

Dwarf Galaxy Stellar Distributions in the Era of WFIRST

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Collaborators:

James Bullock (UCI)

Michael Boylan-Kolchin (UT Austin)

Michael Cooper (UCI)

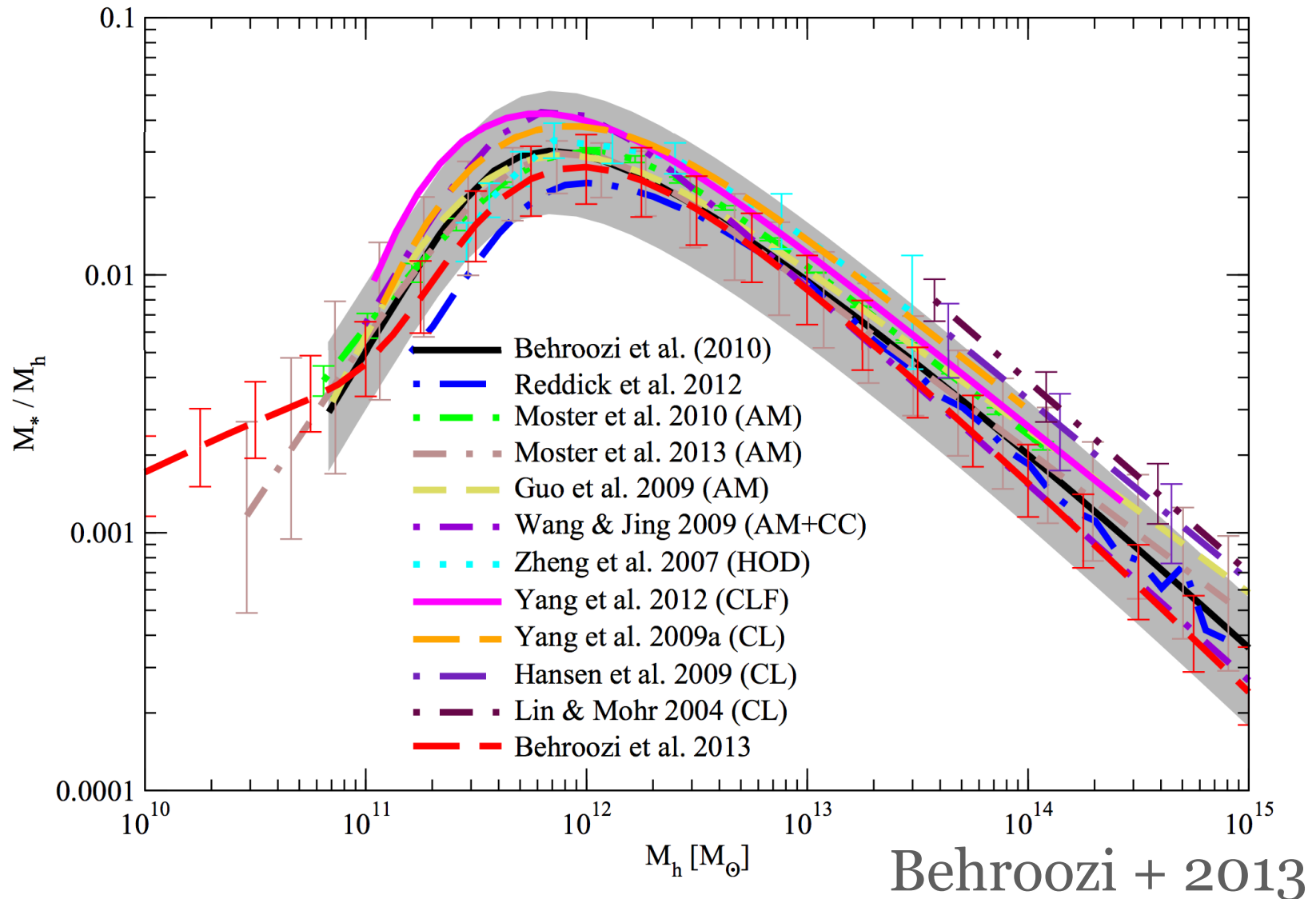
Andrew Wetzel (UC Davis)

Shea Garrison-Kimmel (Caltech)

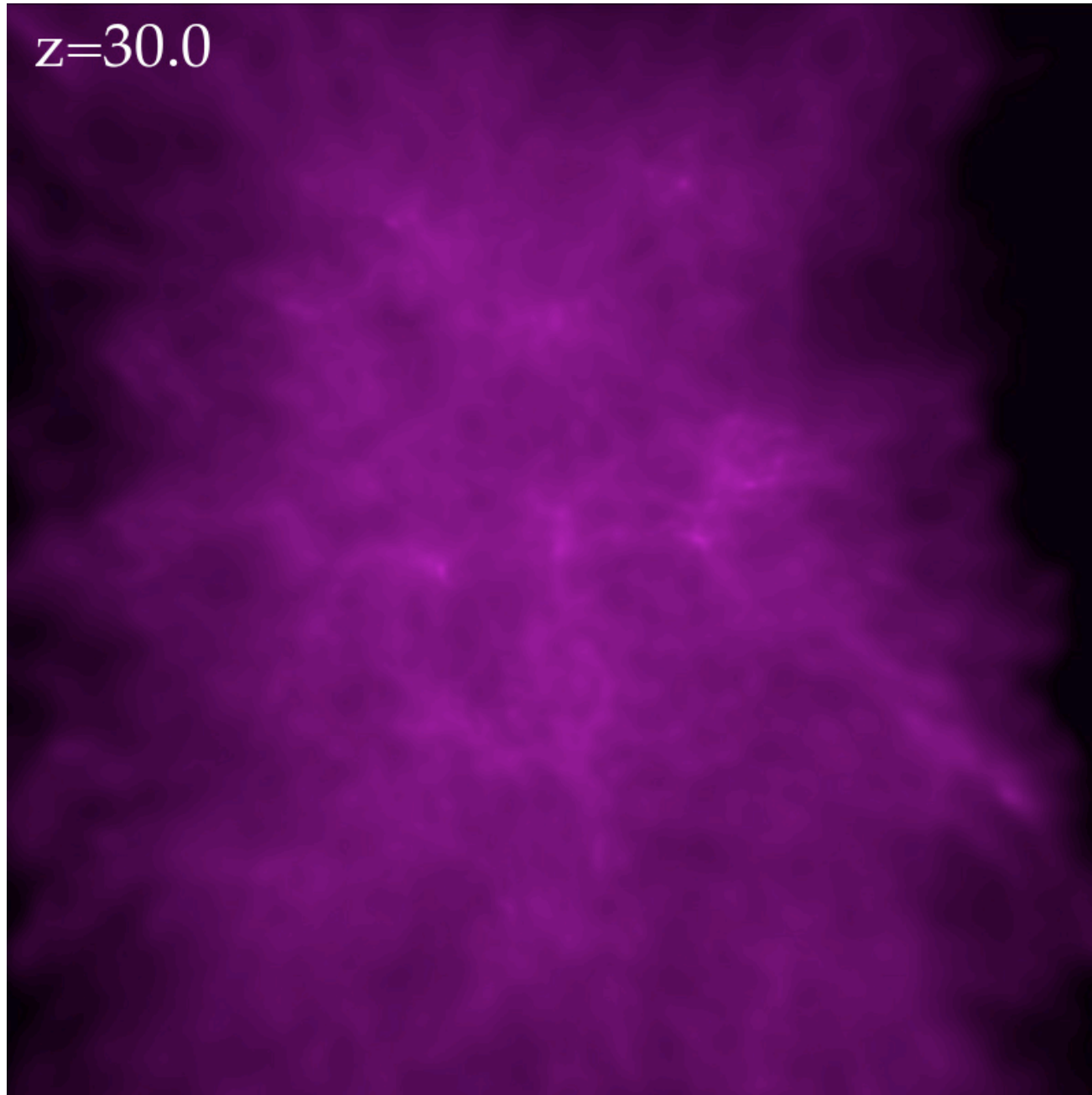
Phil Hopkins (Caltech)

Credit: ESO/Y. Beletsky

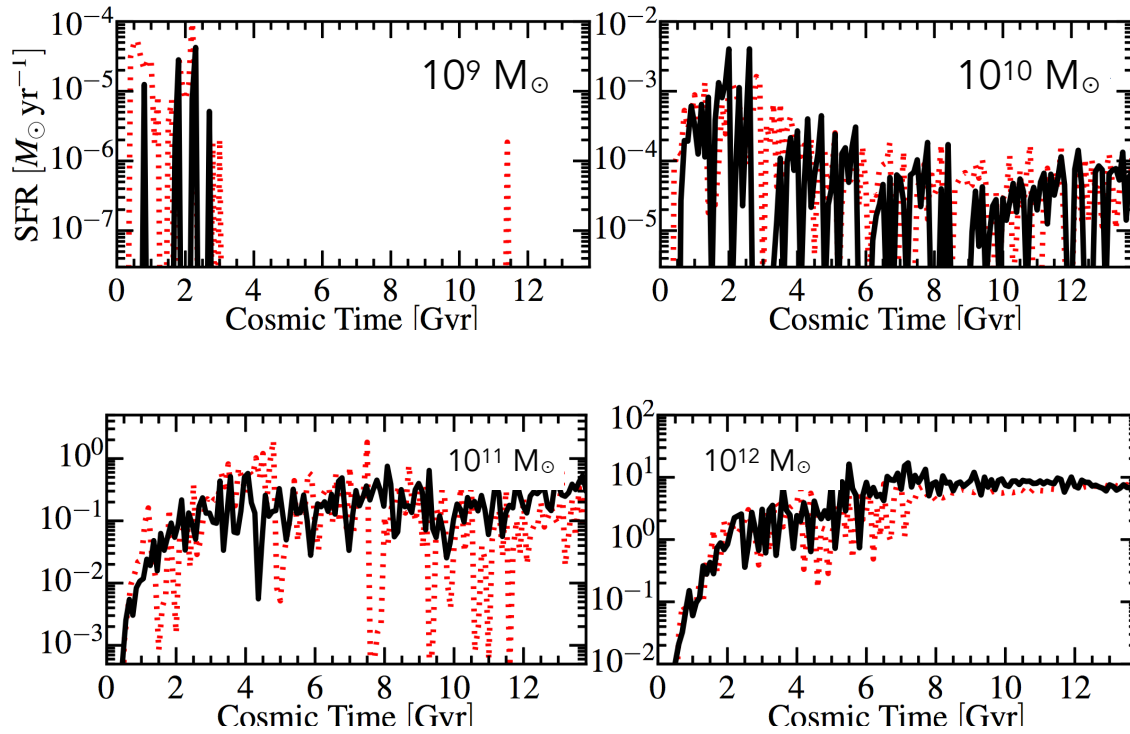
Supernova feedback and dwarf galaxies



Supernova feedback and dwarf galaxies

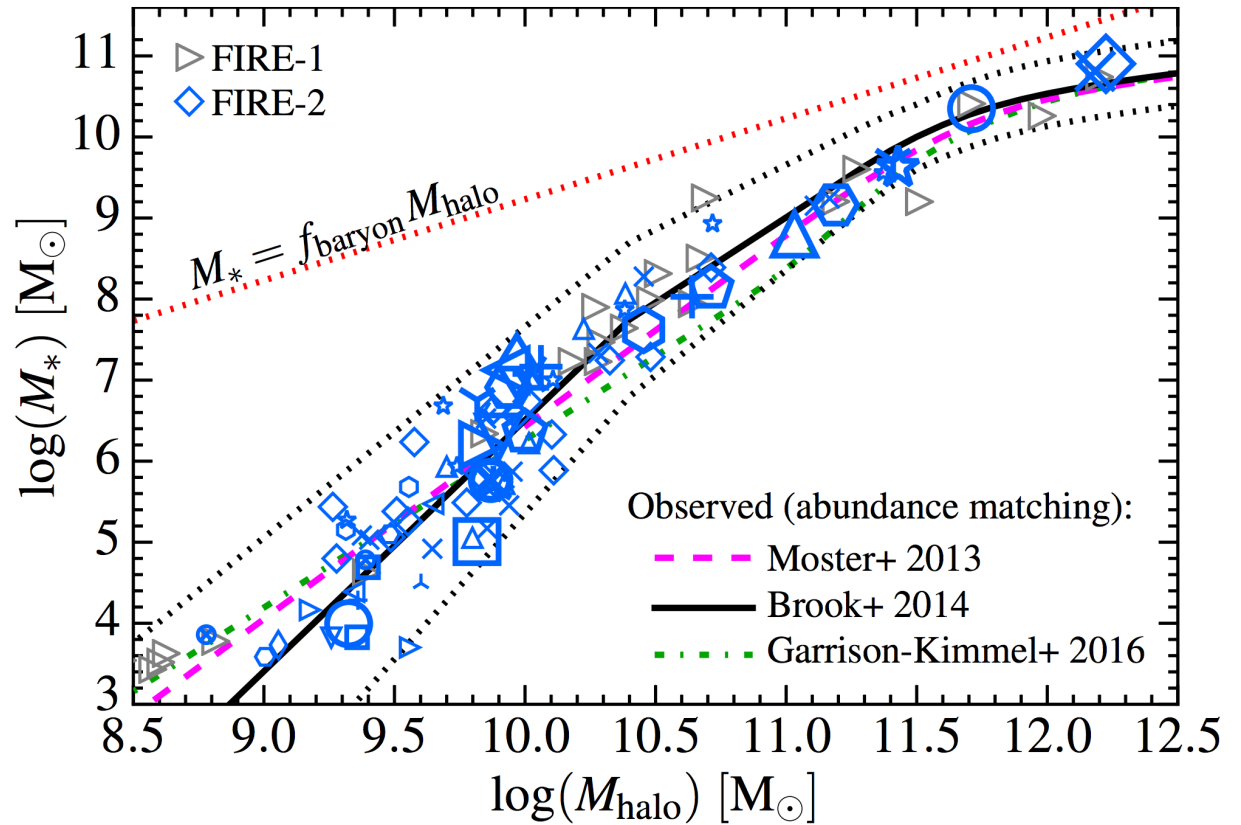
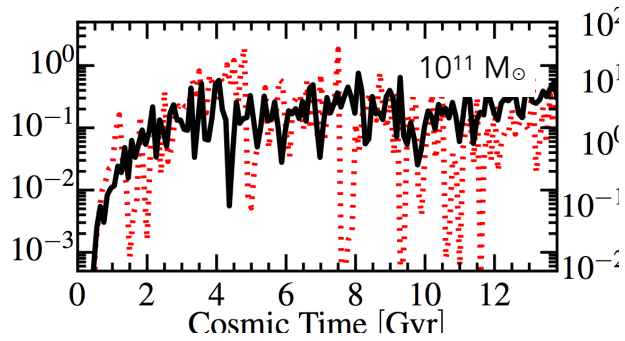
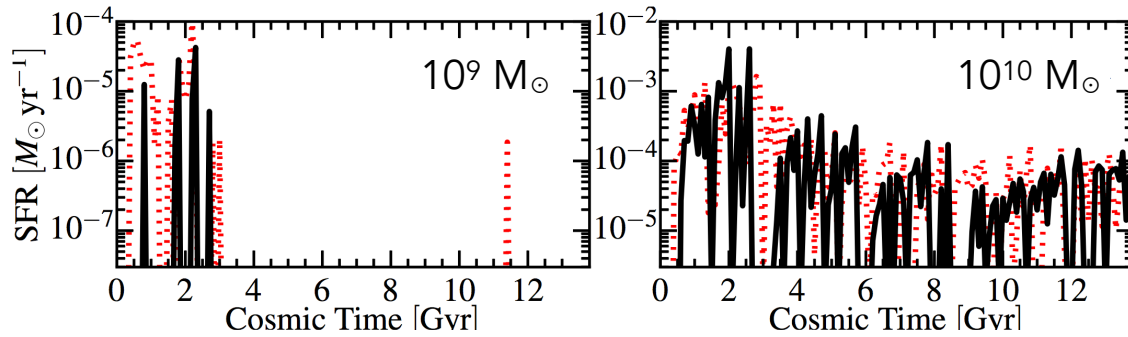


Supernova feedback and dwarf galaxies

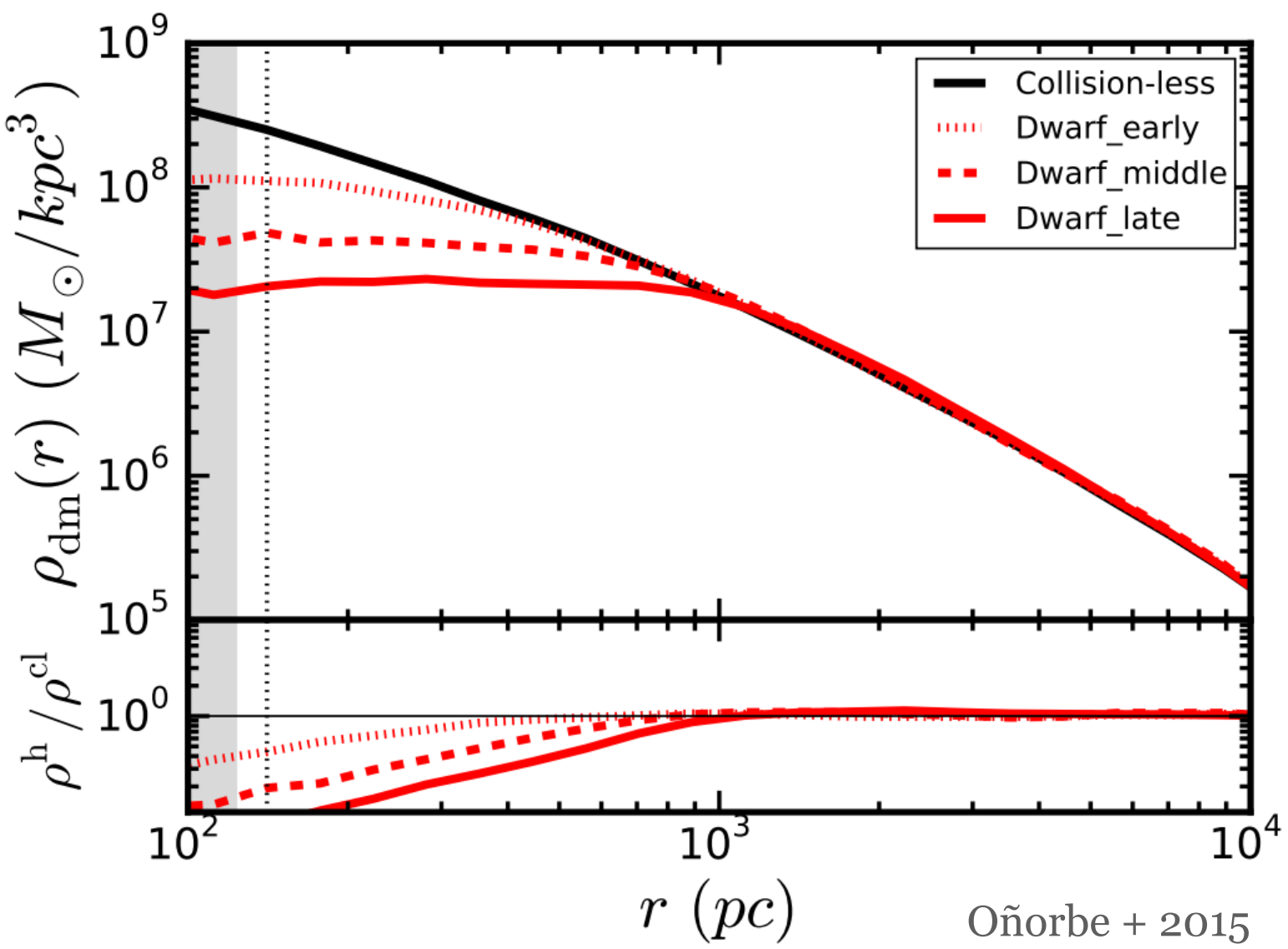


Hopkins + 2018

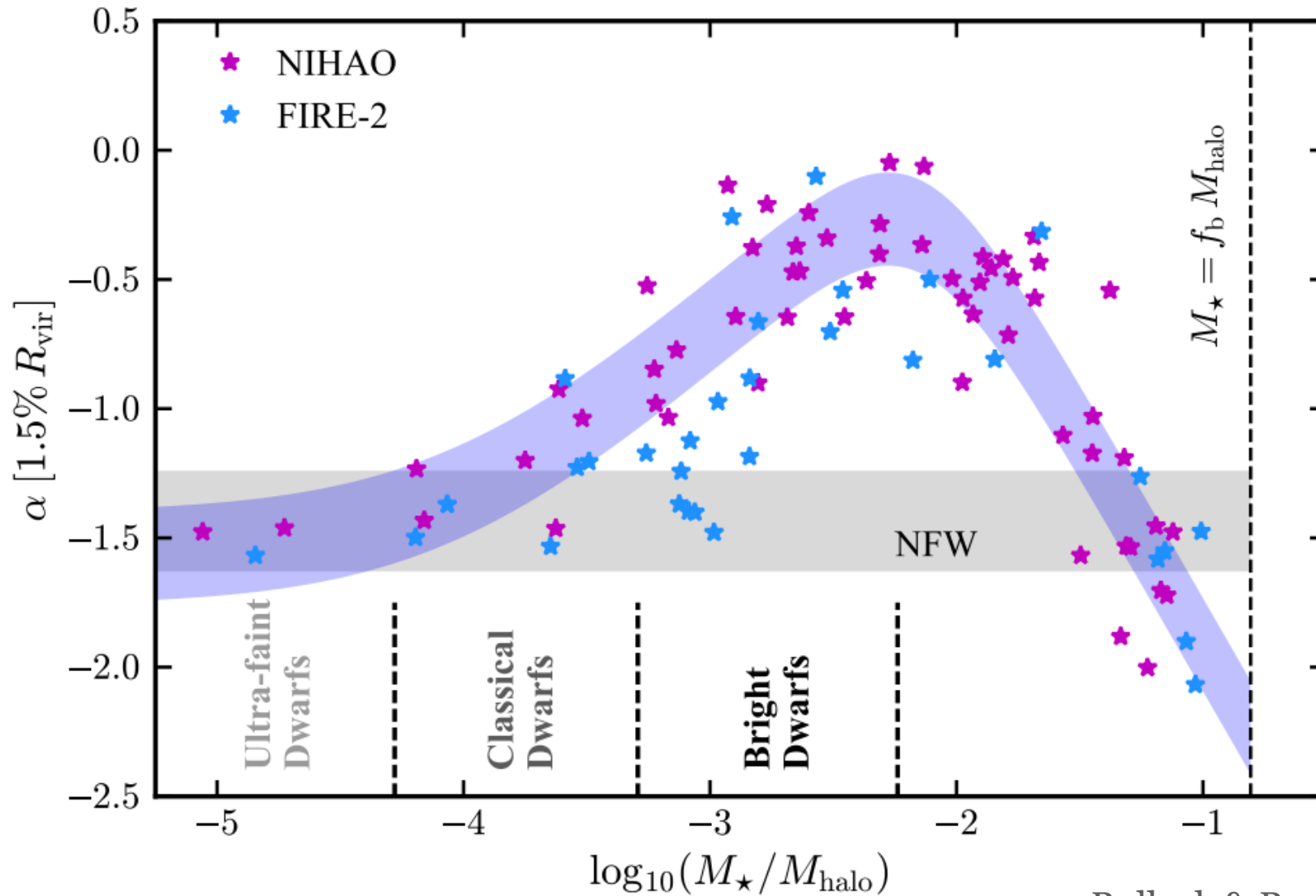
Supernova feedback and dwarf galaxies



Supernova feedback and dwarf galaxies



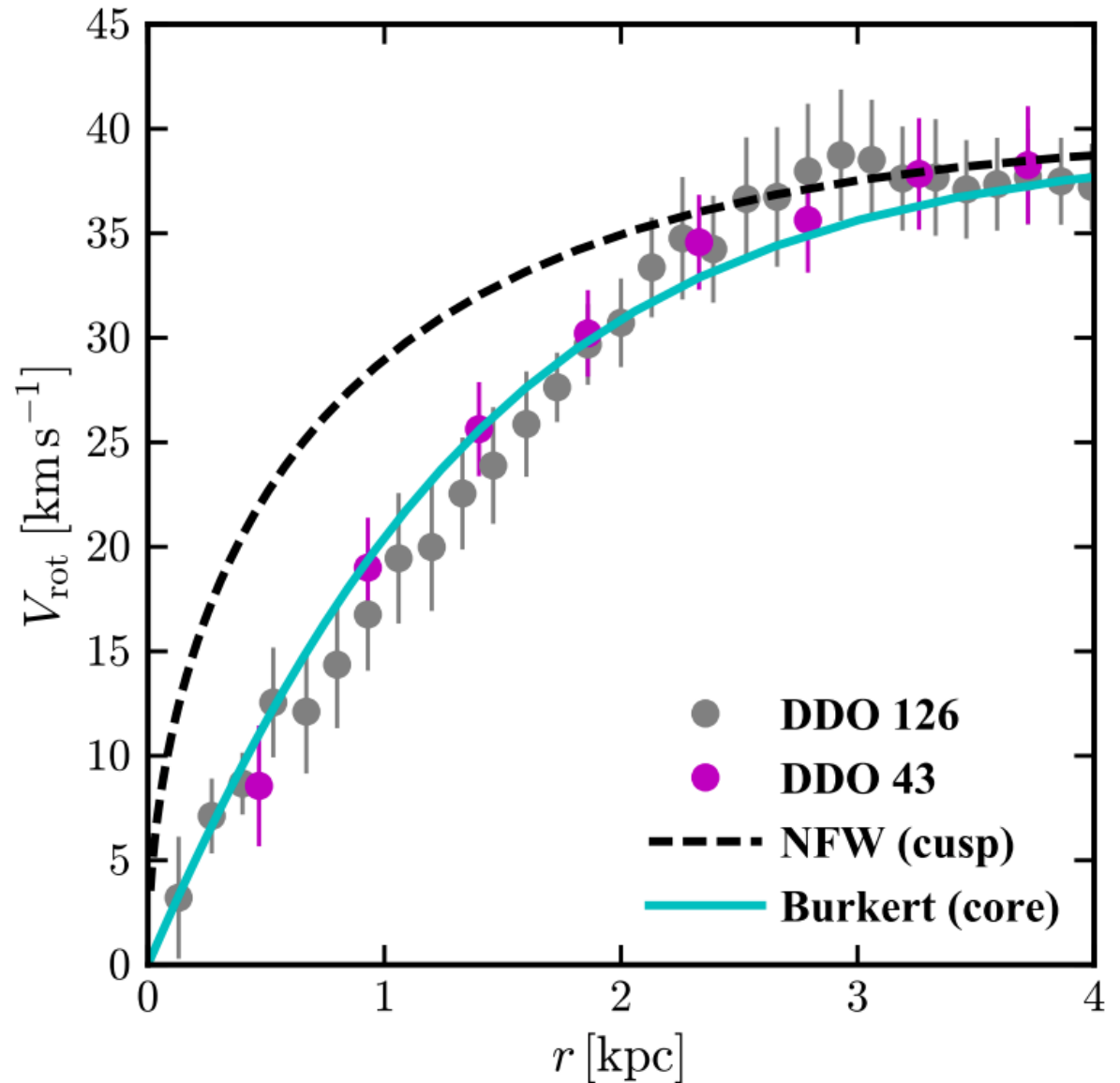
Supernova feedback and dwarf galaxies



Bullock & Boylan-Kolchin 2018

Supernova feedback and dwarf galaxies

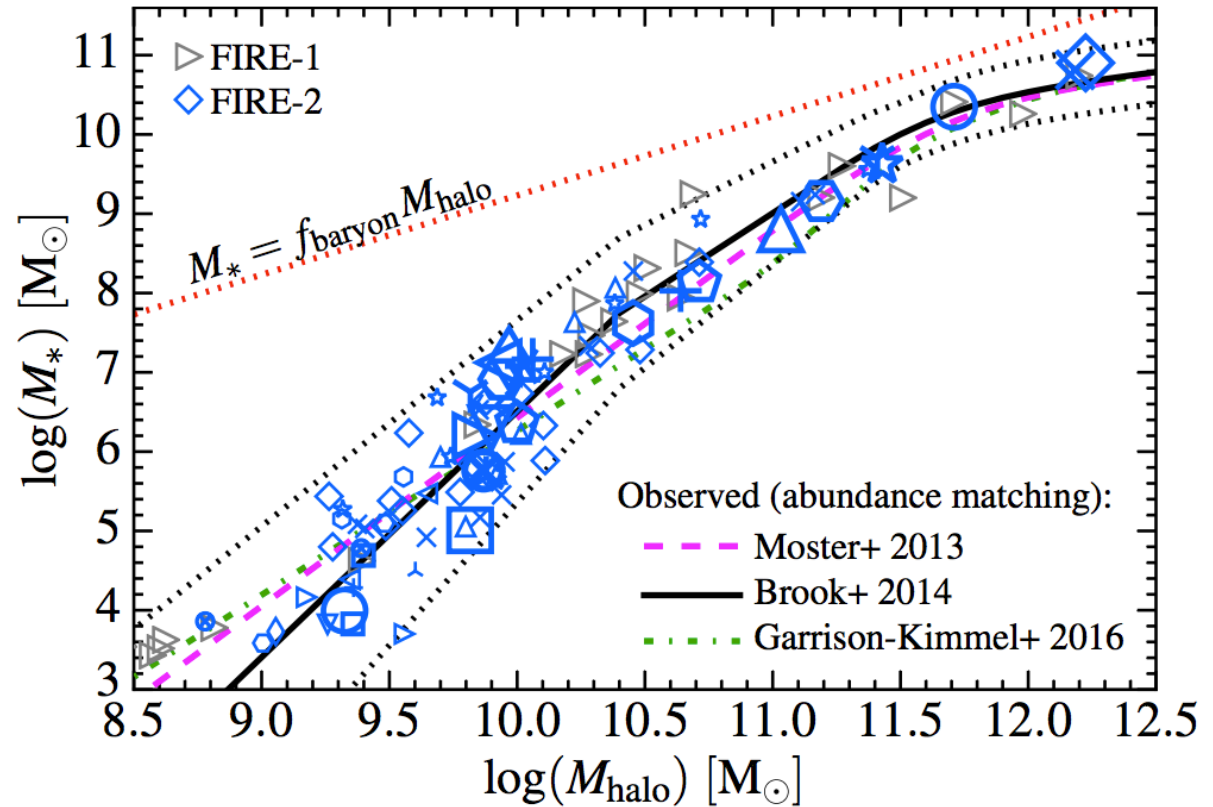
- This is nice because actual galaxies also look like this (maybe)



Data from LITTLE THINGS (Oh + 2015)

Dwarf galaxy stellar distributions

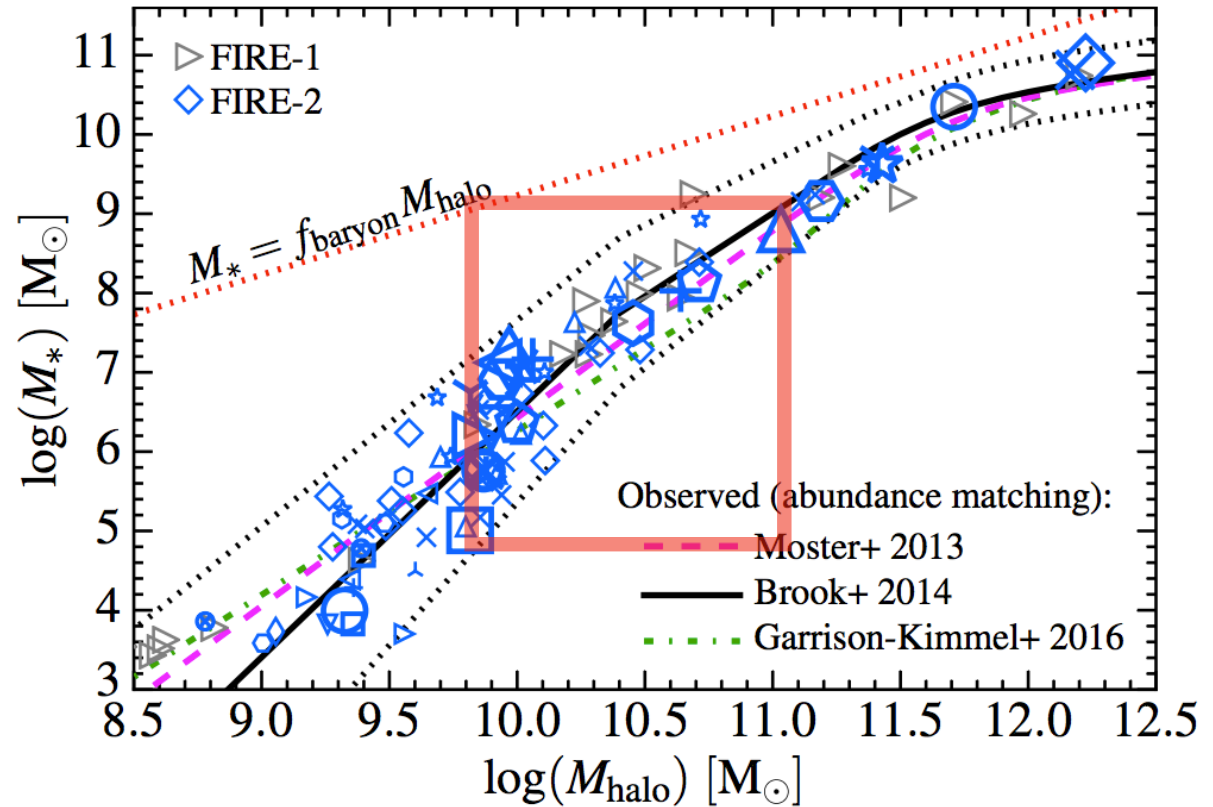
- Focus on a sample of Isolated dwarf galaxies from the FIRE project (Hopkins et al. 2018)



Also see El-badry + 2016

FIRE dwarf galaxies

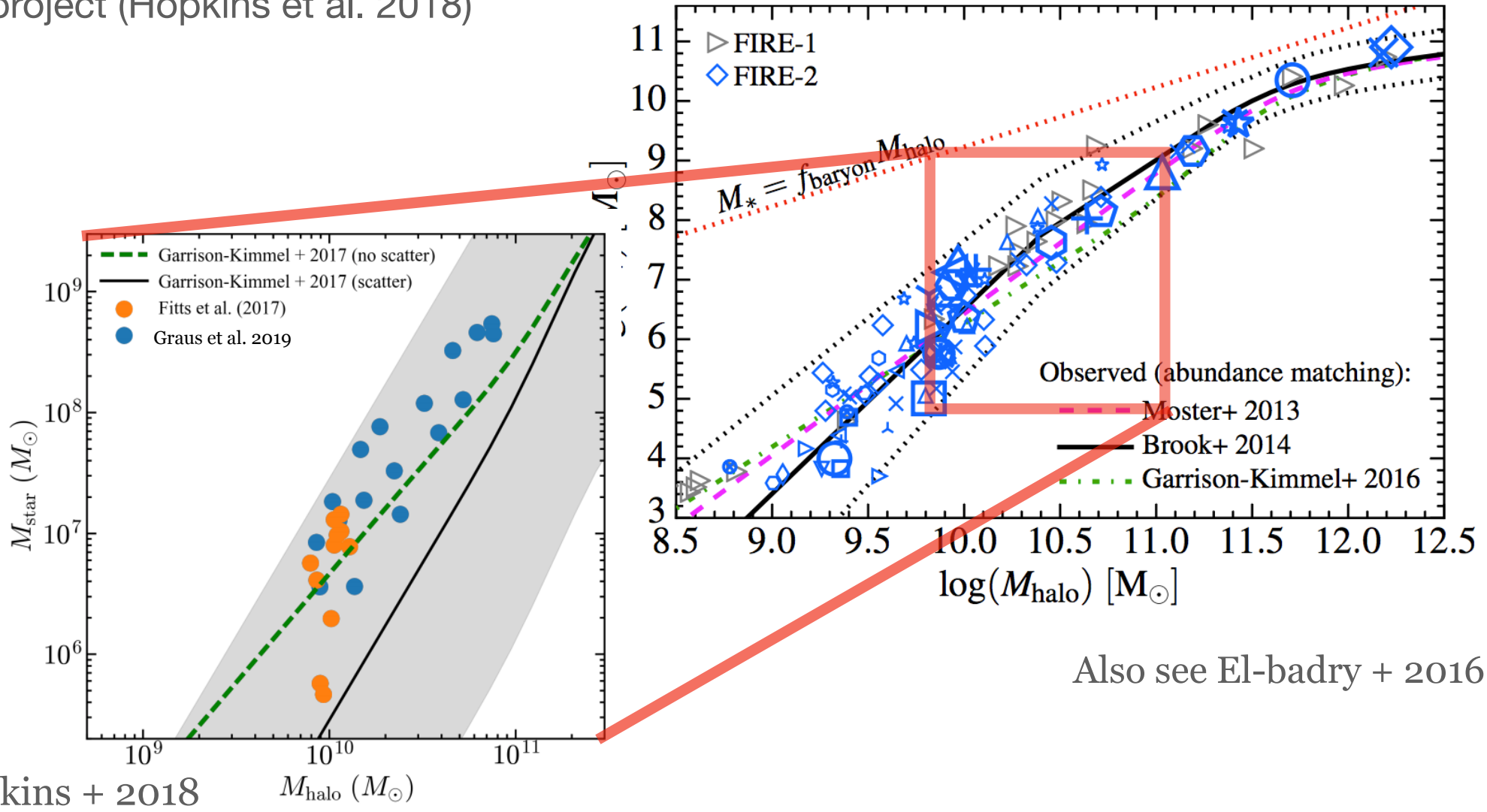
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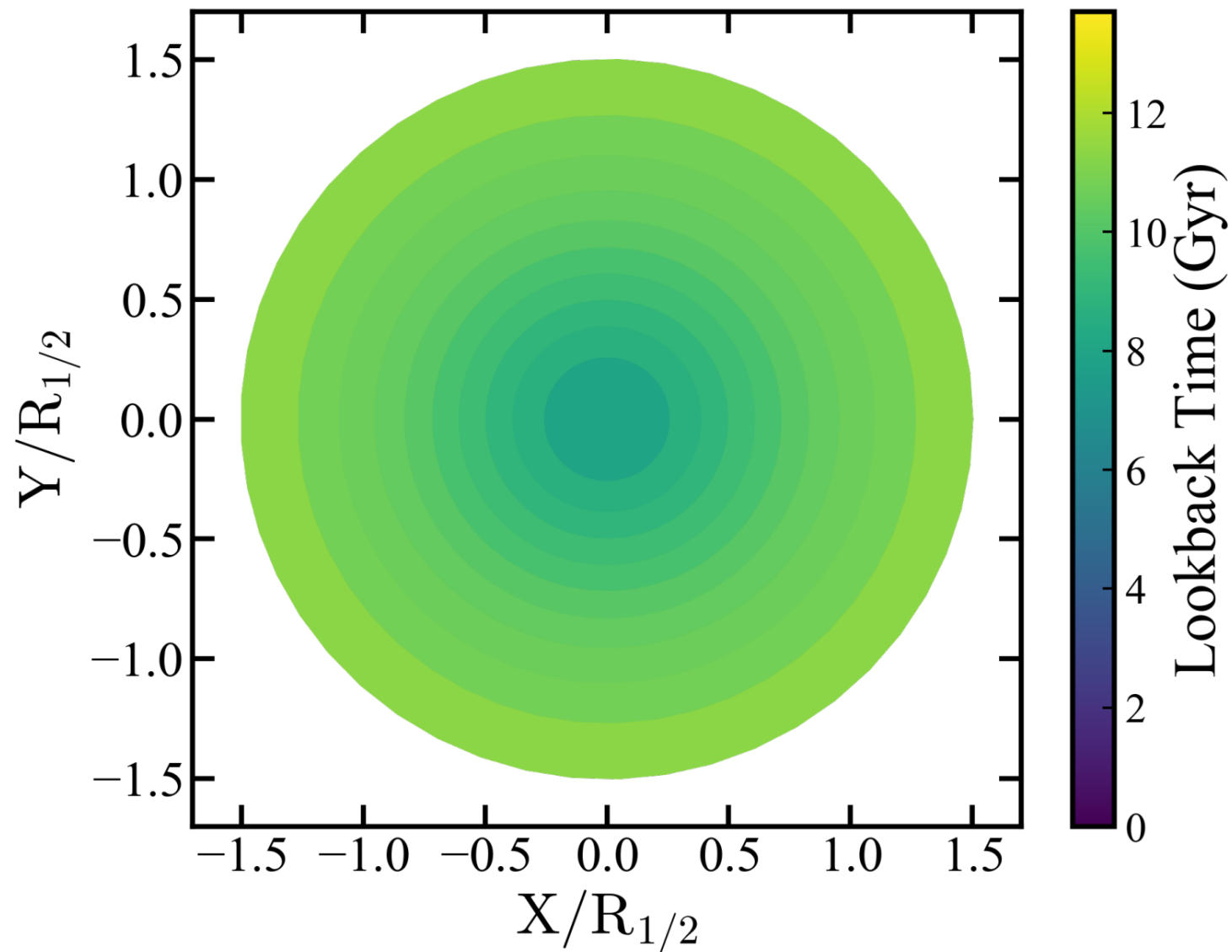
FIRE dwarf galaxies

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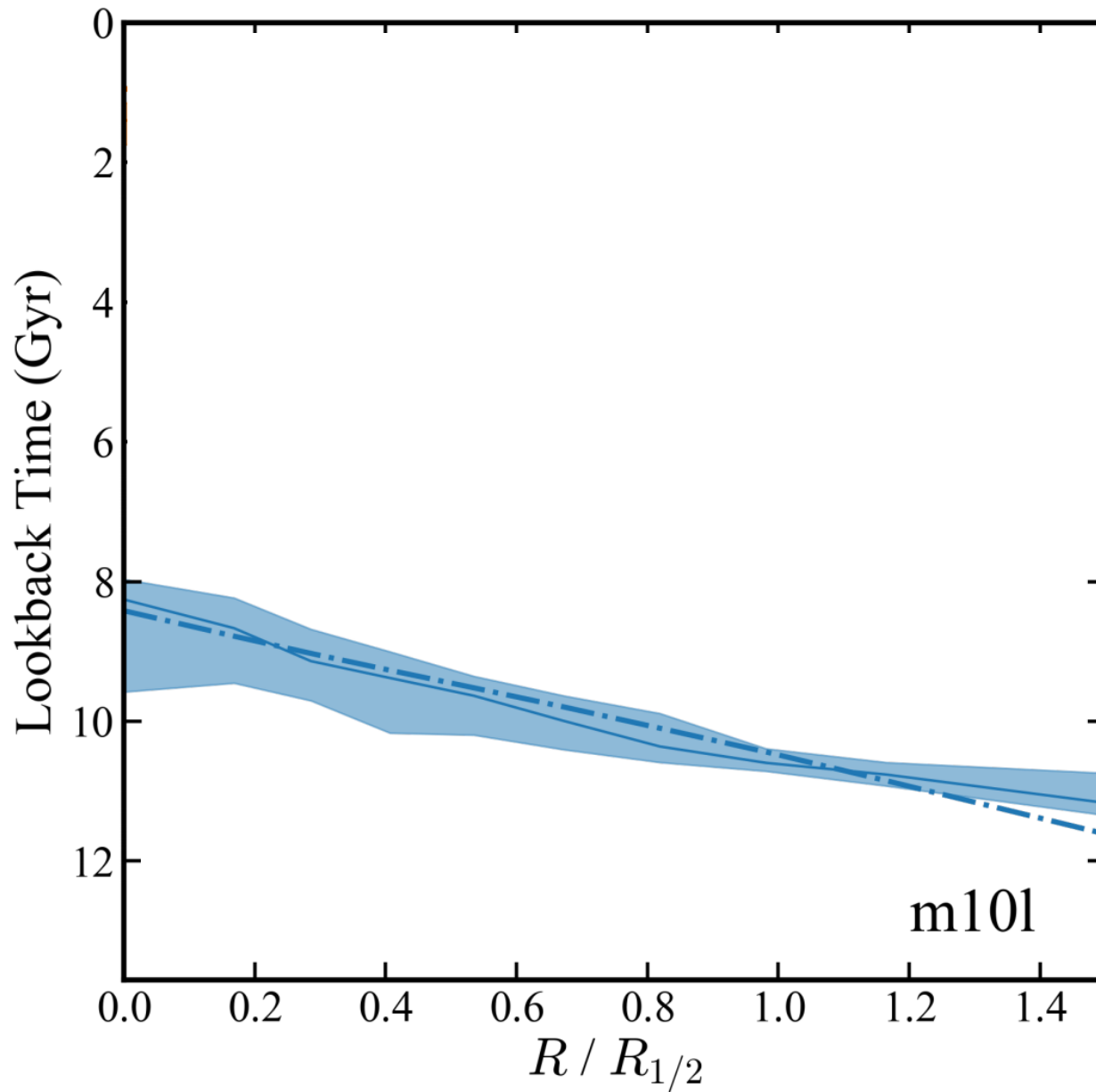
Hopkins + 2018

Age gradients in dwarf galaxies



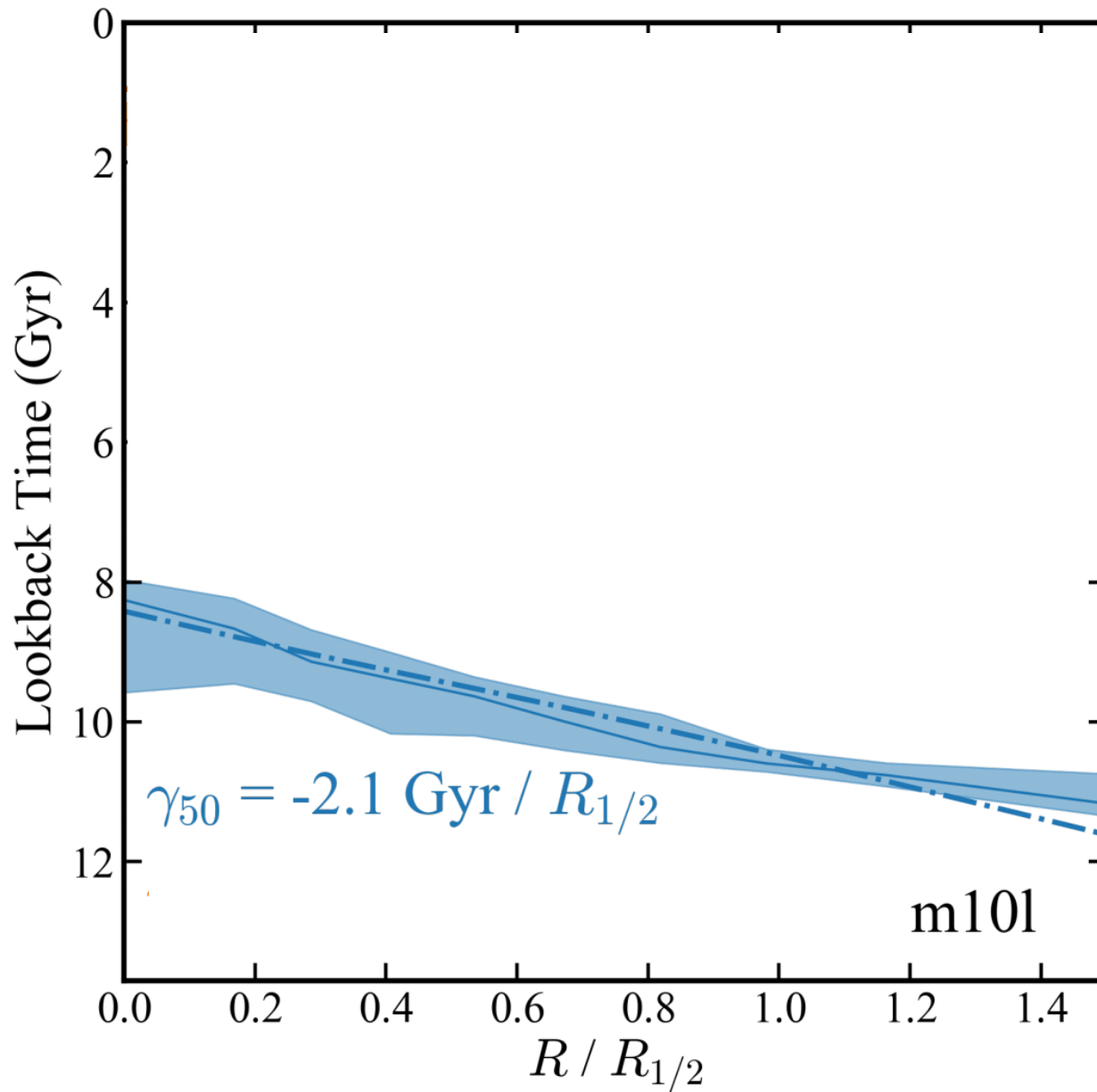
Graus+ 2019

Age gradients in dwarf galaxies



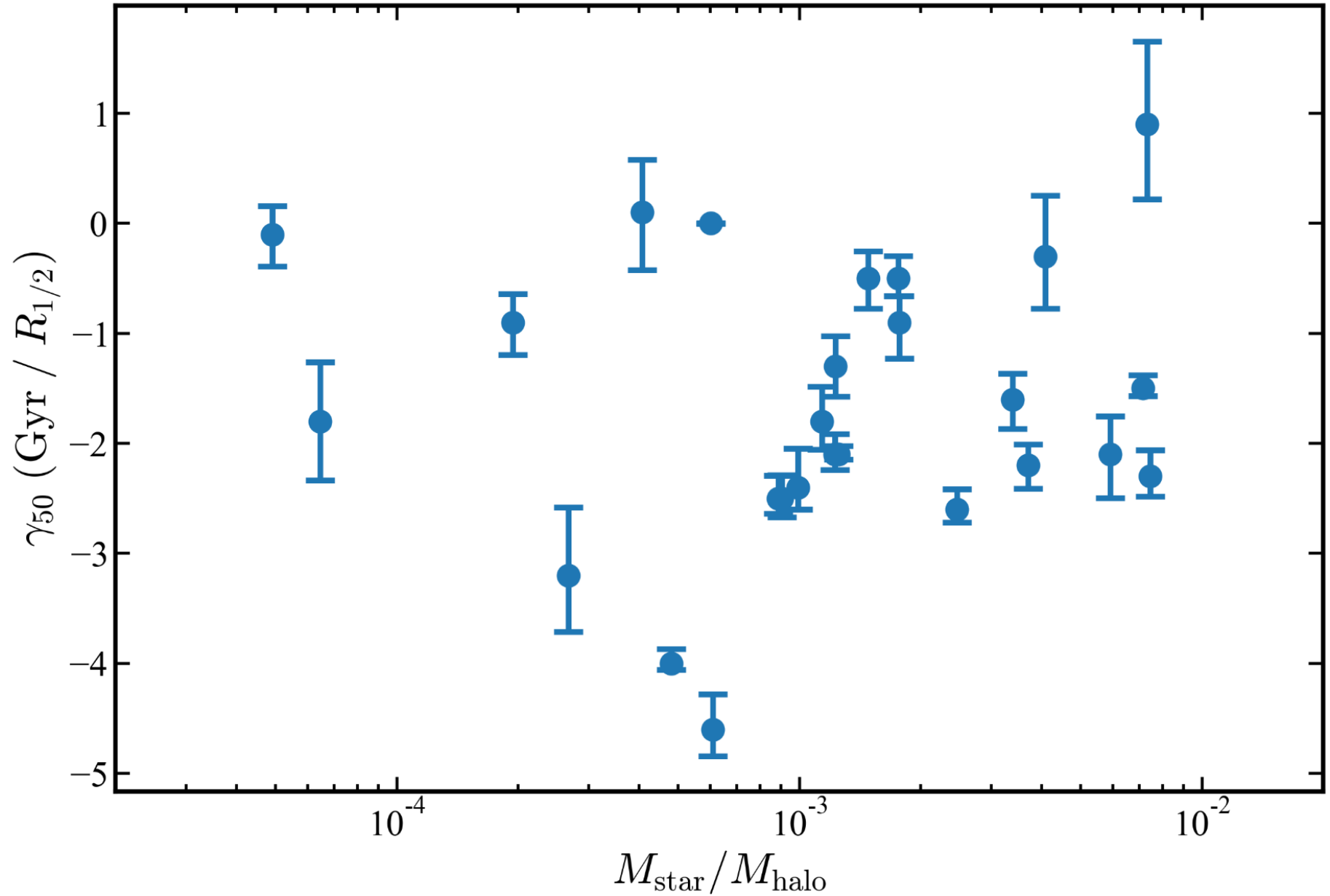
Graus+ 2019

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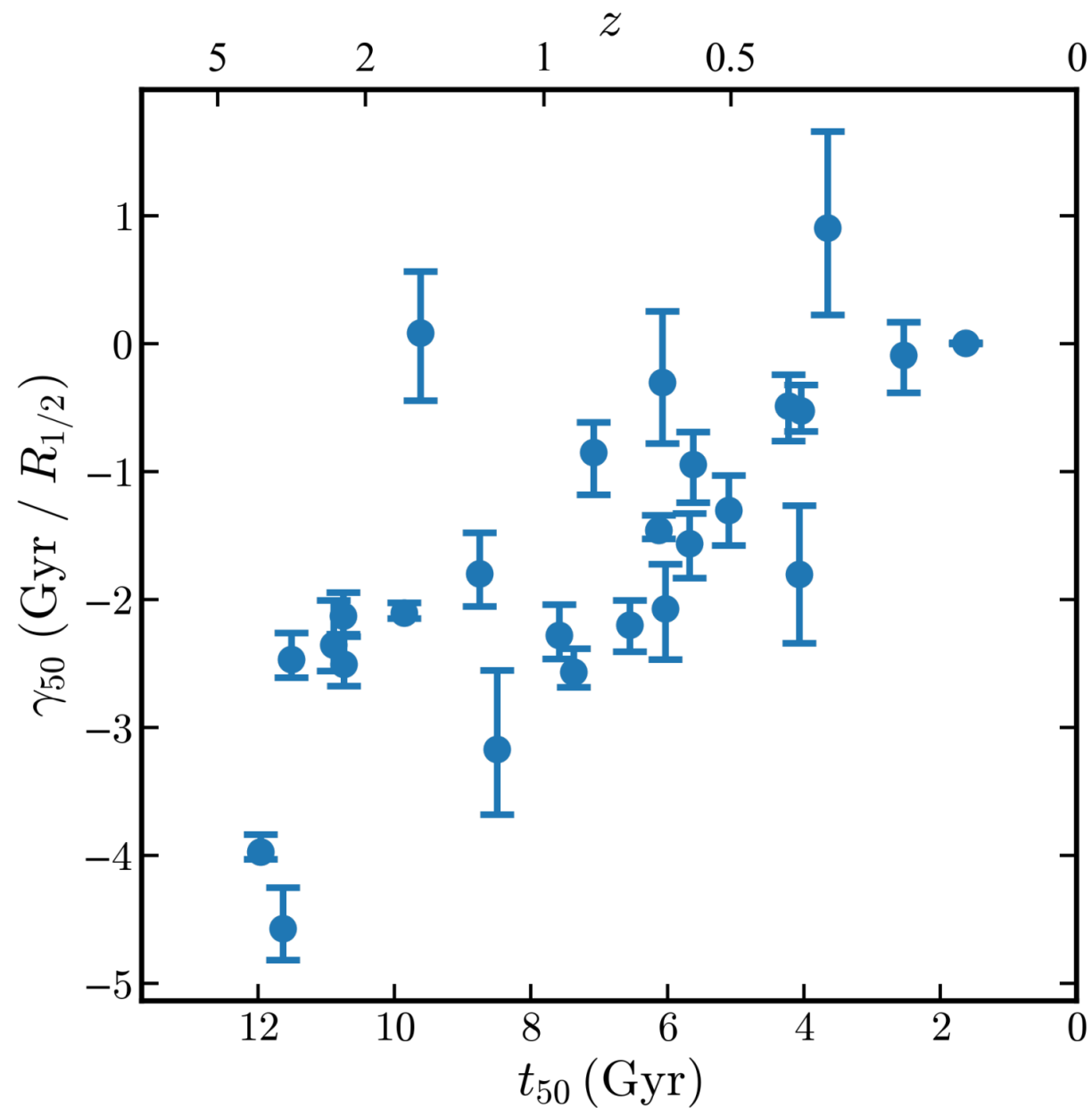
Graus+ 2019

Age gradients in dwarf galaxies



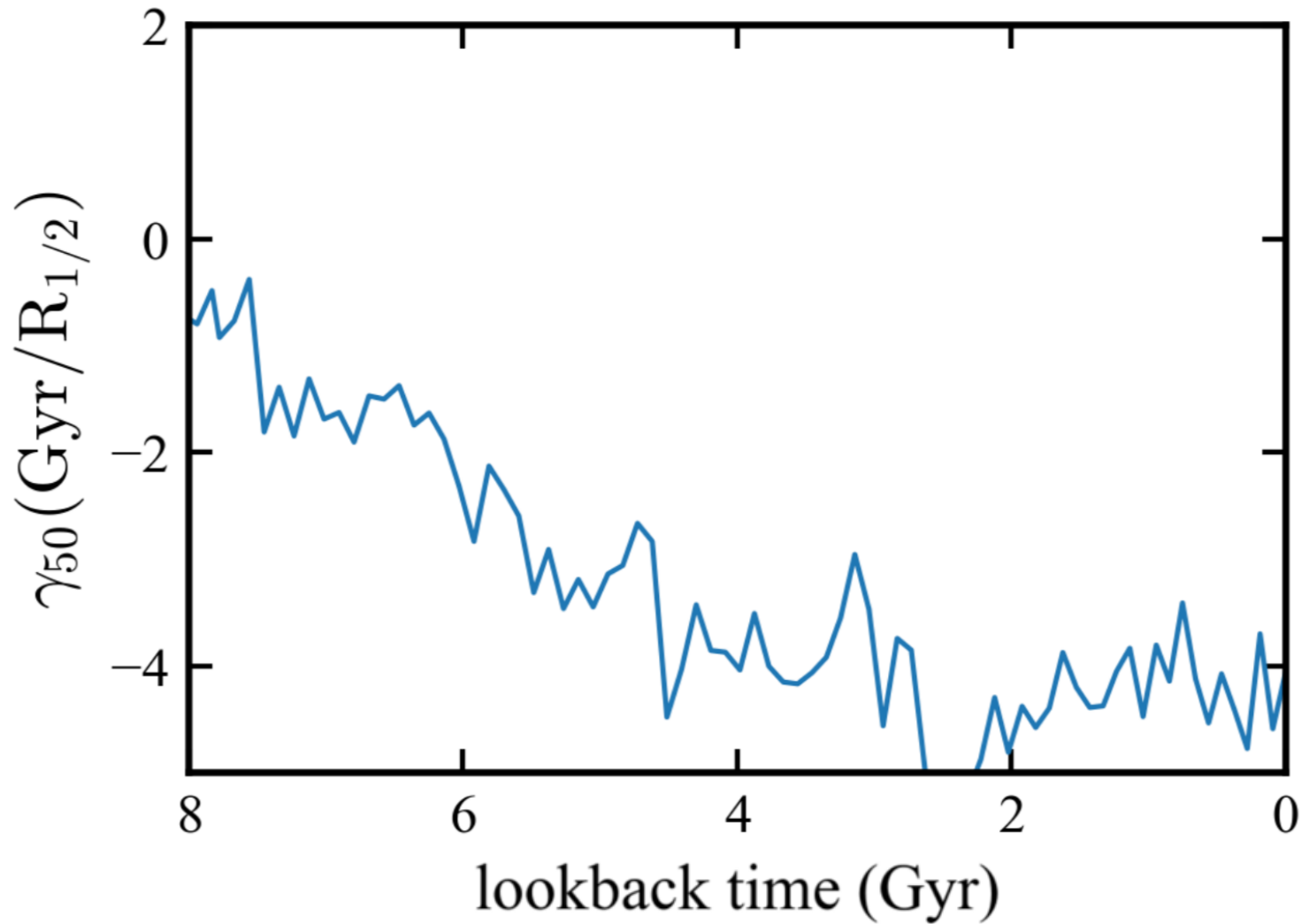
Graus+ 2019

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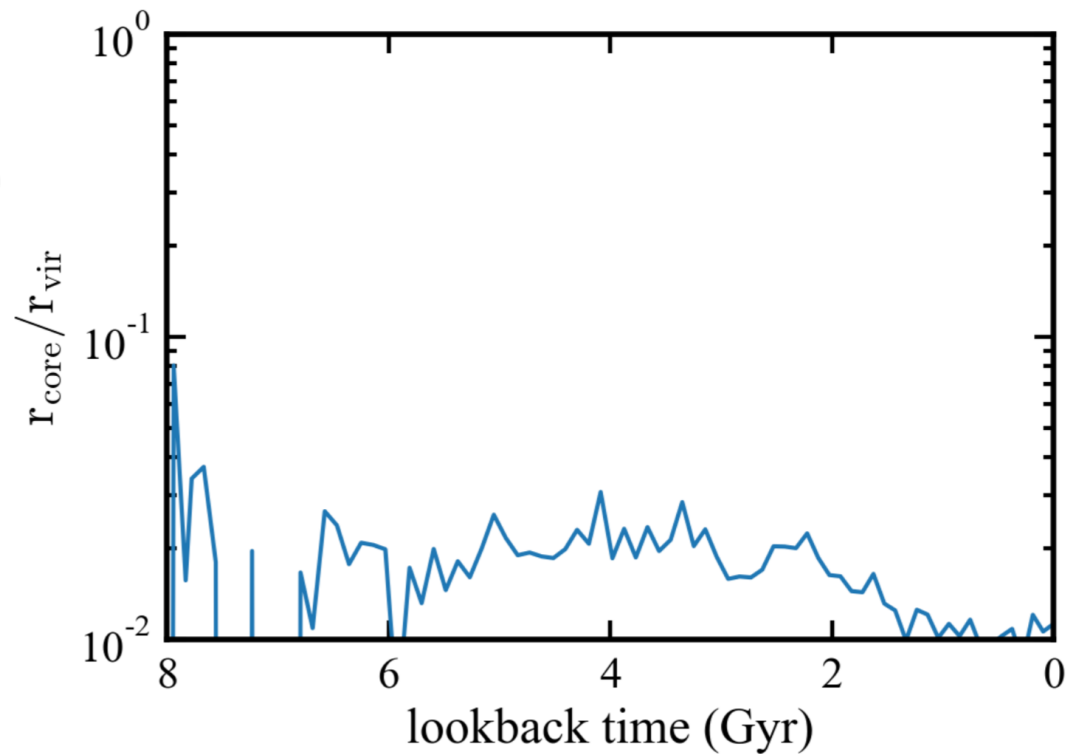
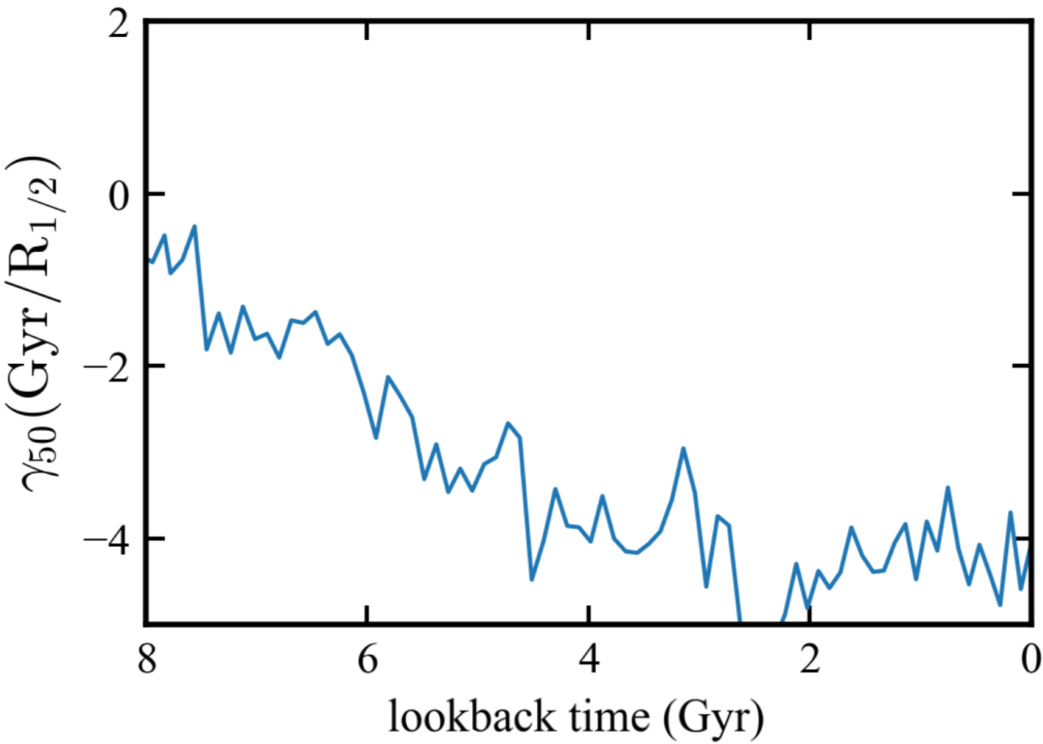


Graus+ 2019

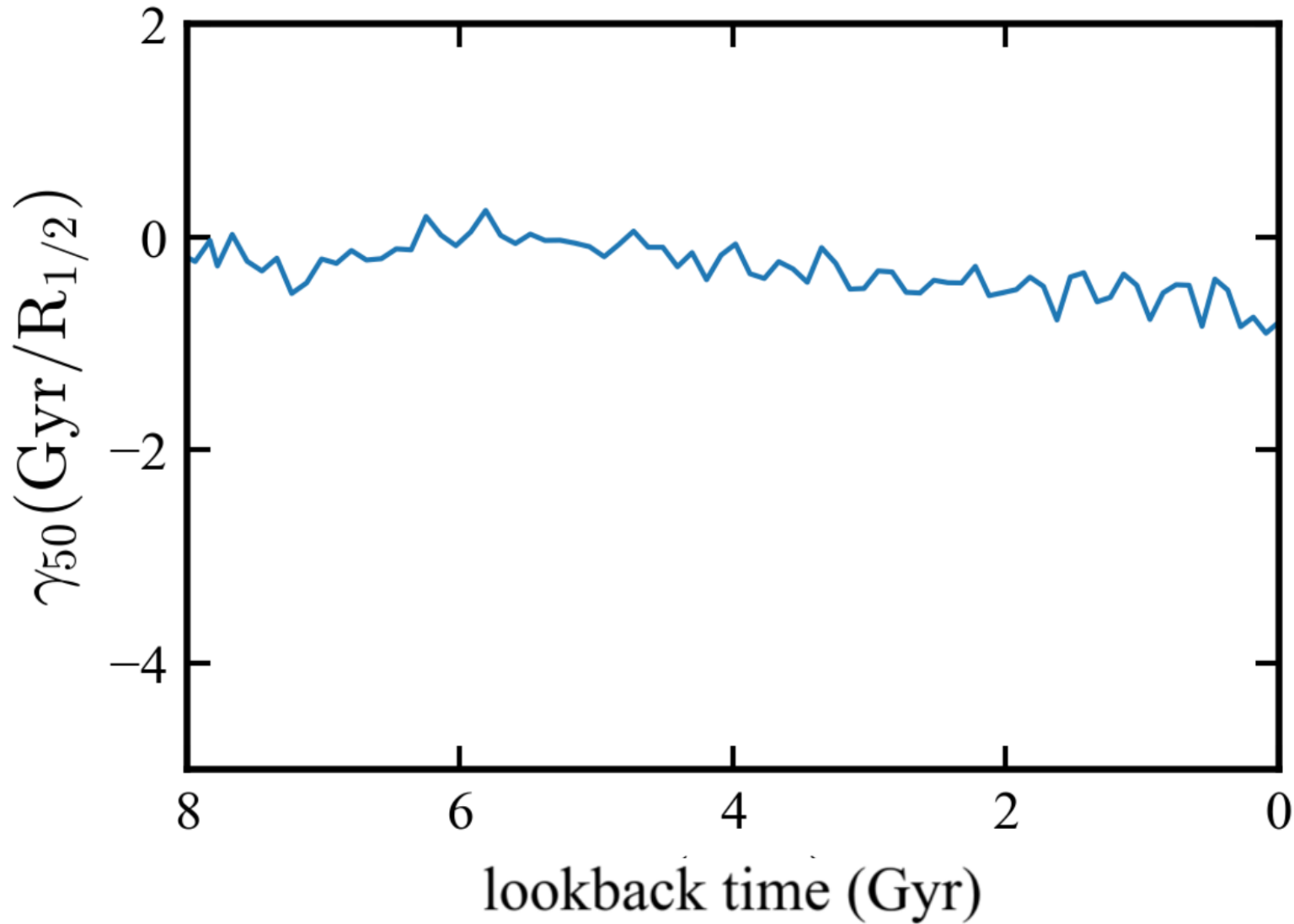
Age gradients in dwarf galaxies



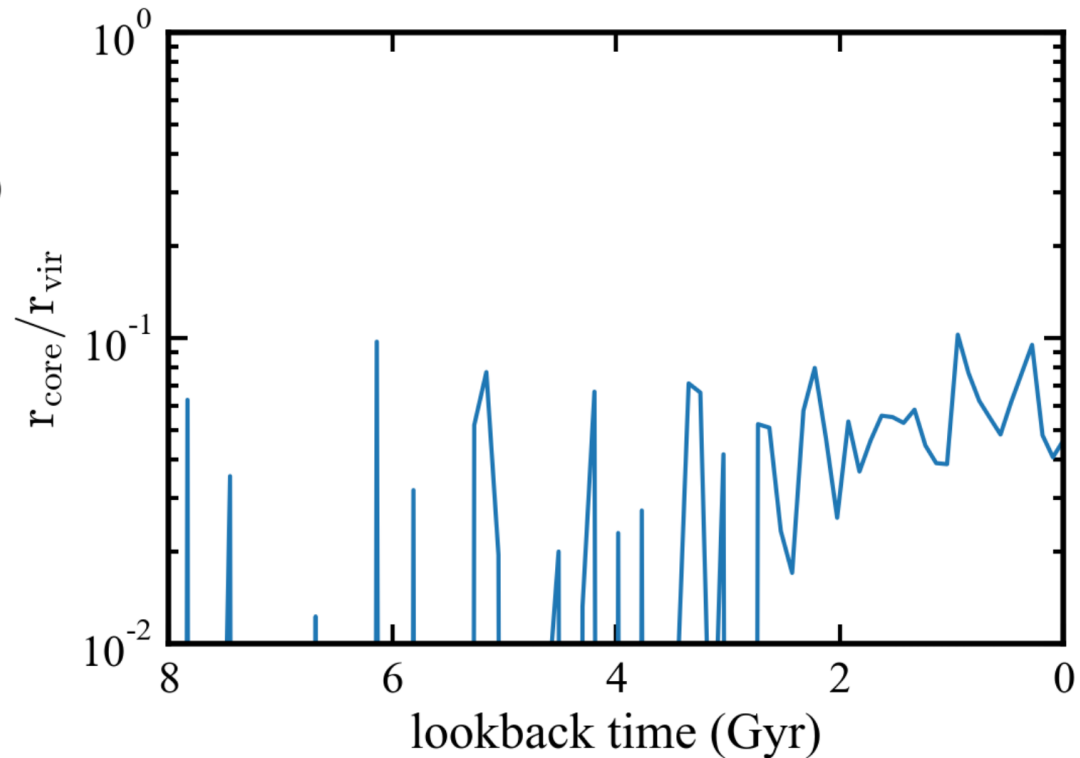
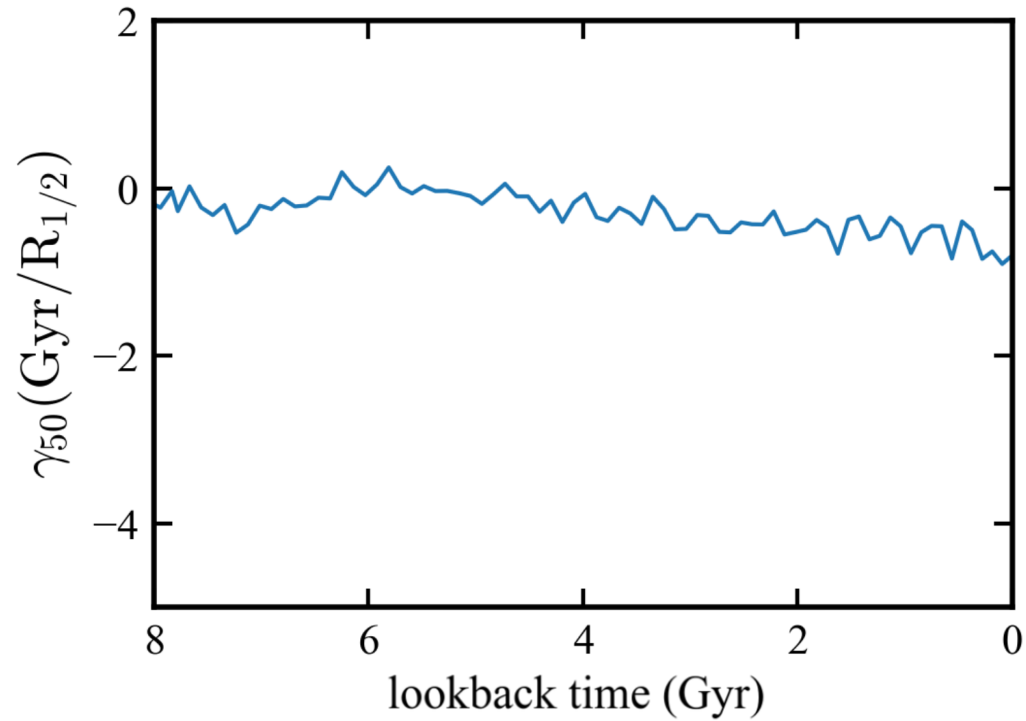
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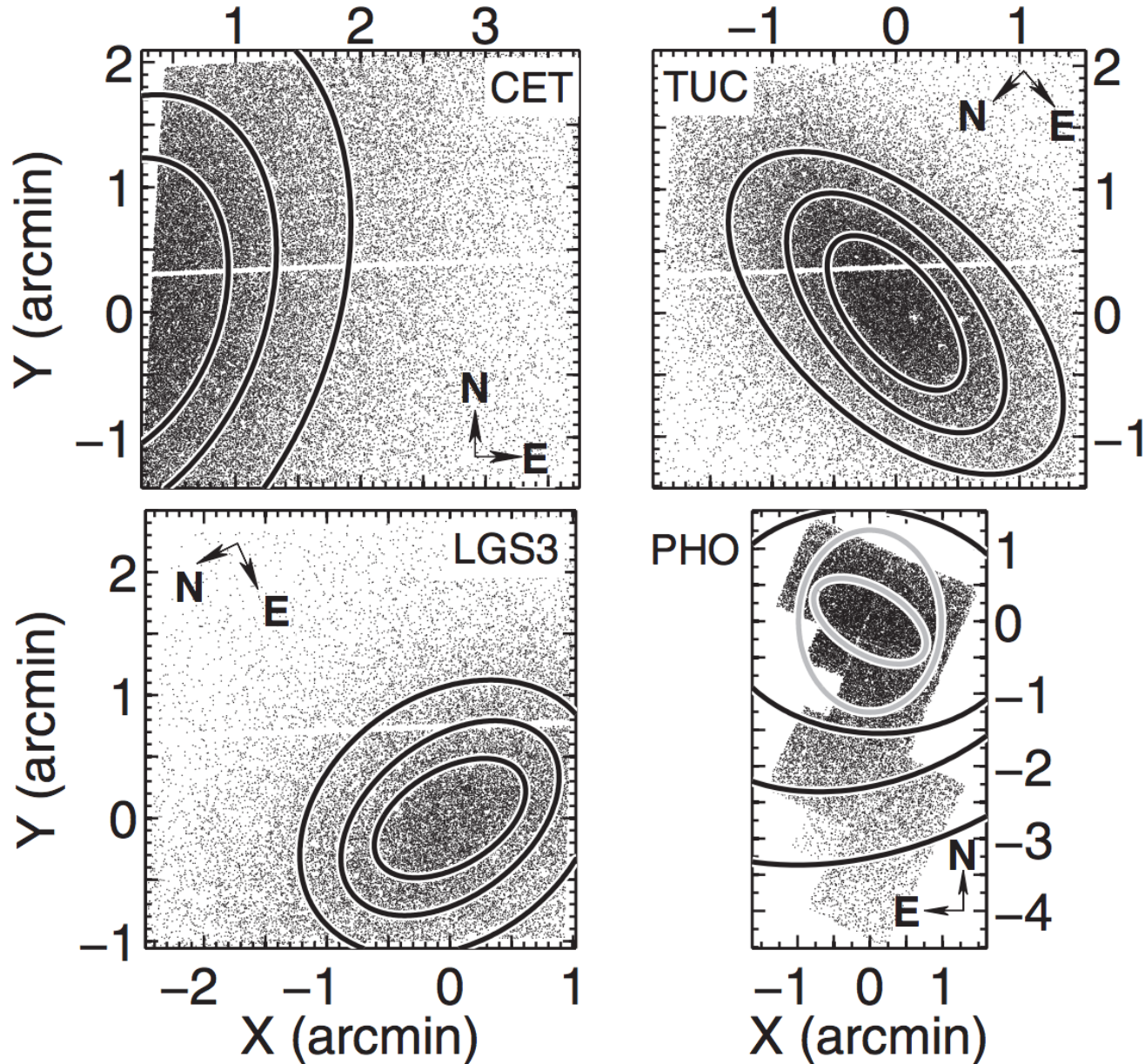
Age gradients in dwarf galaxies



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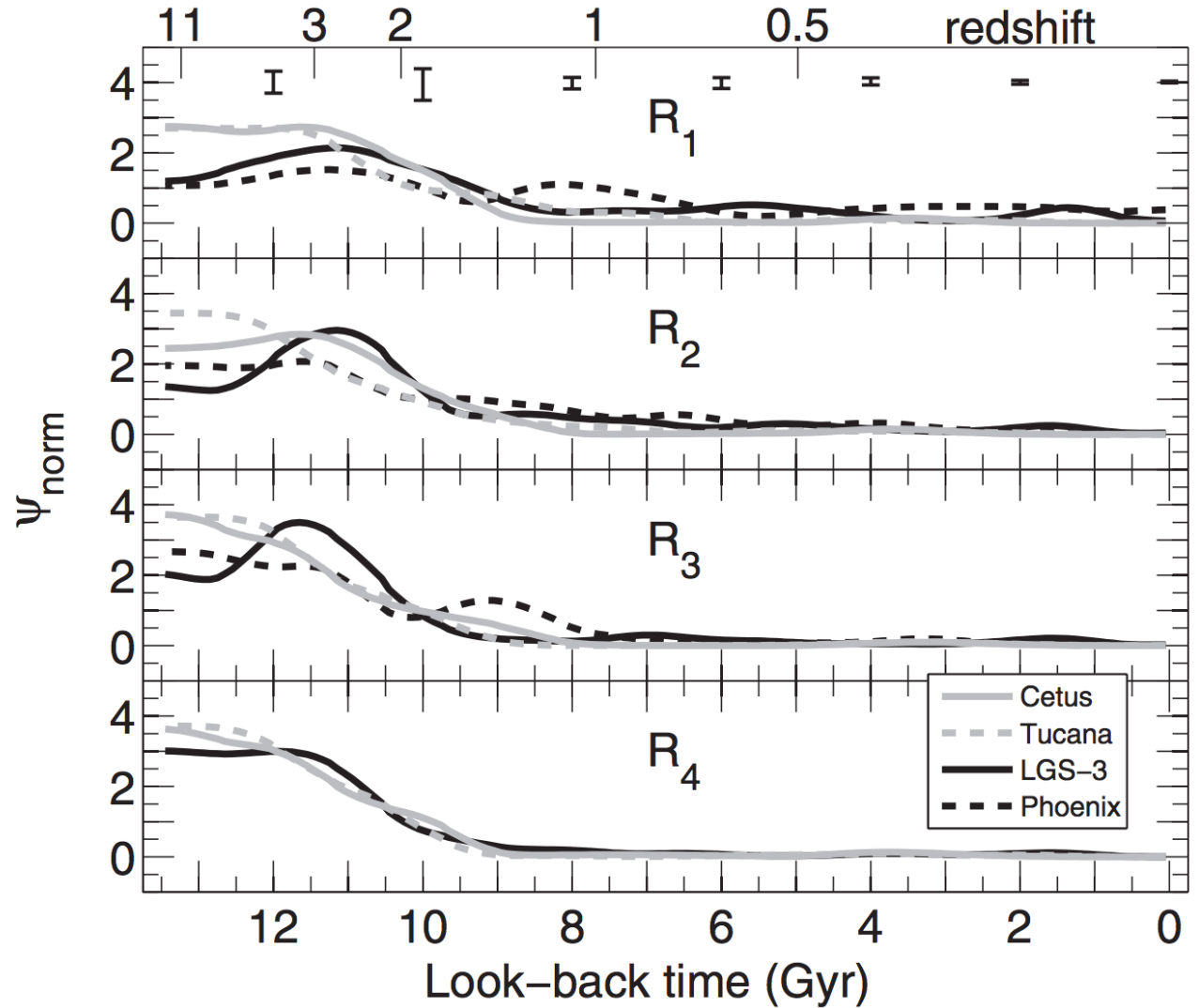
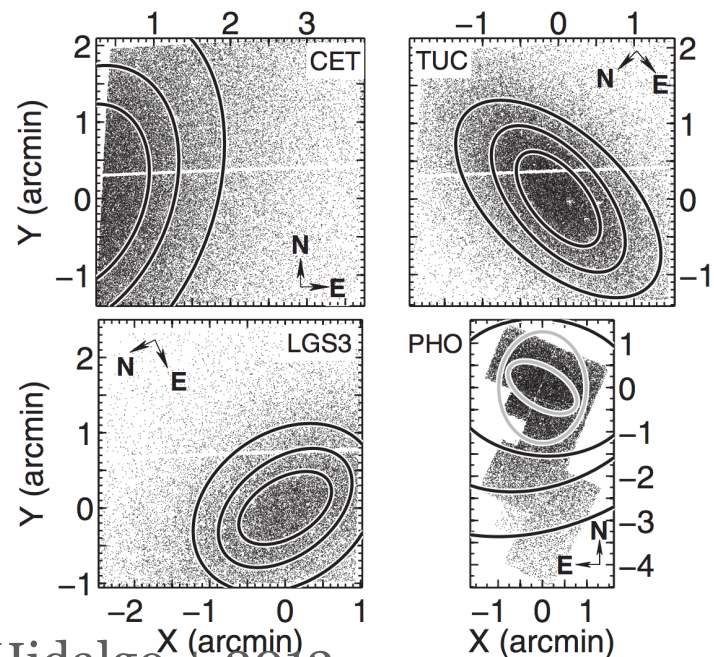


Observed age gradients



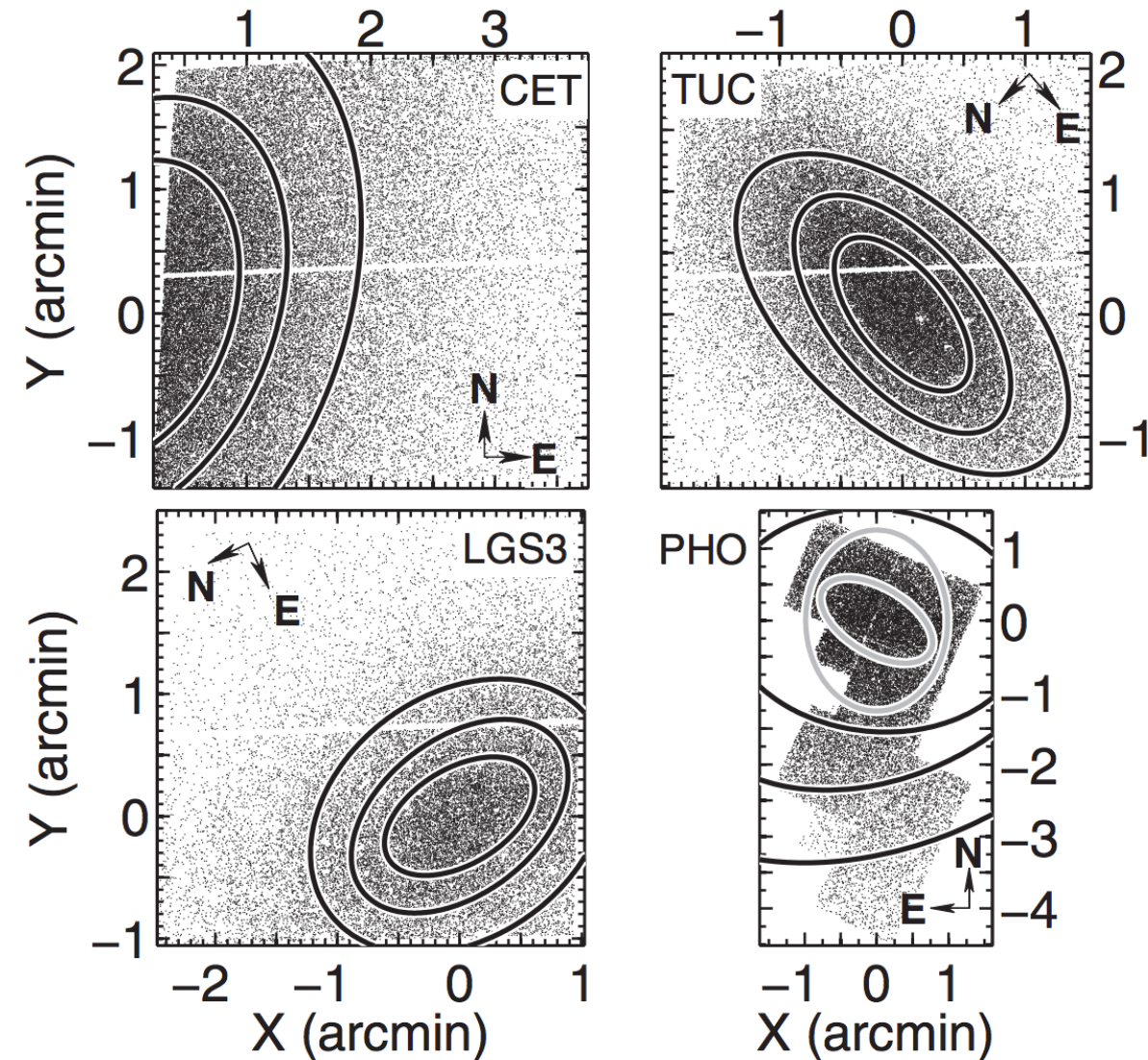
Hidalgo + 2013

Observed age gradients



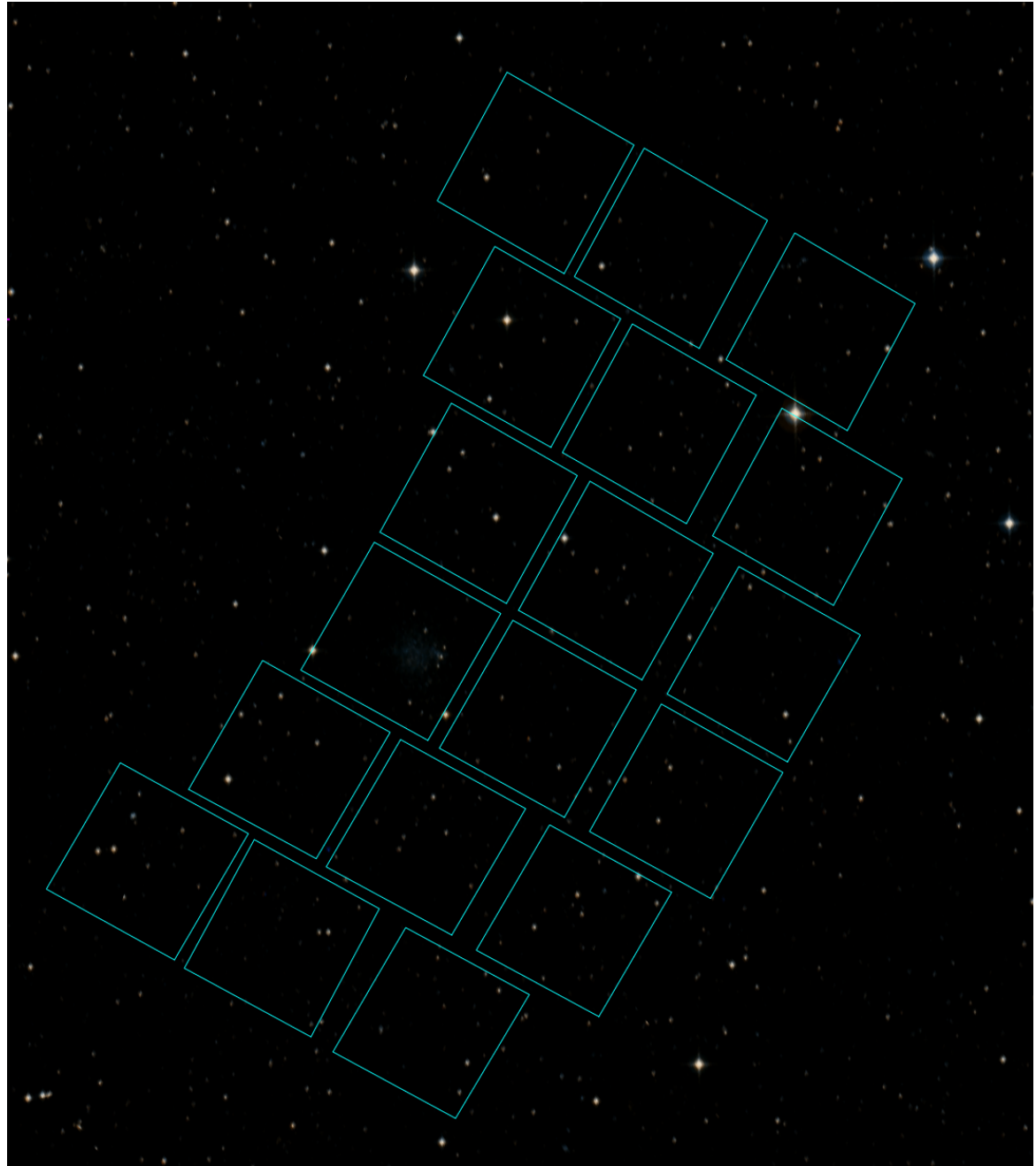
Hidalgo + 2013

Connection to WFIRST

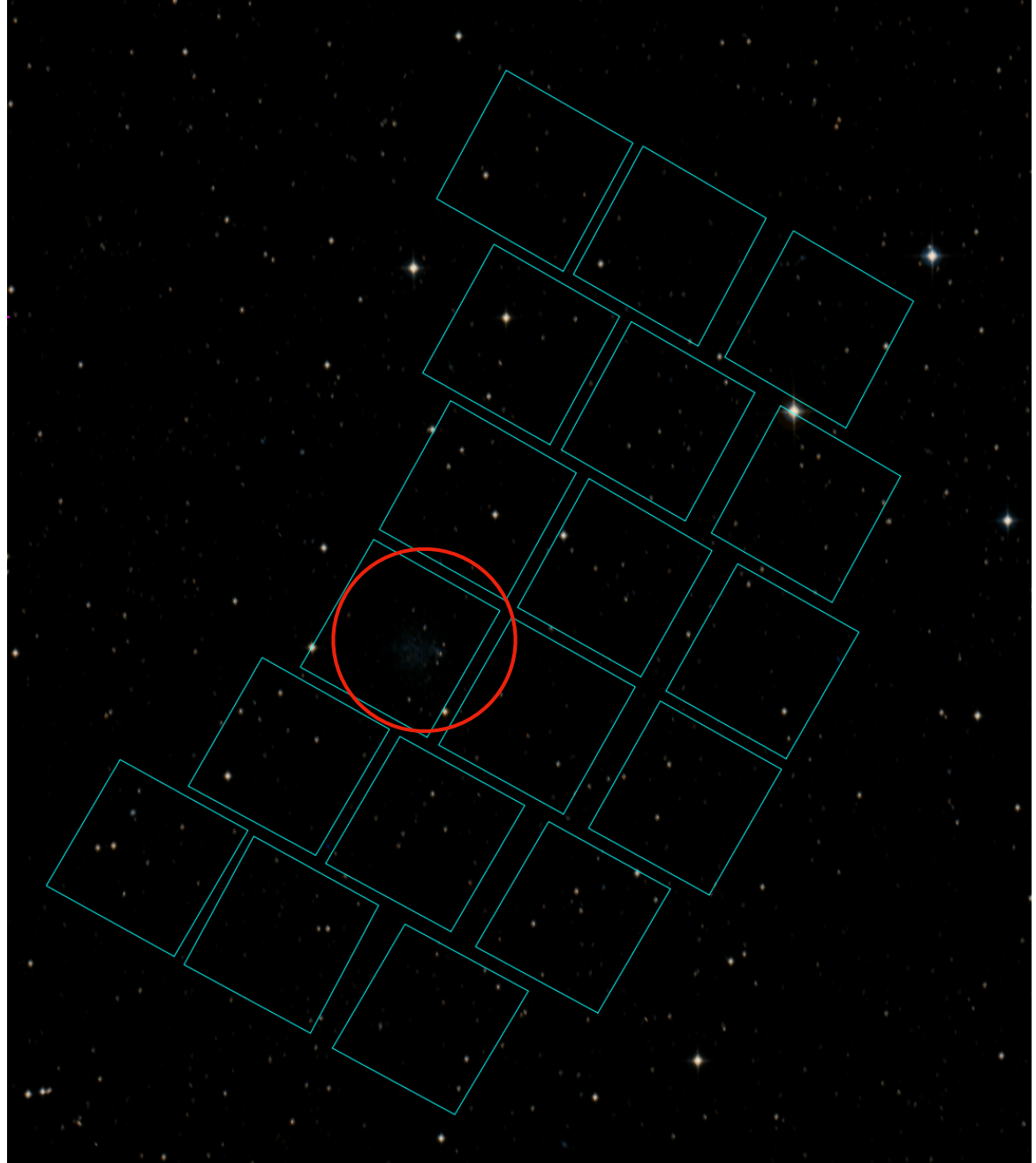


CMD-based SFHs are limited by HST field size!

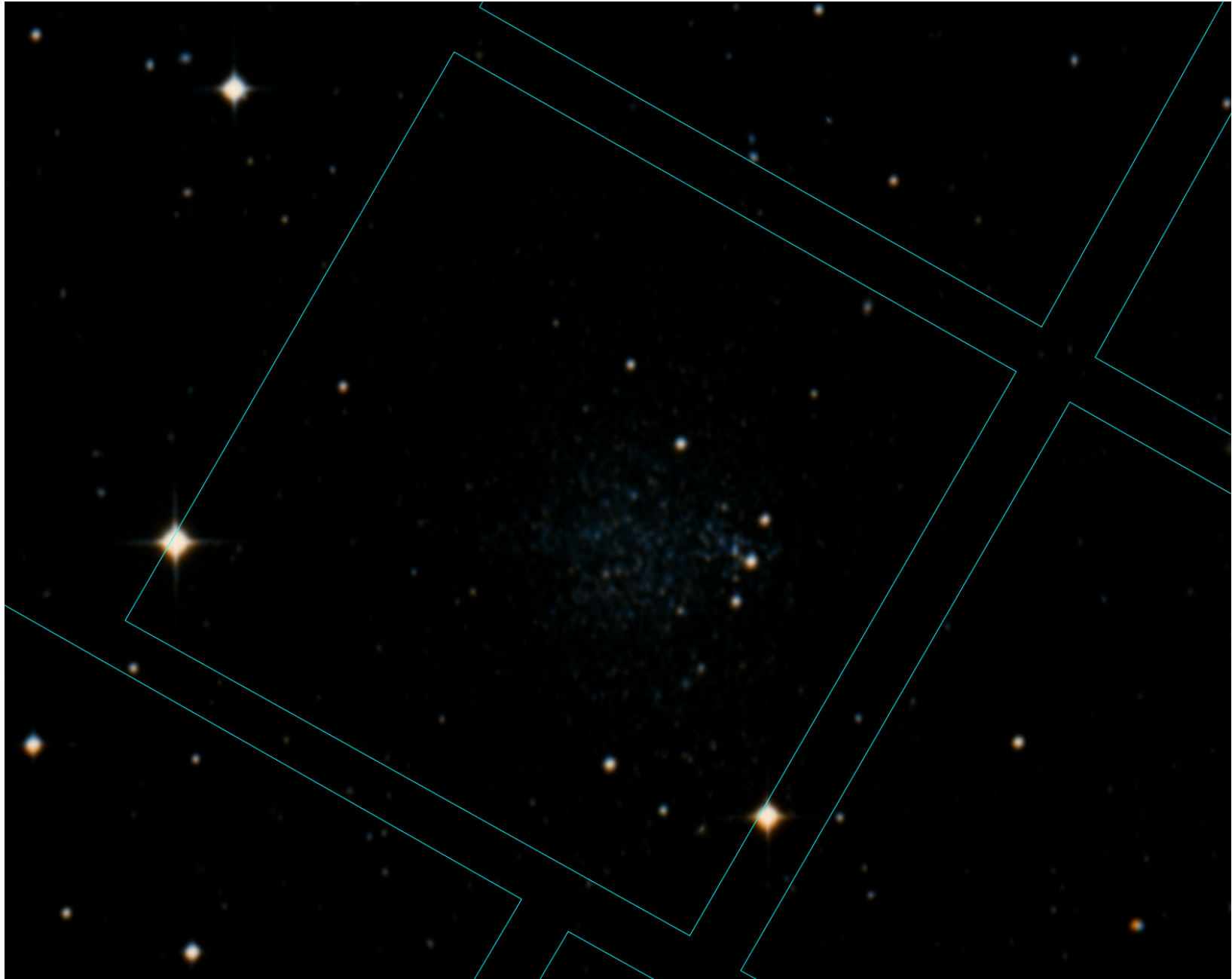
Connection to WFIRST



Connection to WFIRST



Connection to WFIRST



Conclusions

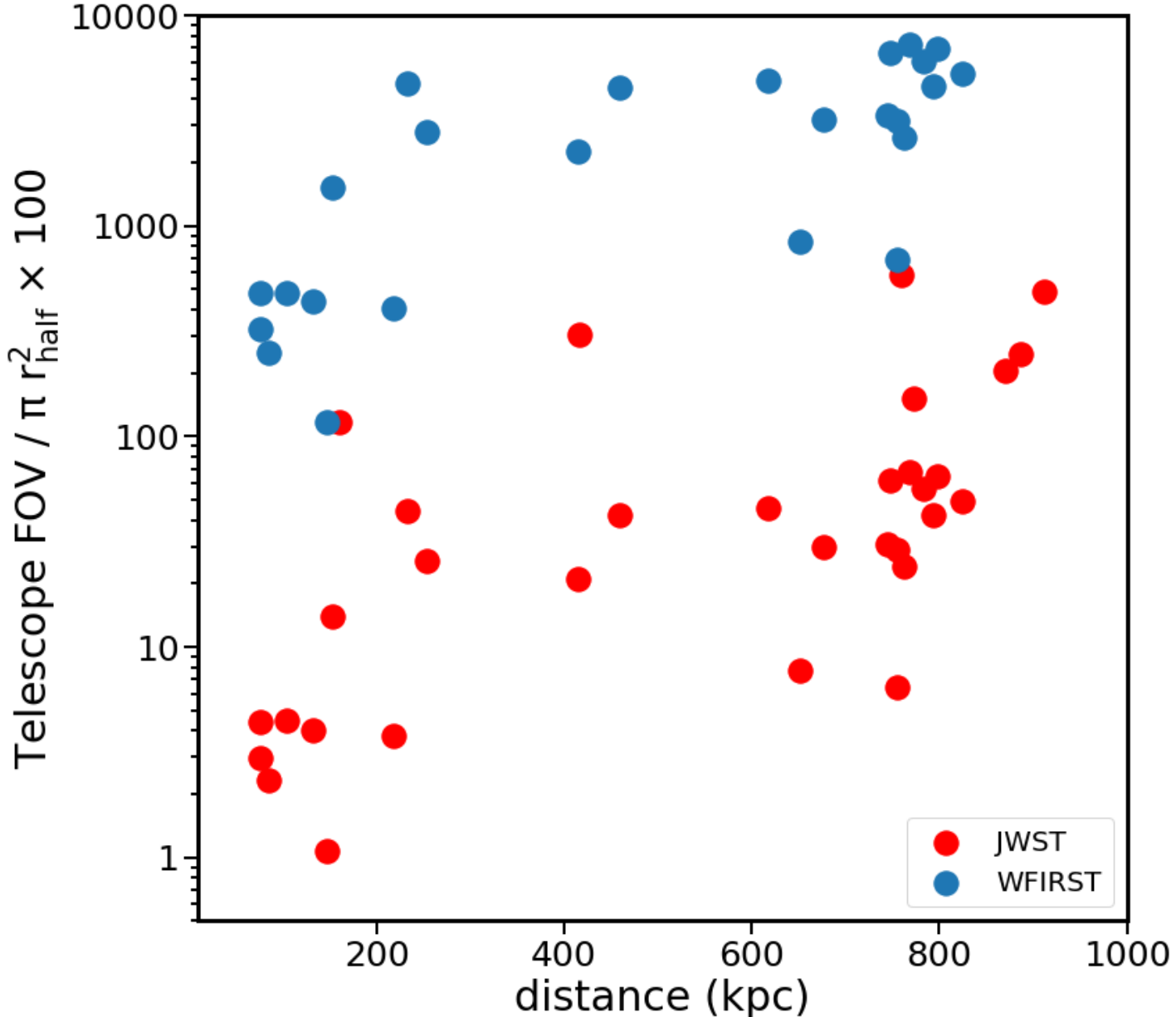
- The Local Group contains a diverse population of galaxies that can be observed at the level of individual stars.
- Supernova feedback can not only impact the distribution of dark matter, but also the stars. Pushing stars out to larger radii
- Galaxies with more recent star formation have flatter age gradients because their stellar populations have been efficiently mixed
- Observations of dwarf galaxies such as those possible with WFIRST will be useful in understanding the formation of dark matter cores and stellar age gradients, and how they relate to one another.

Conclusions

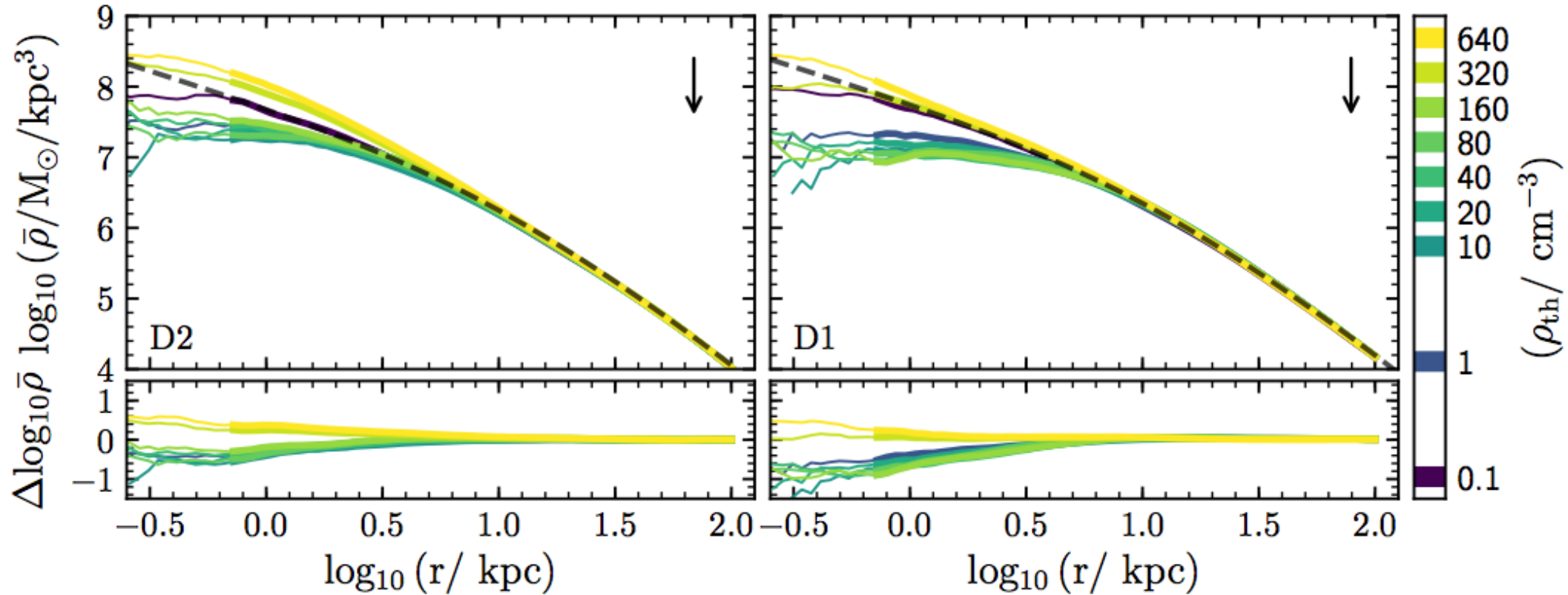
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Thanks!

Connection to WFIRST

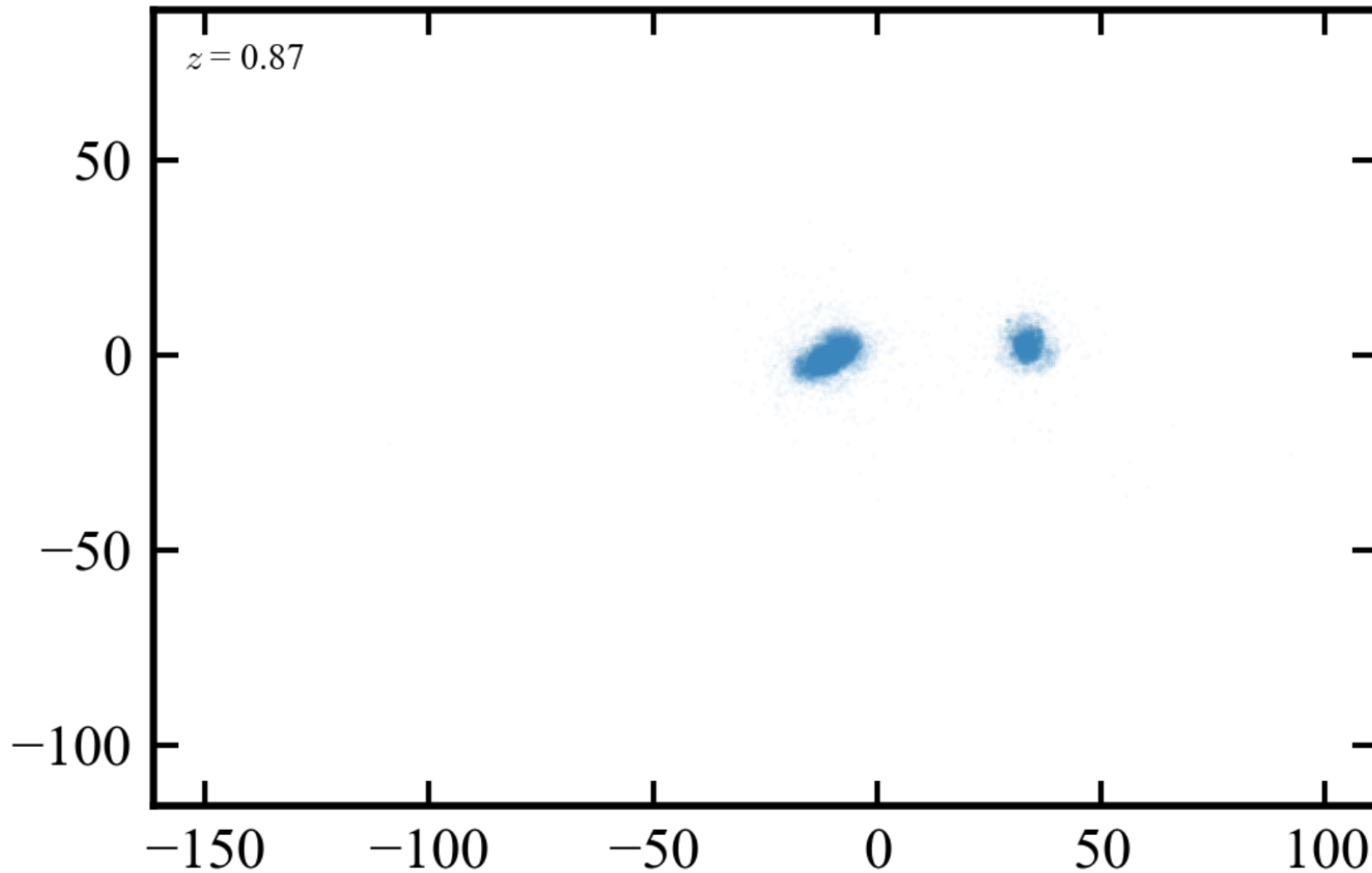


Star formation threshold

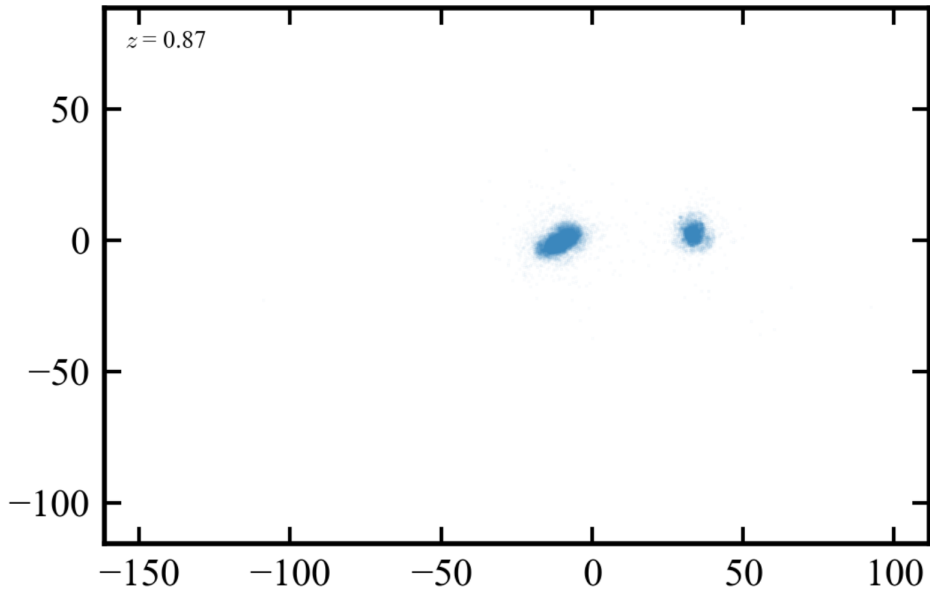


Benítez-llambay + 2018

Age gradients in dwarf galaxies



Age gradients in dwarf galaxies



17% of the stars are brought in via mergers

