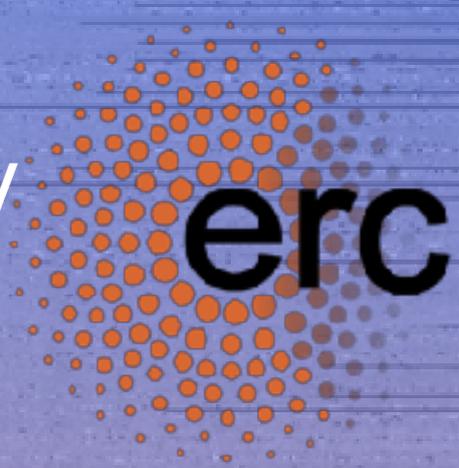




A VLT/VIMOS Public Spectroscopic Survey



*A Lesson in Patience
from LEGA-C*

Arjen van der Wel
Ghent University, Belgium



A VLT/VIMOS Public Spectroscopic Survey



A Lesson in Patience from LEGA-C

- 128 night allocation
- December '14 - April '18
- >3000 galaxies at $0.6 < z < 1.0$
- 20h integrations
- typical $S/N=20/\text{\AA}$ at $R\sim 4500$
- DR2 in 07/2018 (Straatman et al. '18)

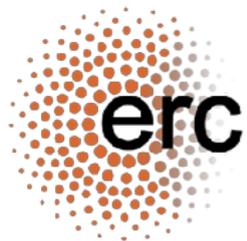
Arjen van der Wel
Ghent University, Belgium

The LEGA-C Collaboration

The LEGA-C group



Ivana Barisic
Priscilla Chauke
Francesco d'Eugenio
Josha van Houdt
Caroline Straatman
Arjen van der Wel (PI)
Aaron Wilkinson
Po-Feng Wu

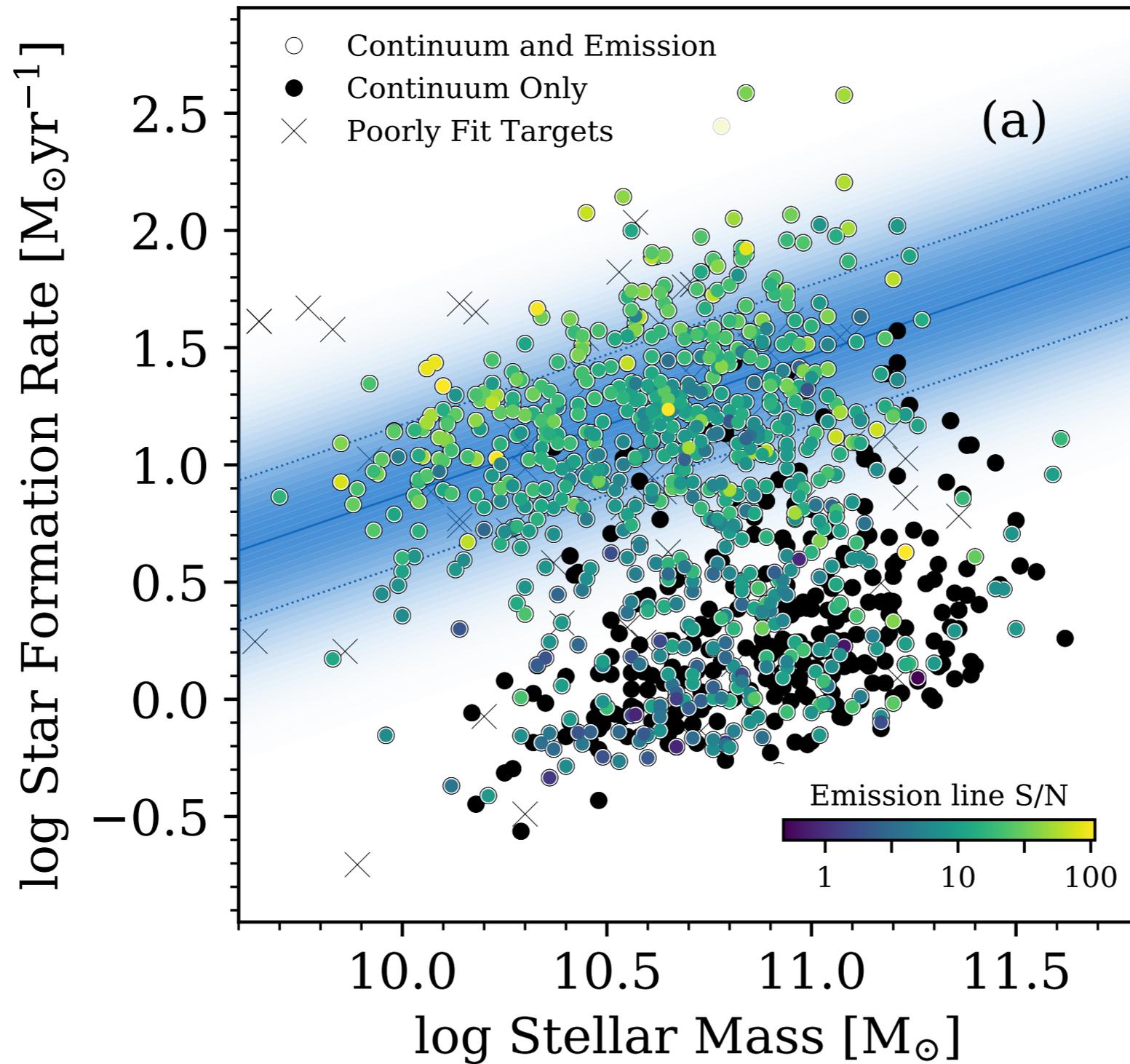


The LEGA-C collaboration

Eric Bell (Michigan, USA)
Rachel Bezanson (Pittsburgh, USA)
Gabriel Brammer (STScI, USA)
Joao Calhau (Lancaster)
Stephane Charlot (IA Paris)
Marijn Franx (Leiden)
Anna Gallazzi (Arcetri)
Ivo Labbe (Leiden)
Michael Maseda (Leiden)
Juan Carlos Munoz (ESO)
Adam Muzzin (York, Canada)
Kai Noeske (Heilbronn planetarium)
Camilla Pacifici (STScI, USA)
Hans-Walter Rix (MPIA)
David Sobral (Lancaster)
Jesse van de Sande (Sydney, Australia)
Ros Skelton (Capetown, South Africa)
Justin Spilker (Arizona, USA)
Pieter van Dokkum (Yale, USA)
Vivienne Wild (St. Andrews)
Christian Wolf (ASU, Australia)

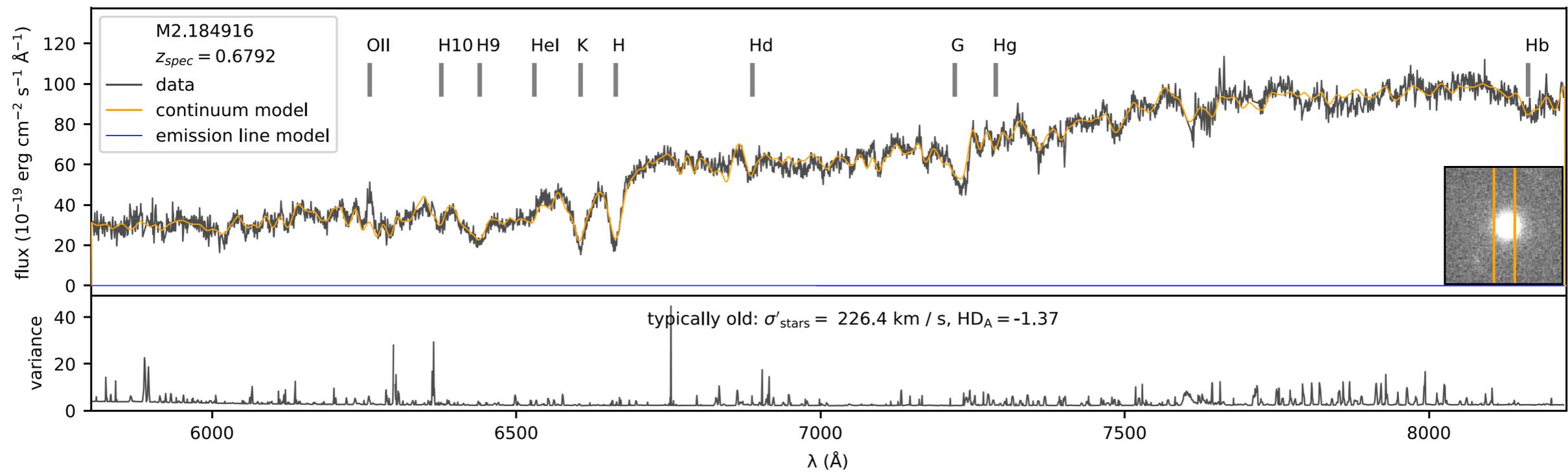
Basic sample properties

Bezanson, et al. 2018b

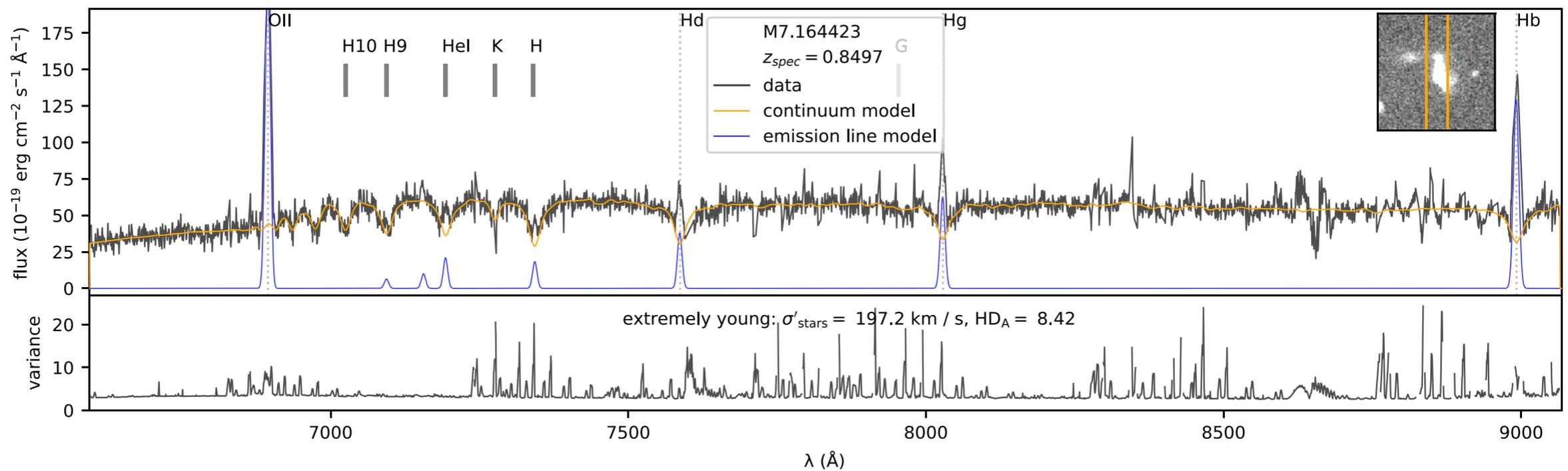
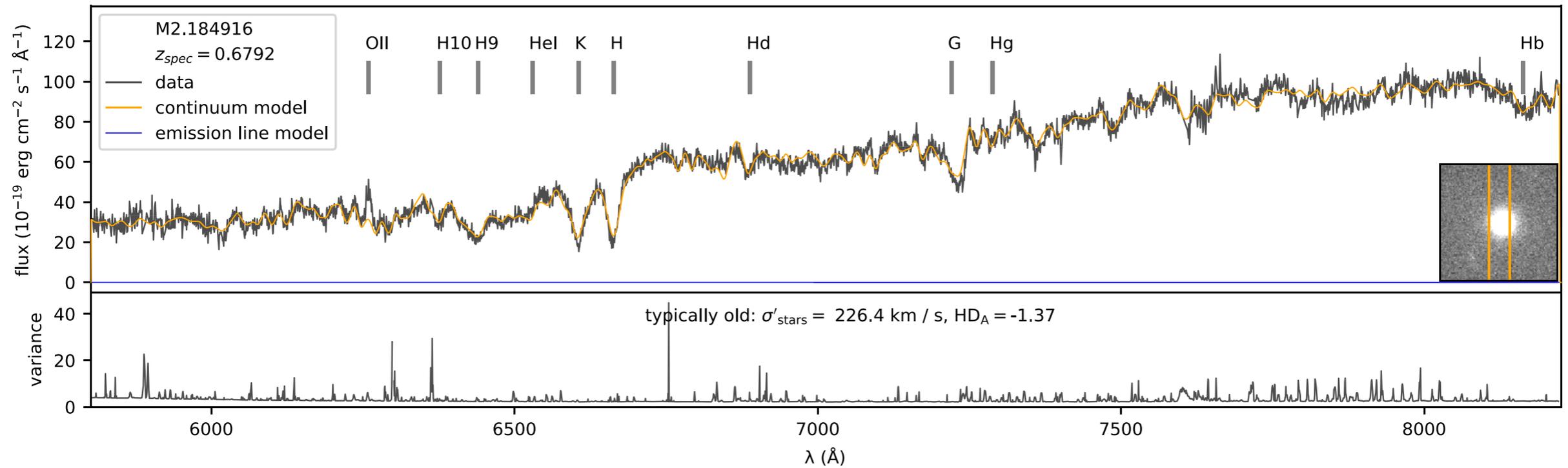


The basic data product: 1d spectra

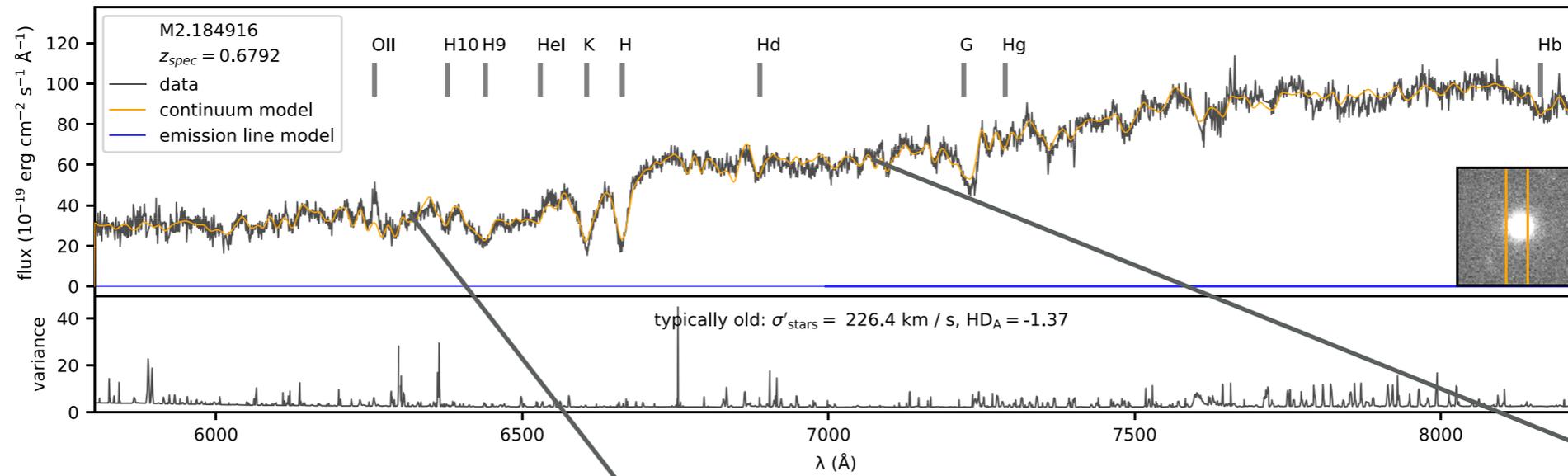
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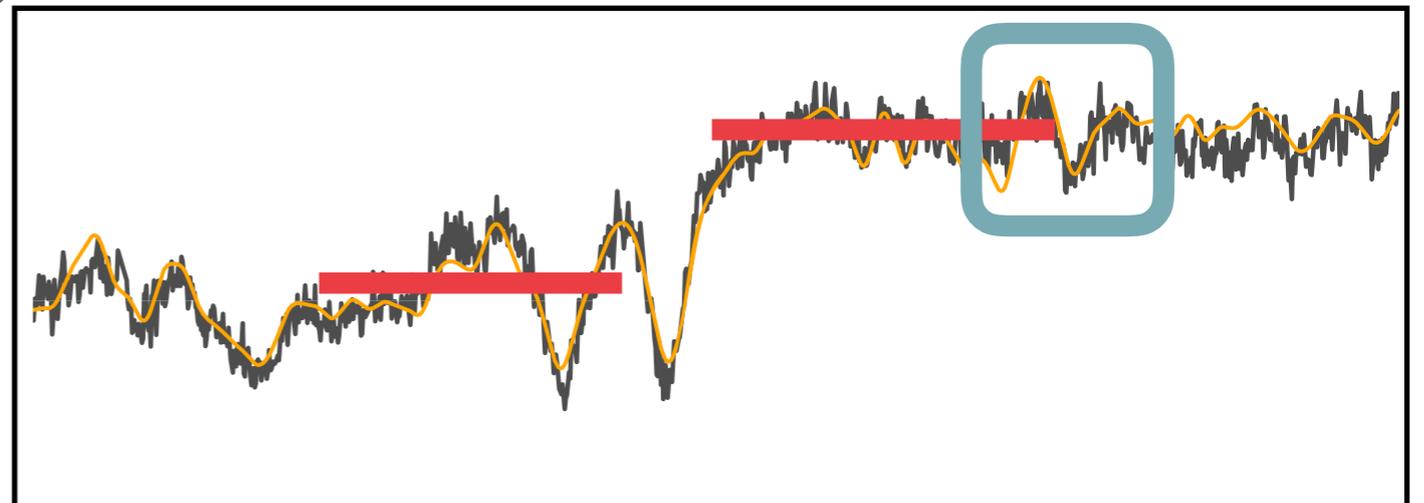
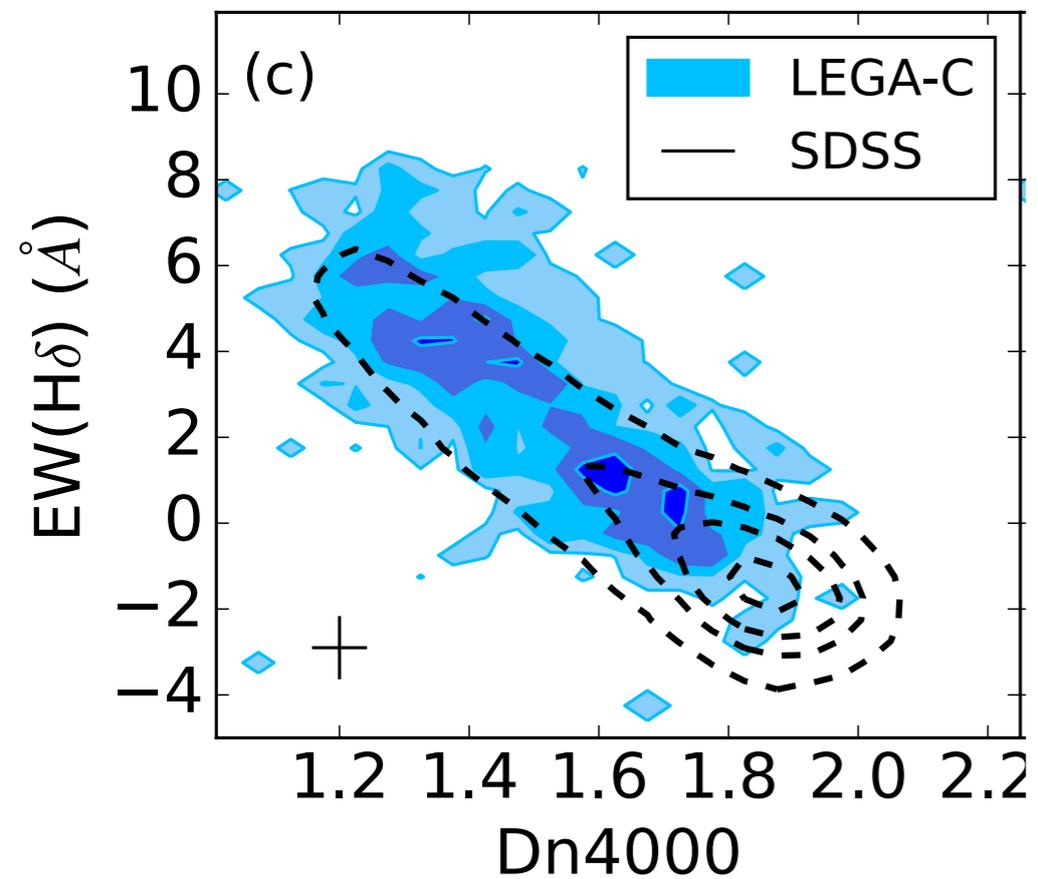
The basic data product: 1d spectra



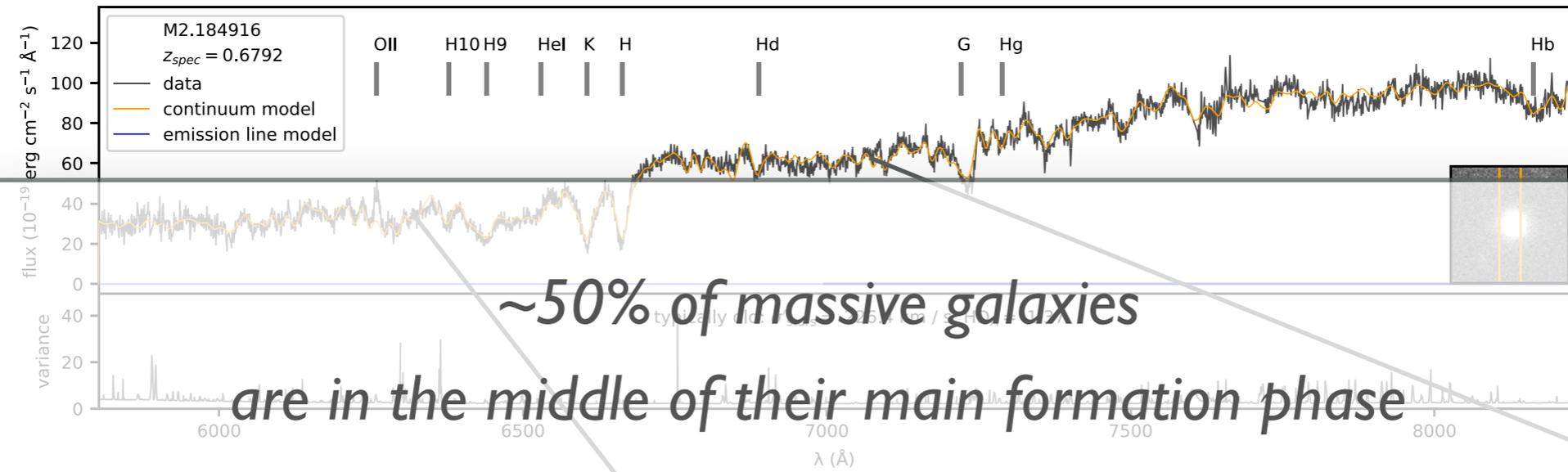
Stellar Populations



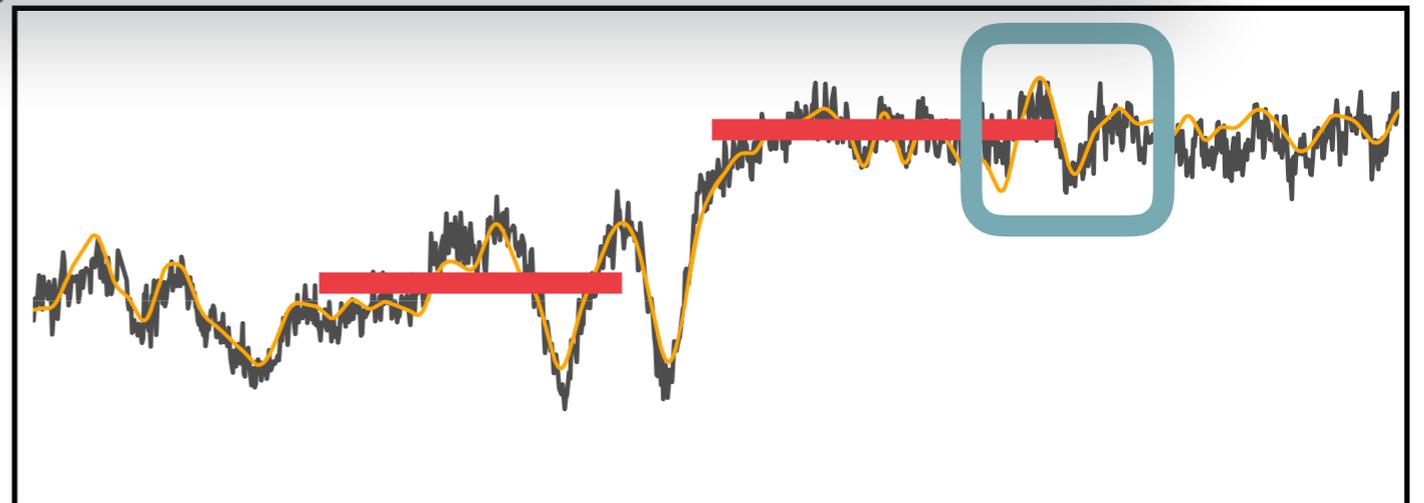
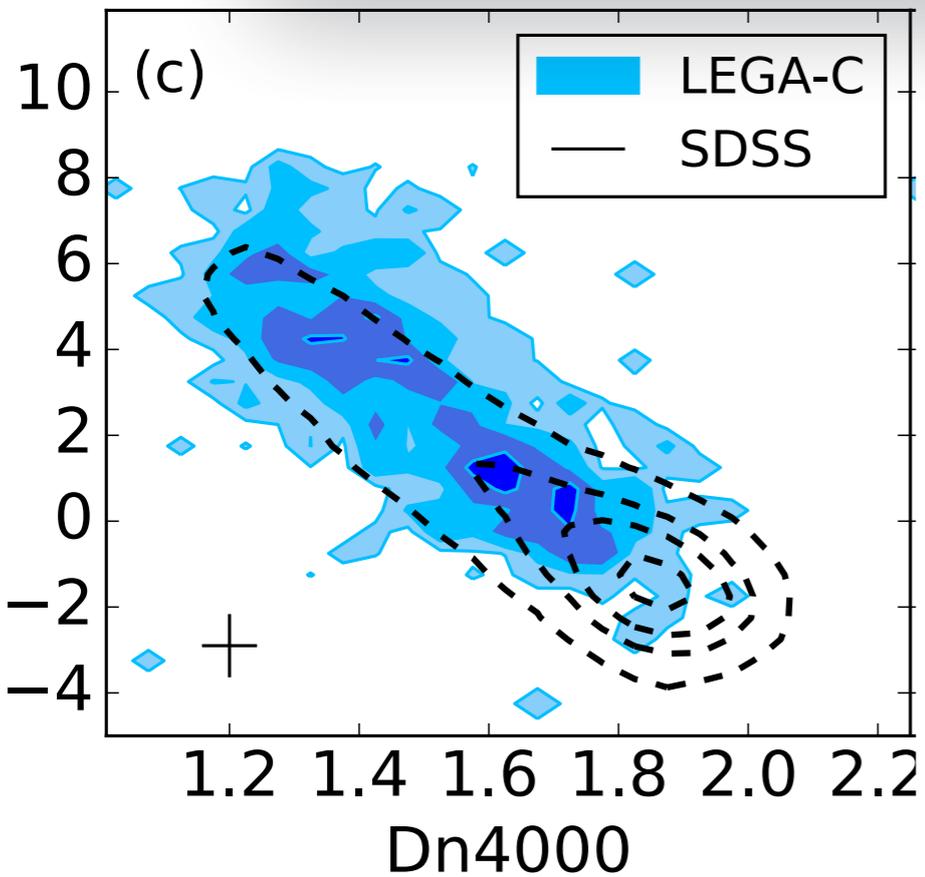
Wu et al. (2018a)



Stellar Populations

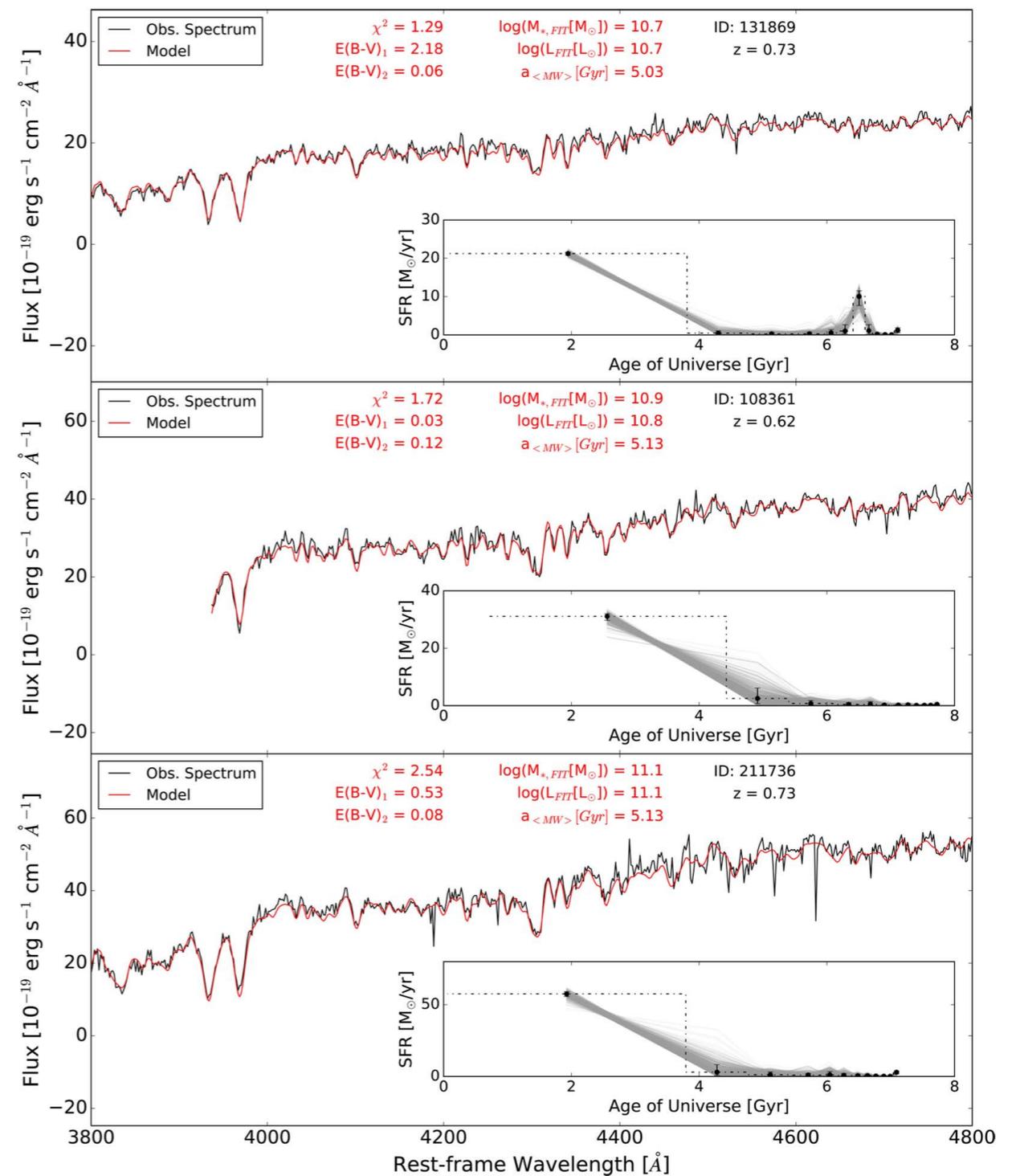
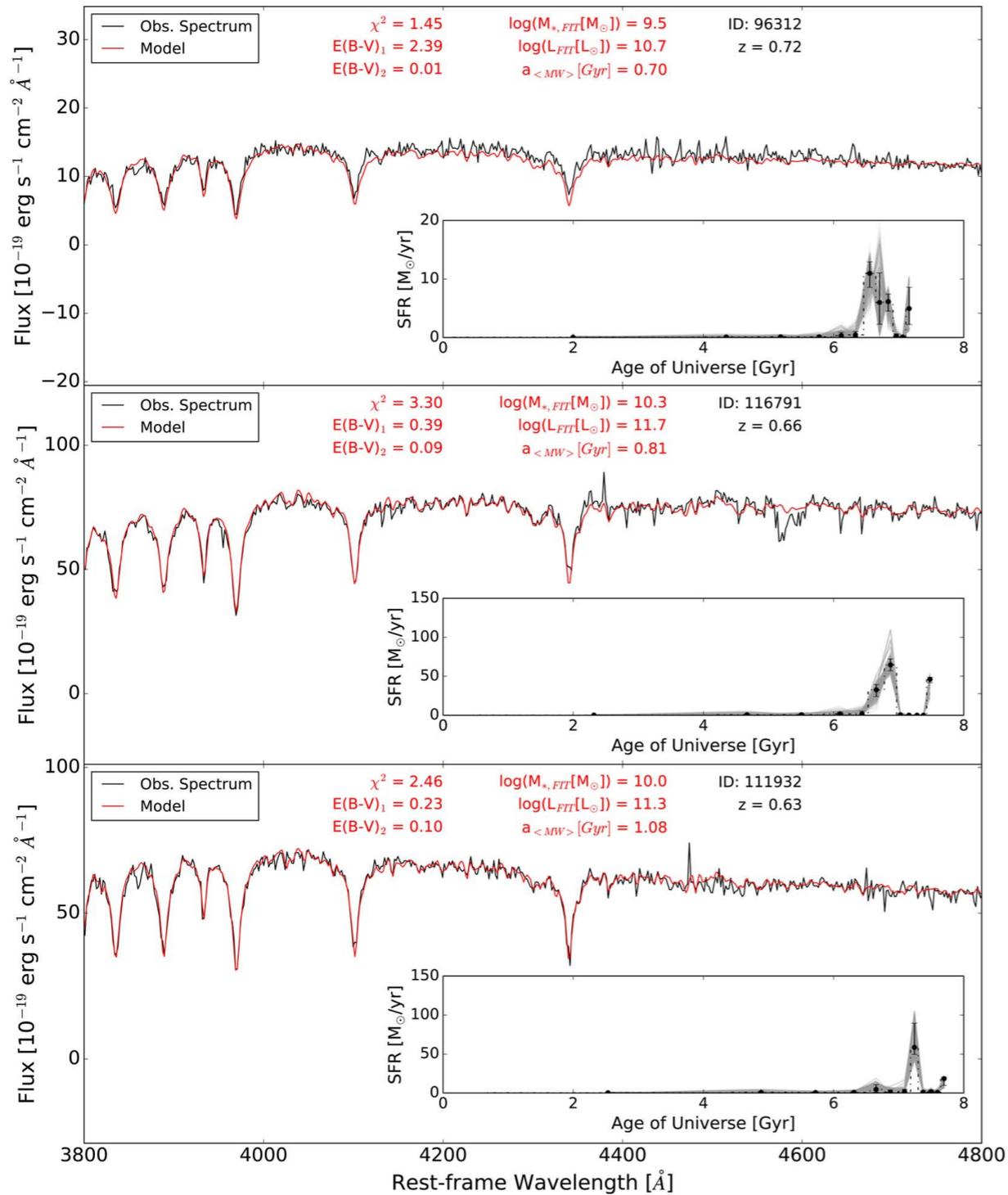


Wu et al. (2018a)



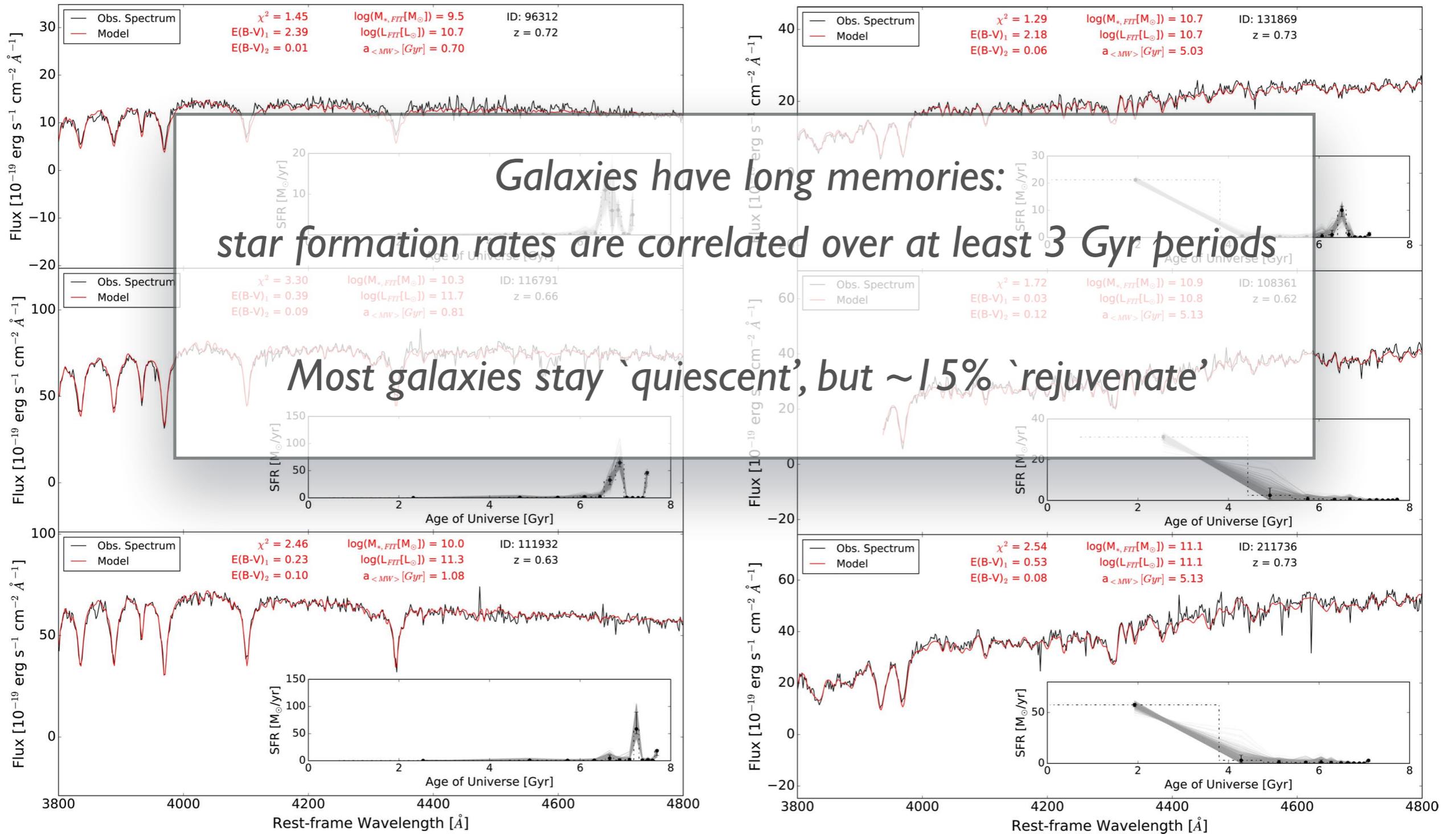
Reconstruction of Star Formation Histories

Chauke et al. (2018, 2019)

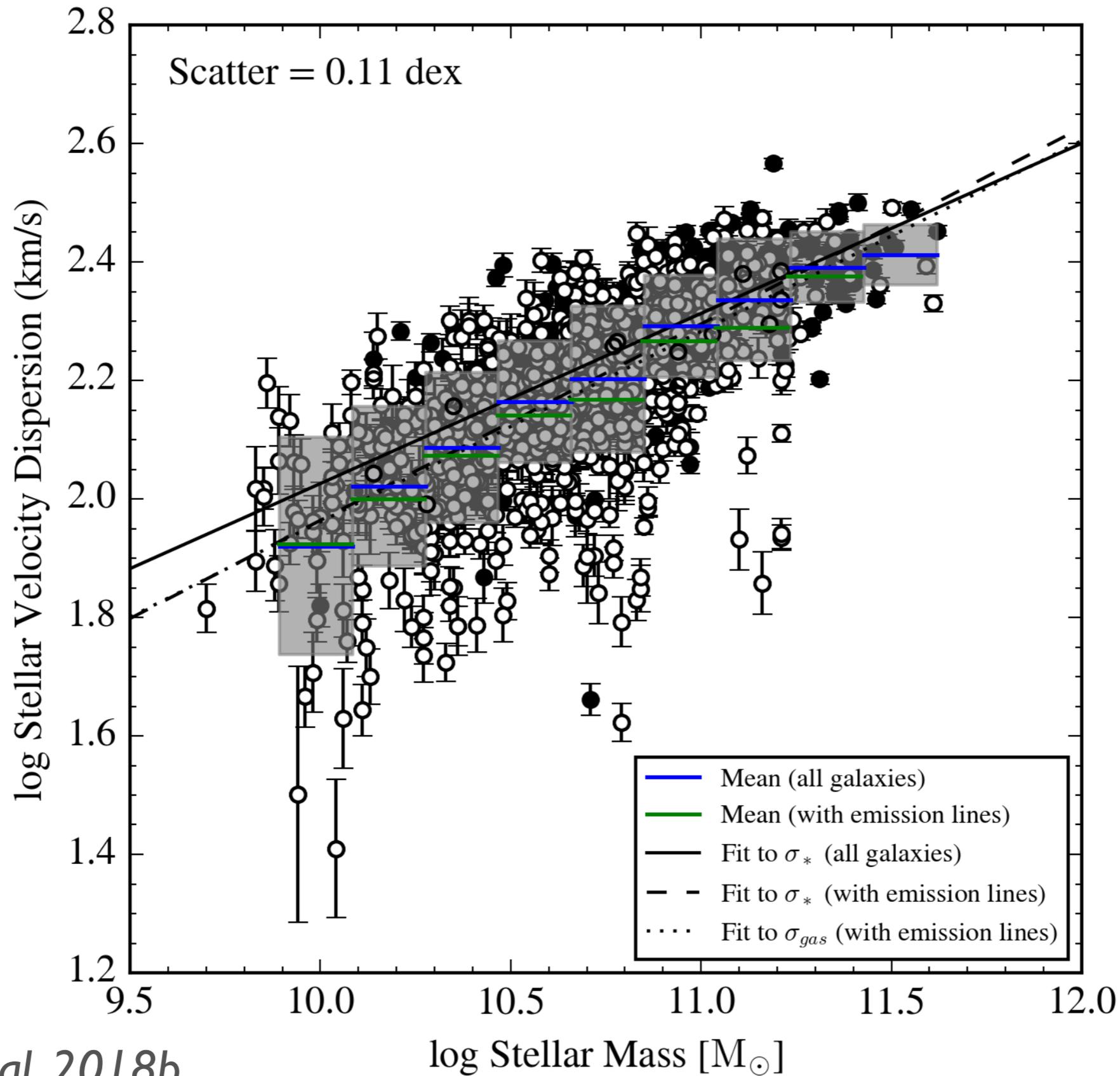


Reconstruction of Star Formation Histories

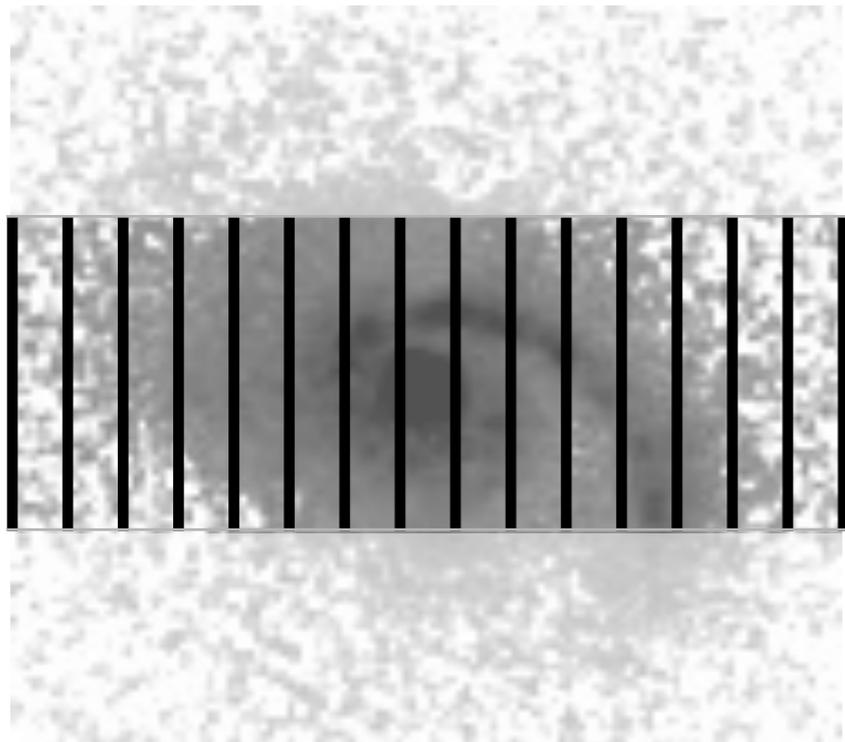
Chauke et al. (2018, 2019)



The Faber-Jackson relation



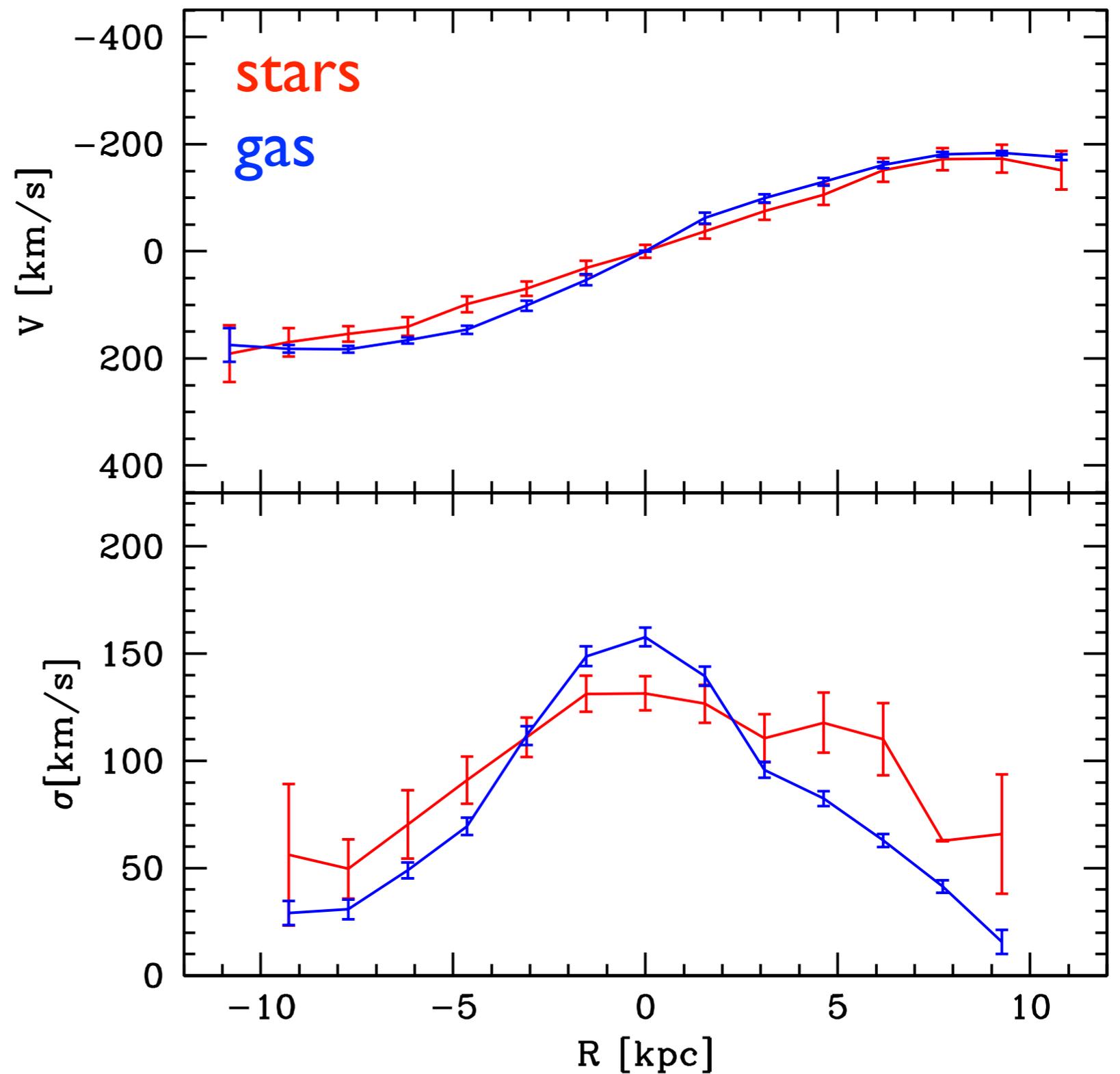
Spatially resolved kinematics



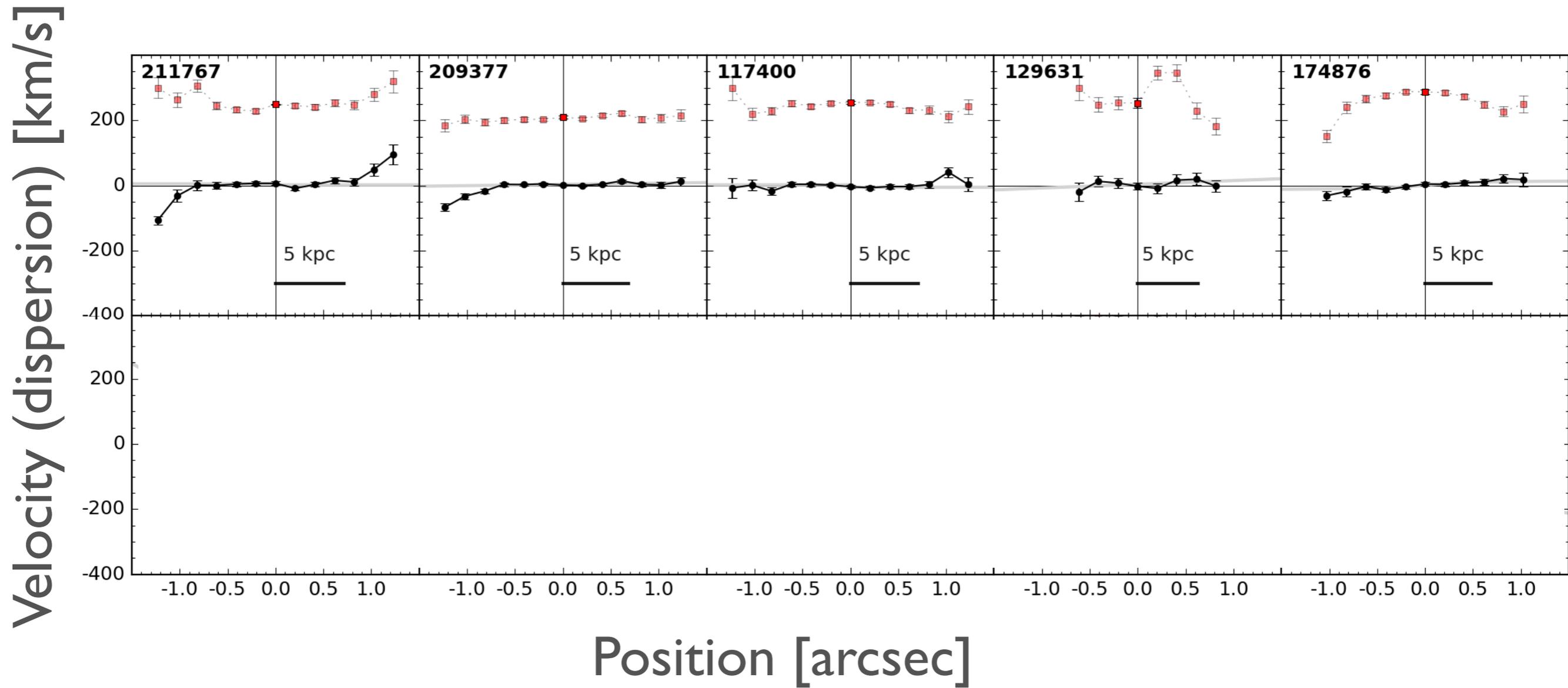
$z = 0.68$

$M_{\text{star}} = 4 \times 10^{10} M_{\text{sol}}$

$\text{SFR} = 28 M_{\text{sol}}/\text{yr}$

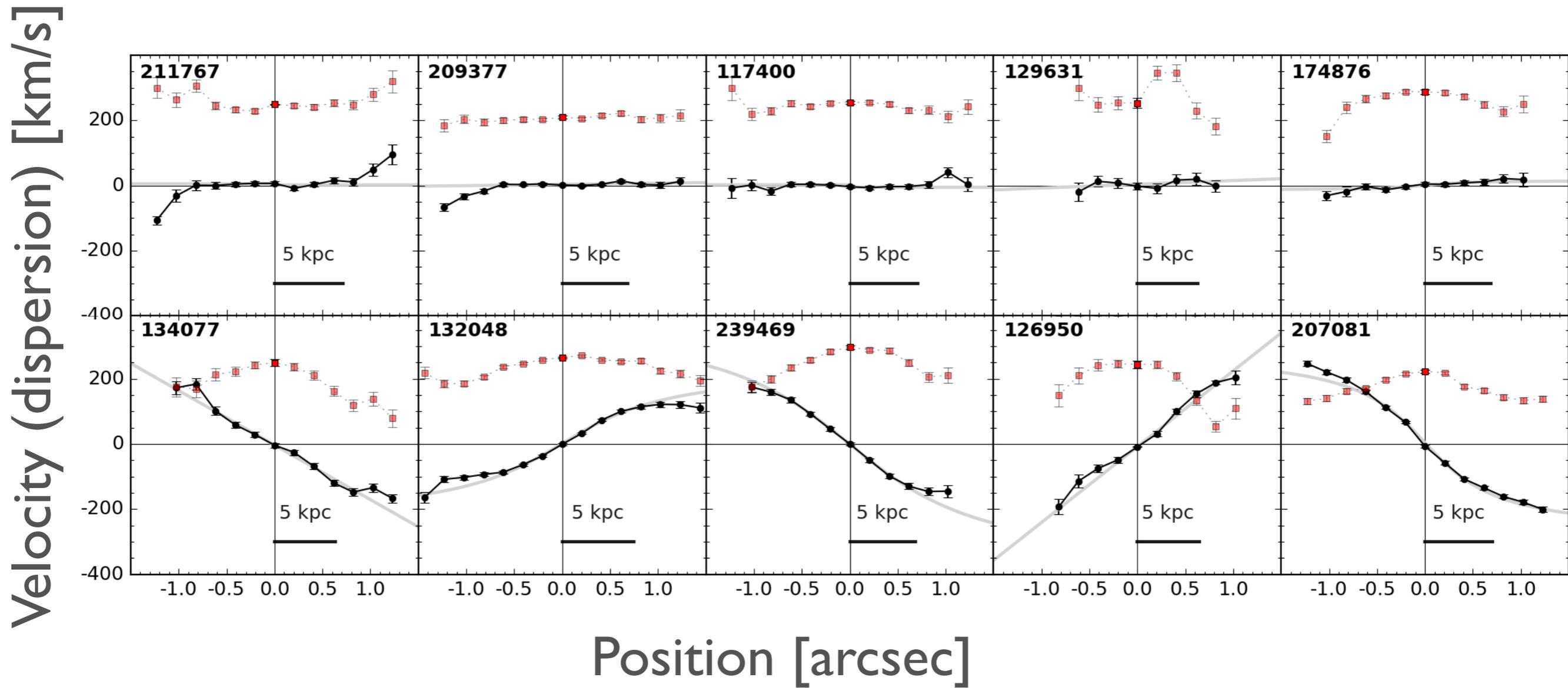


Stellar rotation in passive galaxies



Bezanson et al. (2018a)

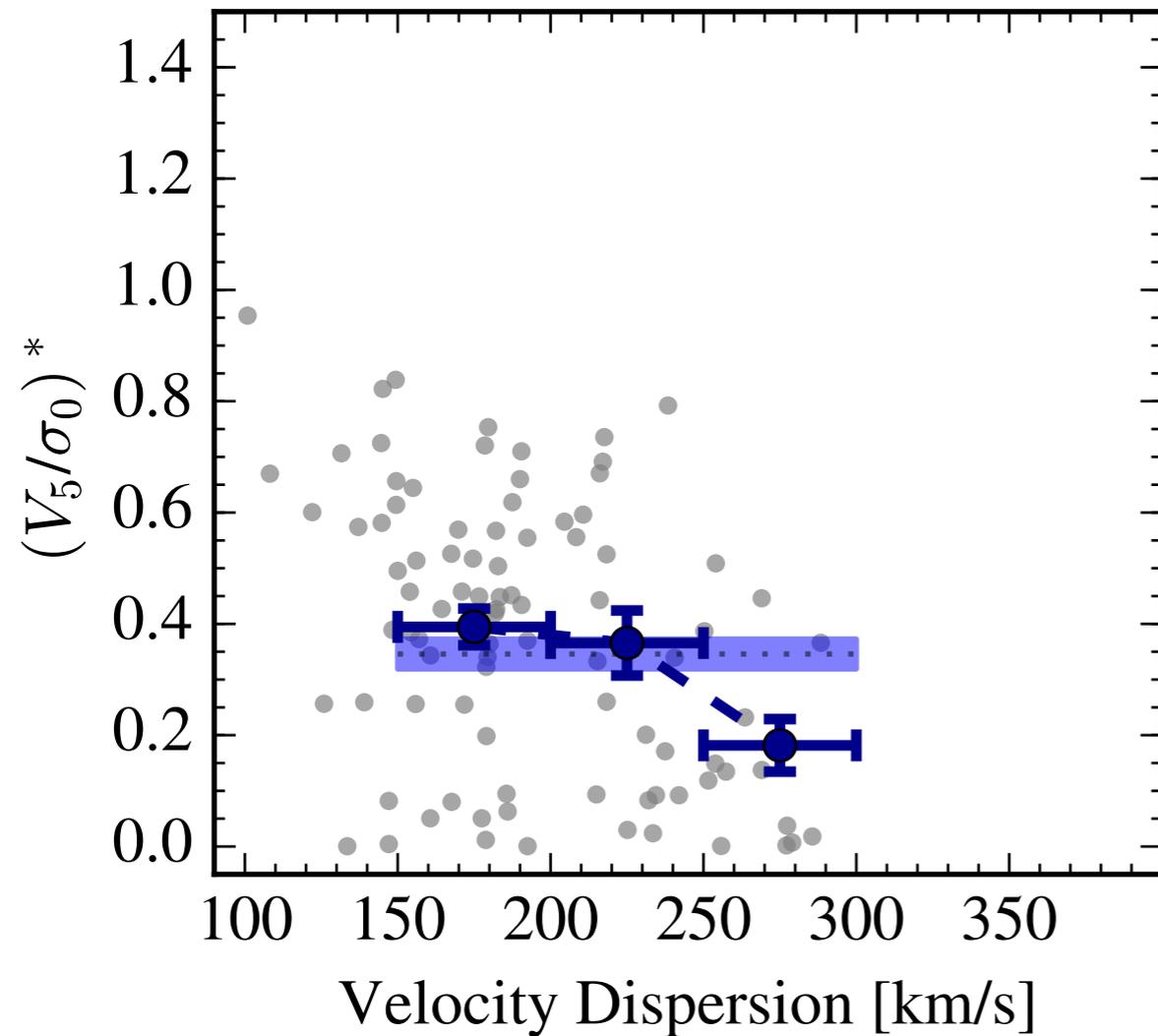
Stellar rotation in passive galaxies



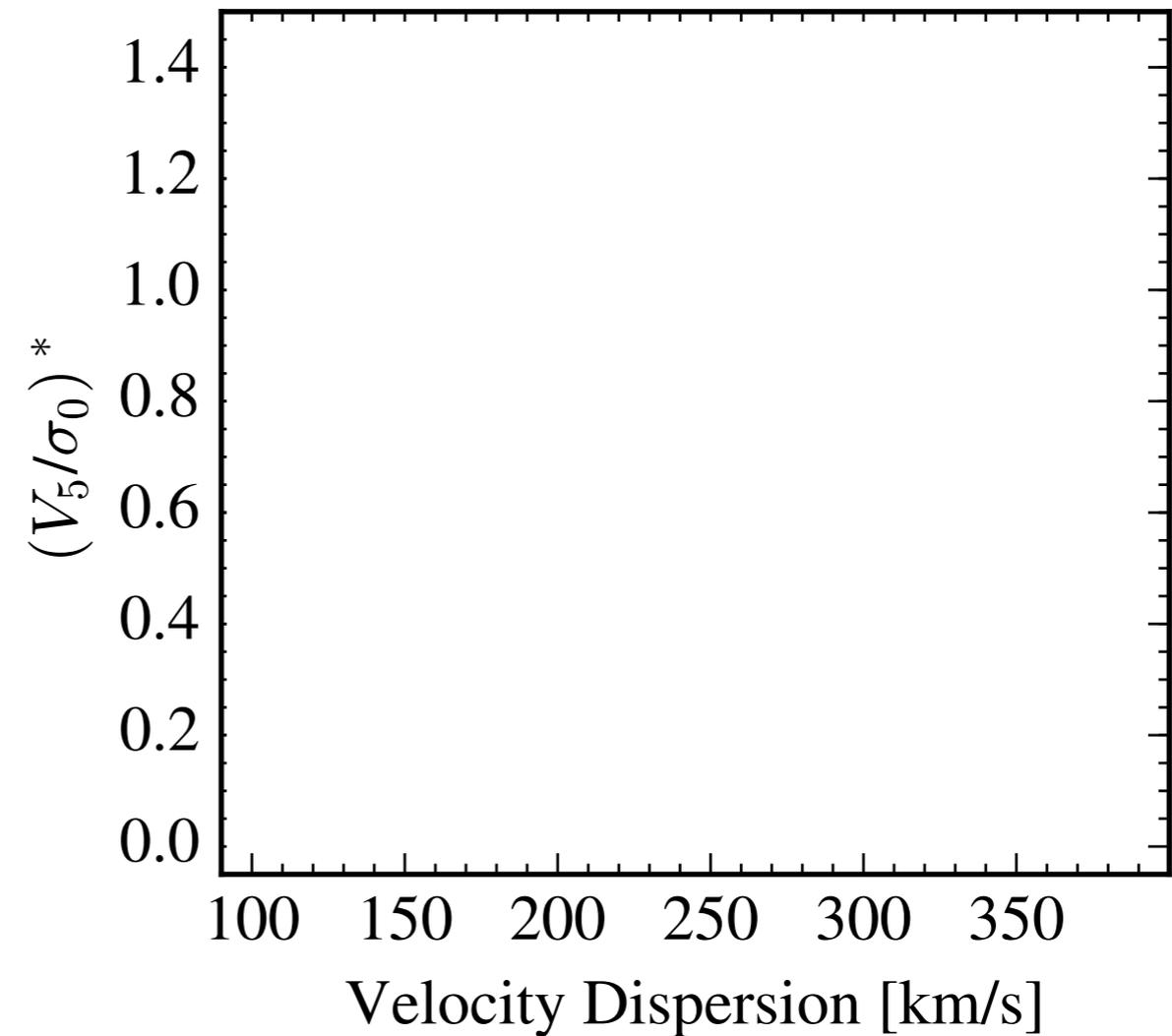
Bezanson et al. (2018a)

Stellar rotation in passive galaxies

CALIFA: $z \sim 0$ (Sanchez+12)



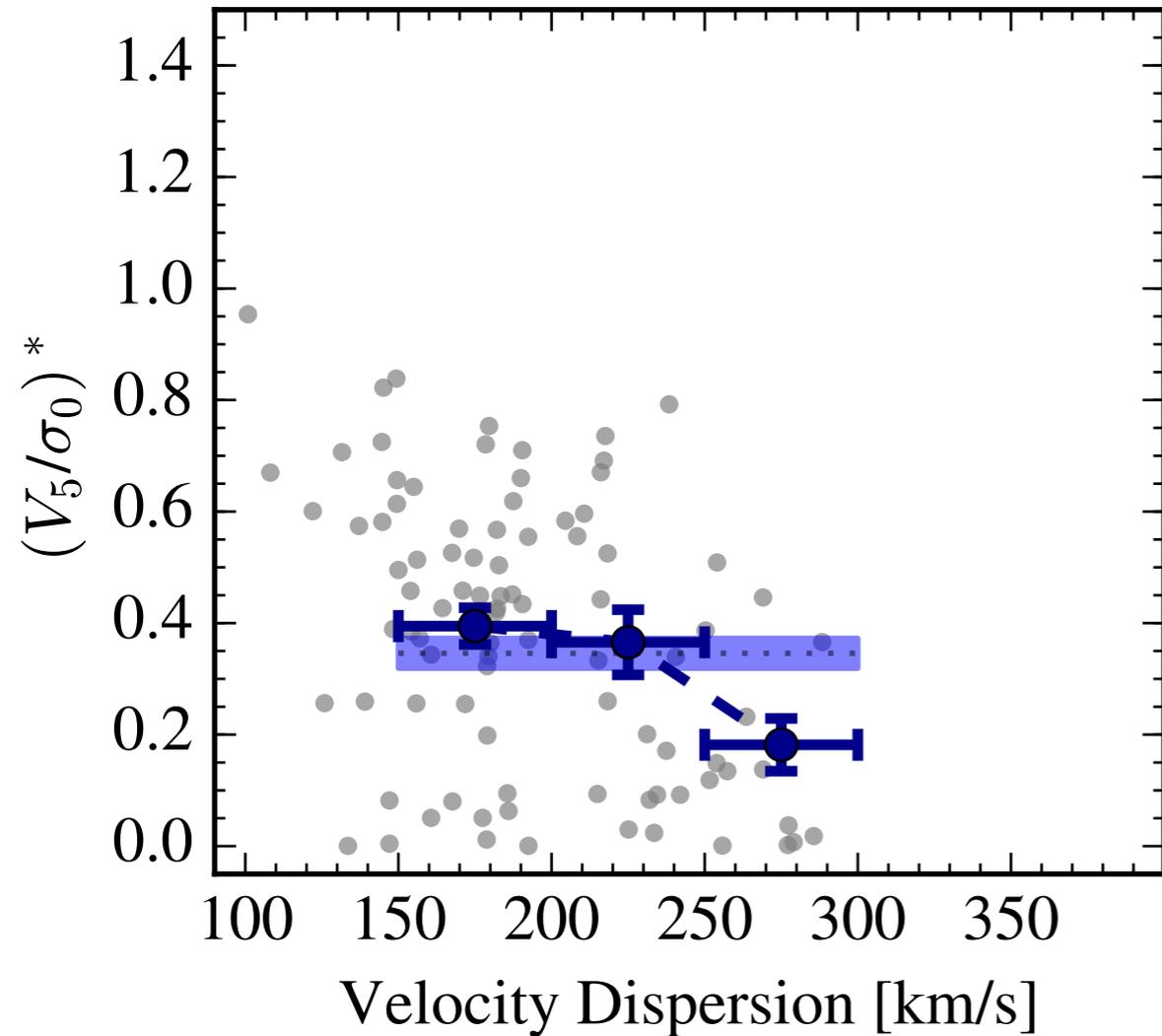
LEGA-C: $z \sim 0.8$



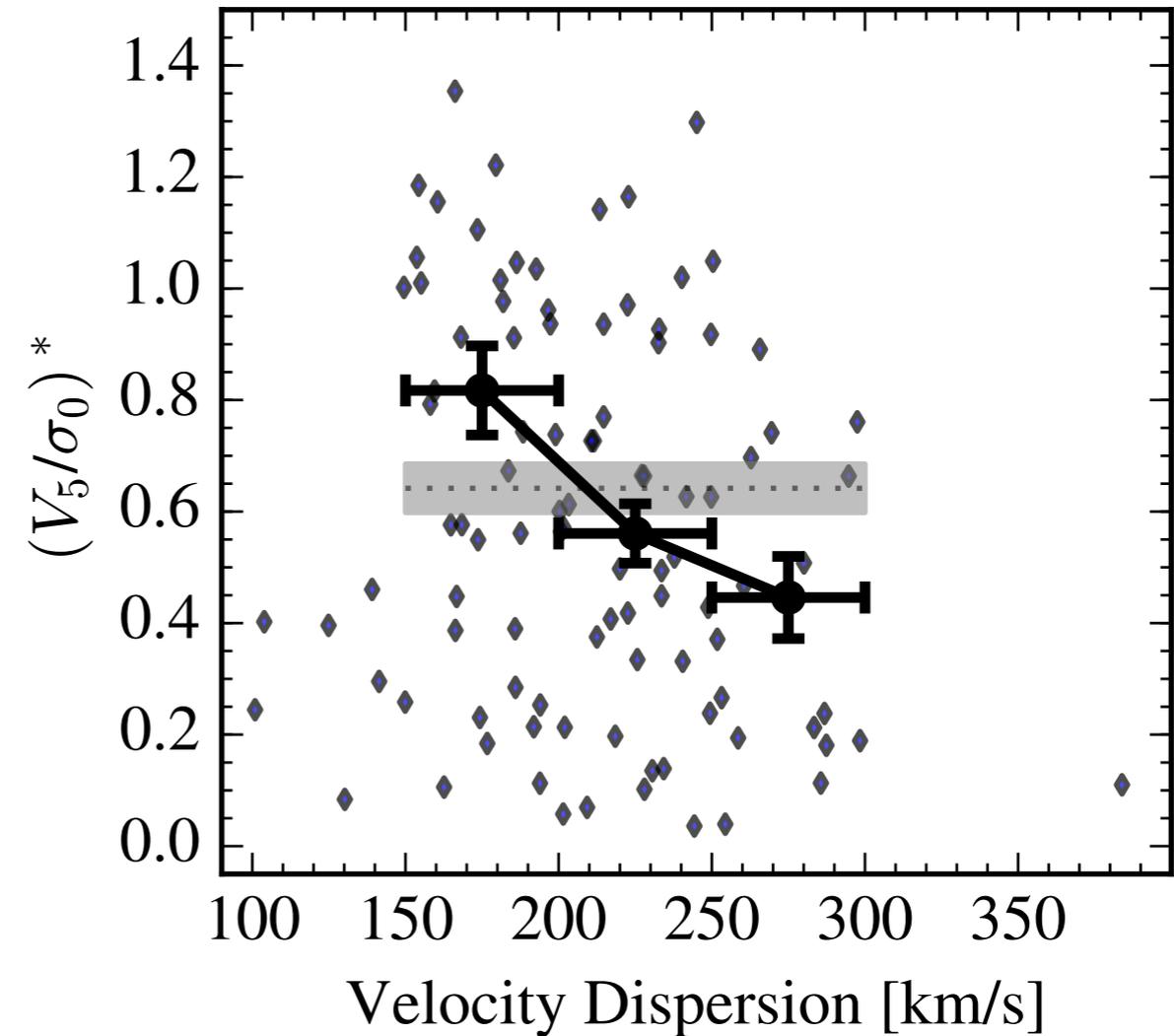
Bezanson et al. (2018a)

Stellar rotation in passive galaxies

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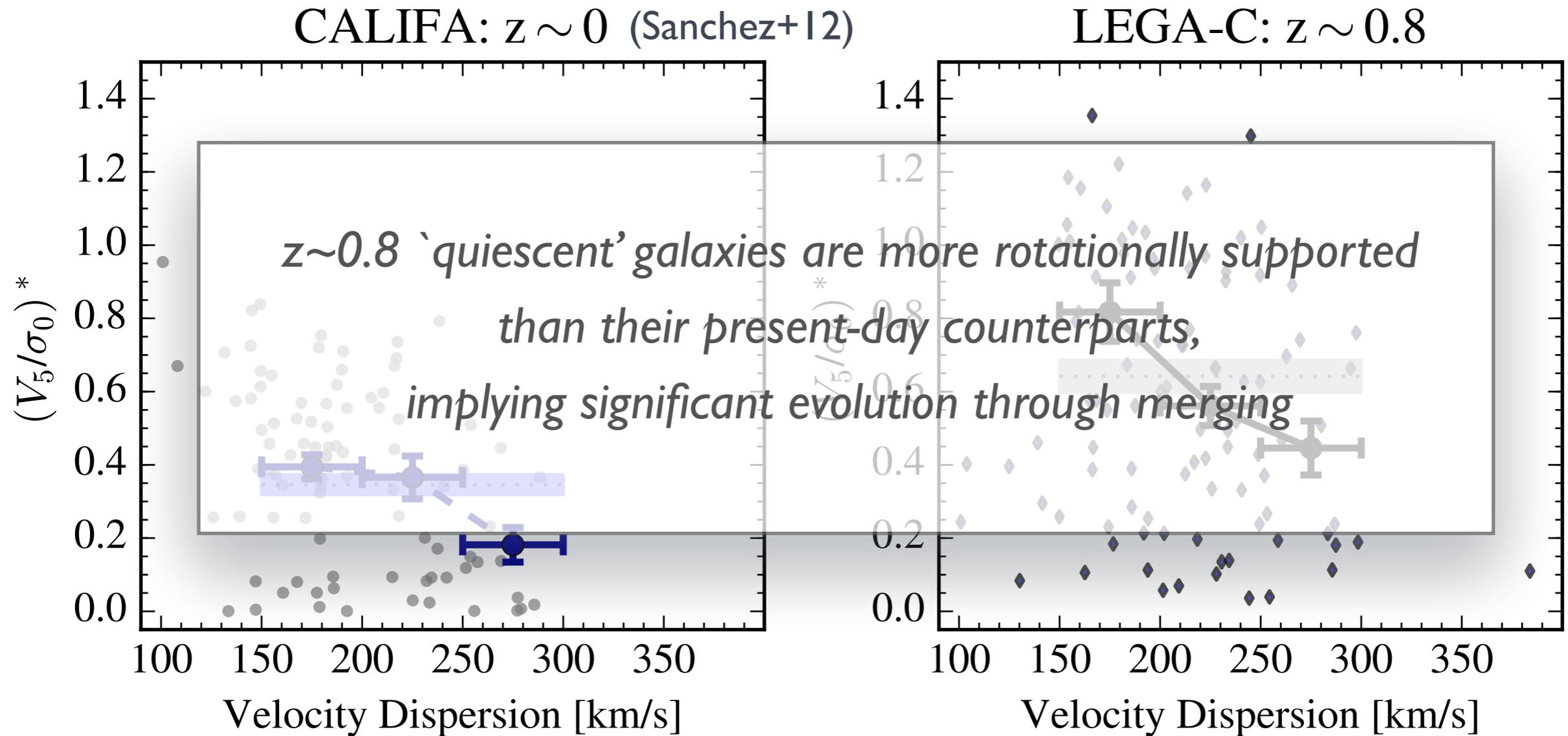


LEGA-C: $z \sim 0.8$



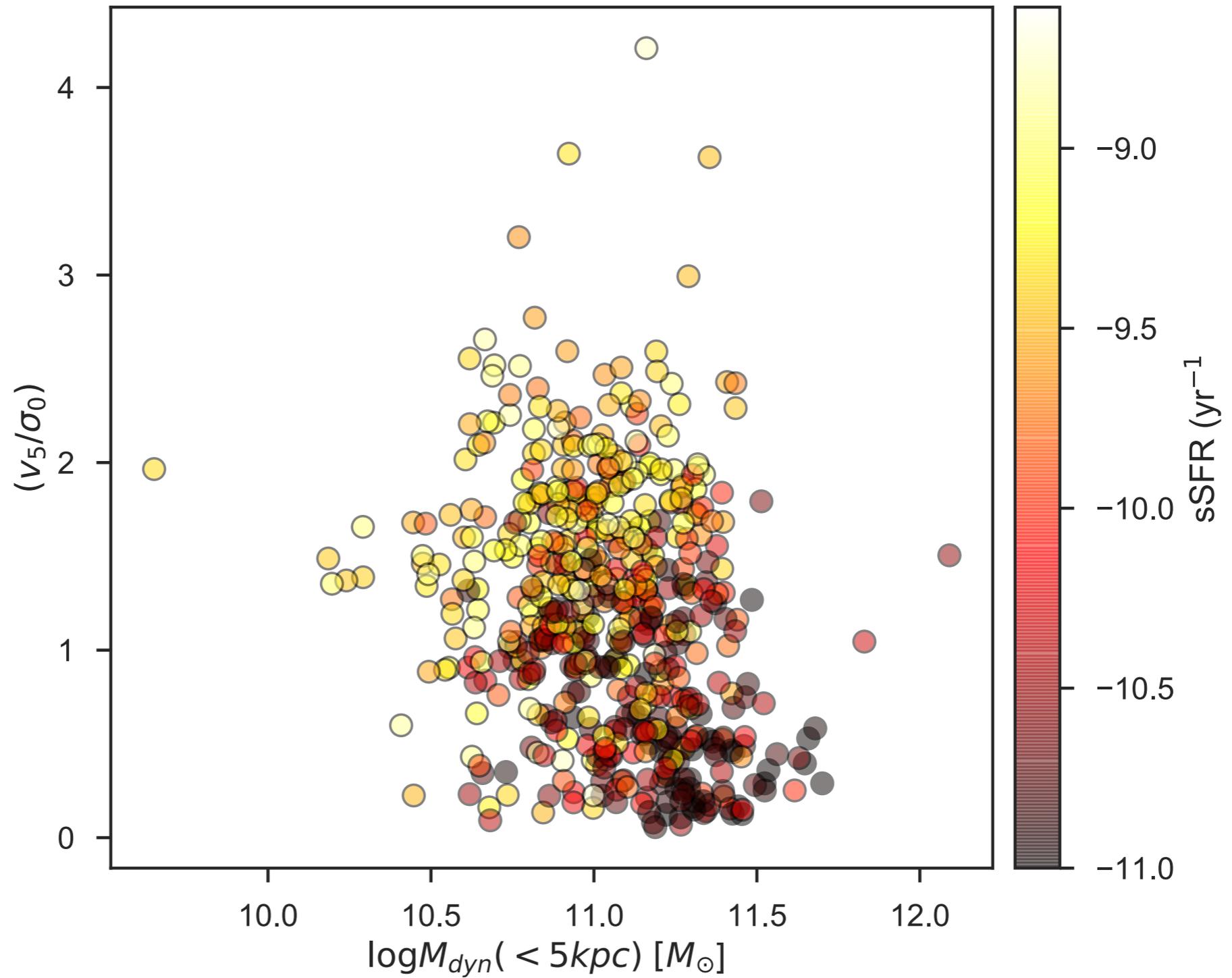
Bezanson et al. (2018a)

Stellar rotation in passive galaxies



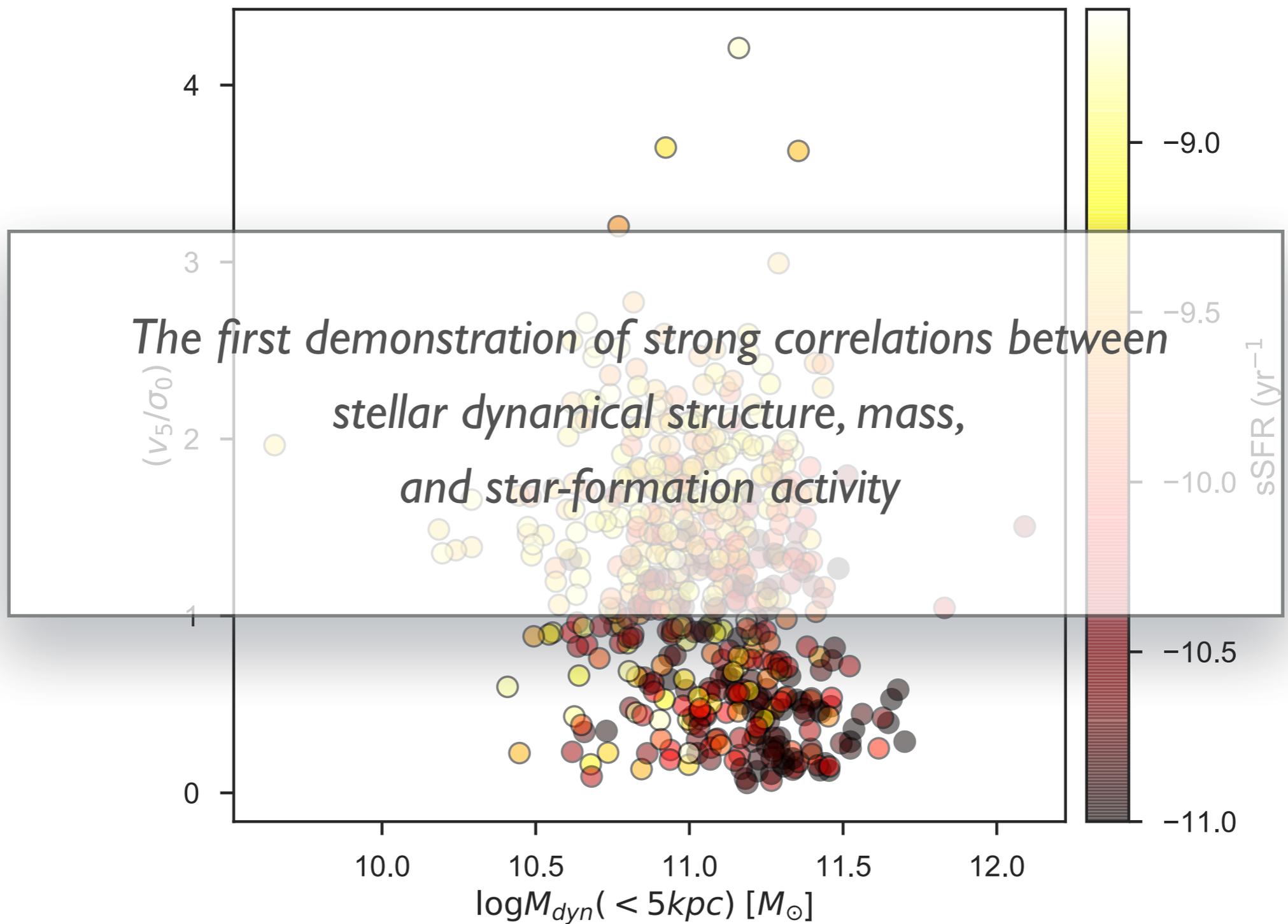
Bezanson et al. (2018a)

Stellar dynamical models



van Houdt et al. (in prep.)

Stellar dynamical models



van Houdt et al. (in prep.)

Deep galaxy surveys with 4MOST

integration times:

for $\log(M_{\text{star}}) > 10$ && $z < 0.5$: 50 hours

for $\log(M_{\text{star}}) > 10.6$ && $z < 0.4$: 10 hours (STePS, Mercurio)

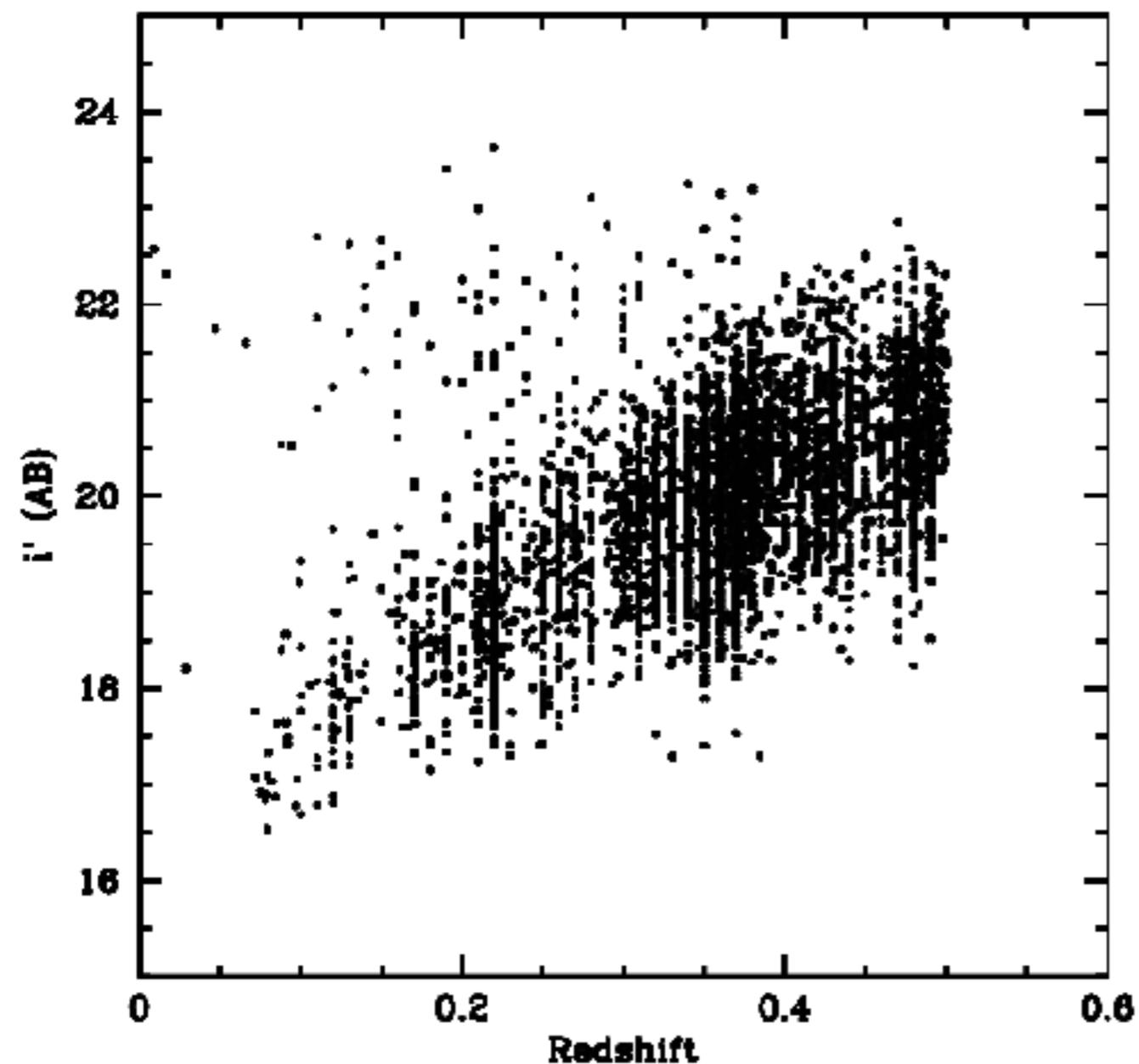
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COSMOS/UVista (Muzzin et al. 2013)



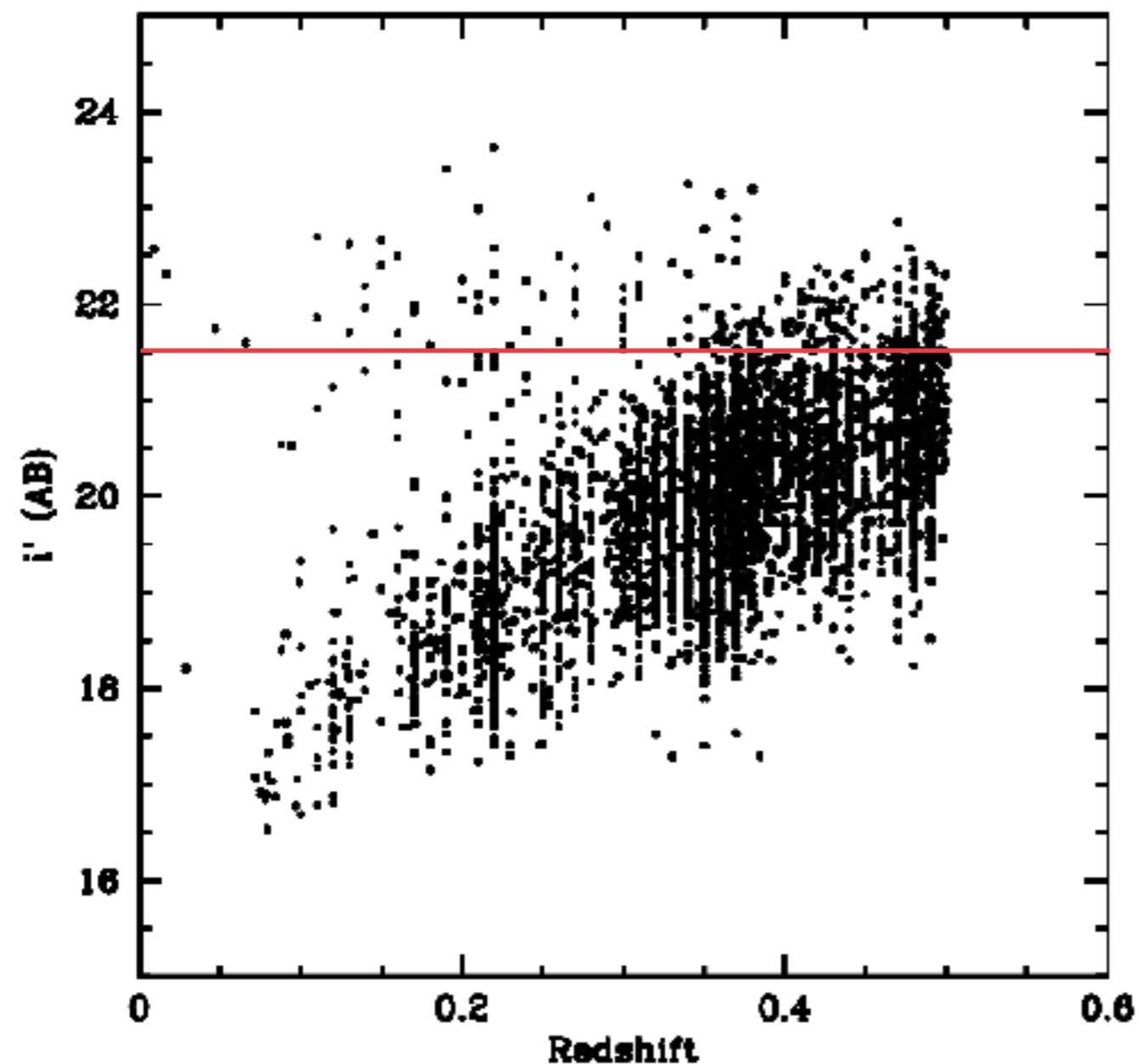
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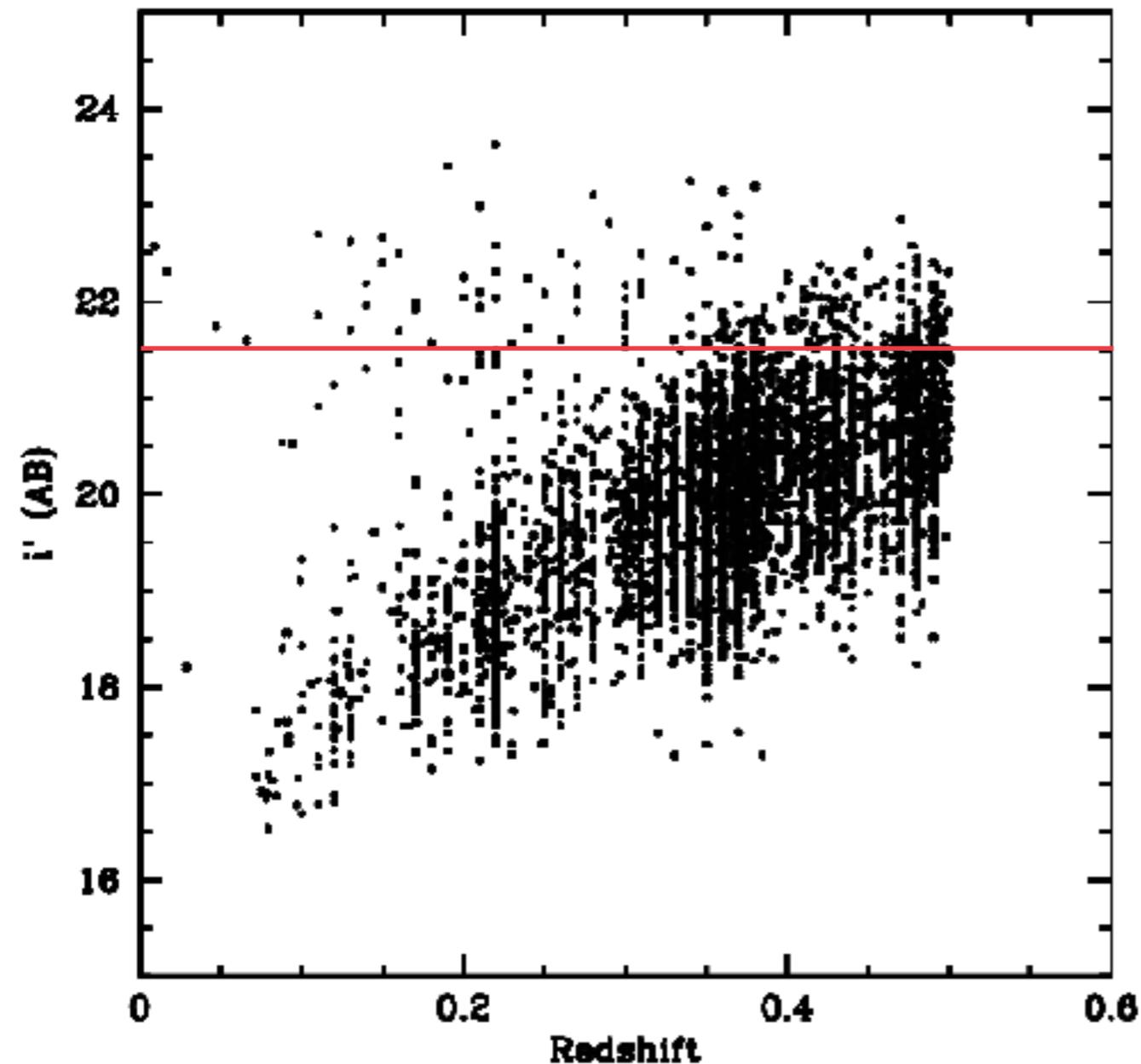
Deep galaxy surveys with 4MOST

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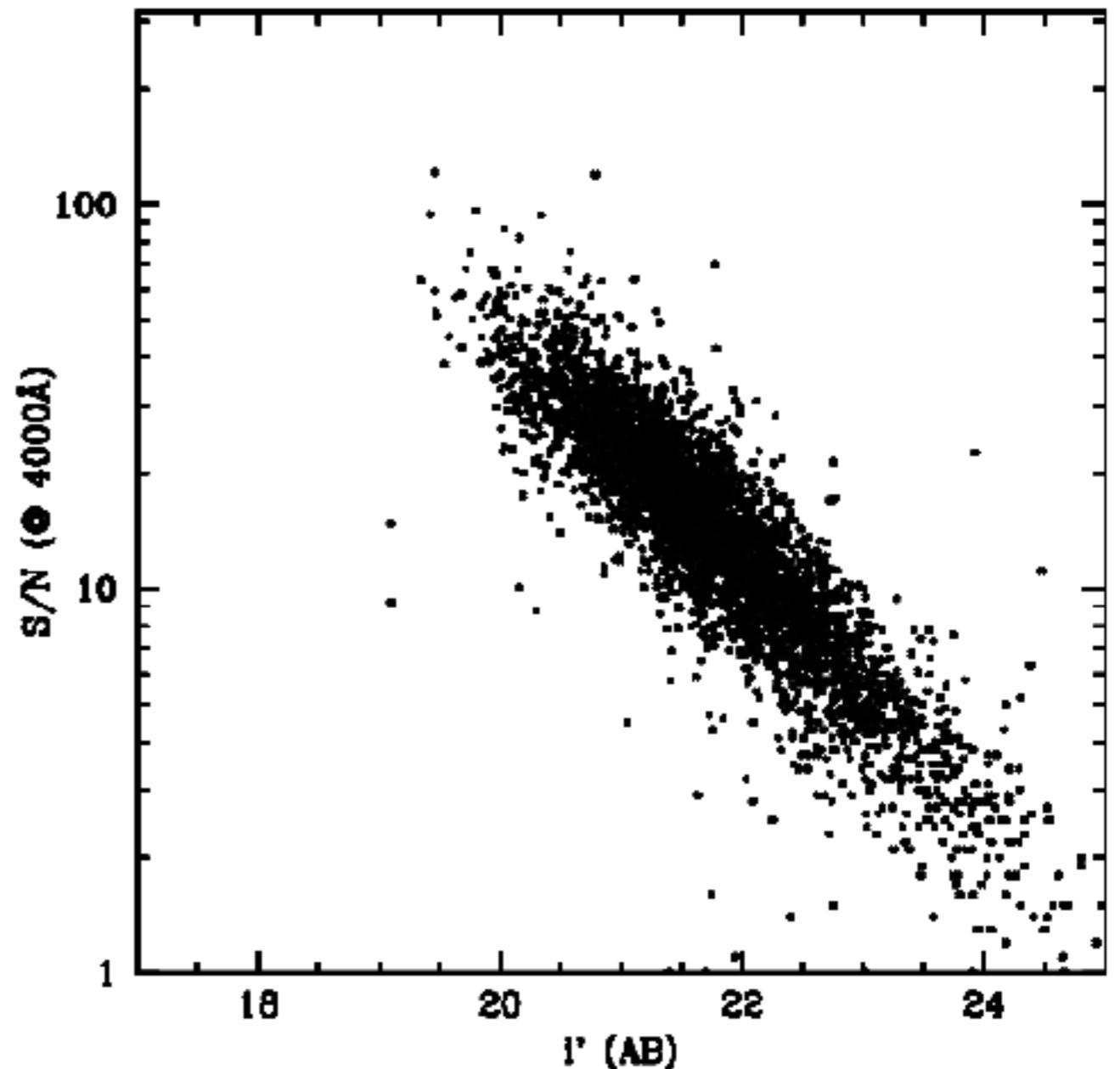
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LEGA-C S/N



Deep galaxy surveys with 4MOST

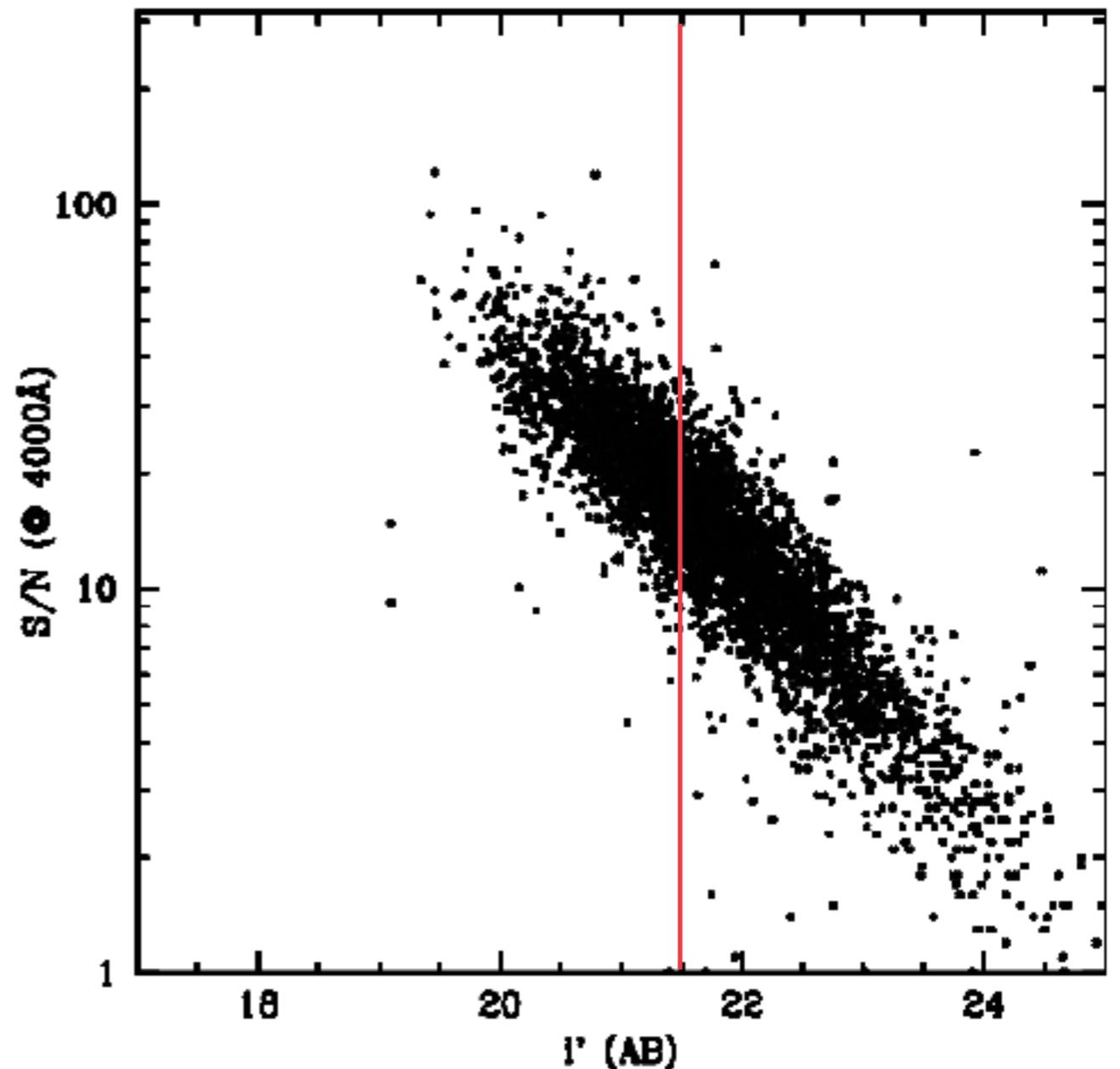
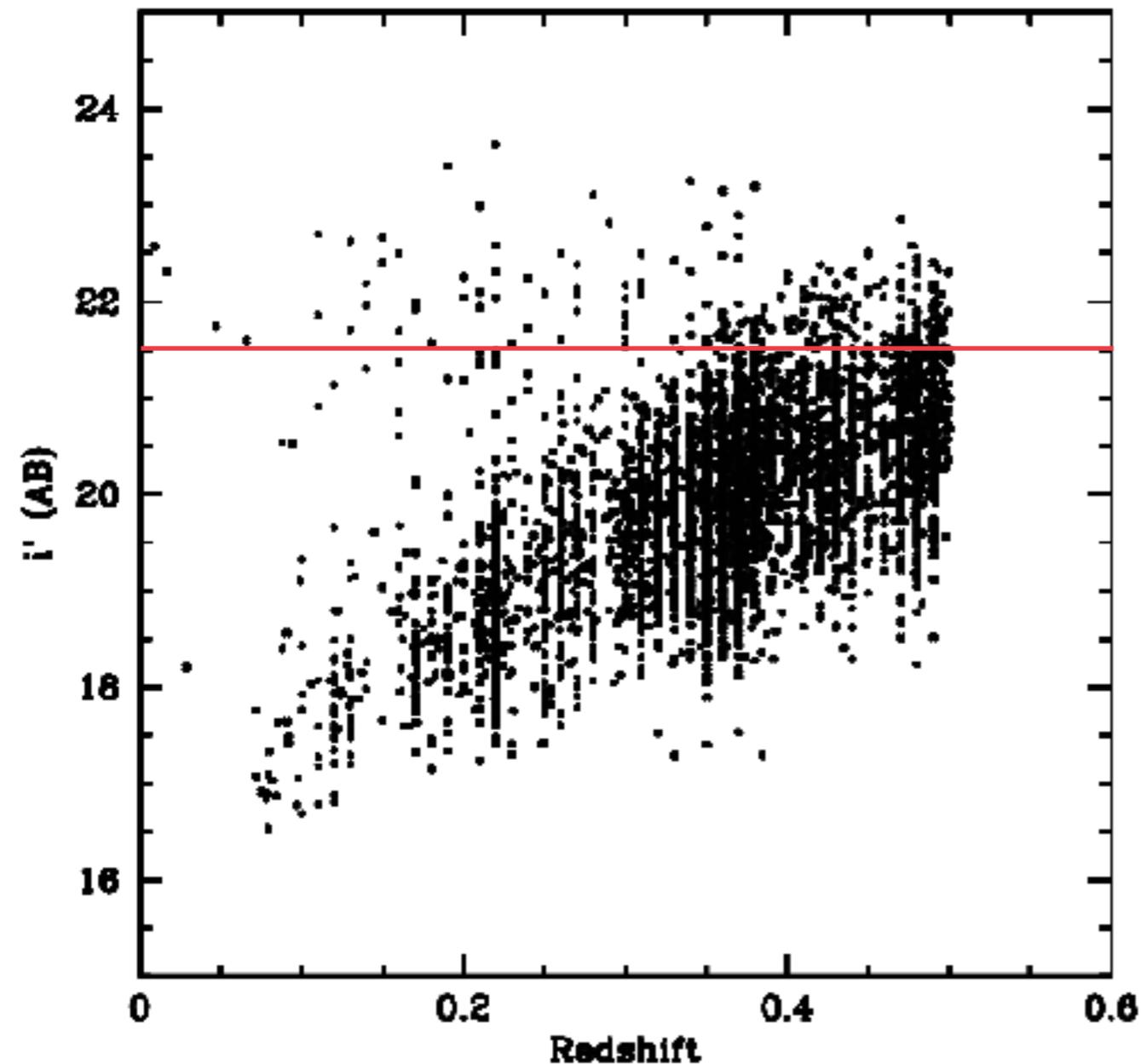
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COSMOS/UVista (Muzzin et al. 2013)

LEGA-C S/N



Deep galaxy surveys with 4MOST

What field(s)?

- COSMOS: too small (~ 2 sq. deg)
- GAMA: too shallow
- VIDEO/E-CDFS: lack of auxiliary data?

Conclusions

- Deep galaxy spectra are worth the effort
- Feasible with 4MOST, but patience is needed
- Not trivial to design and execute