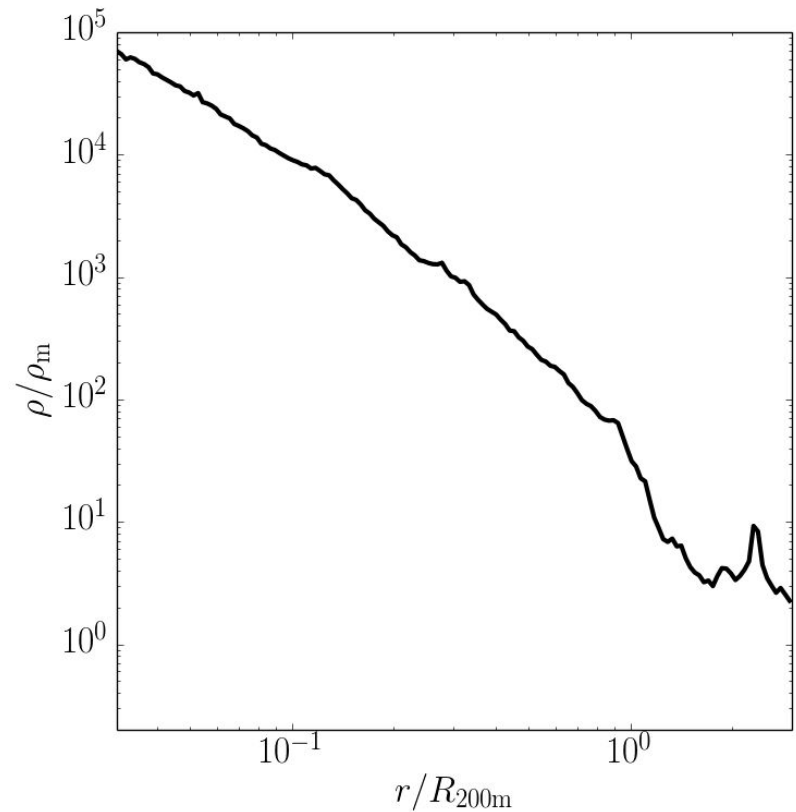
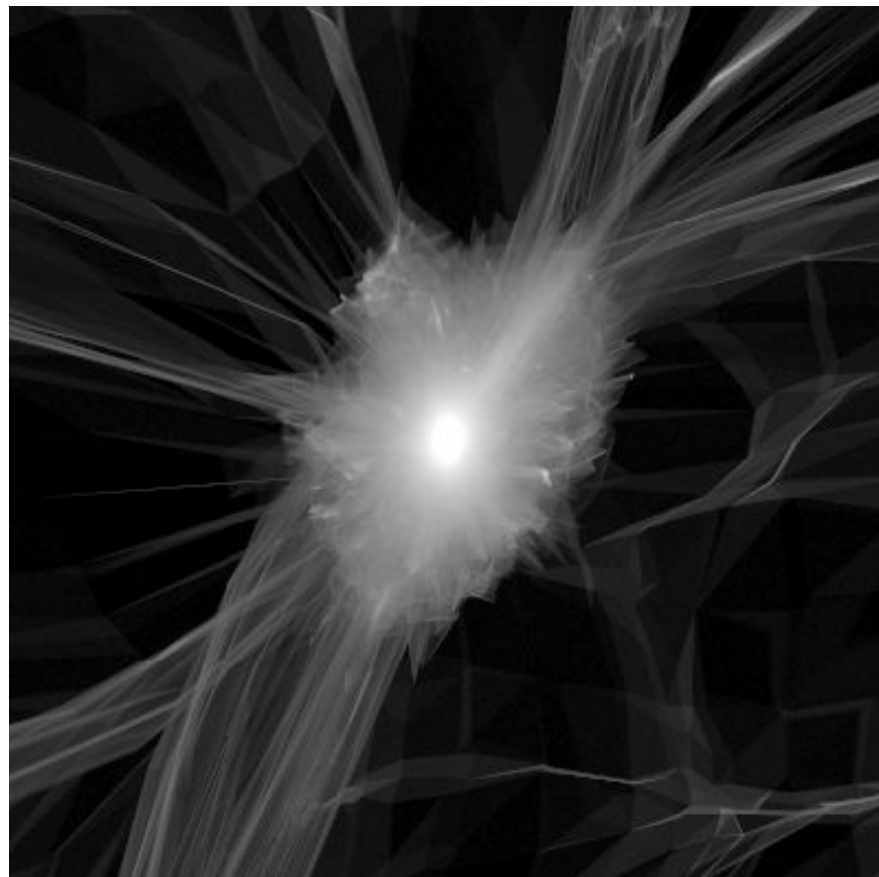
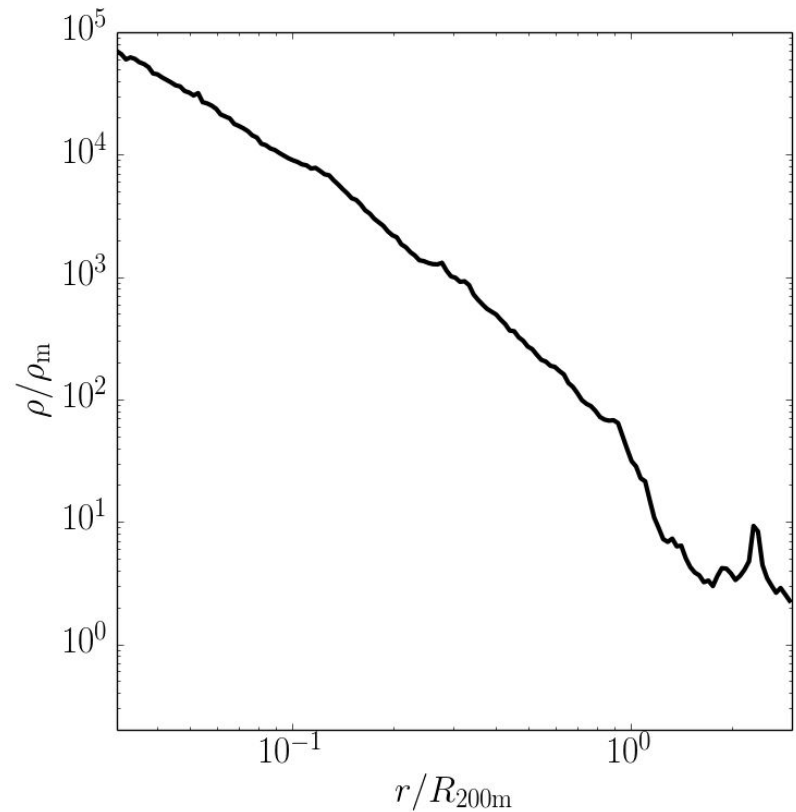


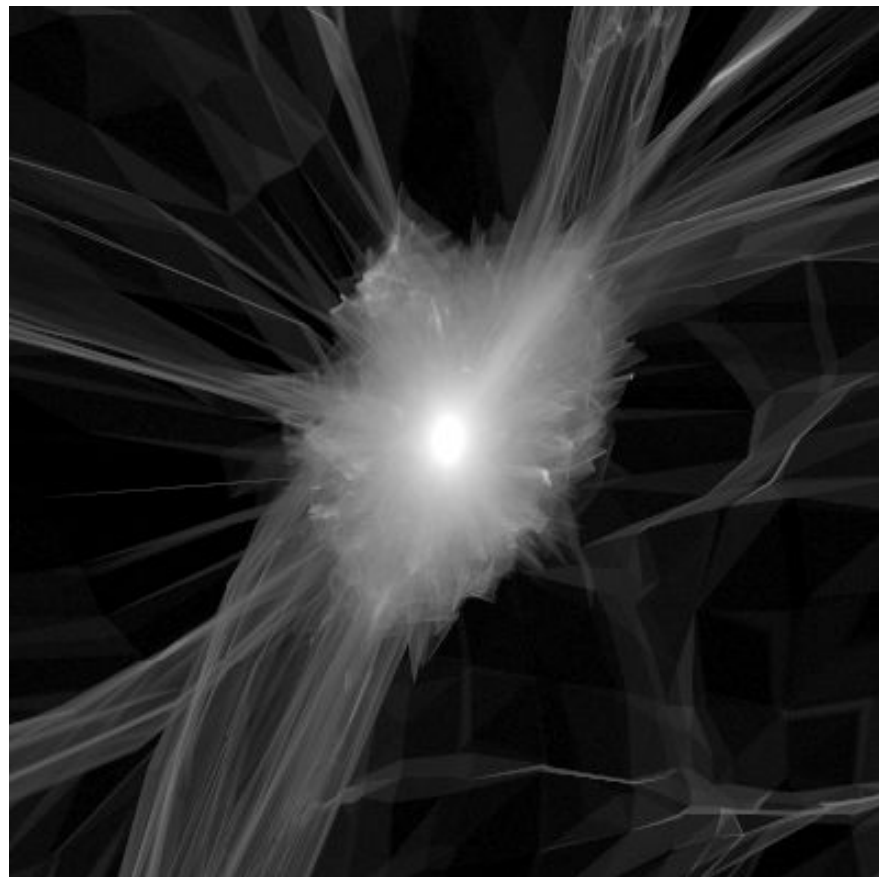
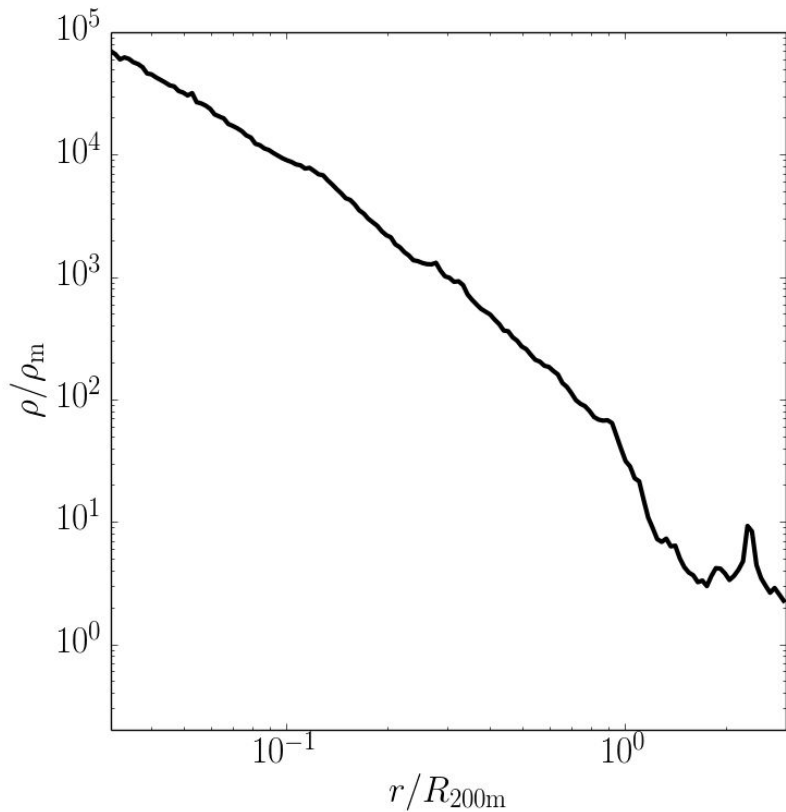
Defining the Splashback Radius

Phil Mansfield
University of Chicago

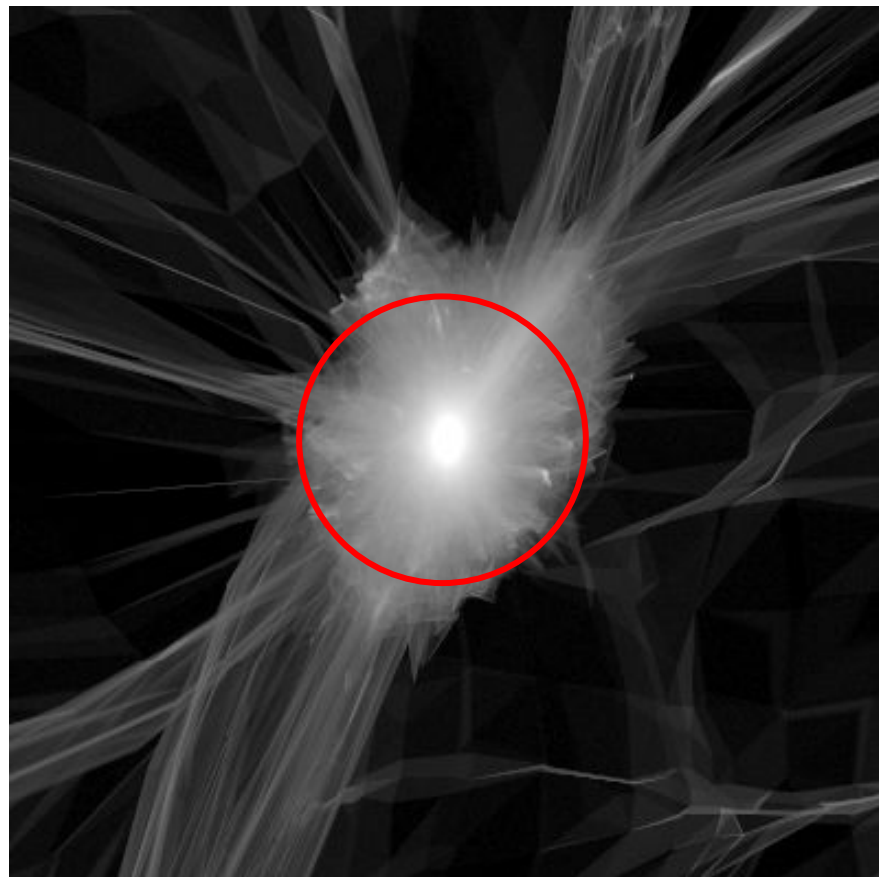
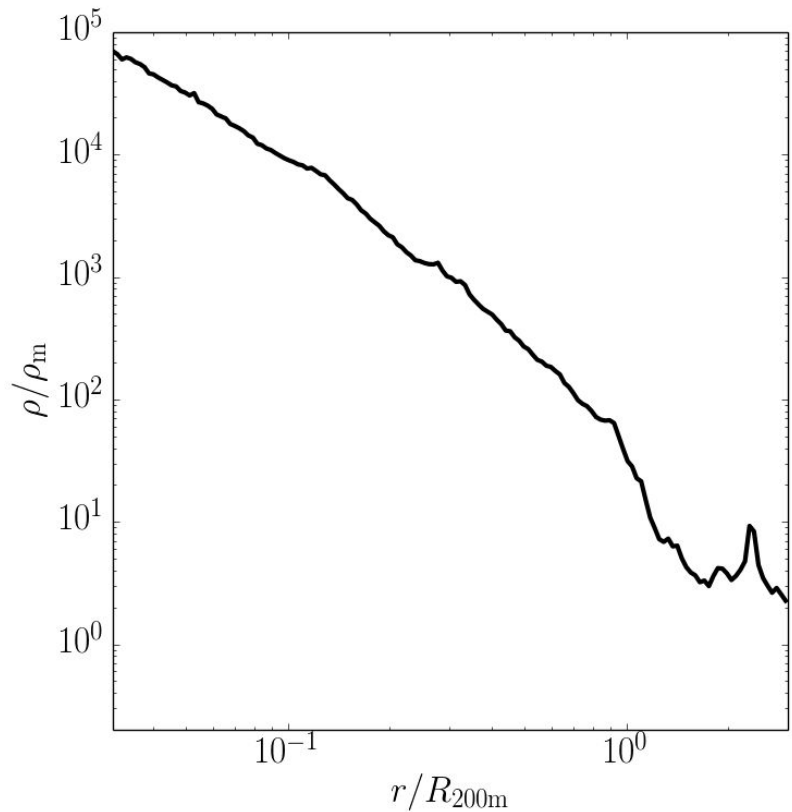




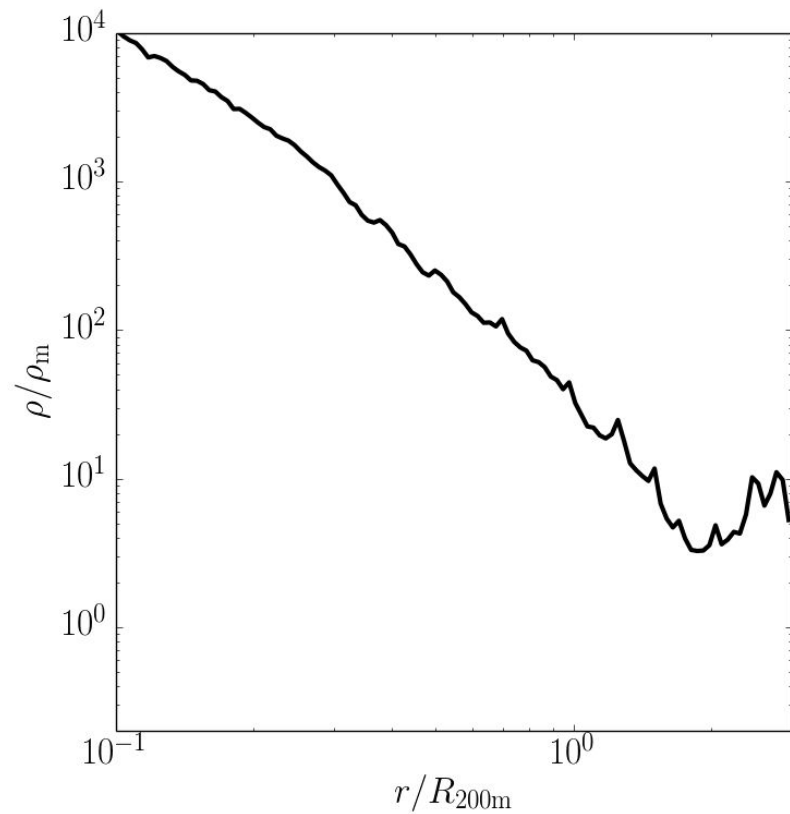
Why do we care?



Why do we care?

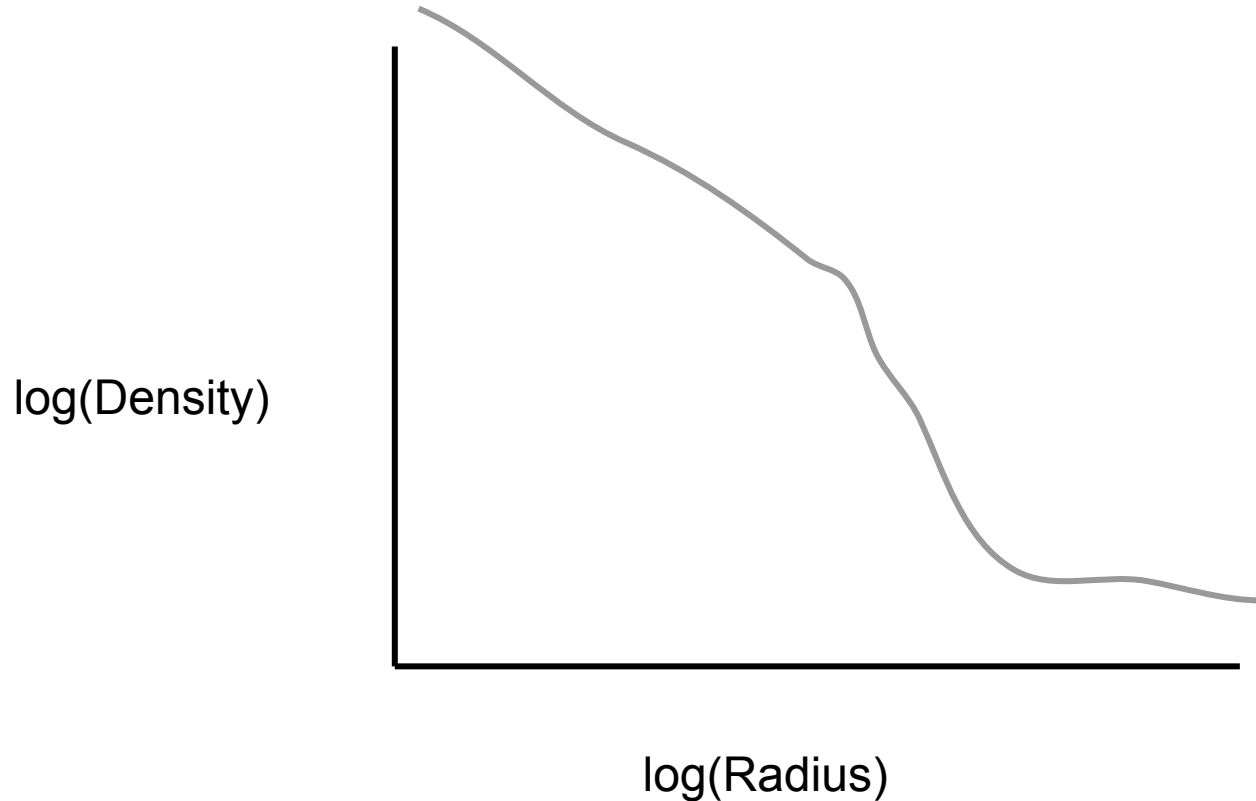


Not all halos are nice

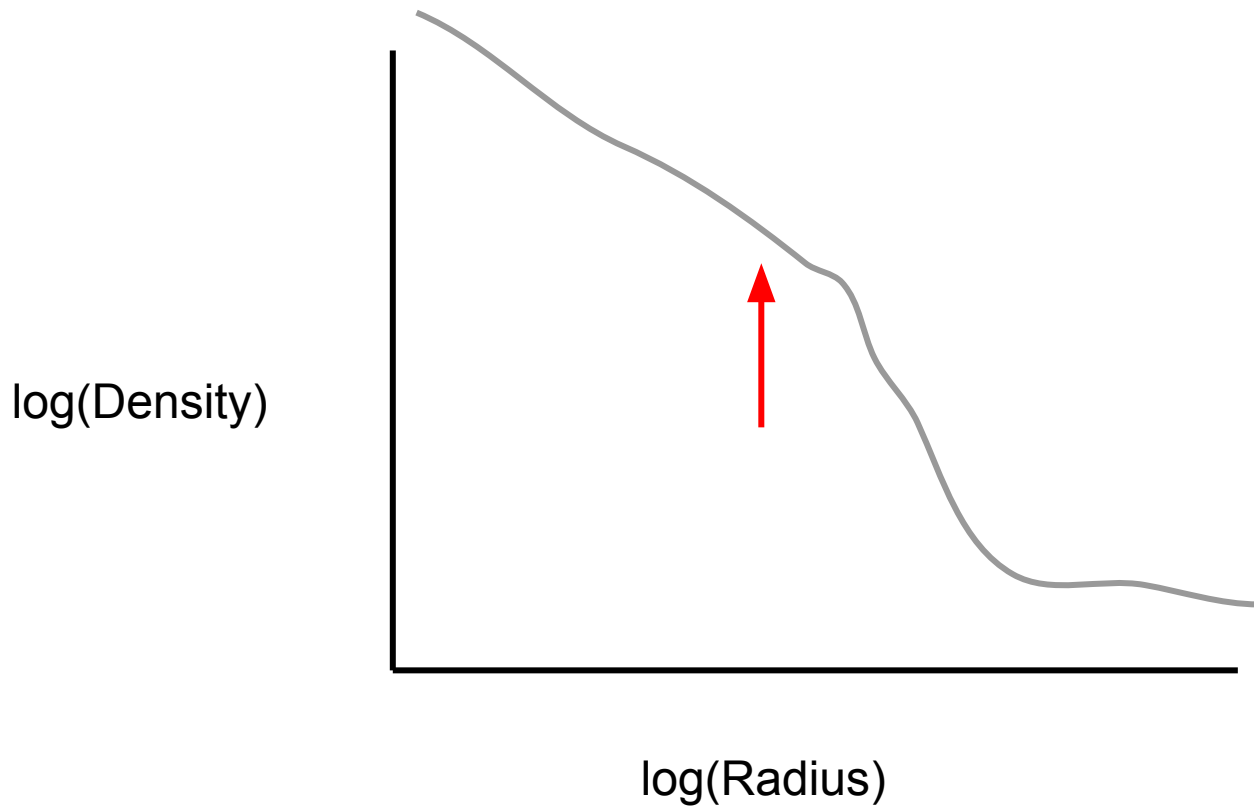


Substructure systematically biases stacked profiles

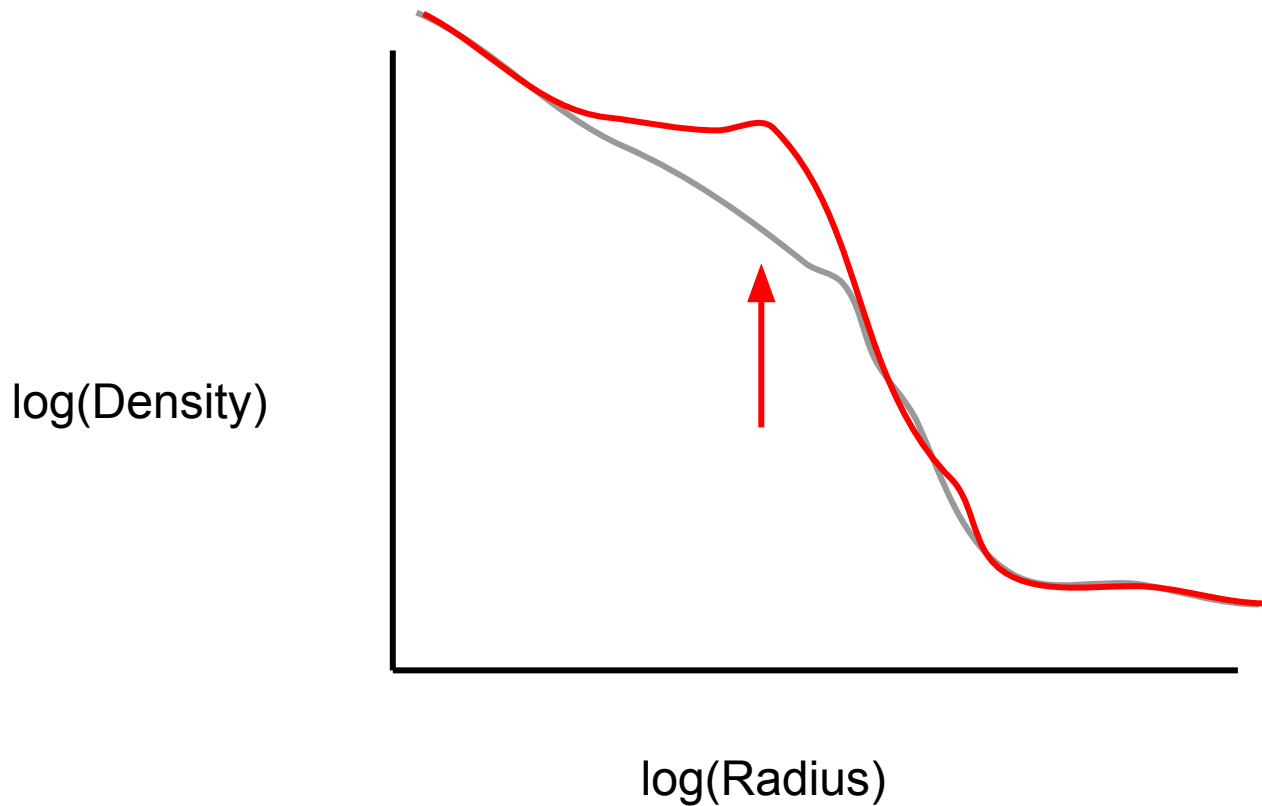
Substructure systematically biases stacked profiles



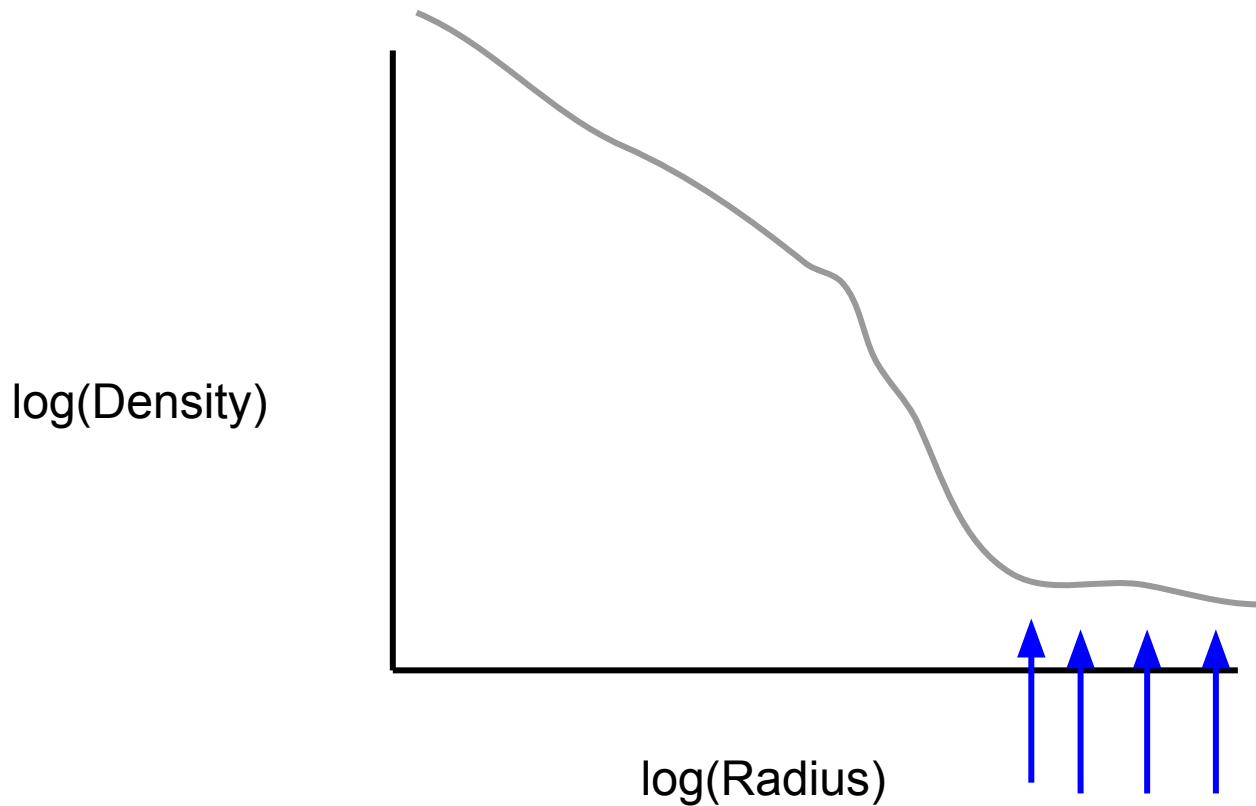
Substructure systematically biases stacked profiles



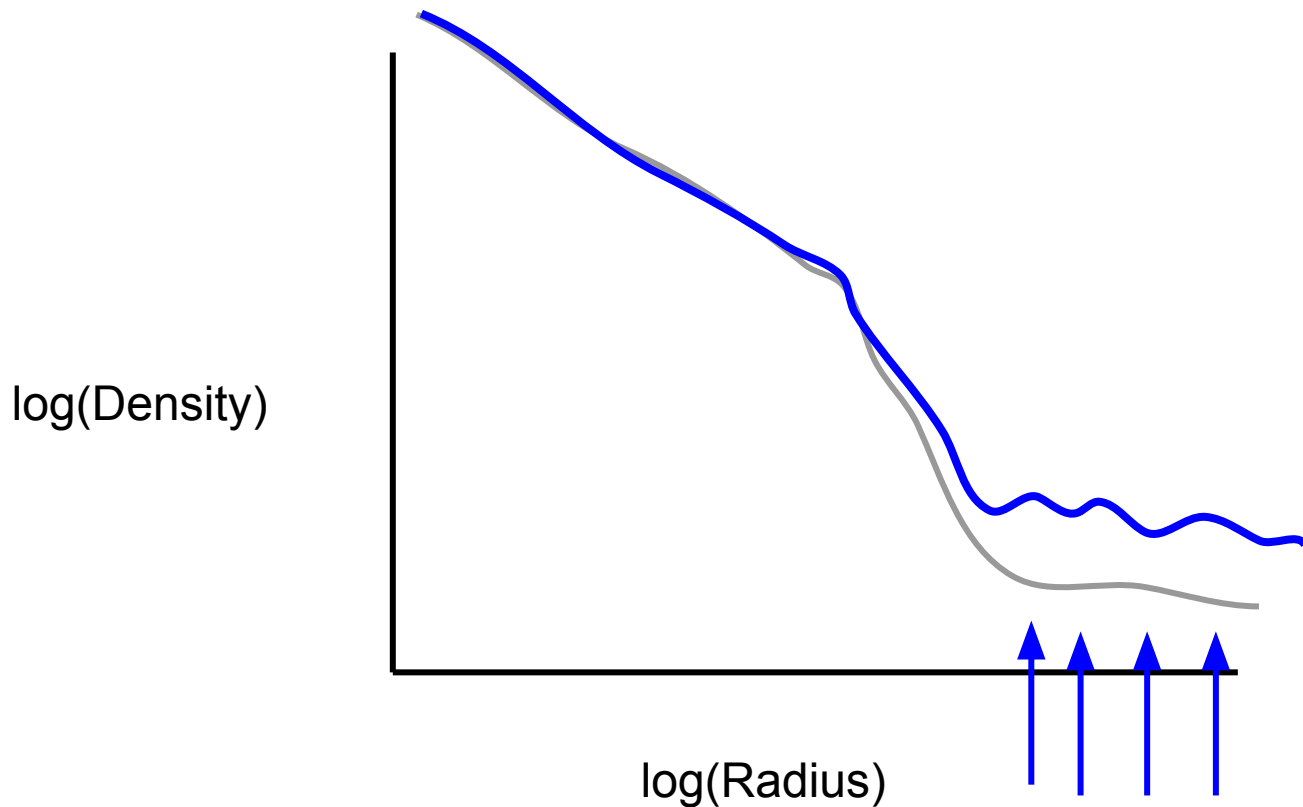
Substructure systematically biases stacked profiles



Substructure systematically biases stacked profiles



Substructure systematically biases stacked profiles

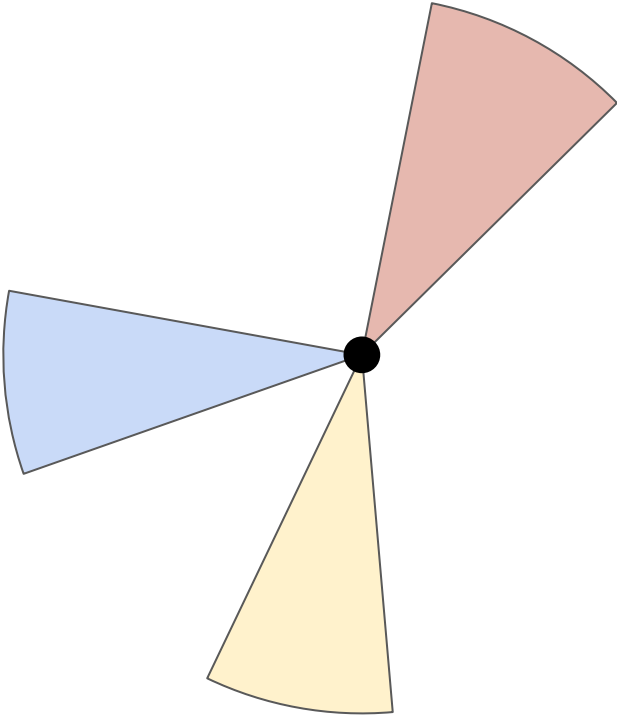


Median Profiles

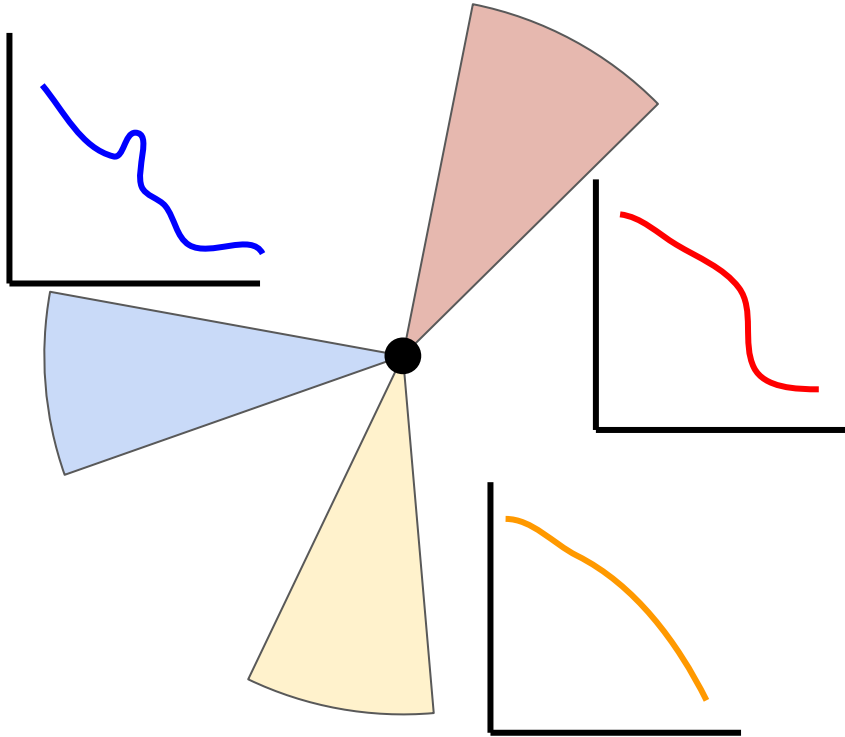
● ← Halo Center

Median Profiles

1. Split into wedges

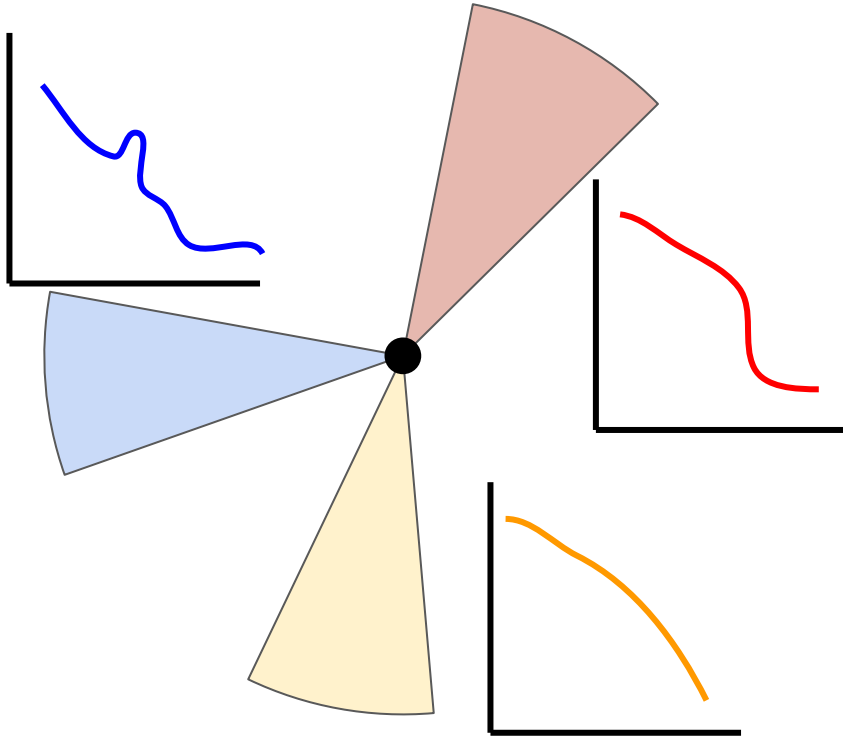


Median Profiles



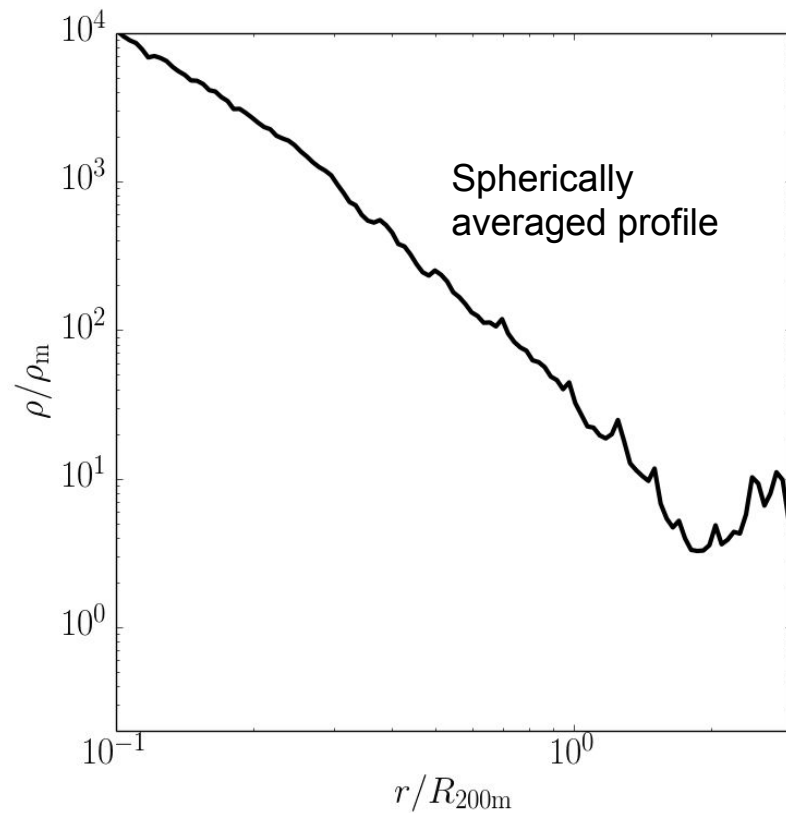
1. Split into wedges
2. Measure profiles

Median Profiles

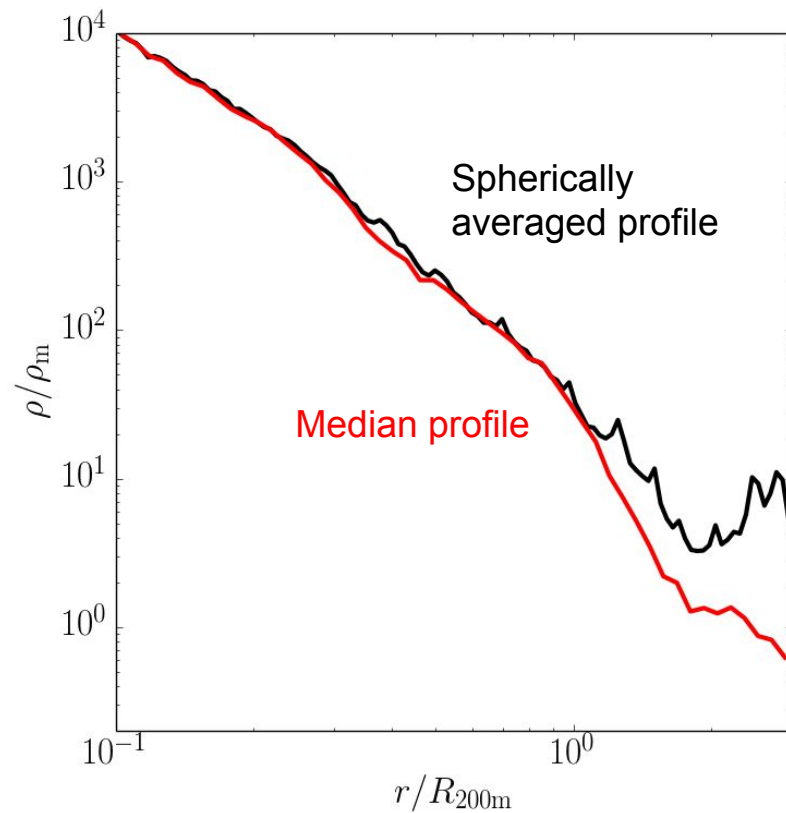


1. Split into wedges
2. Measure profiles
3. Take the median

Median Profiles

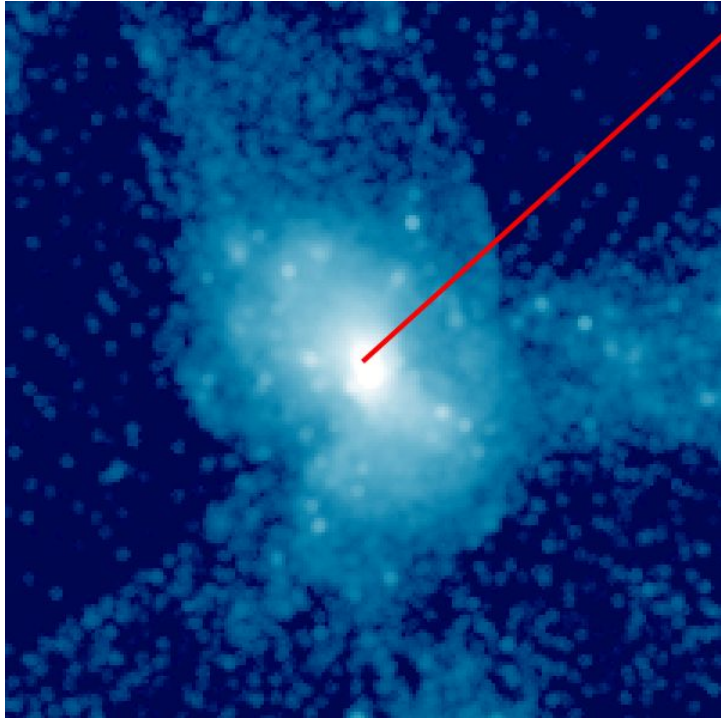


Median Profiles

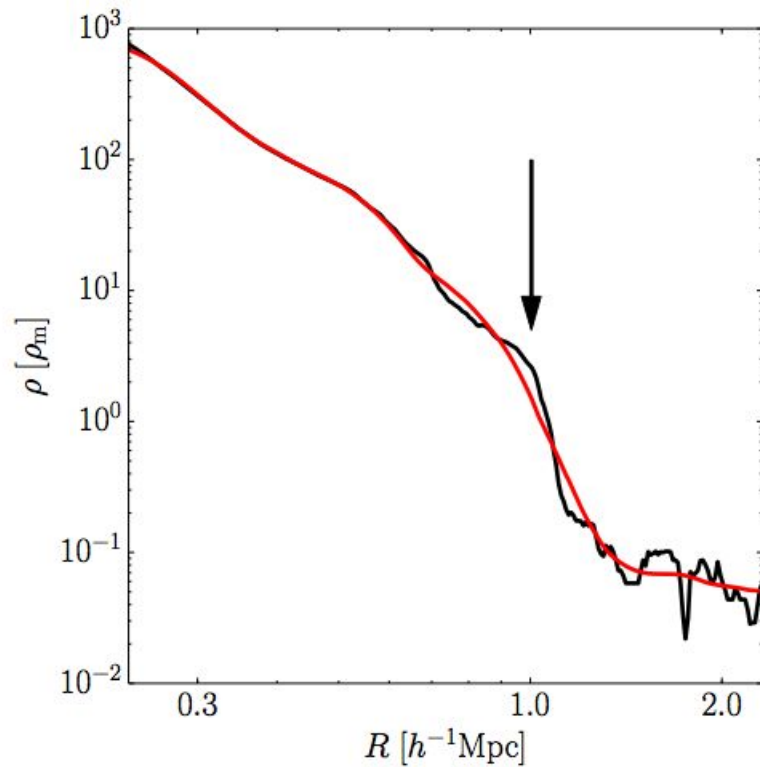
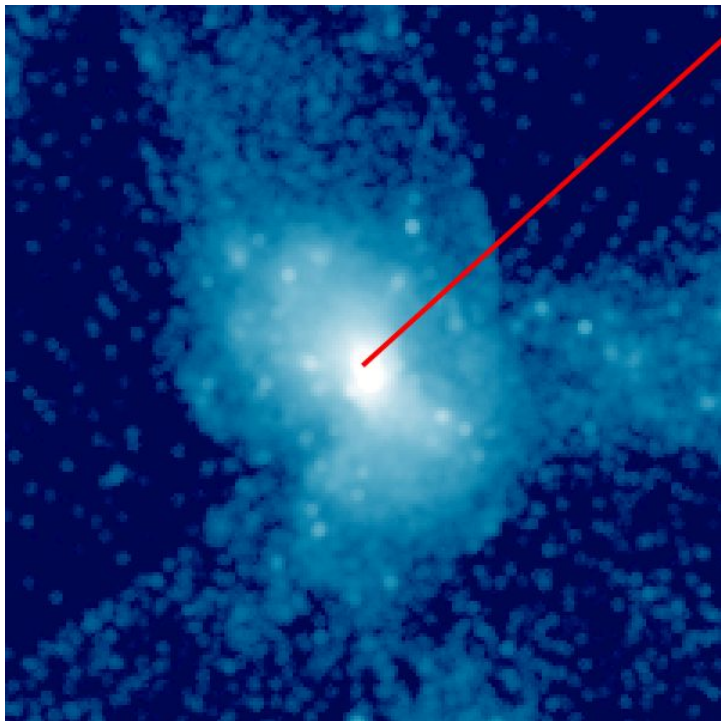


SHELLFISH

SHELLFISH

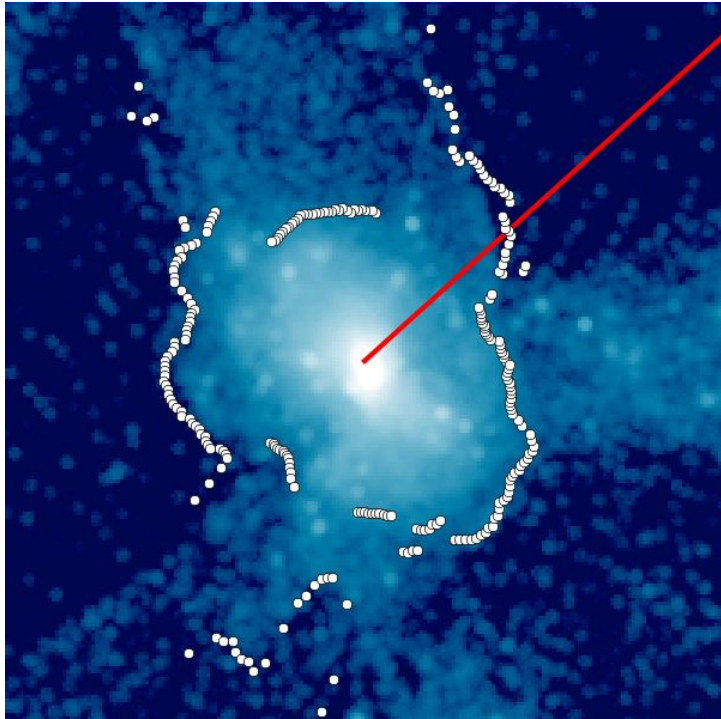


SHELLFISH

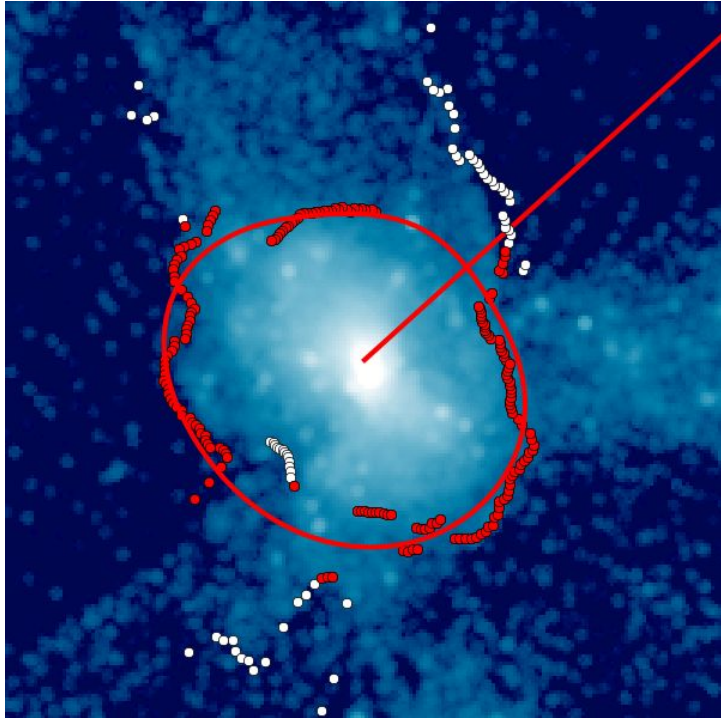


Mansfield et al. (2017)

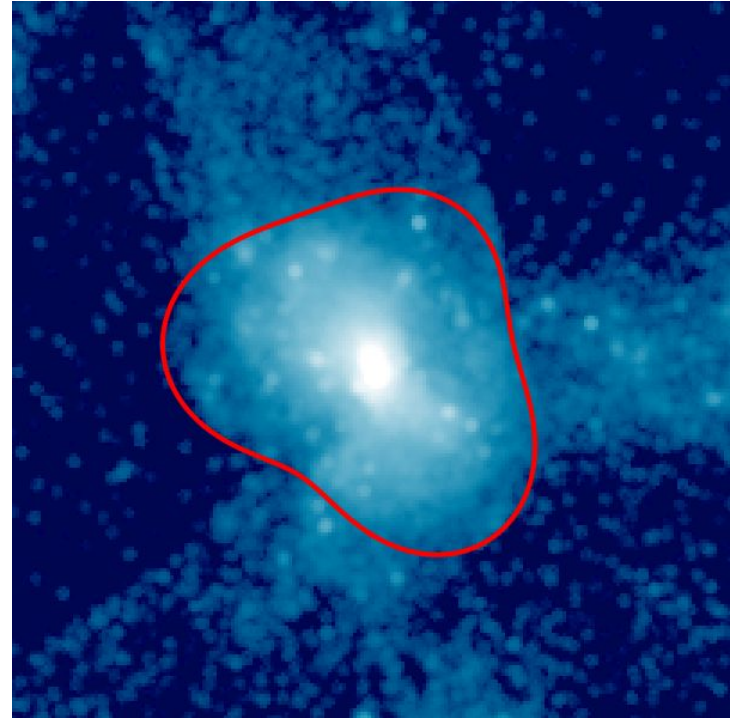
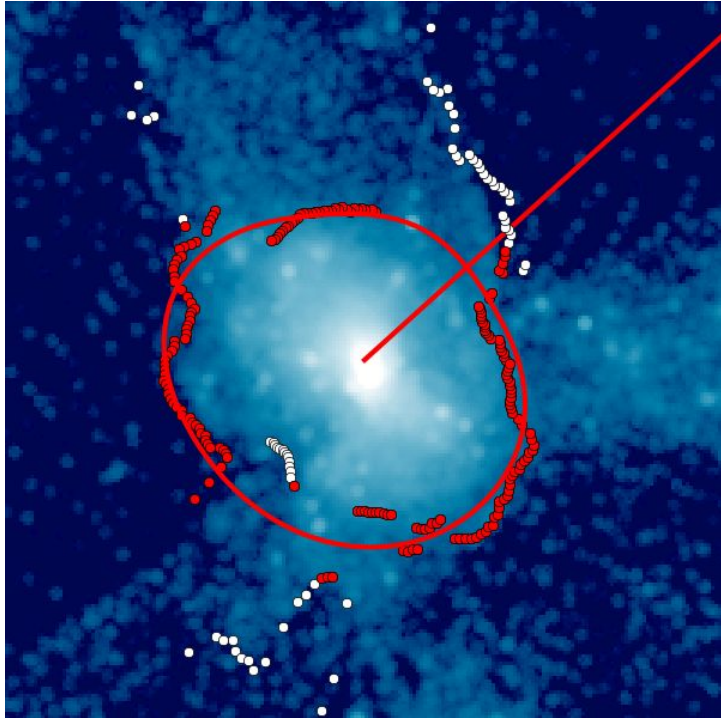
SHELLFISH



SHELLFISH



SHELLFISH

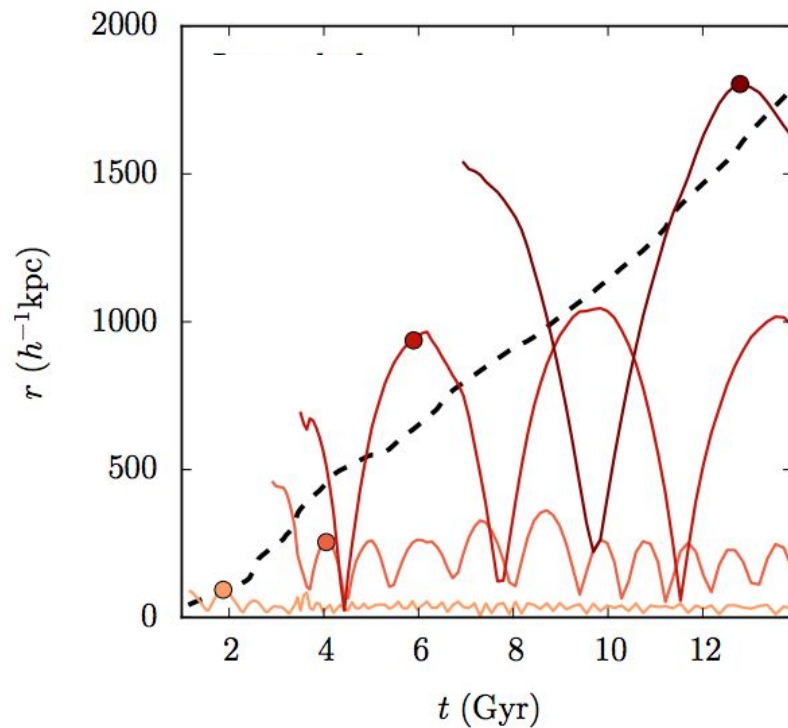


SPARTA

Diemer (2017)

Diemer et al. (2017)

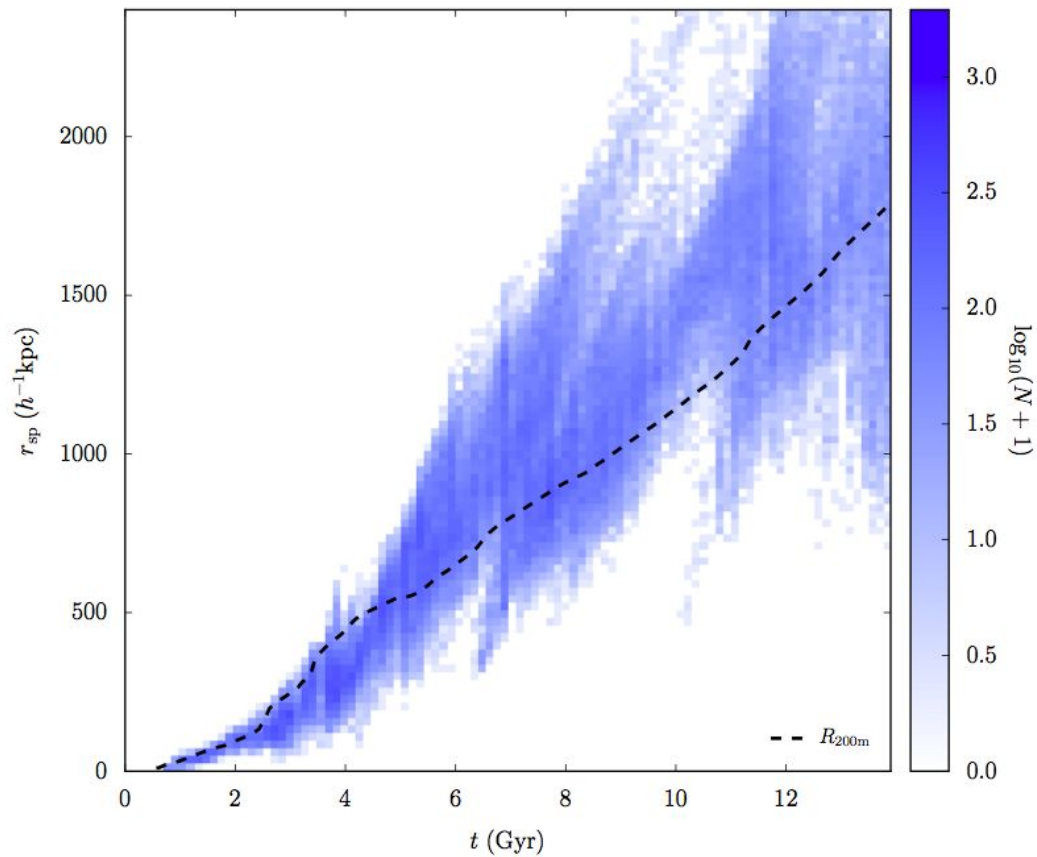
SPARTA



Diemer (2017)

Diemer et al. (2017)

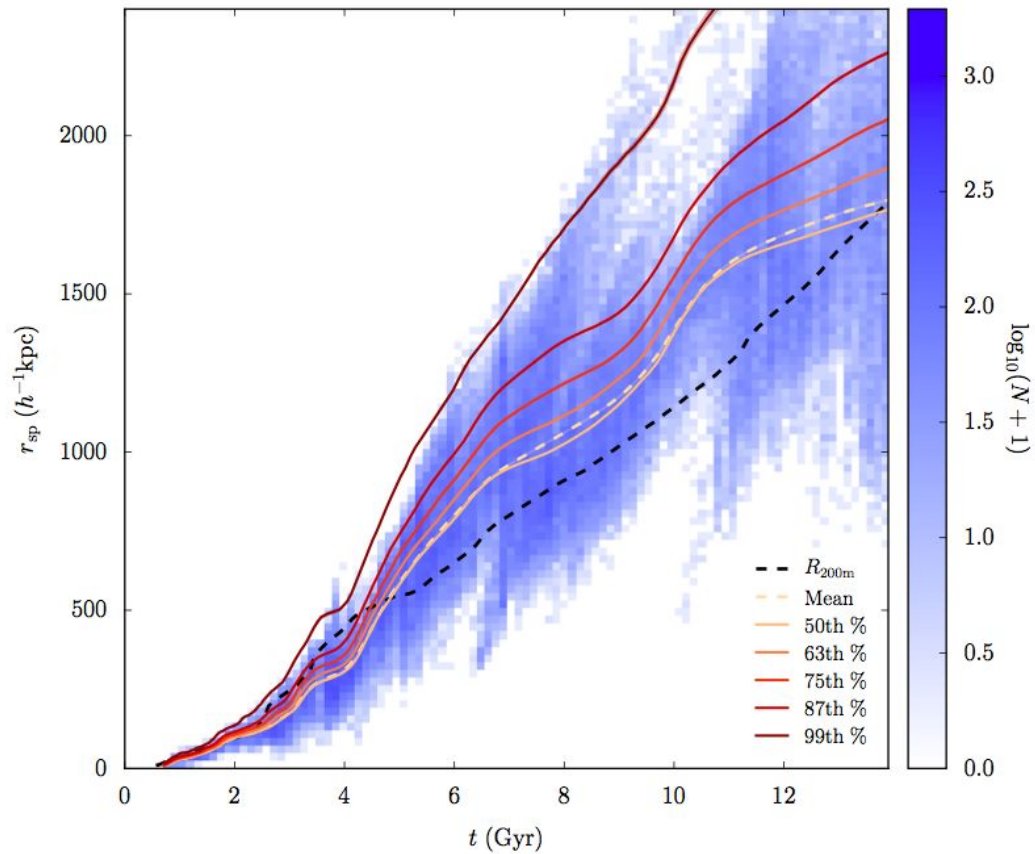
SPARTA



Diemer (2017)

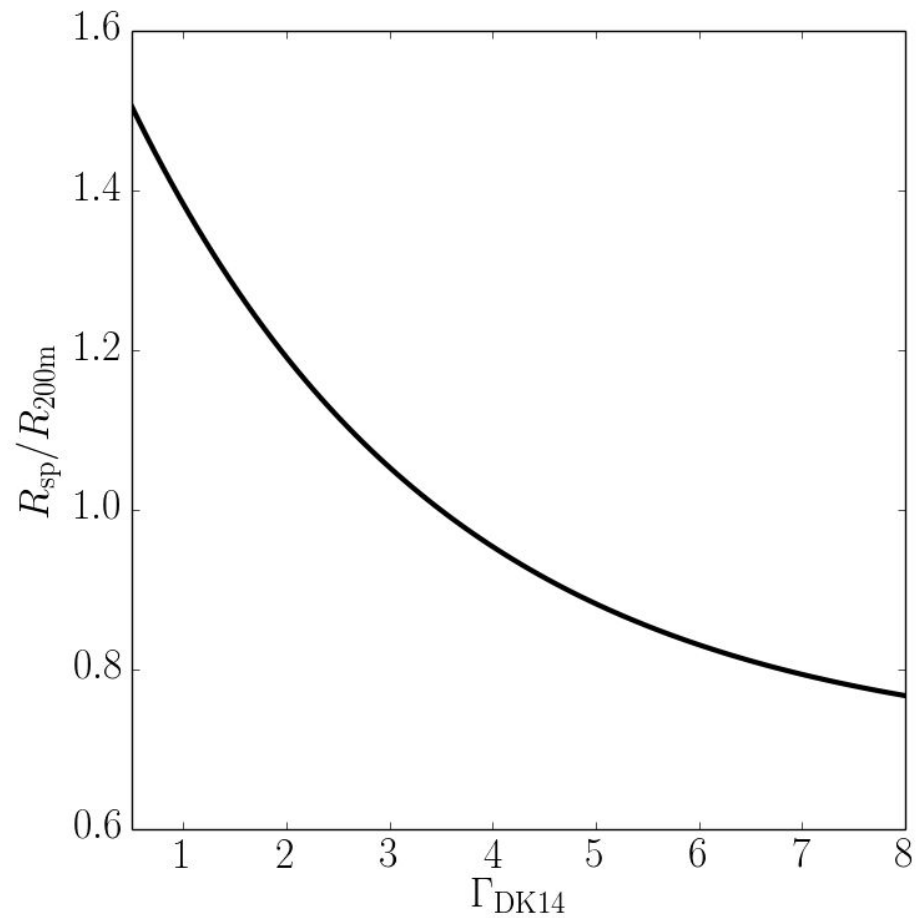
Diemer et al. (2017)

SPARTA



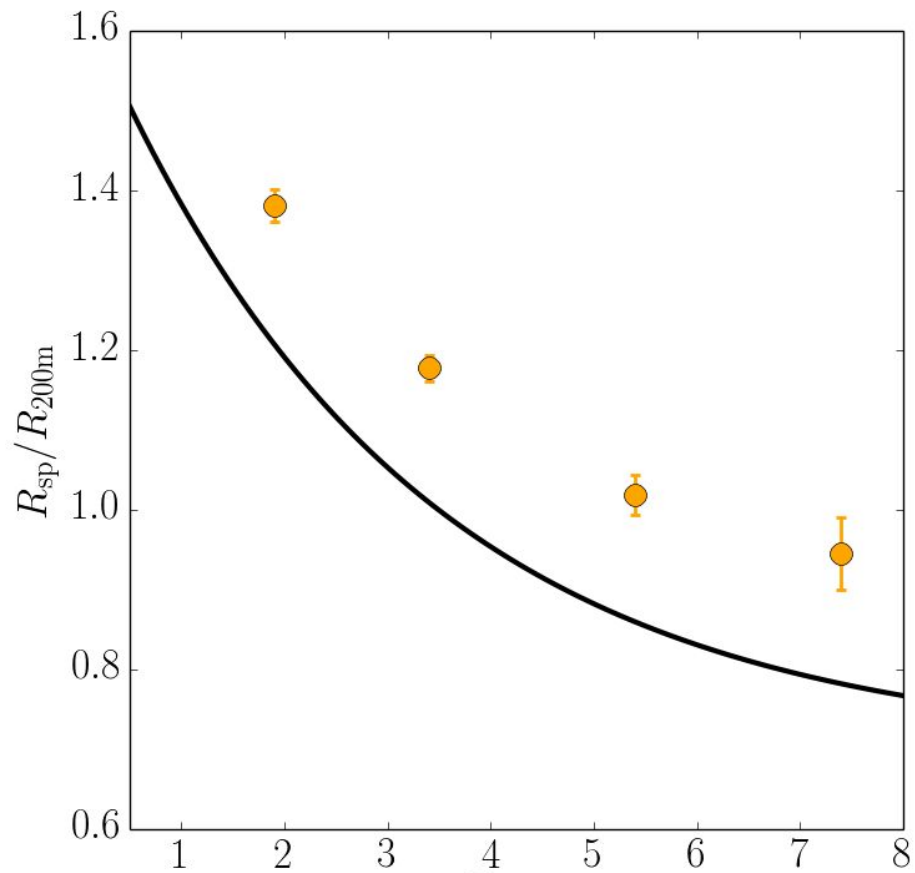
Diemer (2017)

Diemer et al. (2017)



More et al. (2015)

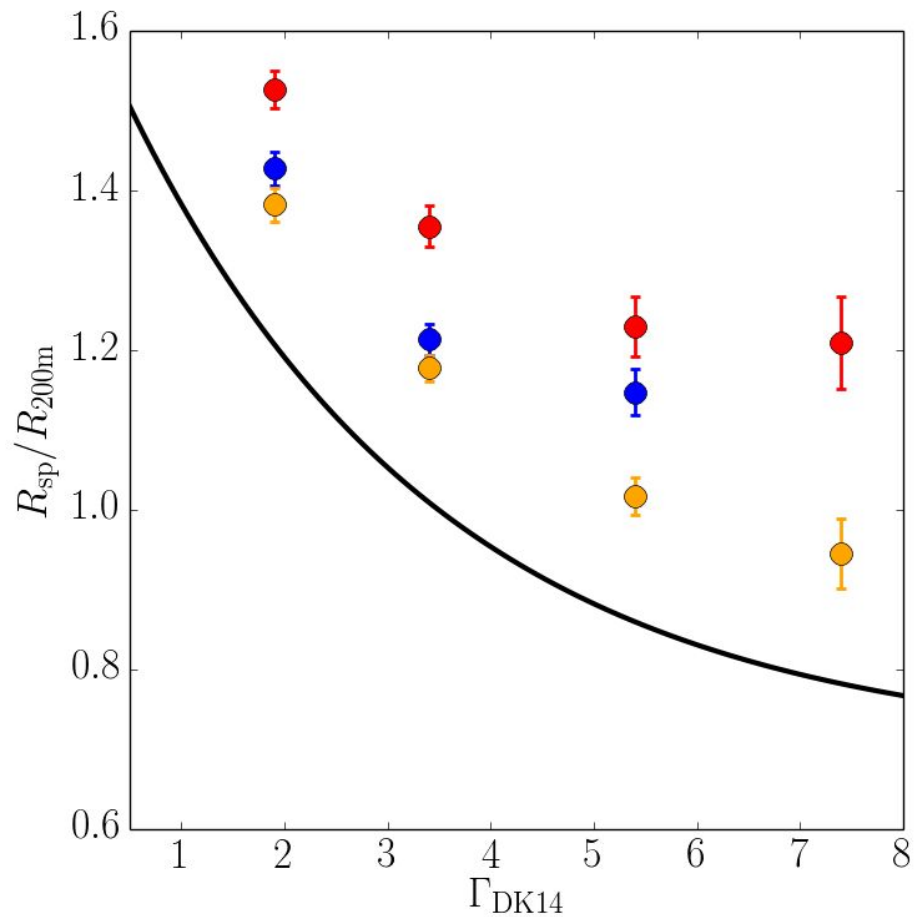
● Median Profiles



More et al. (2015)

Mansfield et al. (2017)

● Median Profiles



Galaxies ($\sim 10^{12} M_{\text{sun}}$)

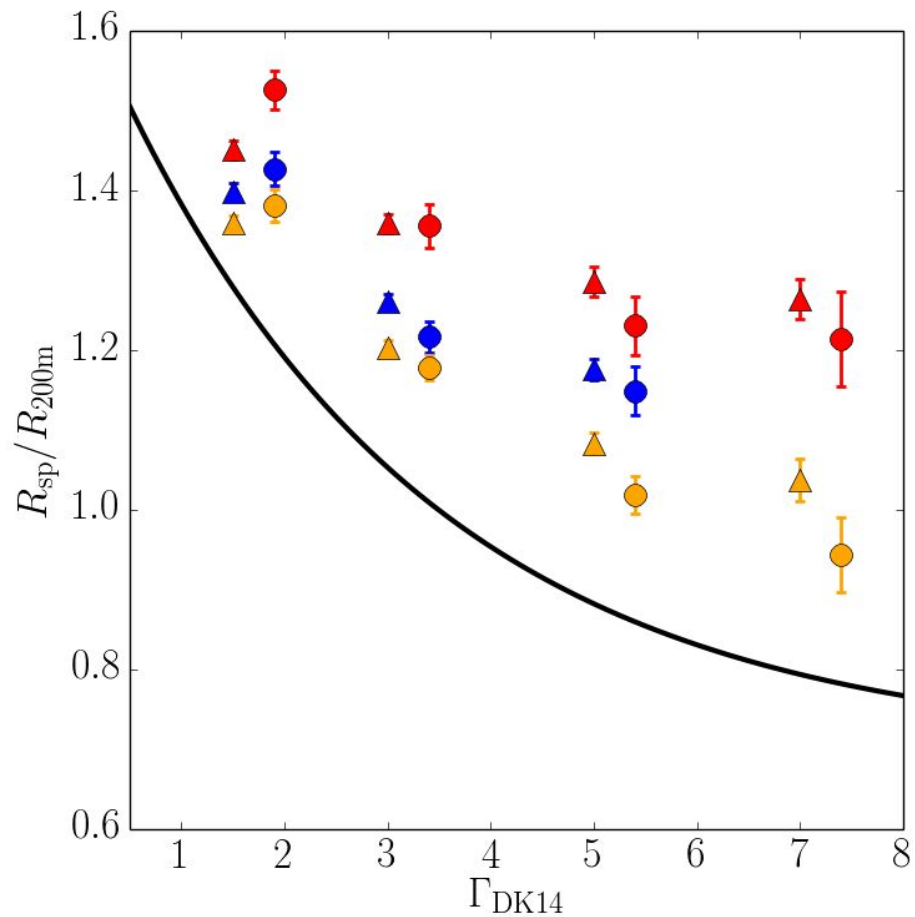
Groups ($\sim 10^{13} M_{\text{sun}}$)

Clusters ($\sim 10^{14} M_{\text{sun}}$)

More et al. (2015)

Mansfield et al. (2017)

● Median Profiles
▲ SHELLFISH



Galaxies ($\sim 1e12 M_{\text{sun}}$)

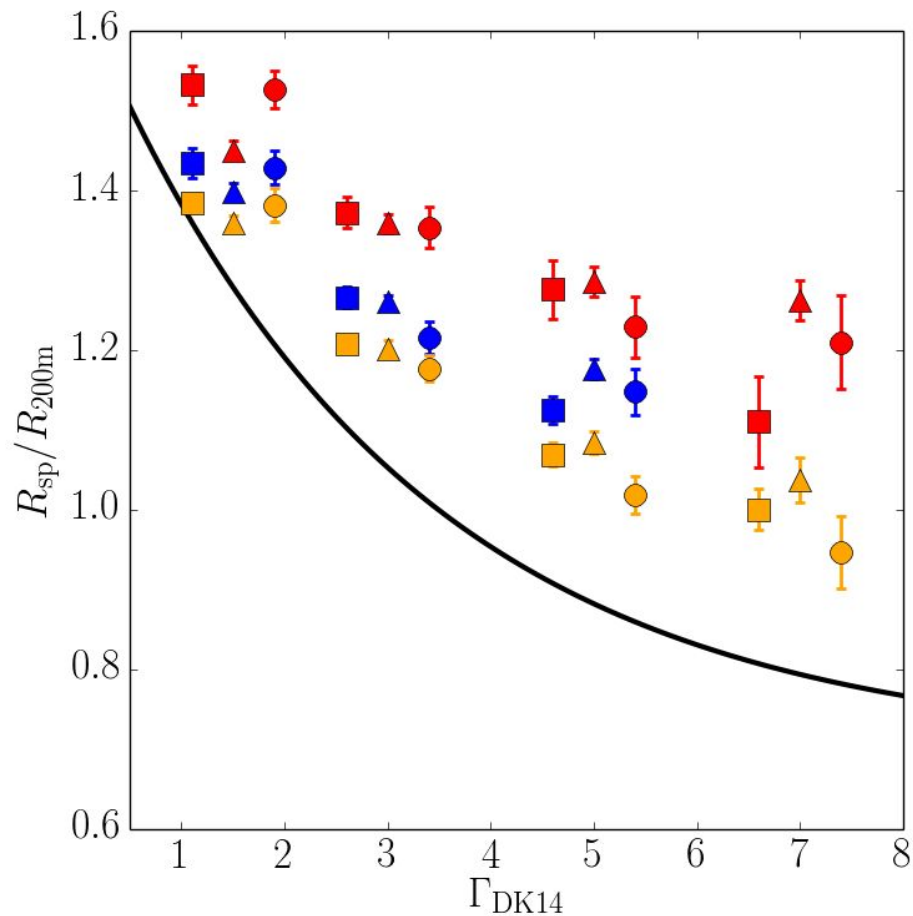
Groups ($\sim 1e13 M_{\text{sun}}$)

Clusters ($\sim 1e14 M_{\text{sun}}$)

More et al. (2015)

Mansfield et al. (2017)

- Median Profiles
- ▲ SHELLFISH
- SPARTA



Galaxies ($\sim 1e12 M_{sun}$)

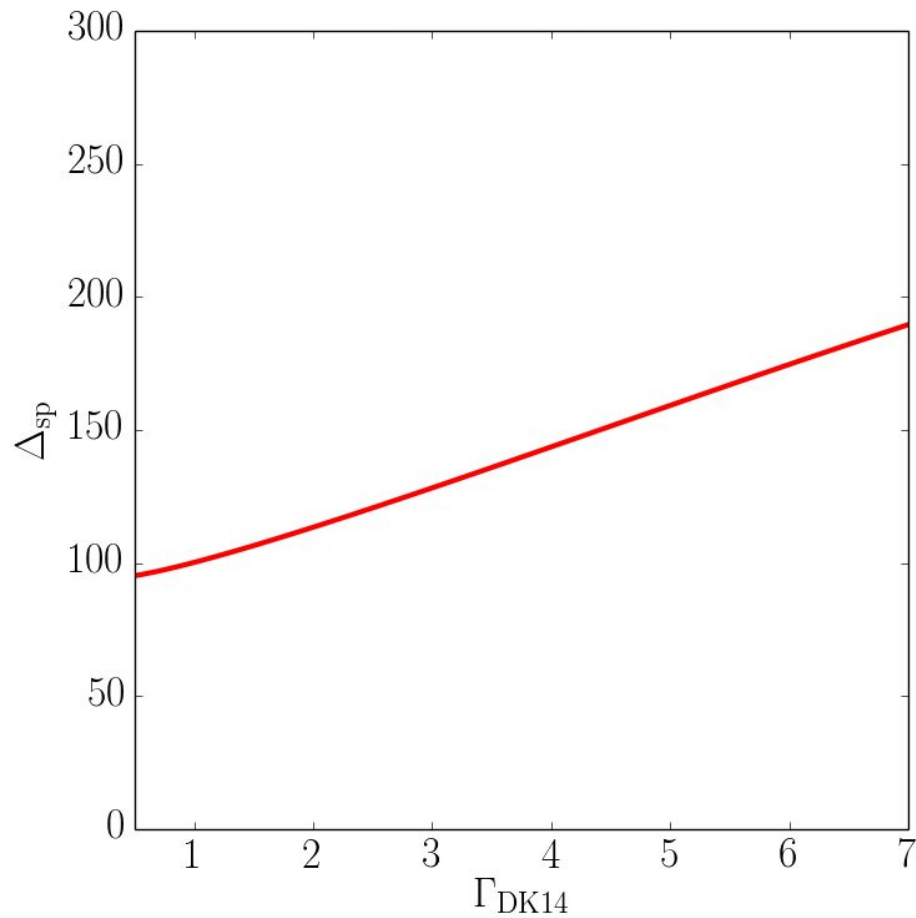
Groups ($\sim 1e13 M_{sun}$)

Clusters ($\sim 1e14 M_{sun}$)

More et al. (2015)

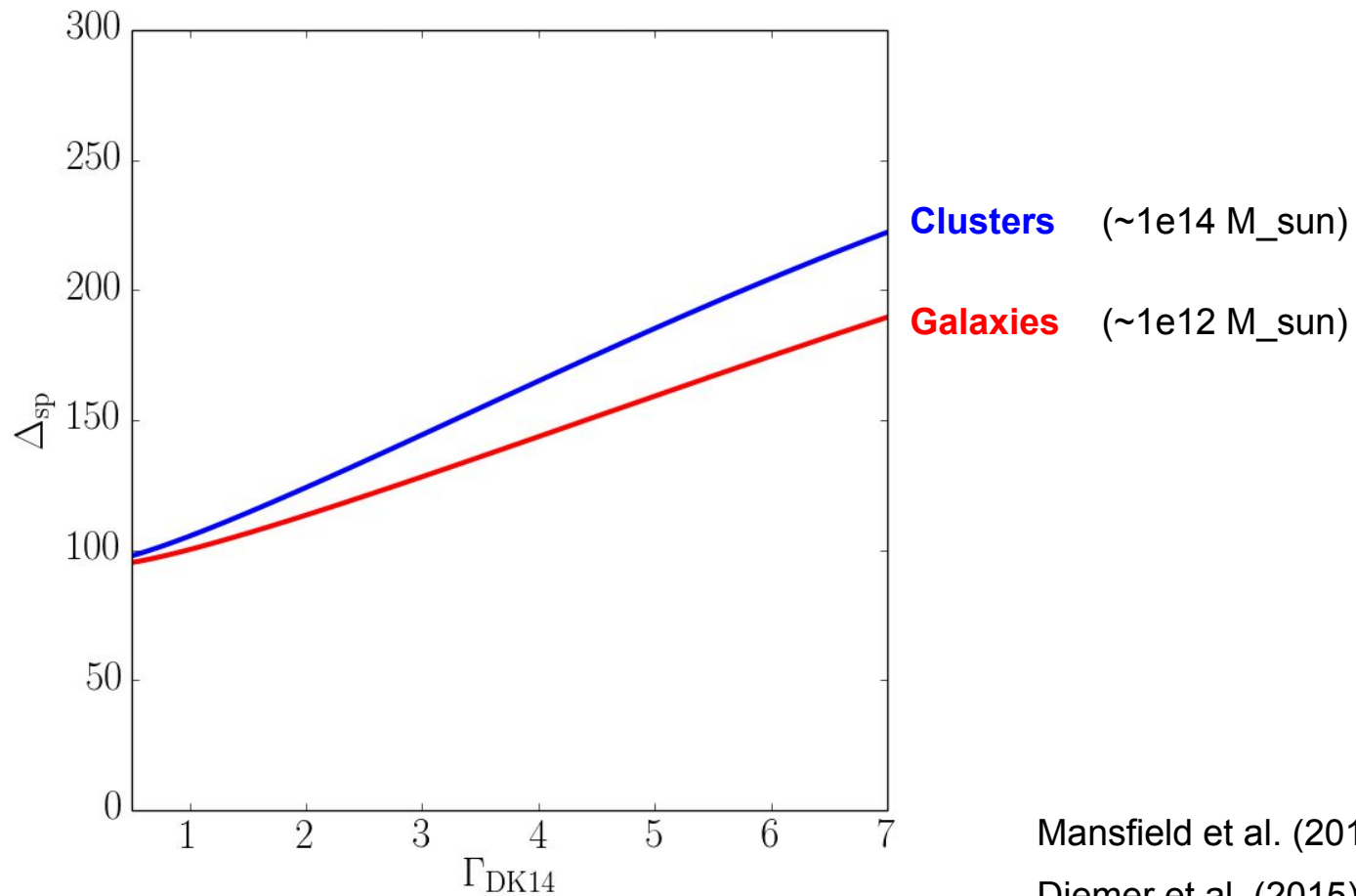
Mansfield et al. (2017)

Diemer et al. (2015)



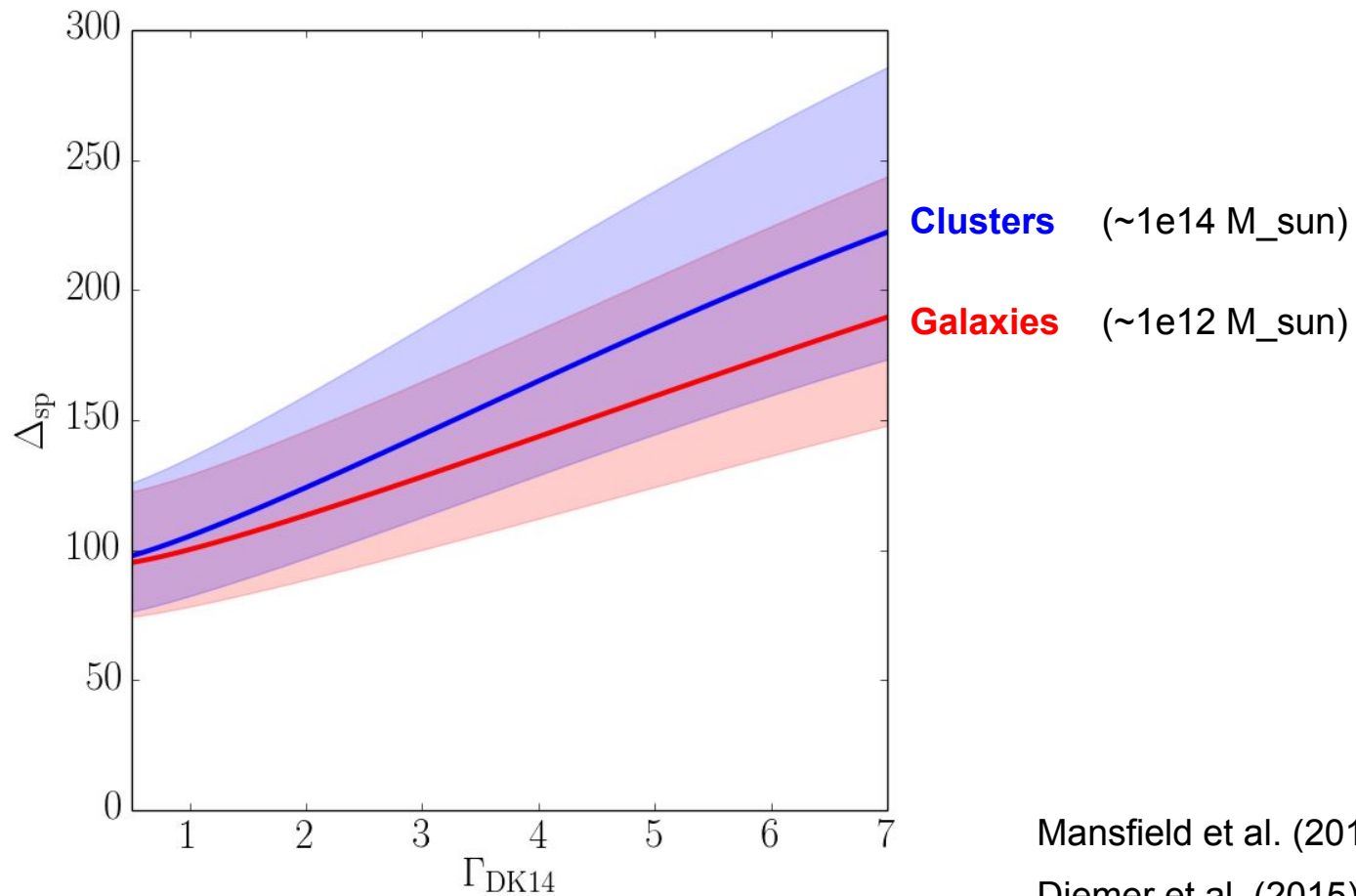
Mansfield et al. (2017)

Diemer et al. (2015)



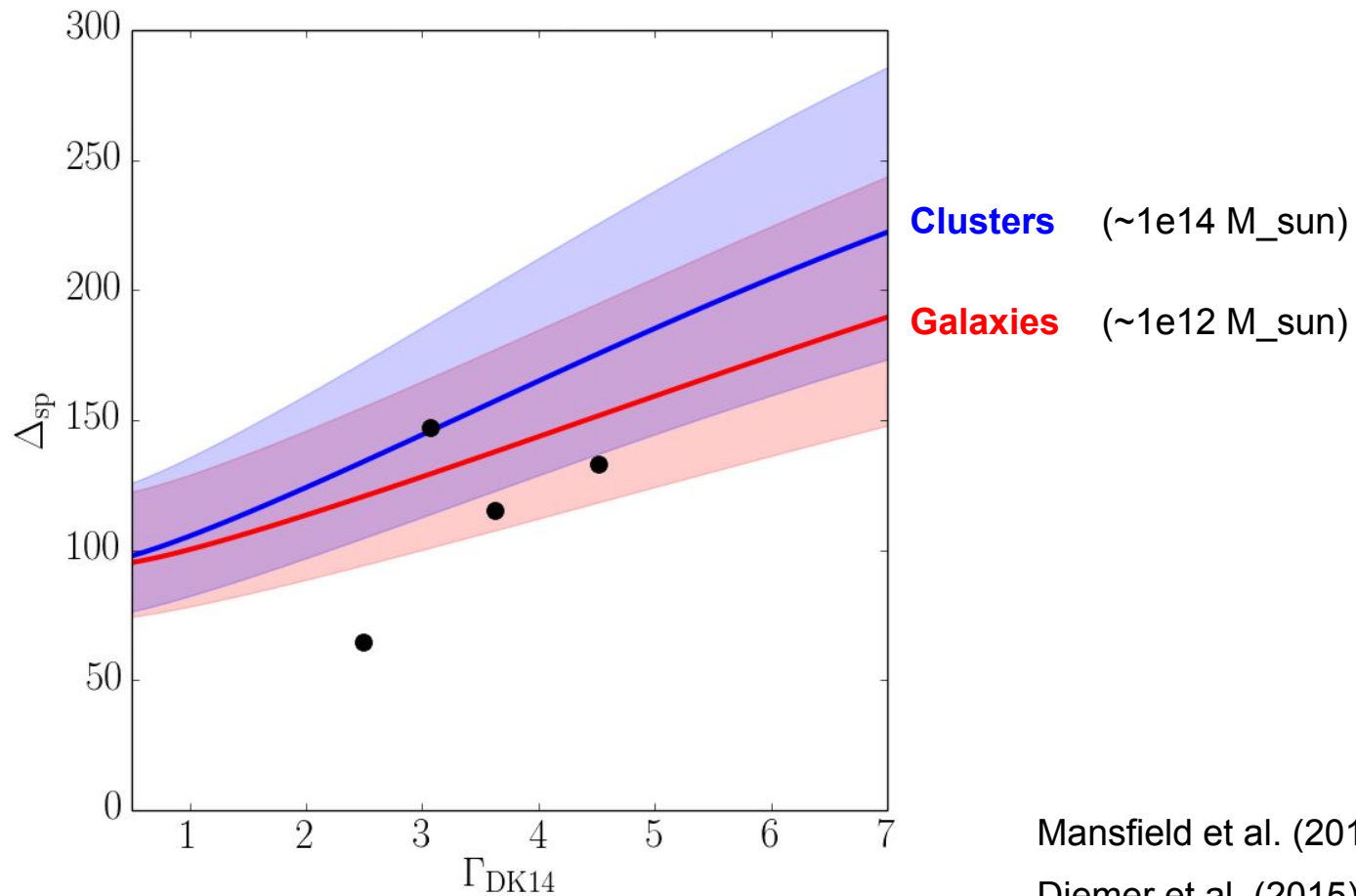
Mansfield et al. (2017)

Diemer et al. (2015)



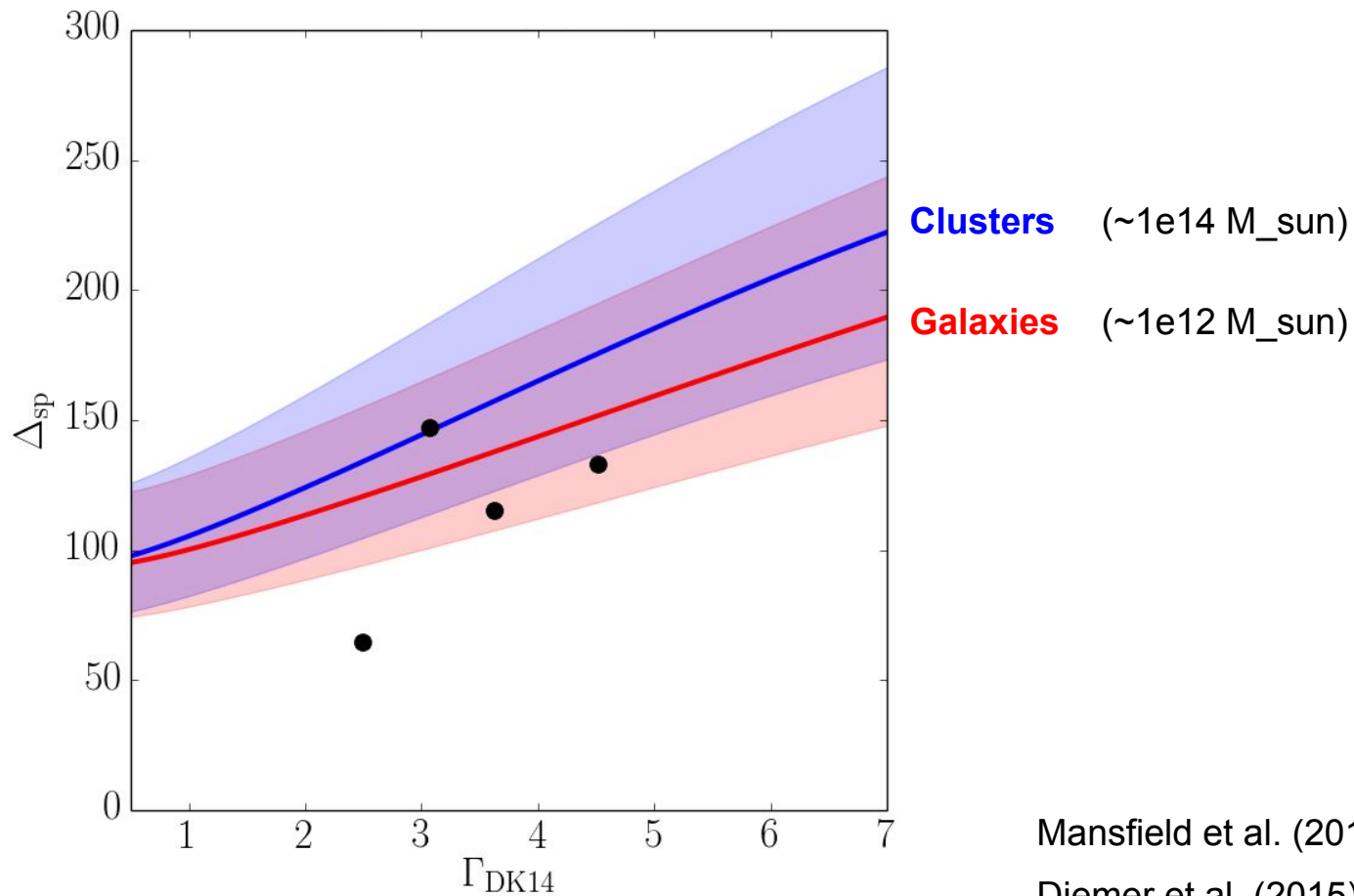
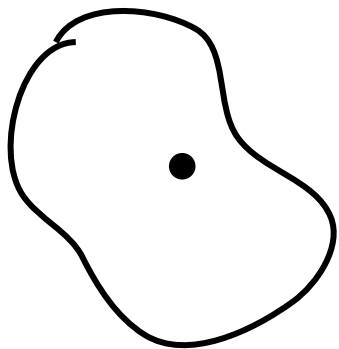
Mansfield et al. (2017)

Diemer et al. (2015)



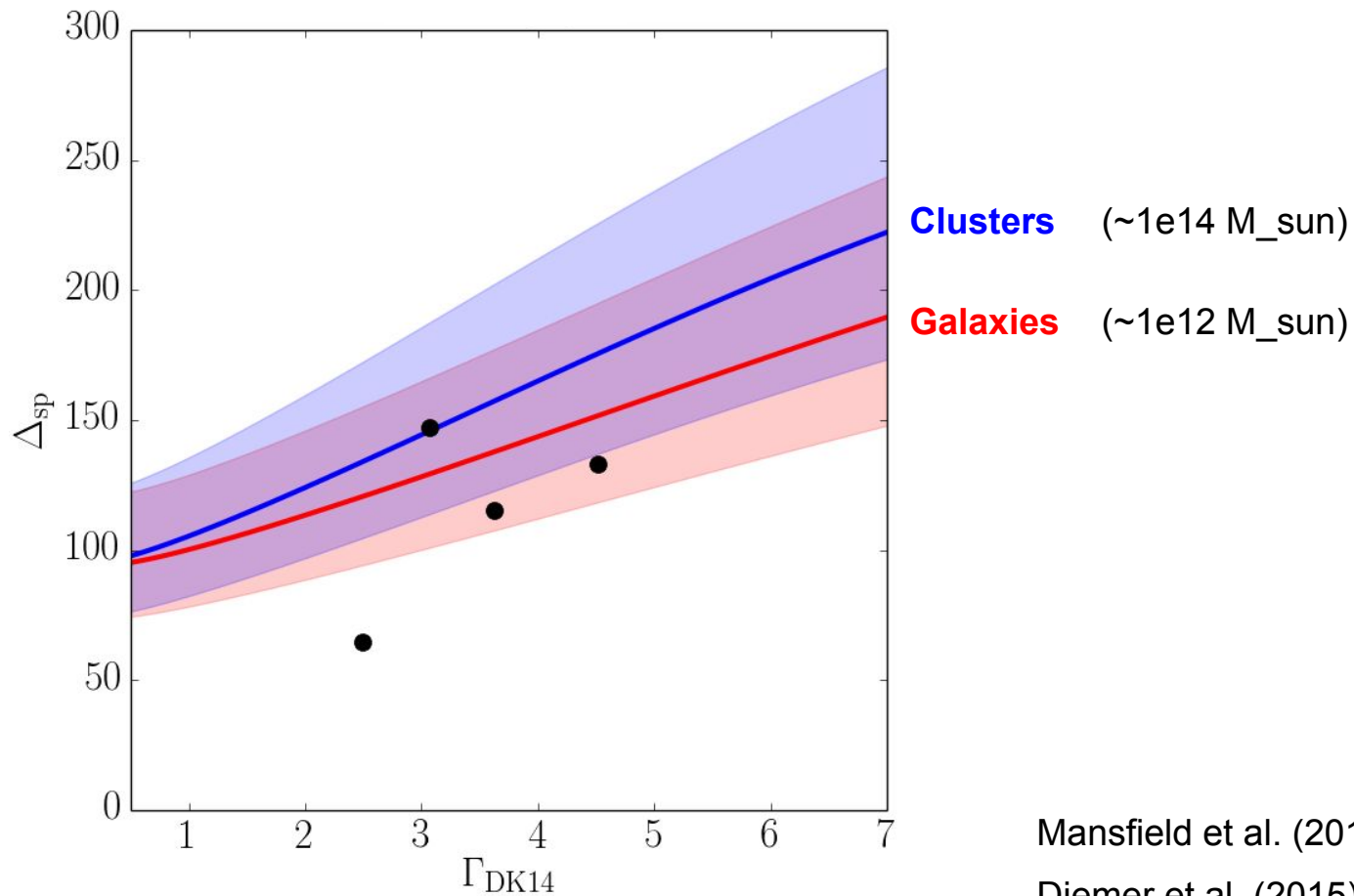
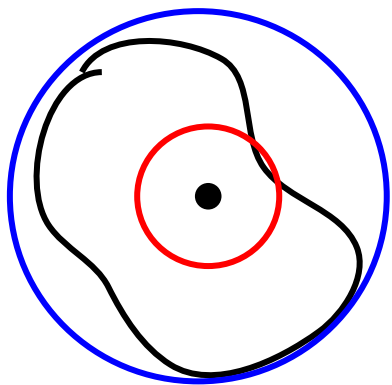
Mansfield et al. (2017)

Diemer et al. (2015)



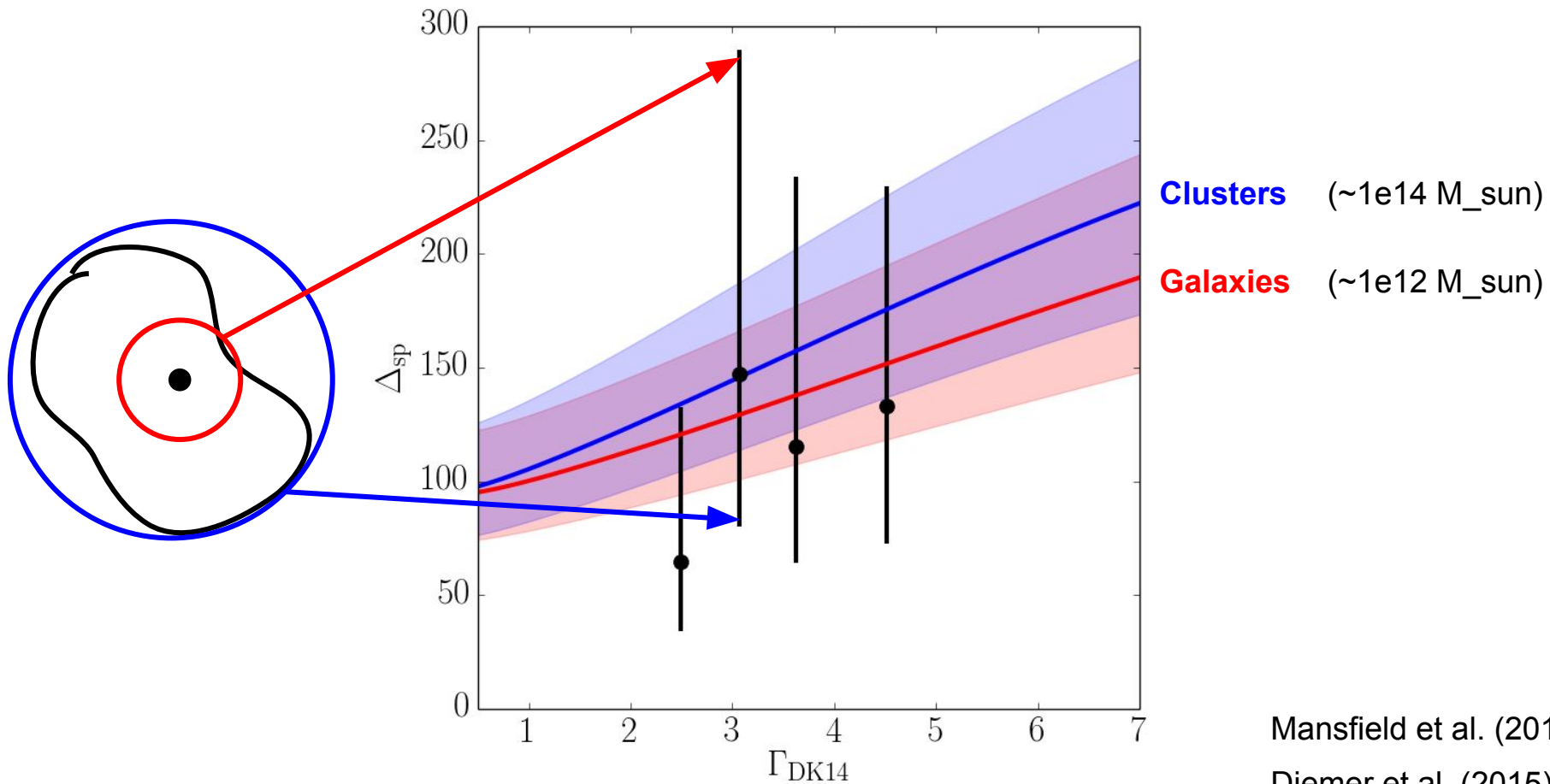
Mansfield et al. (2017)

Diemer et al. (2015)



Mansfield et al. (2017)

Diemer et al. (2015)



Mansfield et al. (2017)

Diemer et al. (2015)

Summary

- Measuring the splashback radius from stacked profiles is biased.
- There are several alternative methods and they all agree with one another.
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- It's hard to model the splashback radius with an overdensity.

Summary

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- There are several alternative methods and they all agree with one another.
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`github.com/phil-mansfield/shellfish`