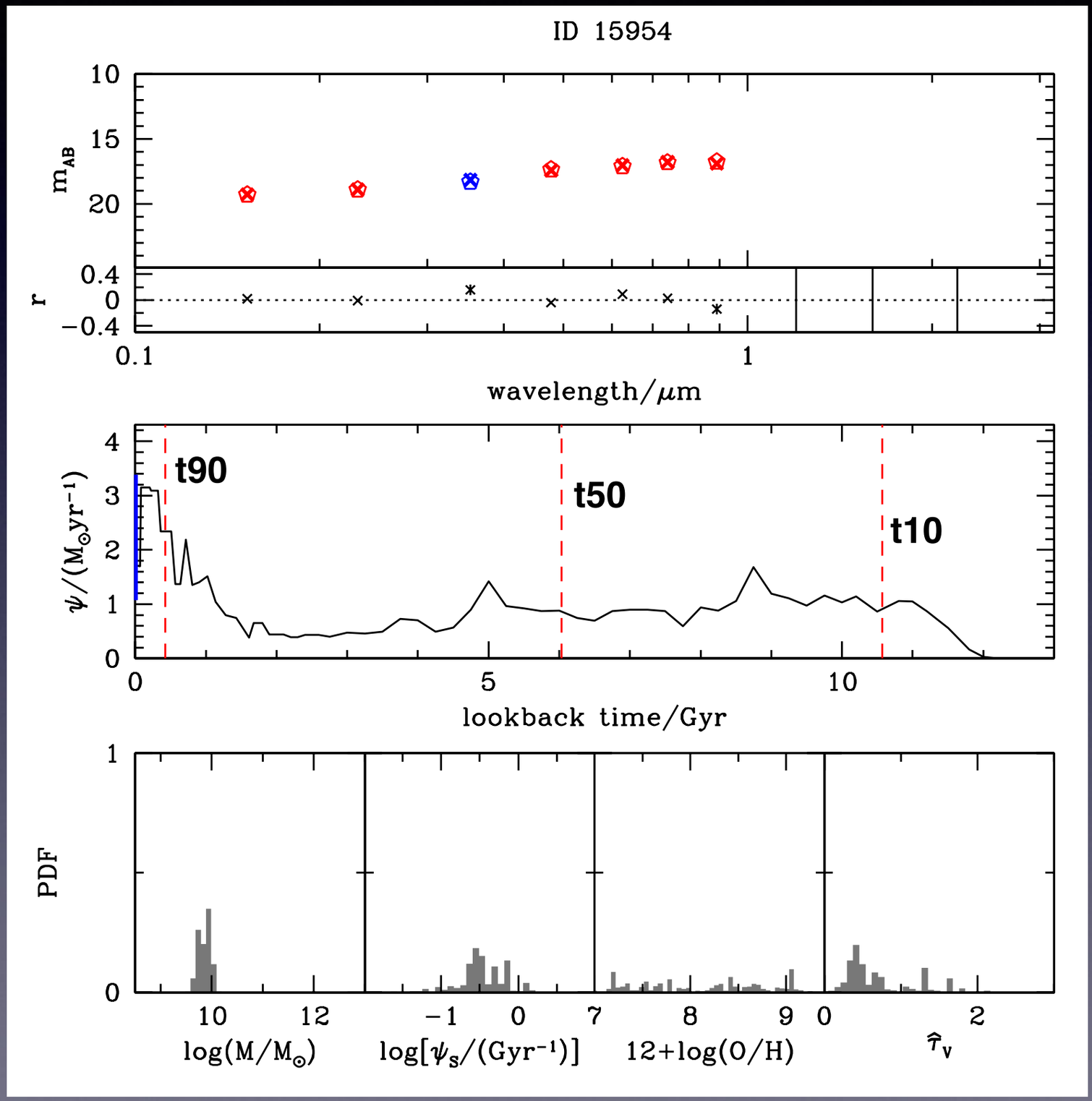

Next steps

- Biases caused by data
- Include absorption features?
- Catalog galaxies by position in clusters/groups
- Role of AGNs