

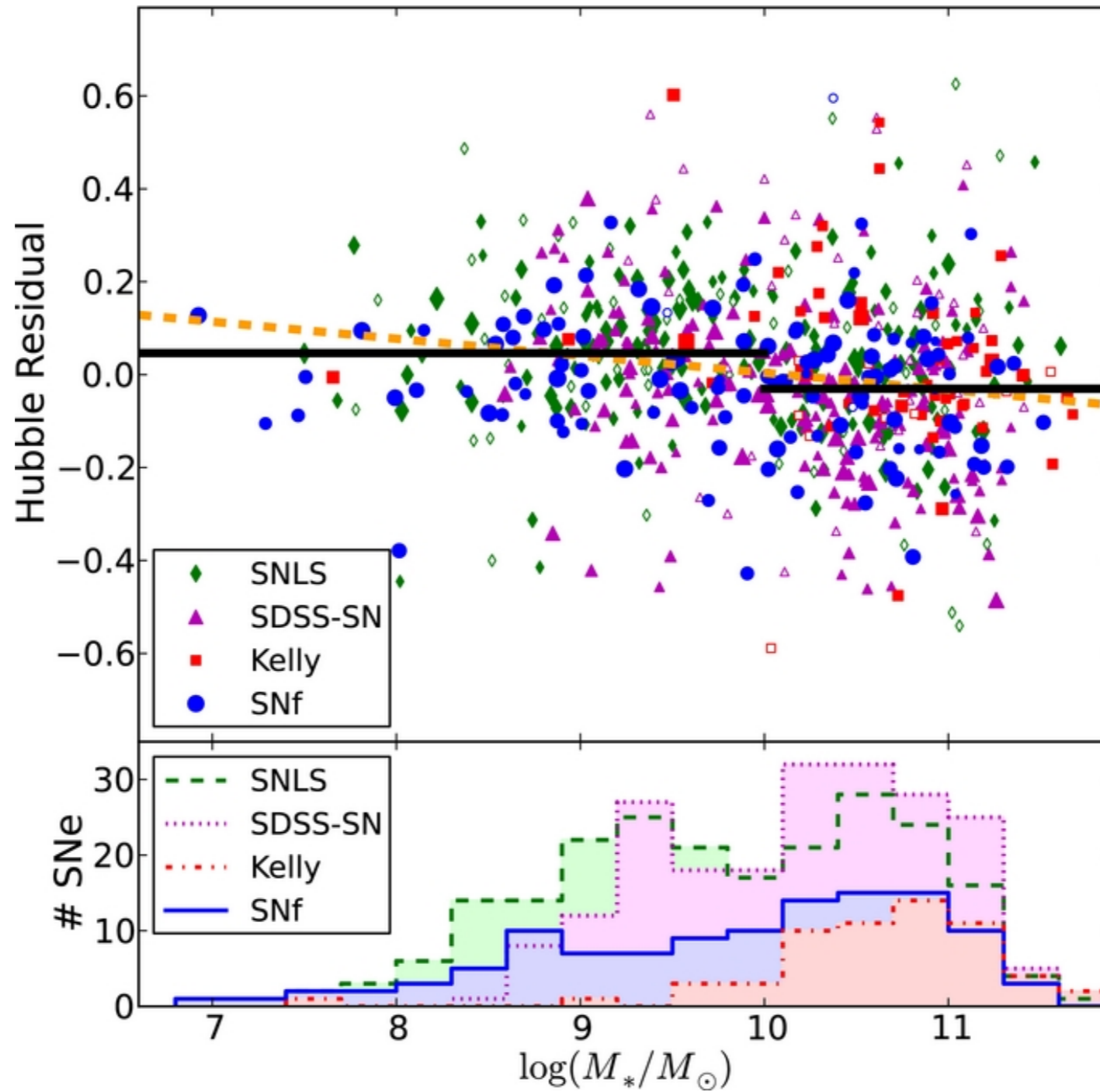


Host galaxy environment influence on Type Ia Supernovae

Martin BRIDAY - m.briday@ipnl.in2p3.fr

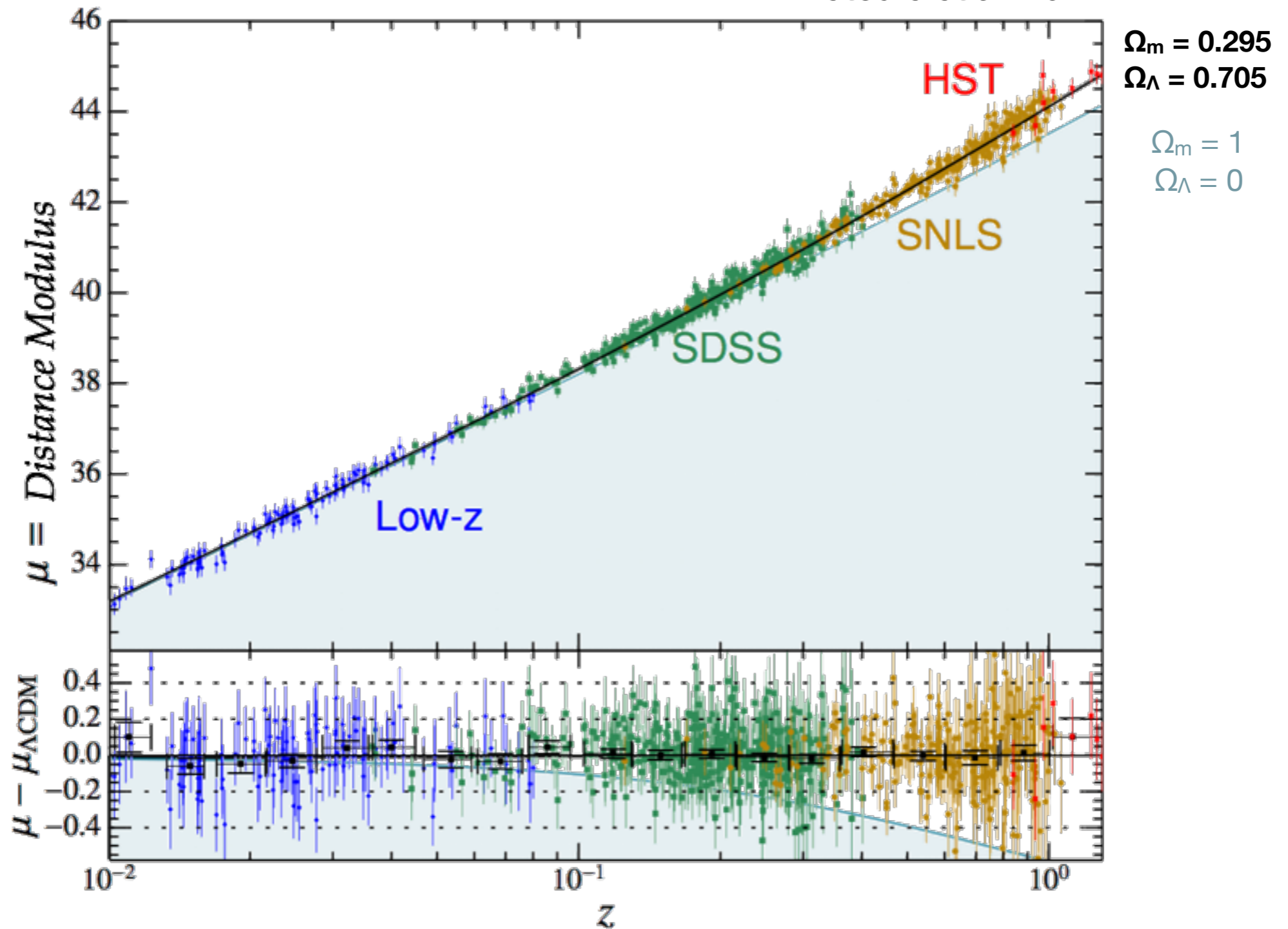
Mass step

Childress et al. 2013



Hubble residuals

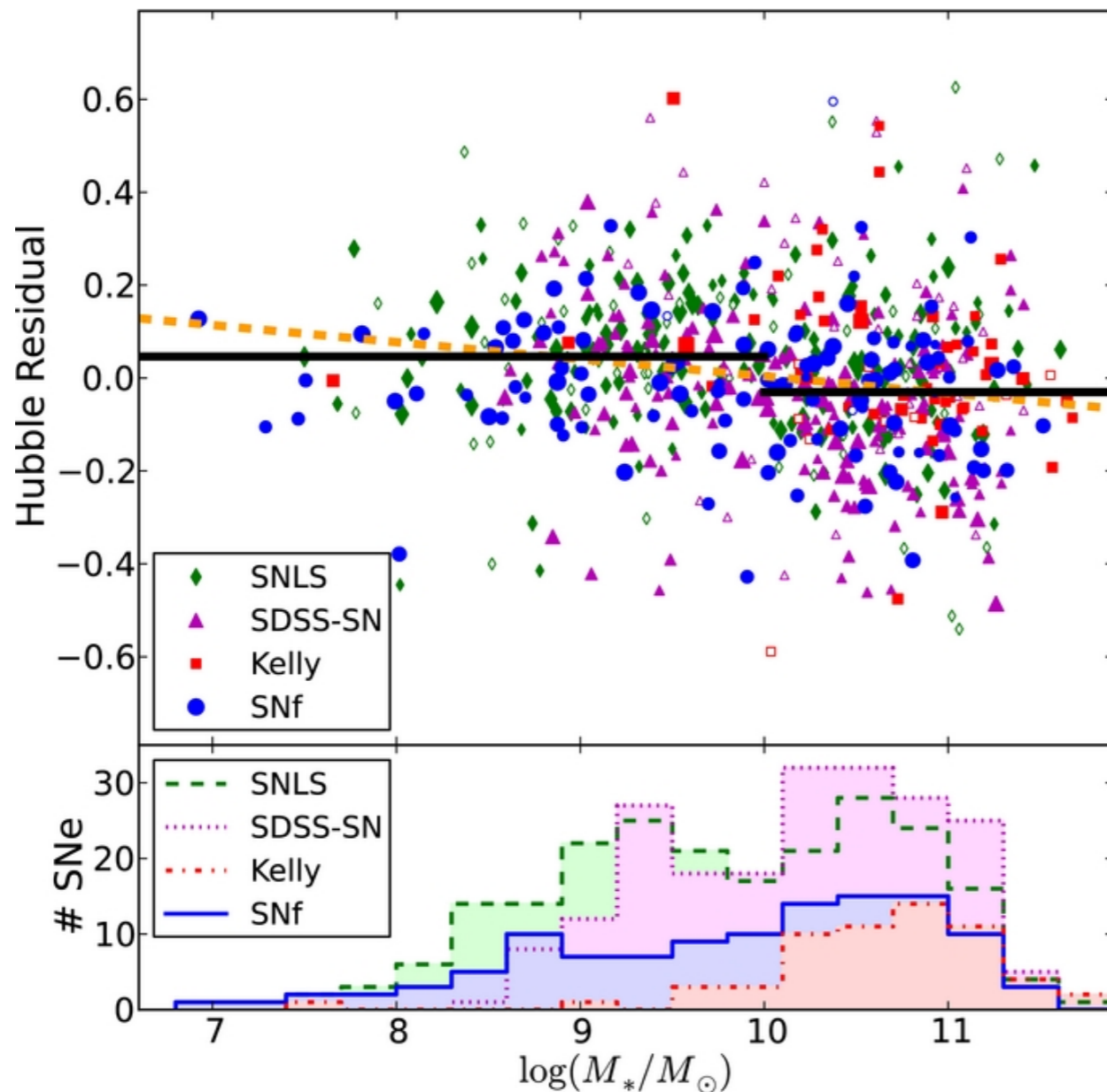
Betoule et al. 2014



Mass step

Fainter
↓
Brighter

Childress et al. 2013

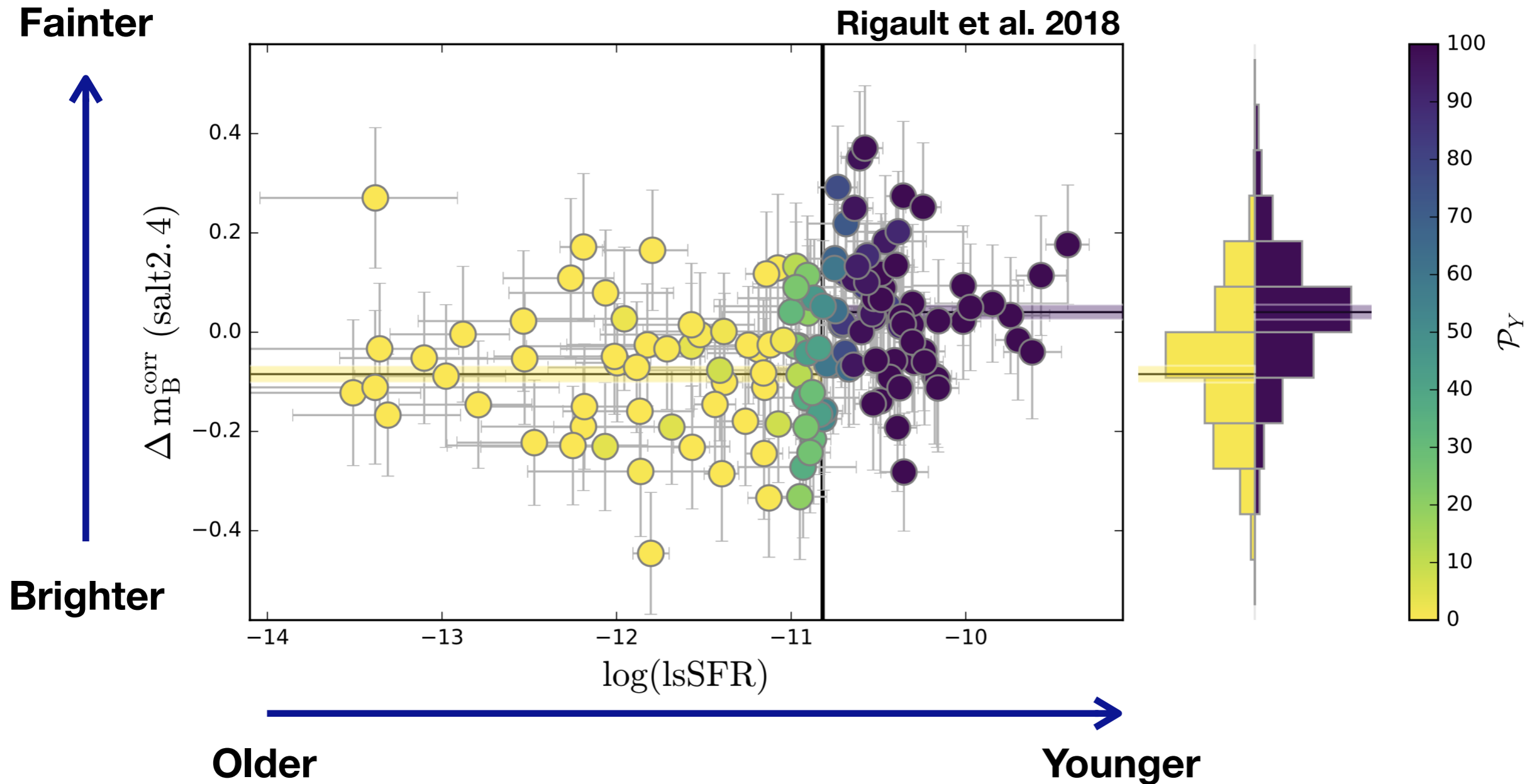


$\Delta \text{HR} = 0.077 \pm 0.014 \text{ mag}$

Lighter

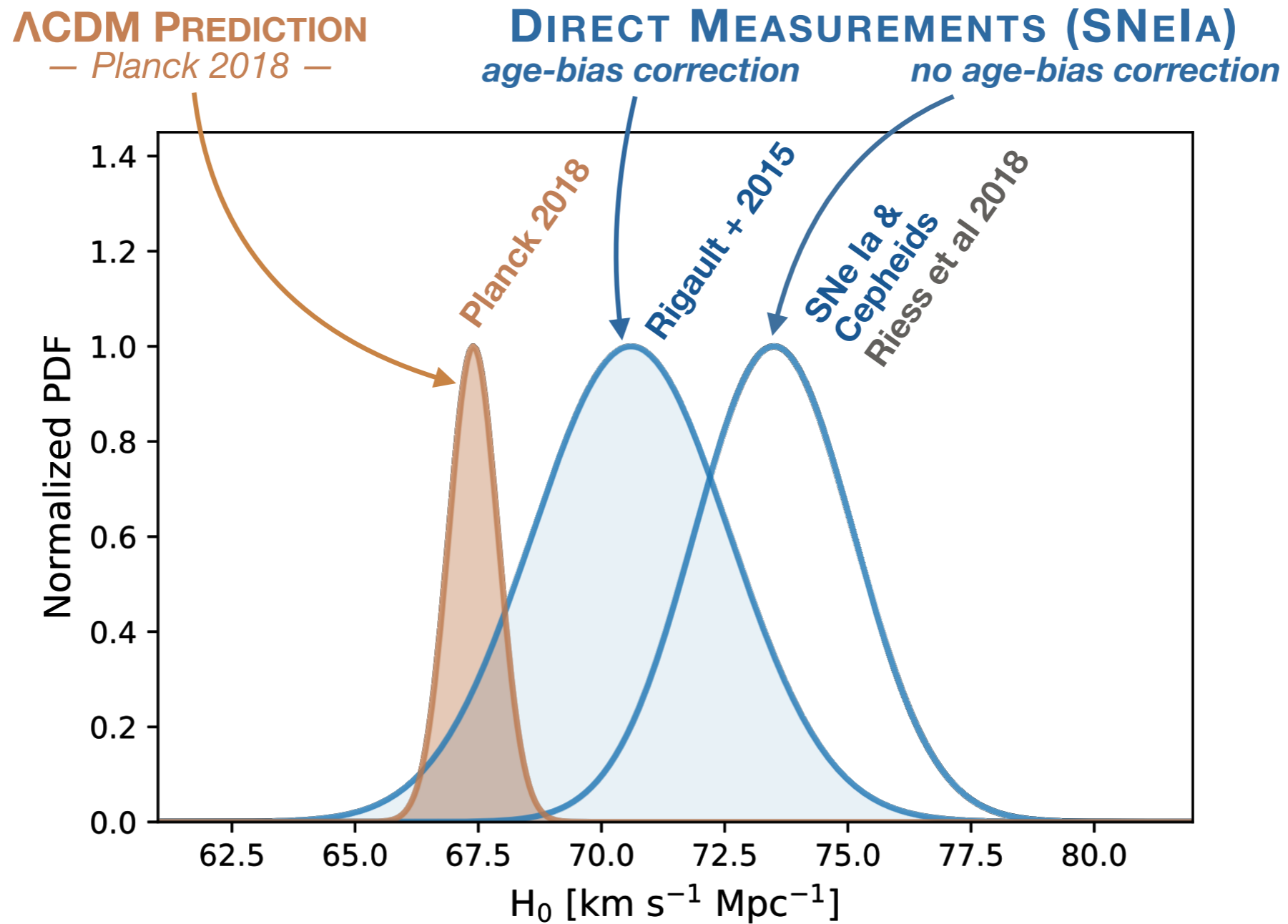
Heavier

Age step



$$\Delta \text{HR} = 0.163 \pm 0.029 \text{ mag}$$

Hubble constant tension

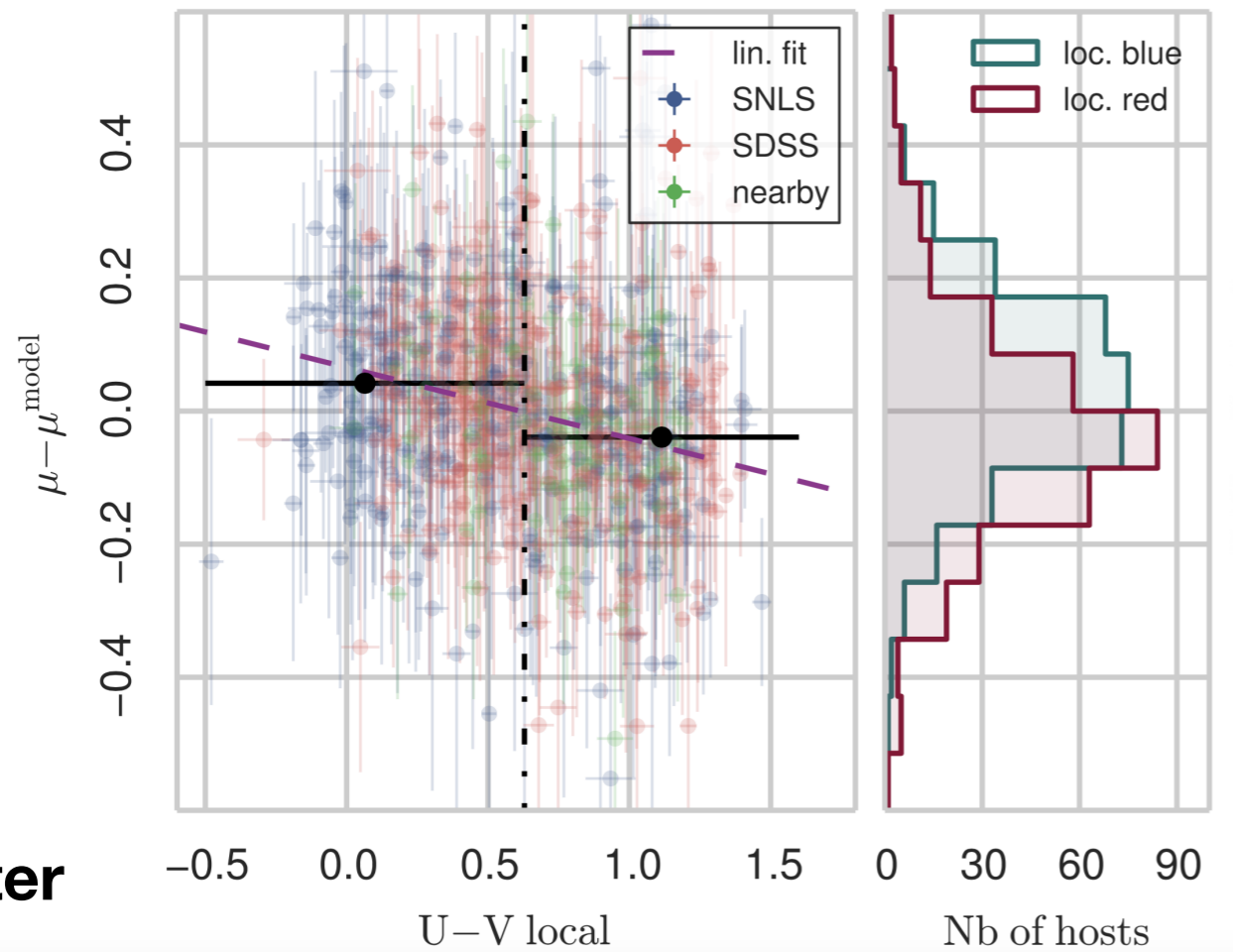


$H_0 \sim 70.6 \pm 2.5 \text{ km s}^{-1} \text{Mpc}^{-1}$

Age steps

Fainter

Roman et al. 2017

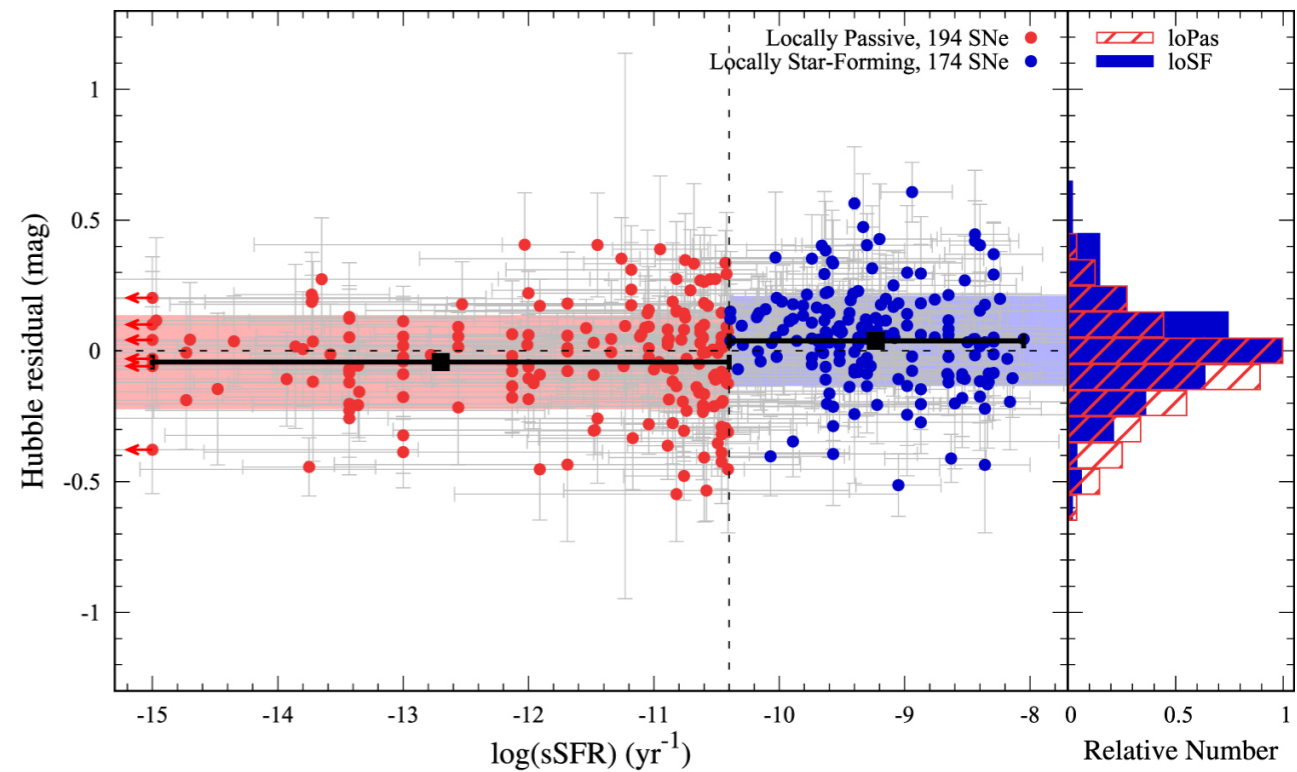


Brighter

Bluer

Redder

Kim et al. 2018



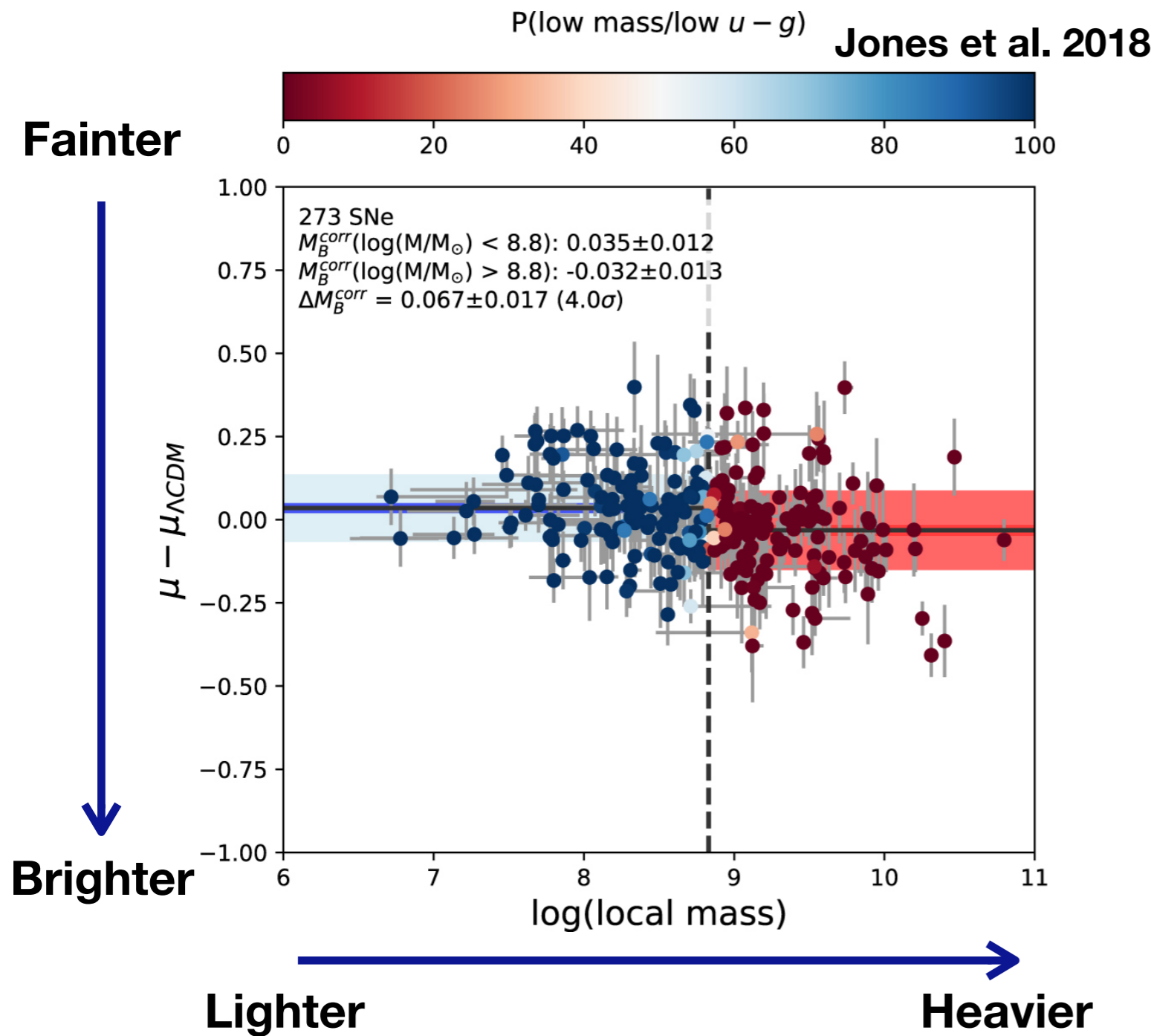
Older

Younger

$$\Delta \text{HR} = 0.091 \pm 0.013 \text{ mag}$$

$$\Delta \text{HR} = 0.081 \pm 0.018 \text{ mag}$$

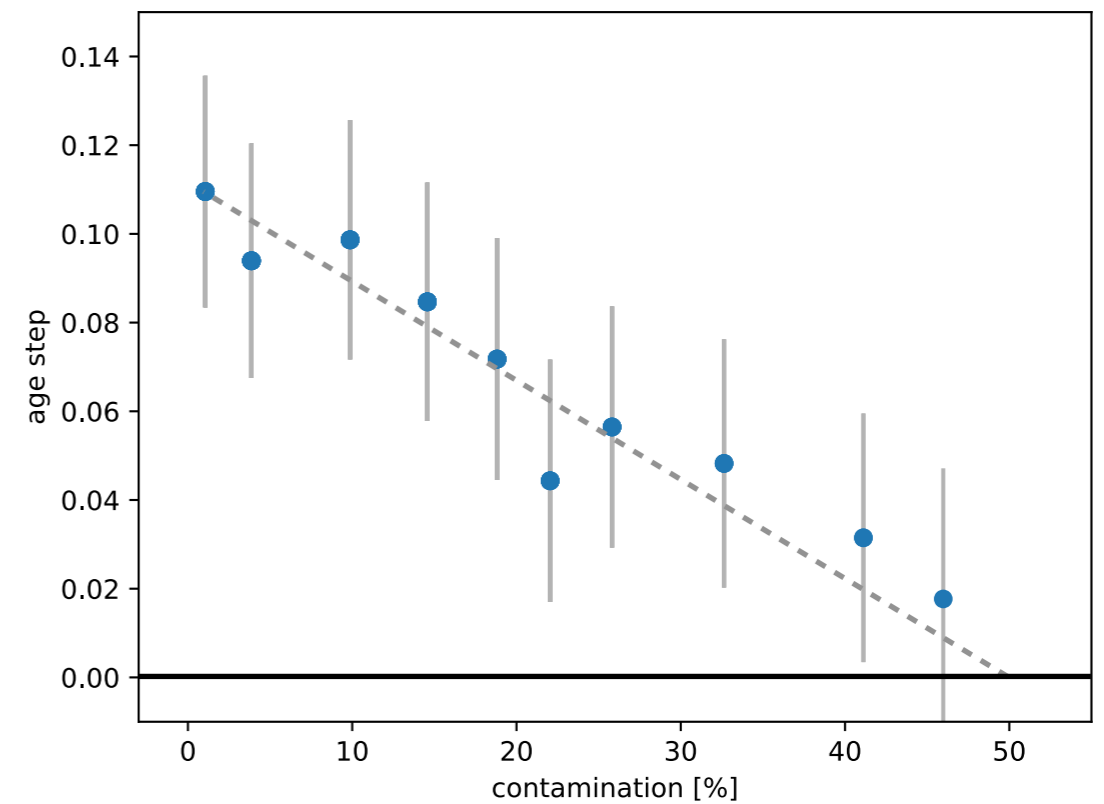
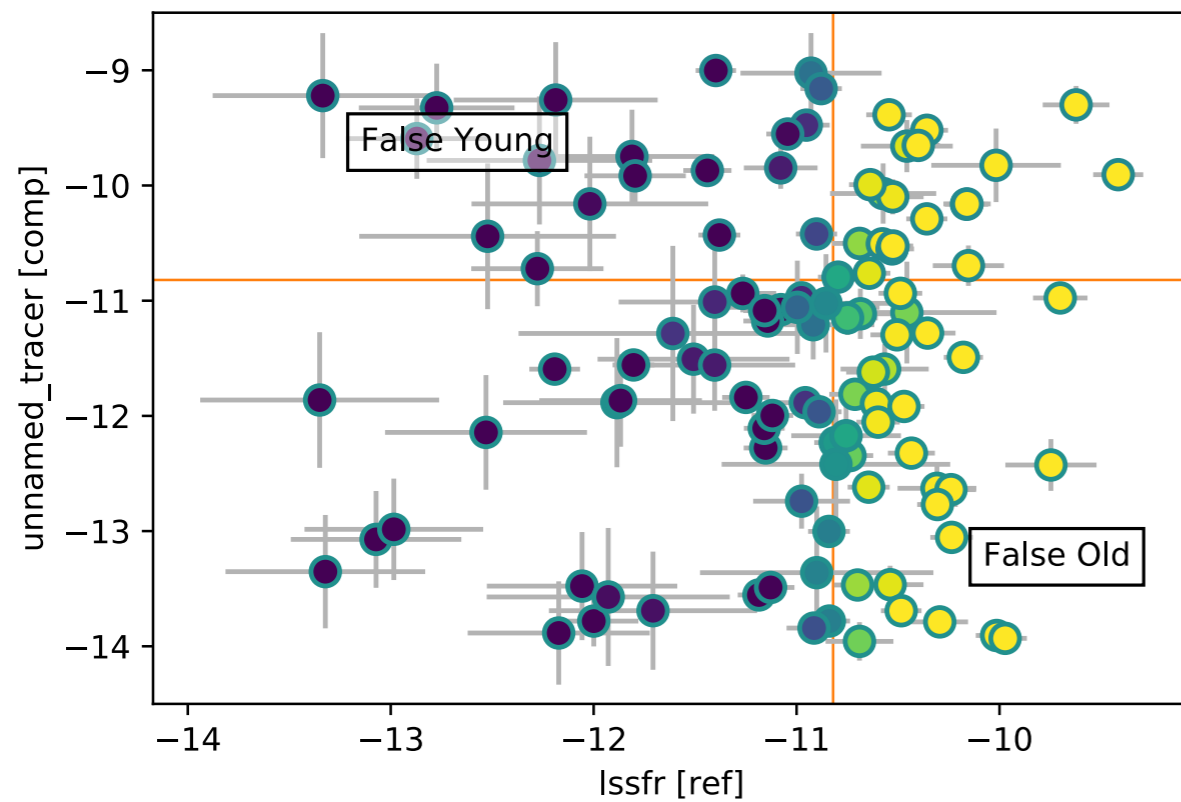
Age steps



$\Delta \text{HR} = 0.067 \pm 0.017 \text{ mag}$

Contamination

—> False-negative and false-positive fractions



Age tracers

Reference

• Local Specific Star Formation Rate (LsSFR)

• Stellar mass

• Colors

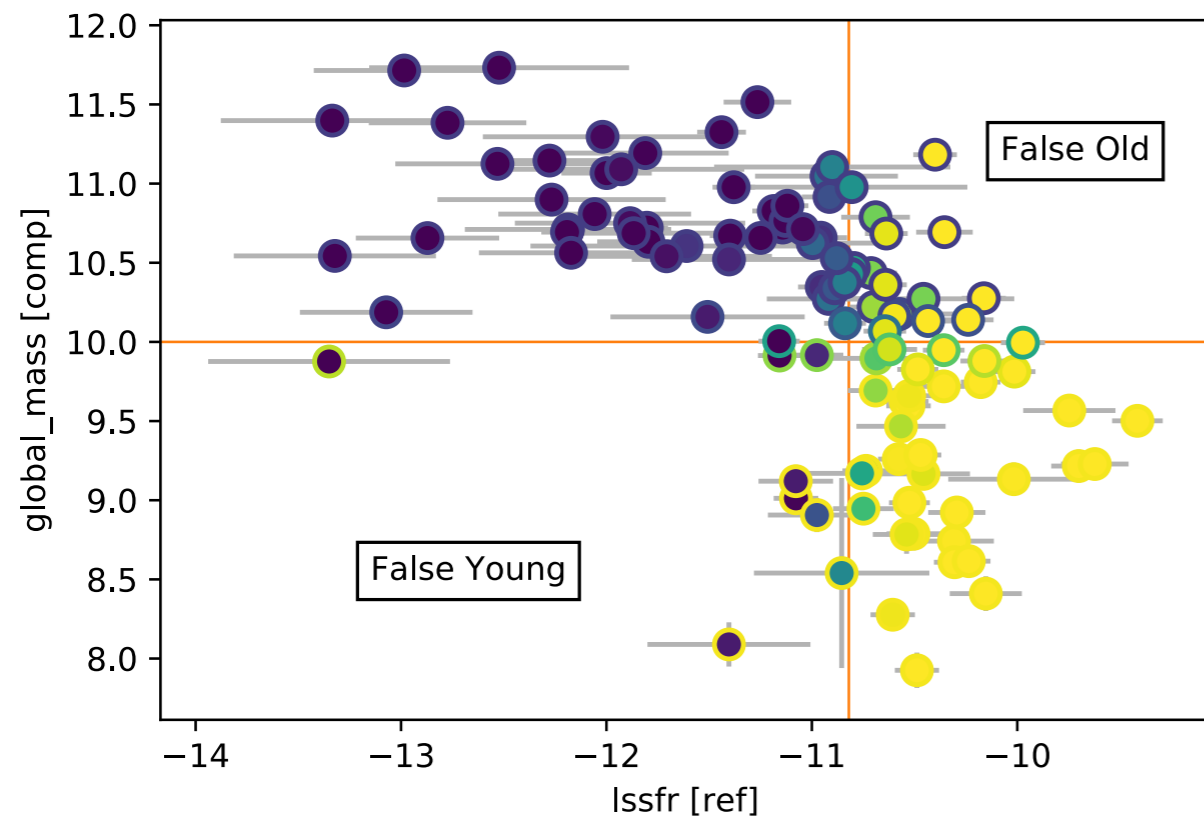
• Morphology

} SNf

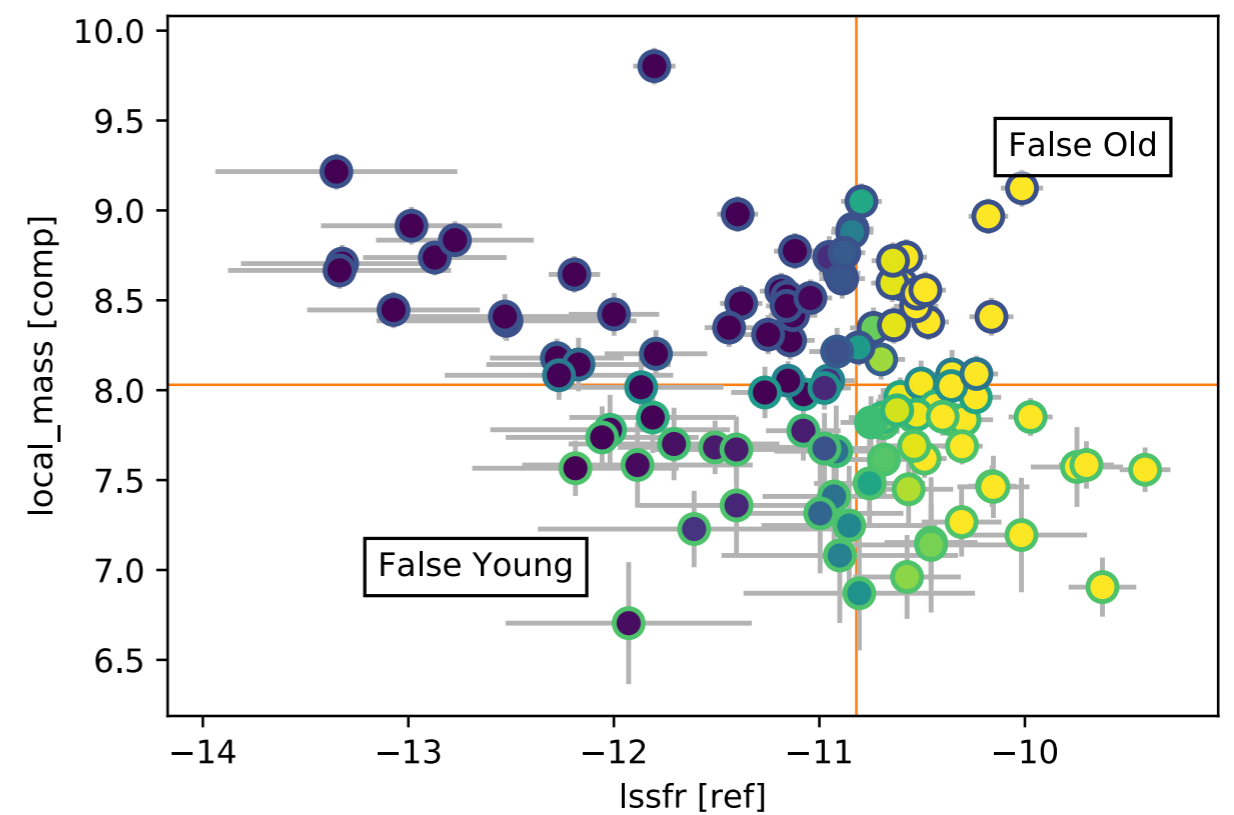
} SDSS

Age tracer : stellar mass

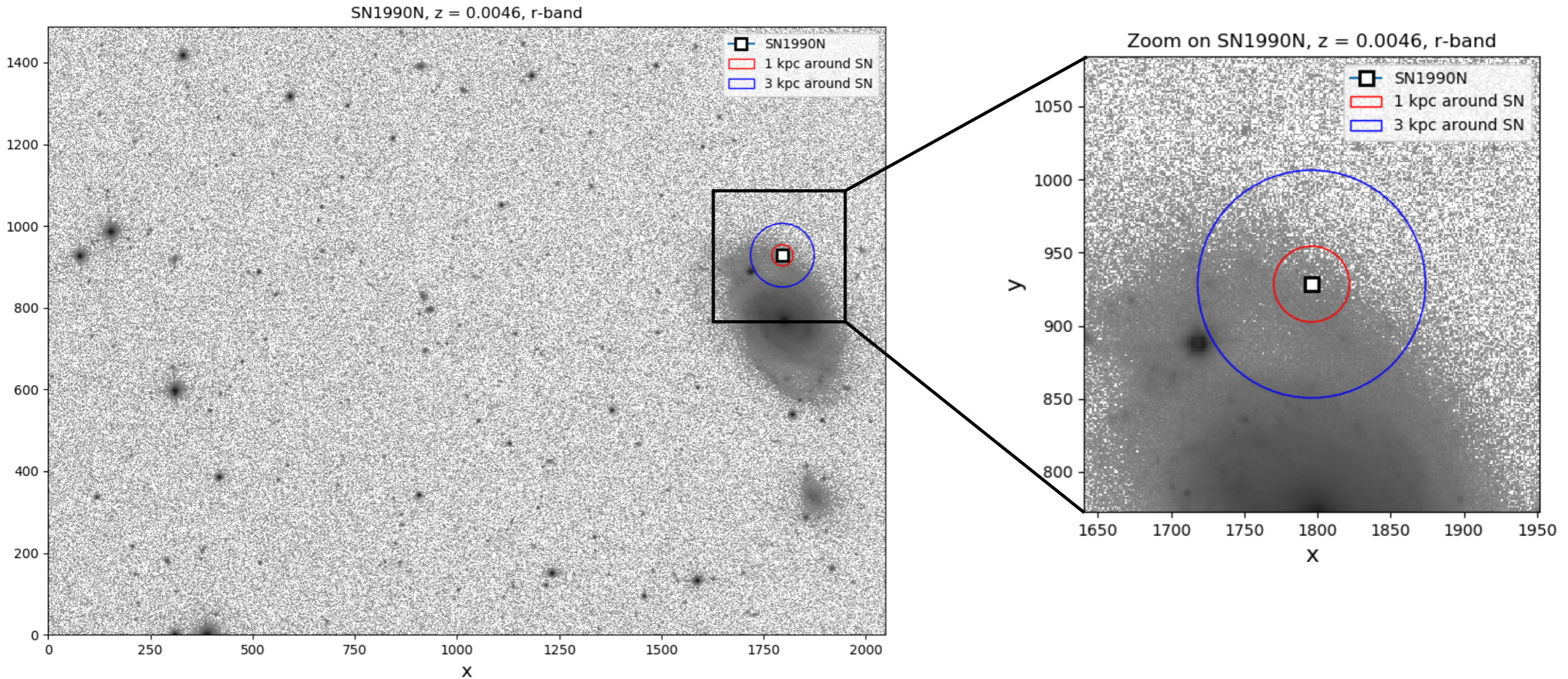
global mass vs. LsSFR



local mass (1 kpc) vs. LsSFR

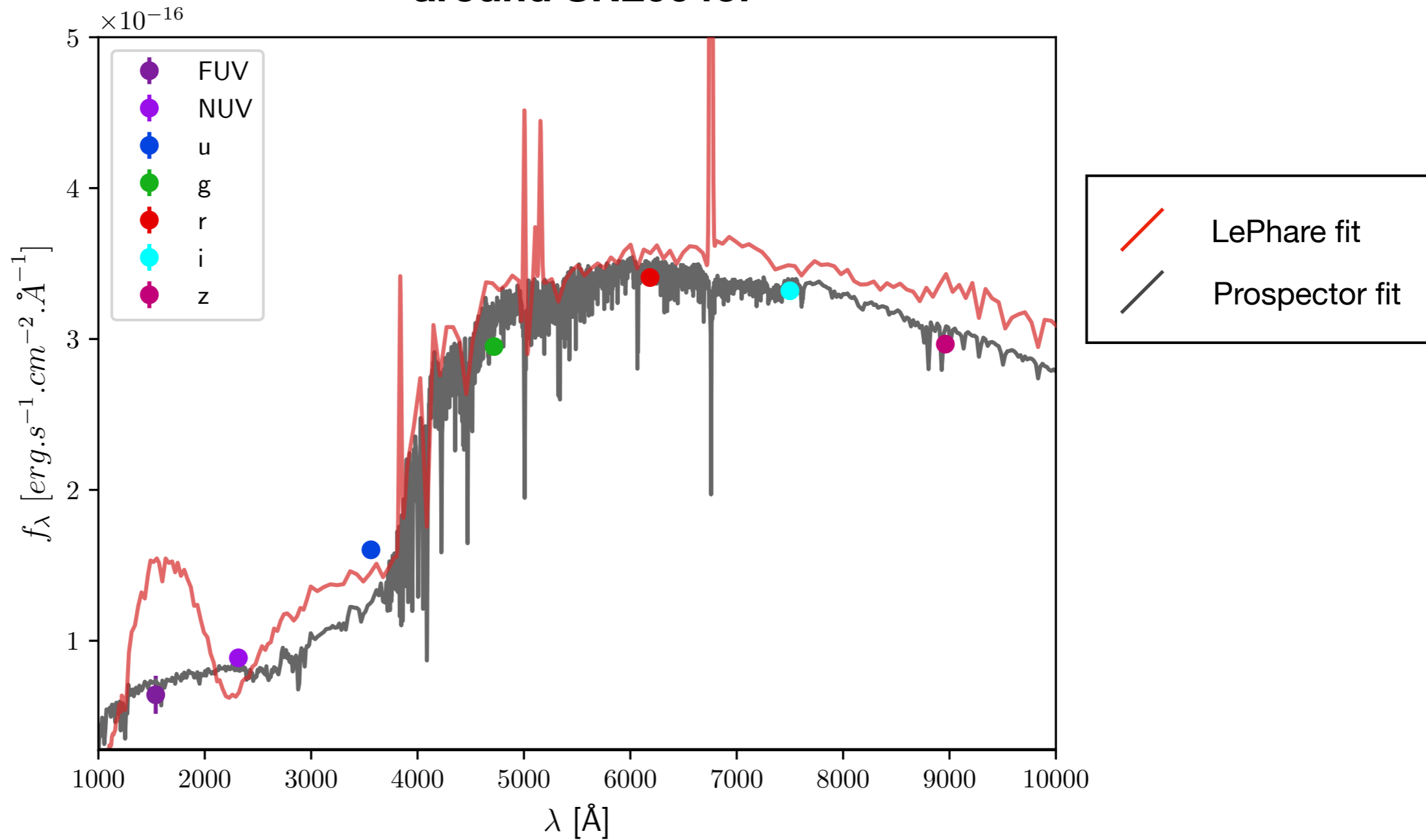


Age tracer : colors



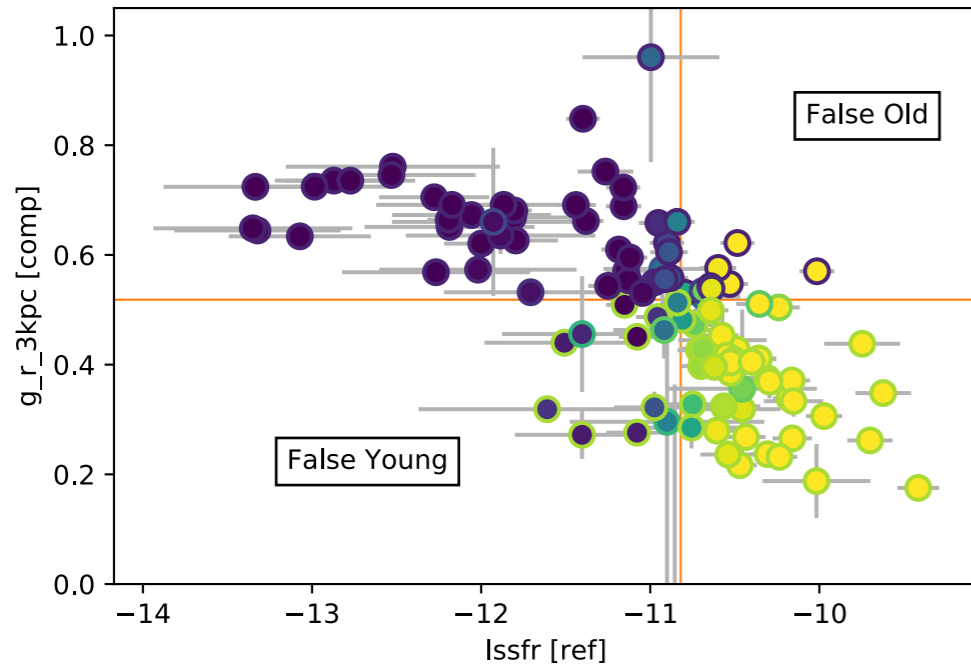
Age tracer : colors

3 kpc radius environment fitted SED spectrum
around SN2004ef

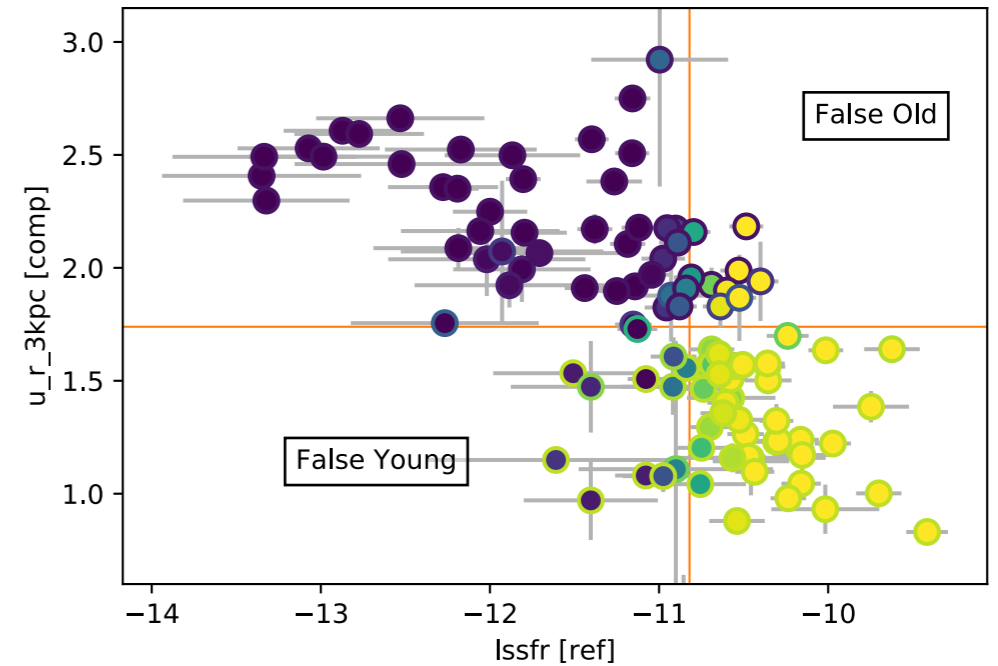


Age tracer : colors

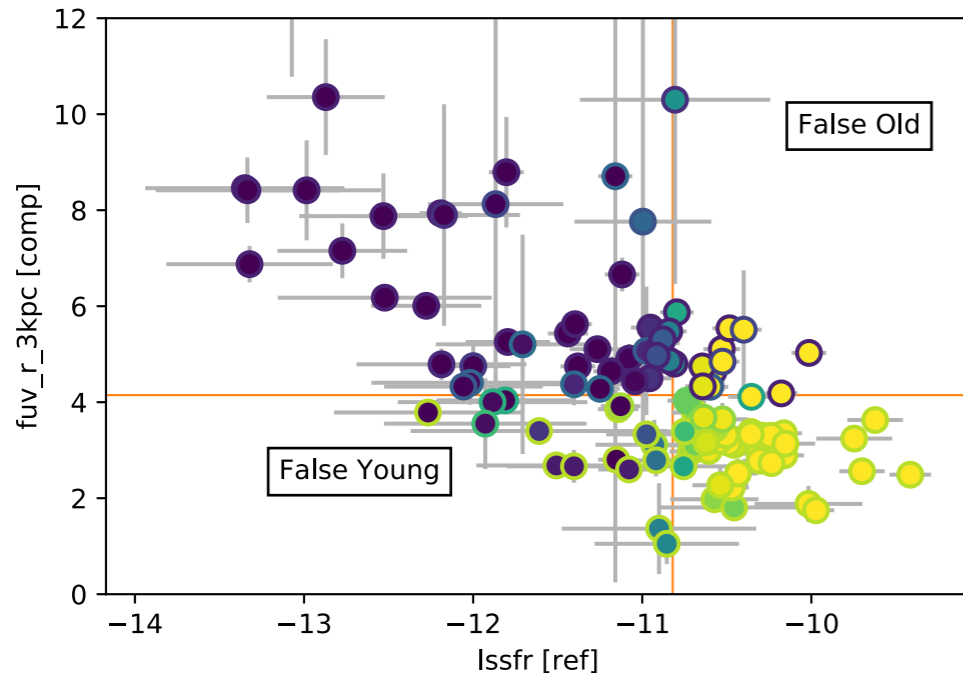
“g-r” (3 kpc) vs. LsSFR



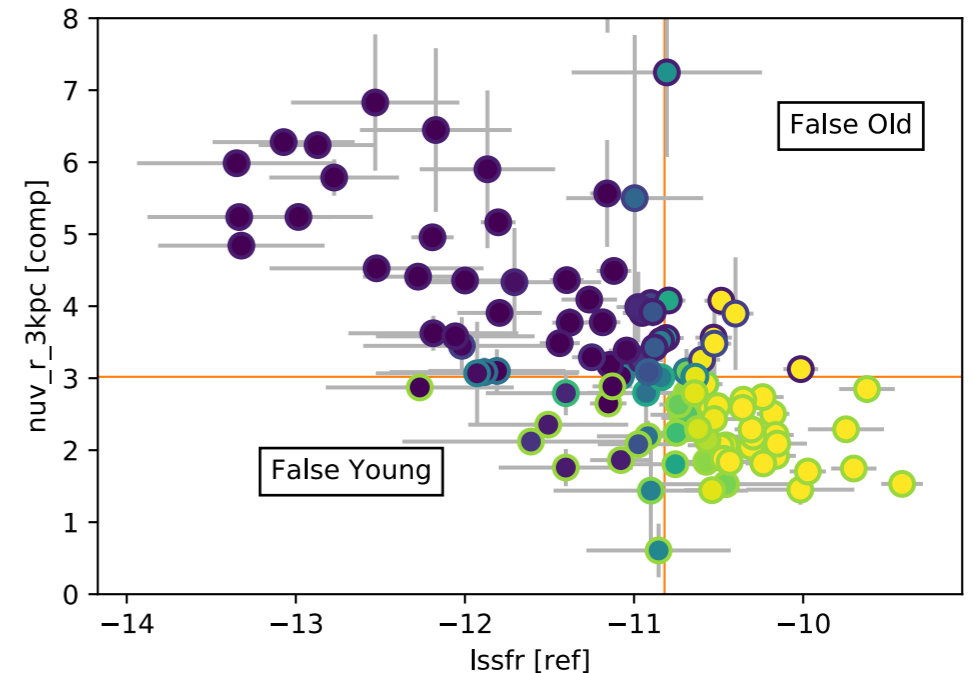
“u-r” (3 kpc) vs. LsSFR



“FUV-r” (3 kpc) vs. LsSFR



“NUV-r” (3 kpc) vs. LsSFR

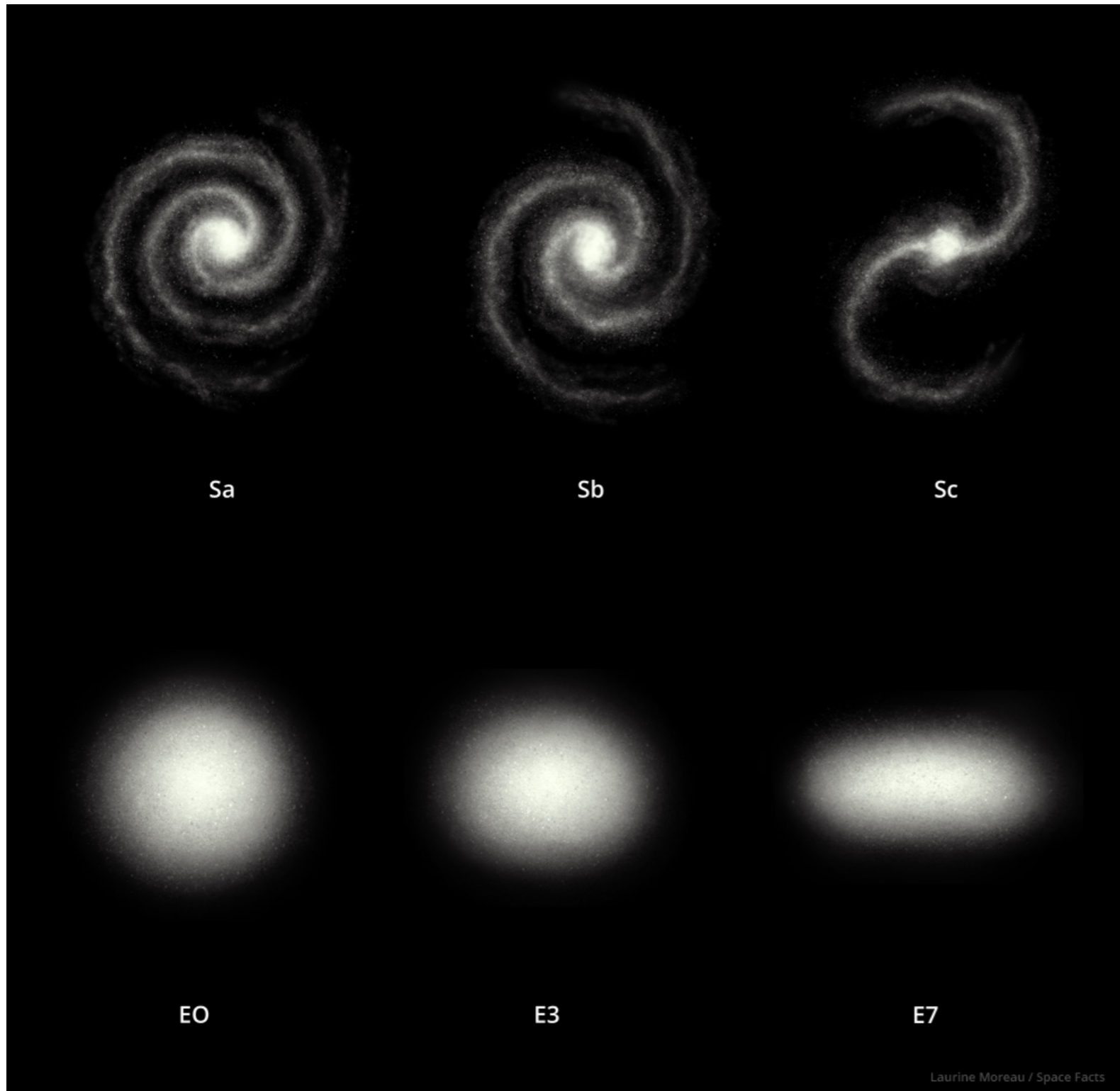


Age tracer : morphology

Inverse Concentration Index:

$$ici = \frac{\text{Petro_R}_{50\%}}{\text{Petro_R}_{90\%}}$$

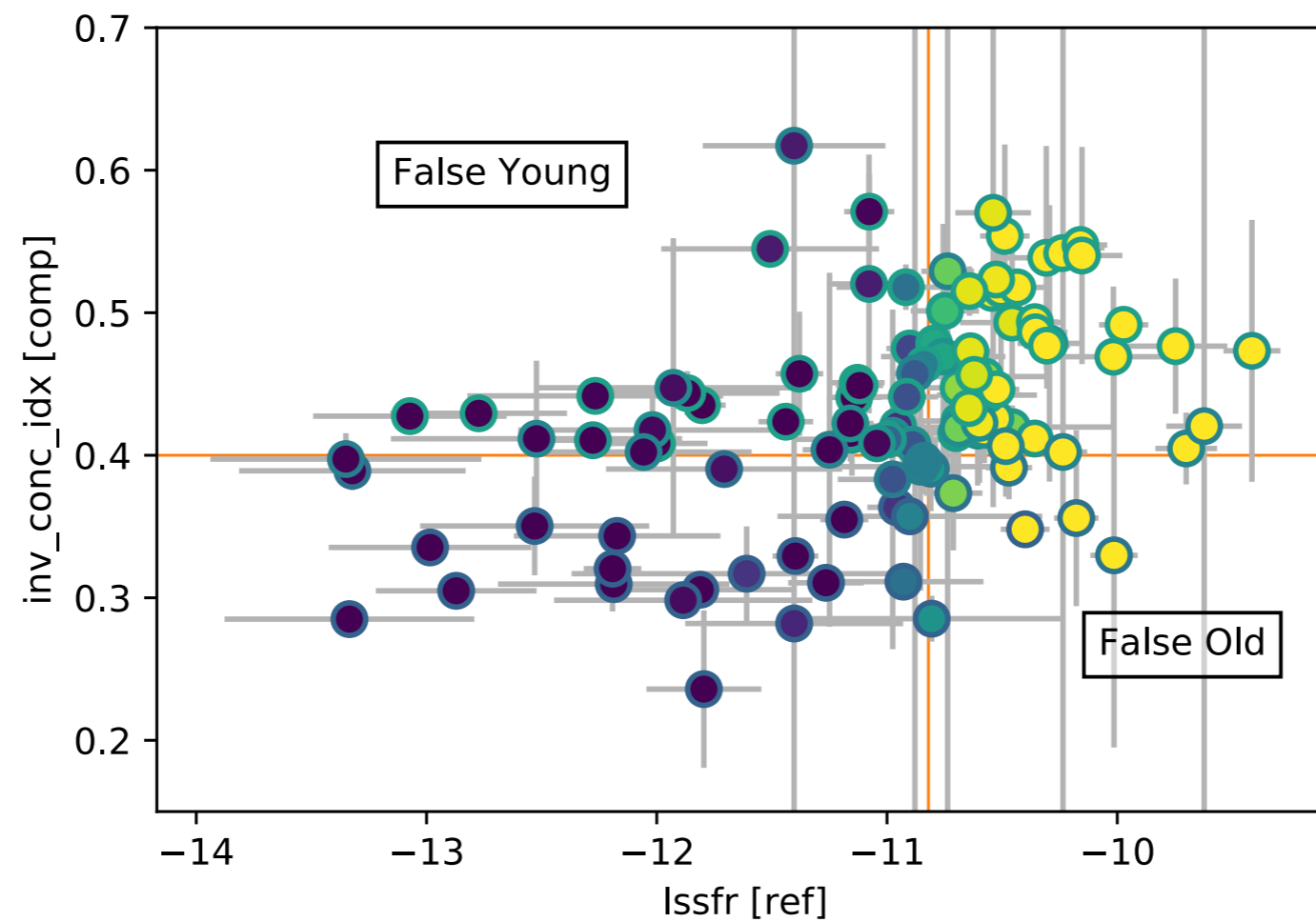
Age tracer : morphology



Sab / Scd : ici ~ 0.43

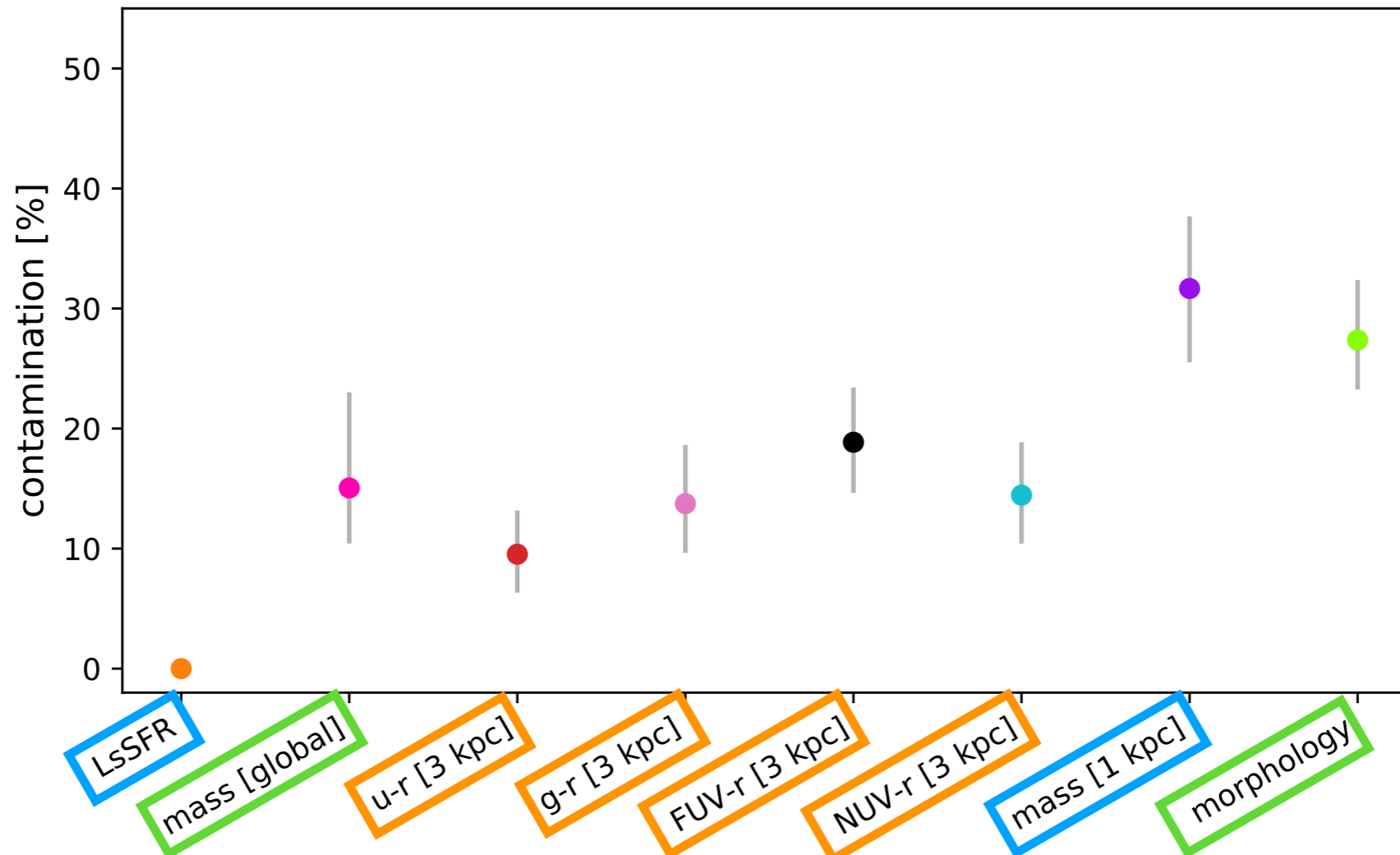
E / S0 : ici ~ 0.3

Age tracers : morphology



Preliminary results

Contaminations

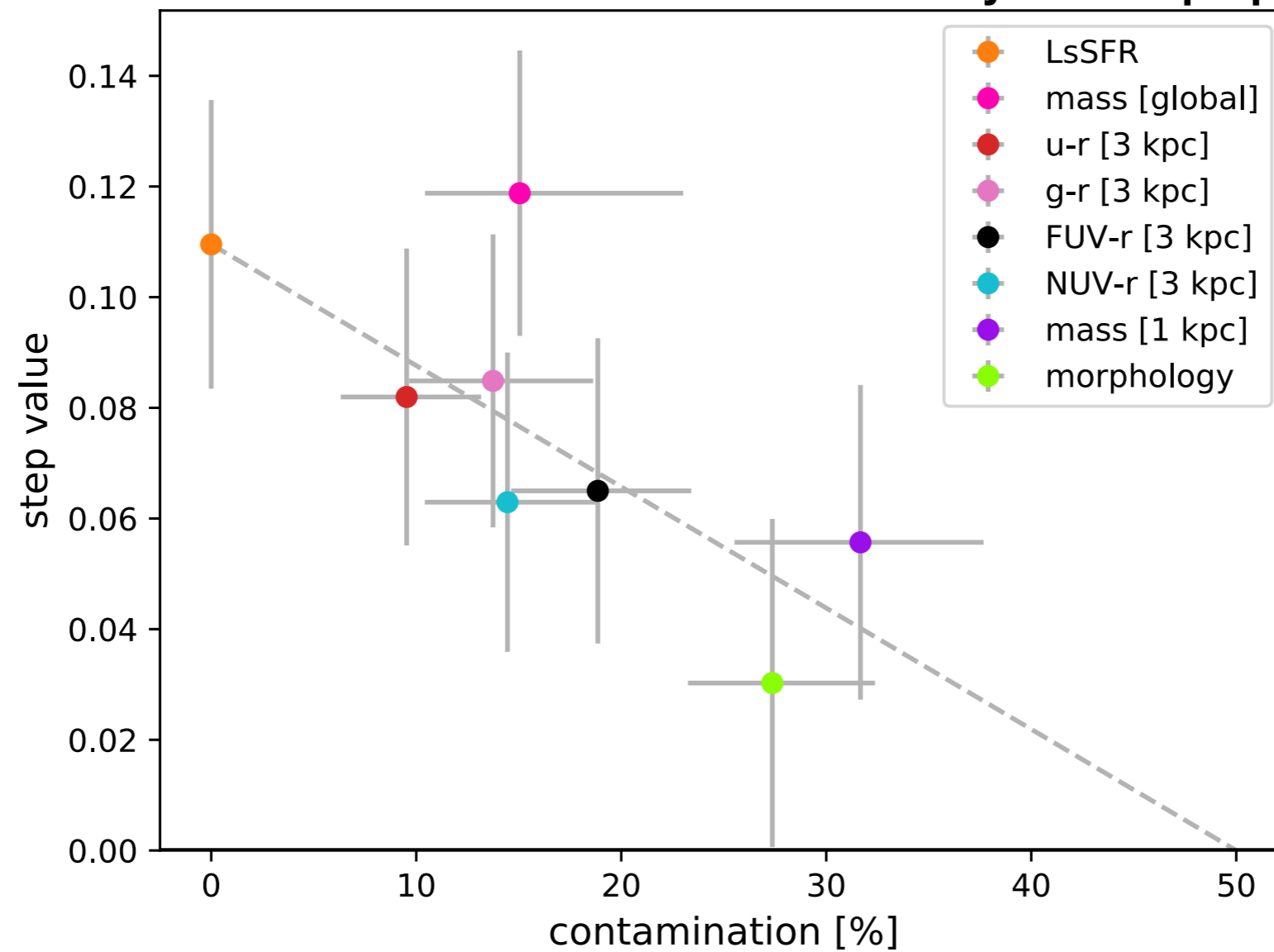


- Local (1 kpc around SNela)
- Semi-local (3 kpc around SNela)
- Global (SNela host galaxy)

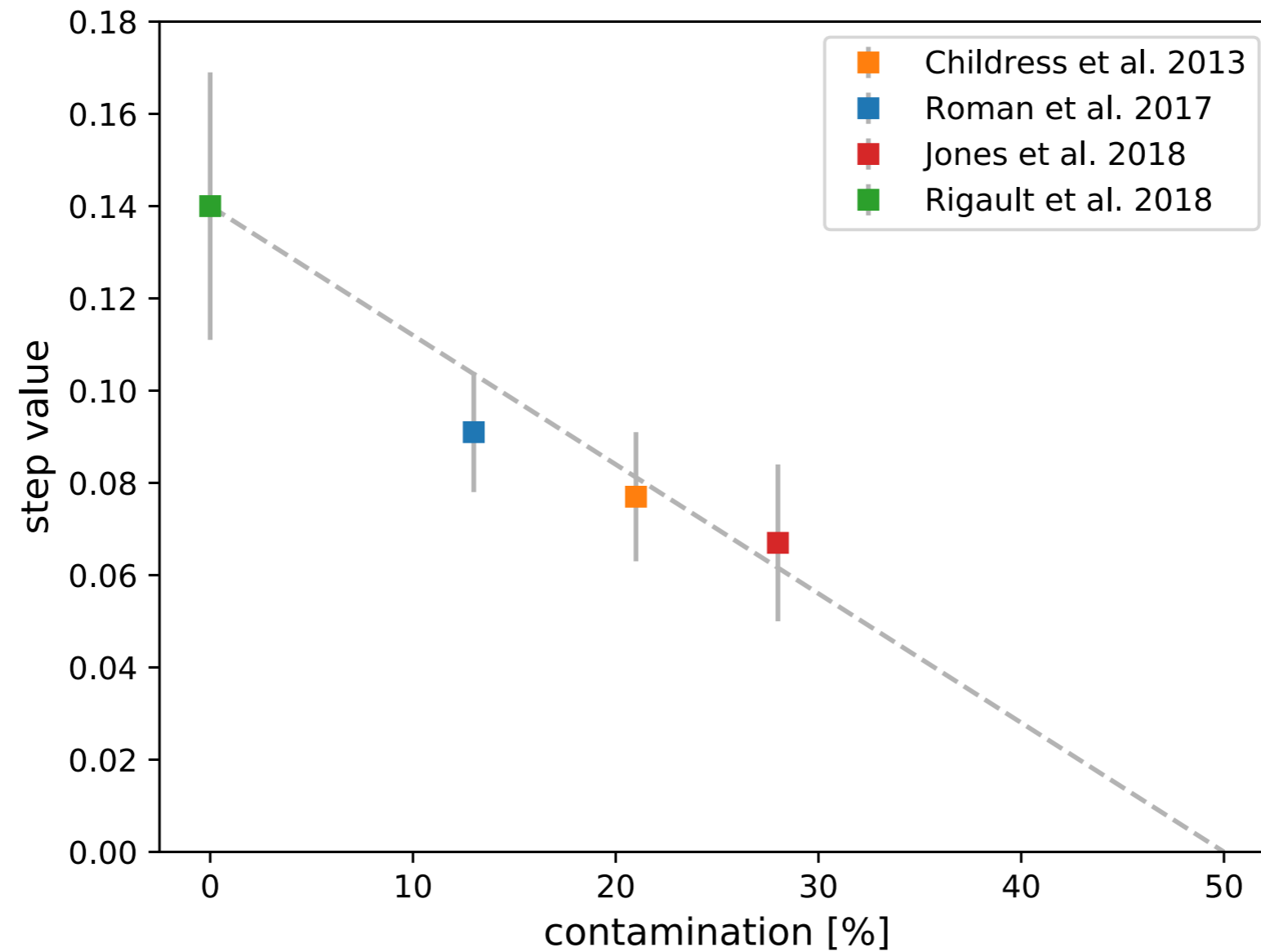
Preliminary results

Age step vs contamination

Briday et al. in prep.



Steps from literature

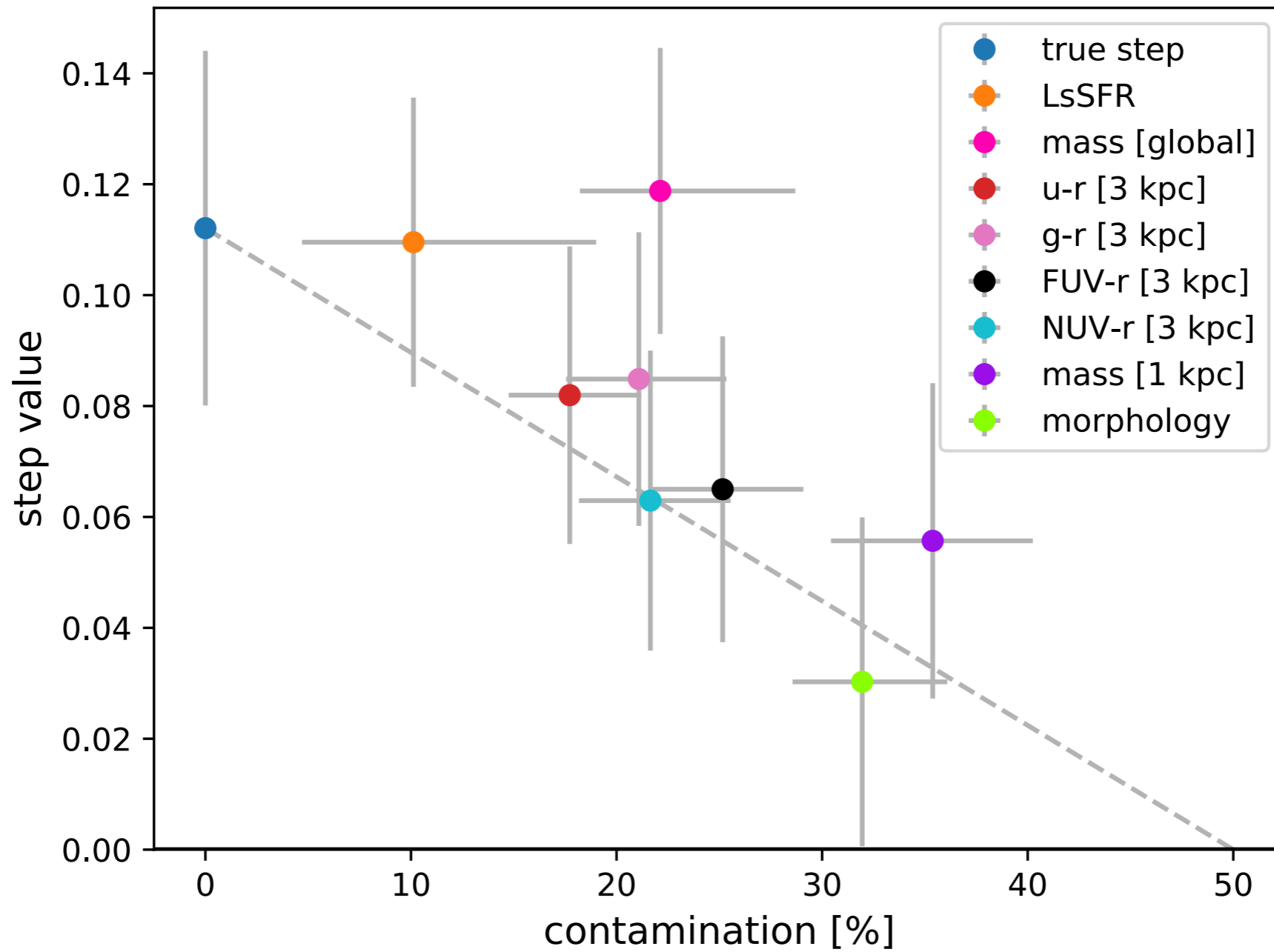


Conclusion

- Still working on MCMC
- Apply on SH0ES sample
- Fit the LsSFR contamination
- Global mass ?

- Questions?

Back-up



Back-up

