

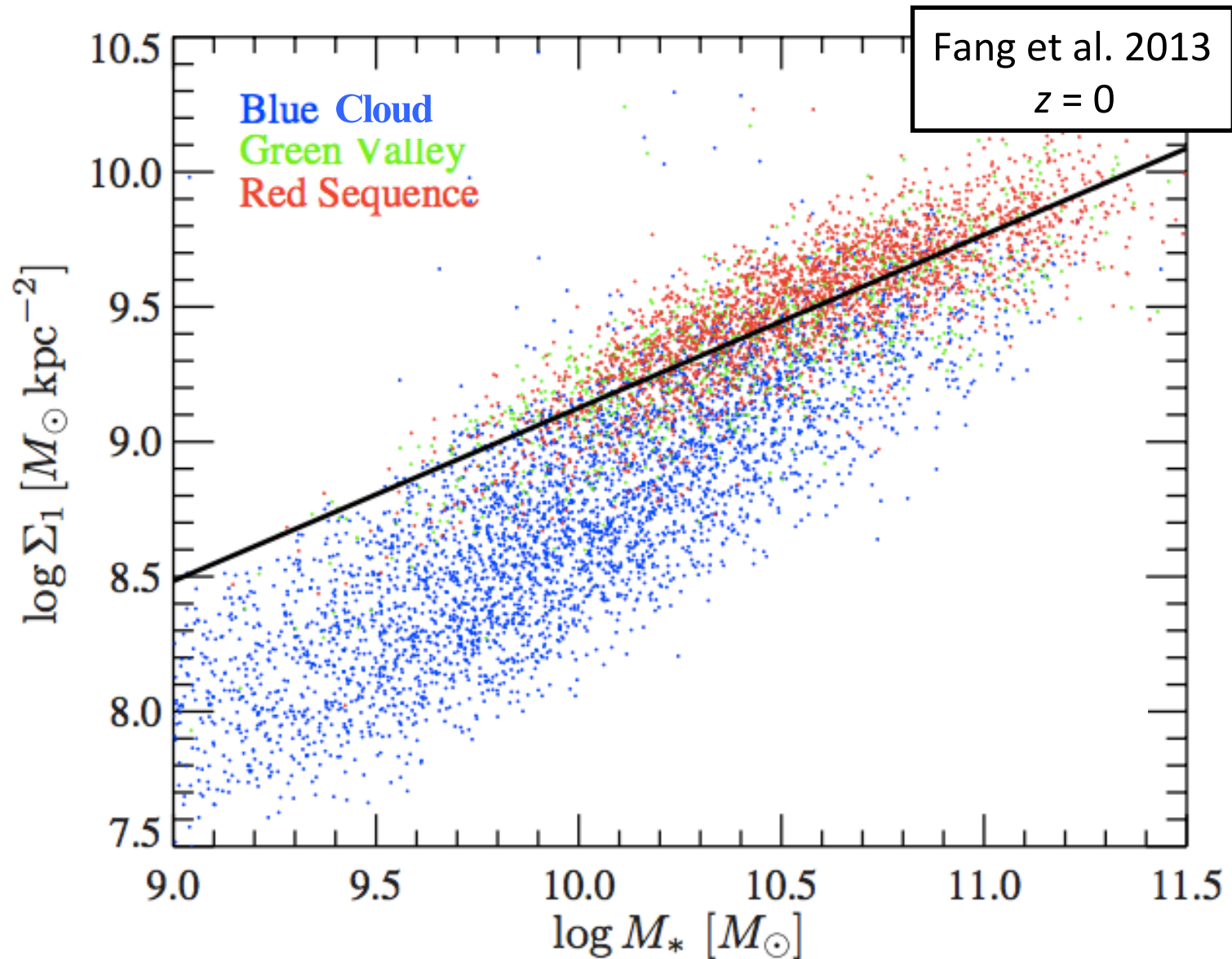
# Structure Within the Ridgeline of Quenched SDSS Galaxies

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Guillermo Barro, Marc Huertas-Company,  
Hassen Yesuf, Sandro Tacchella

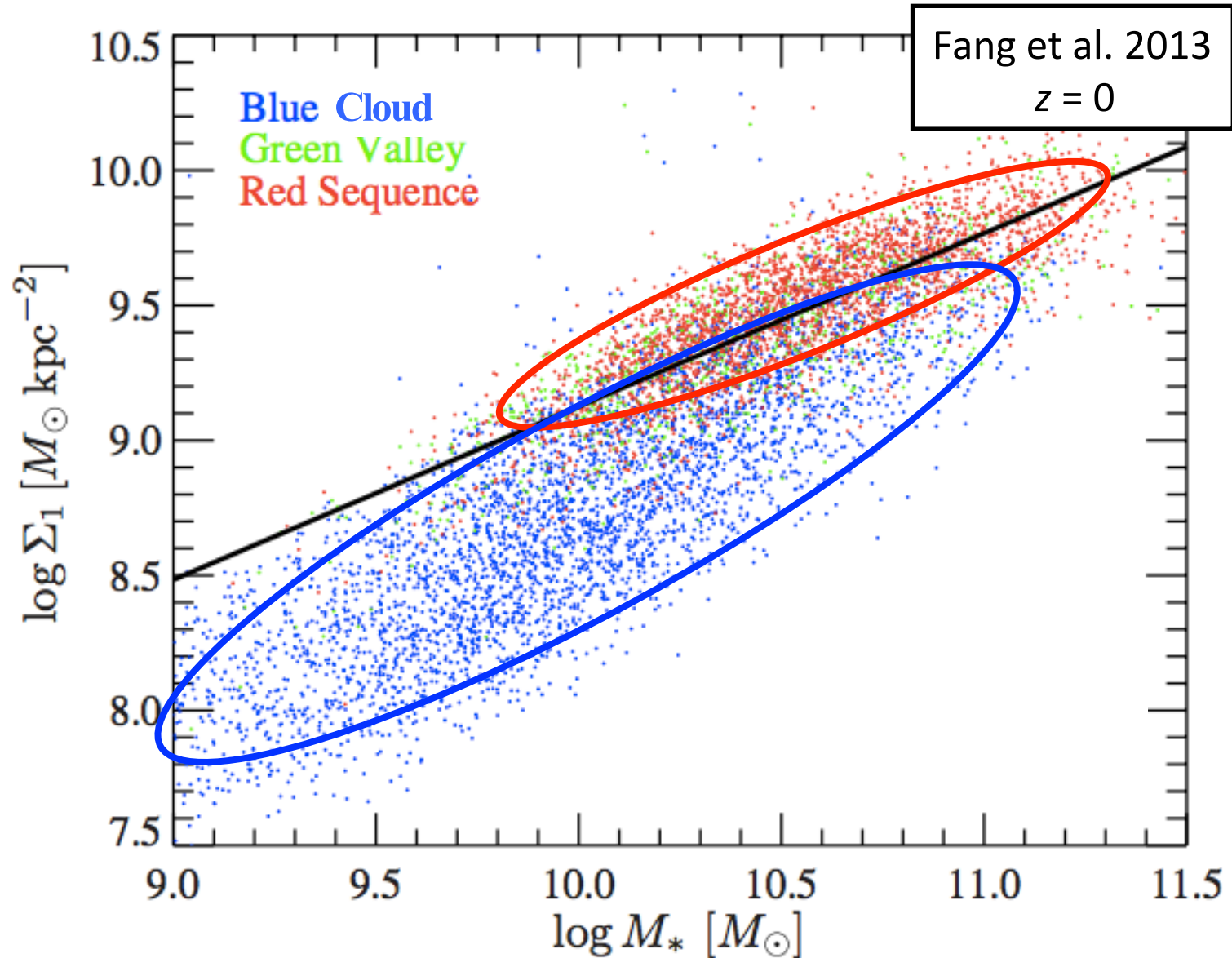
CANDELS Meeting UCSC

August 4, 2017

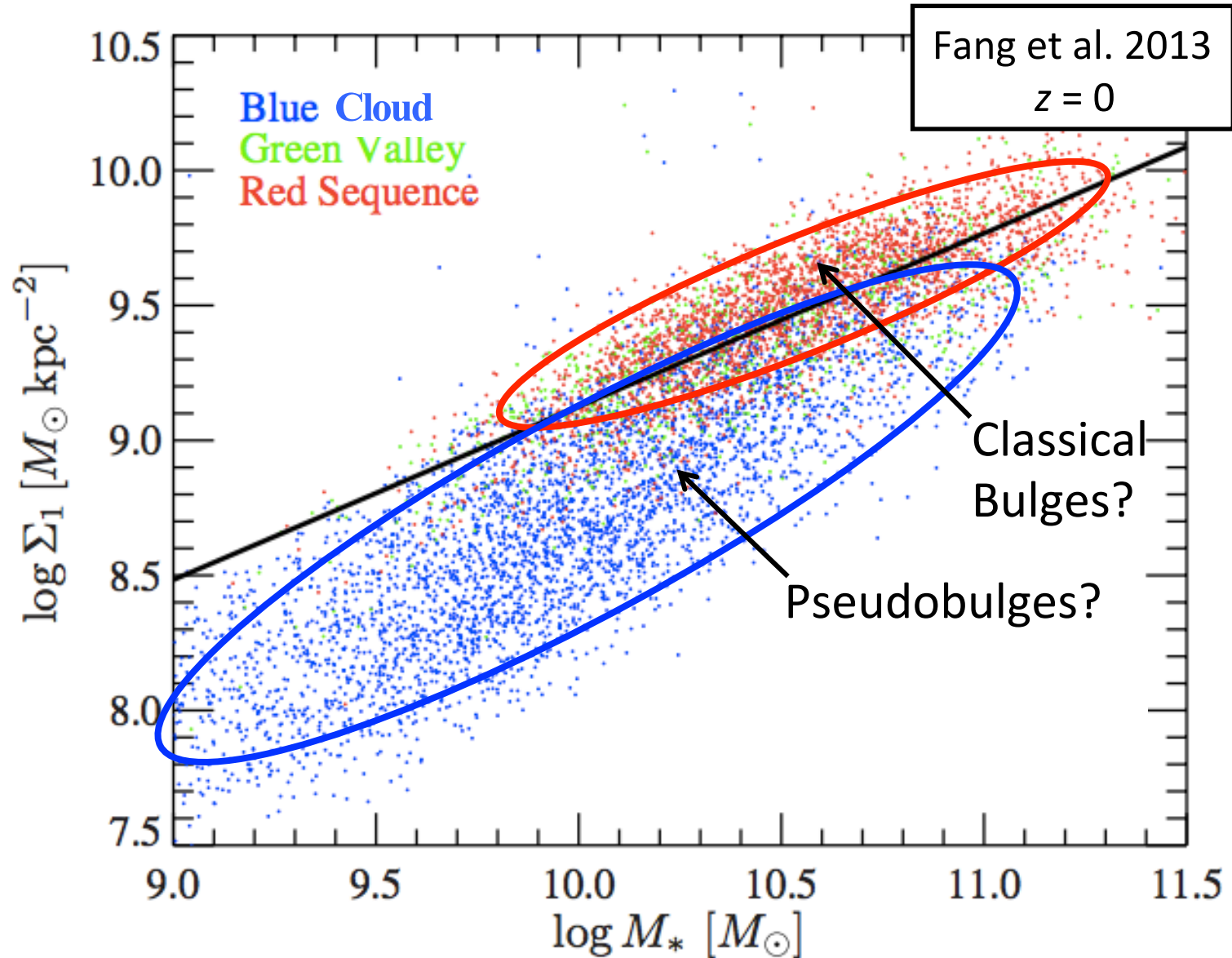
New parameter  $\Sigma_1$ : Central stellar density within 1 kpc

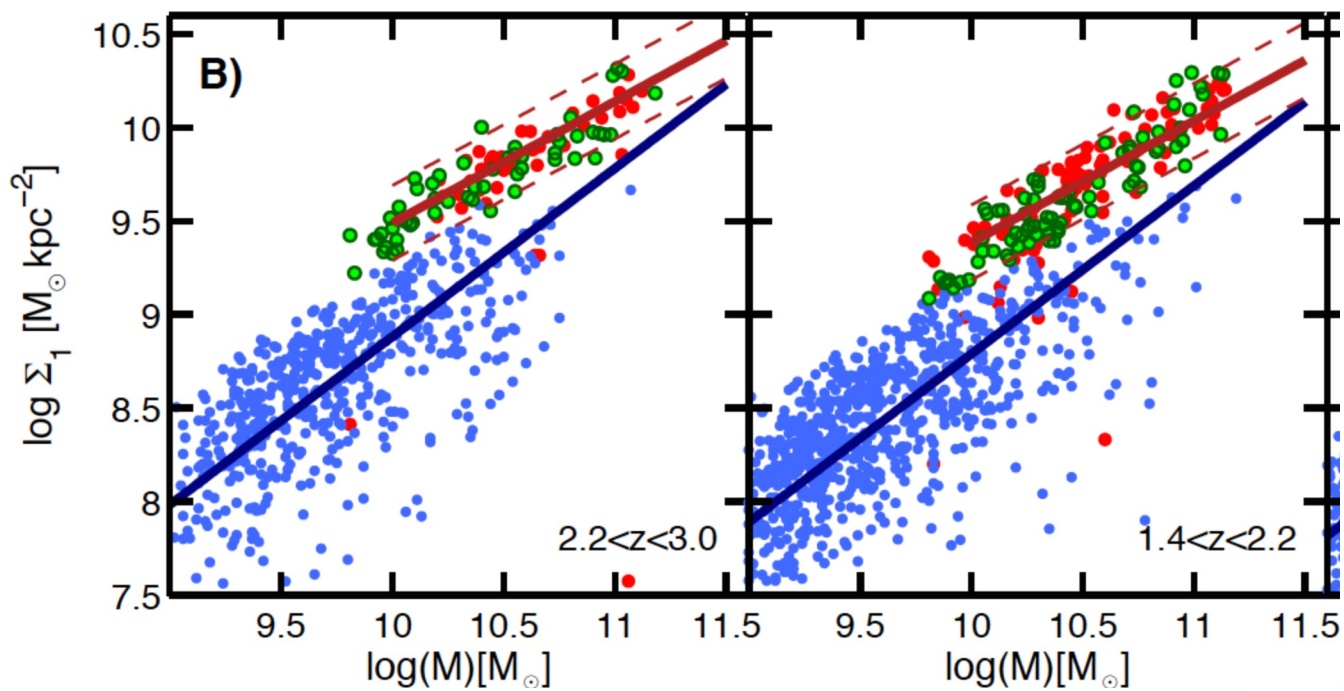


$\Sigma_1$  separates quenched from star-forming



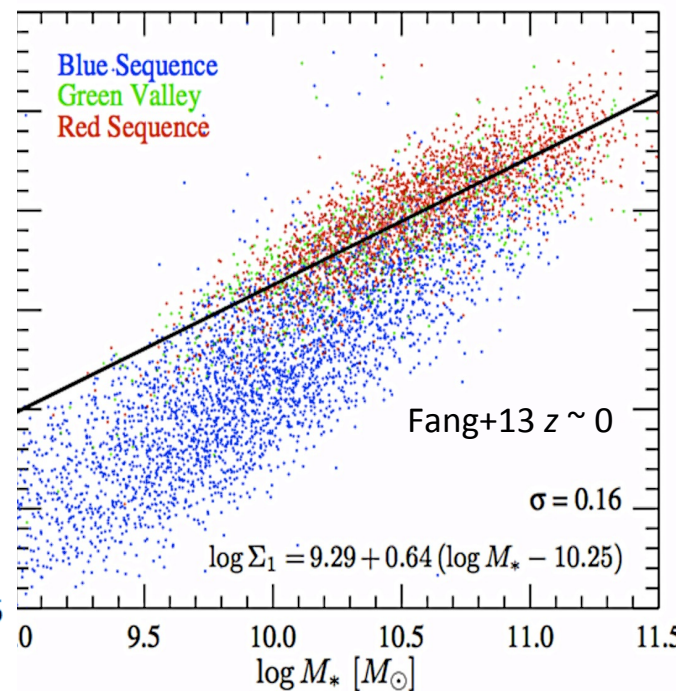
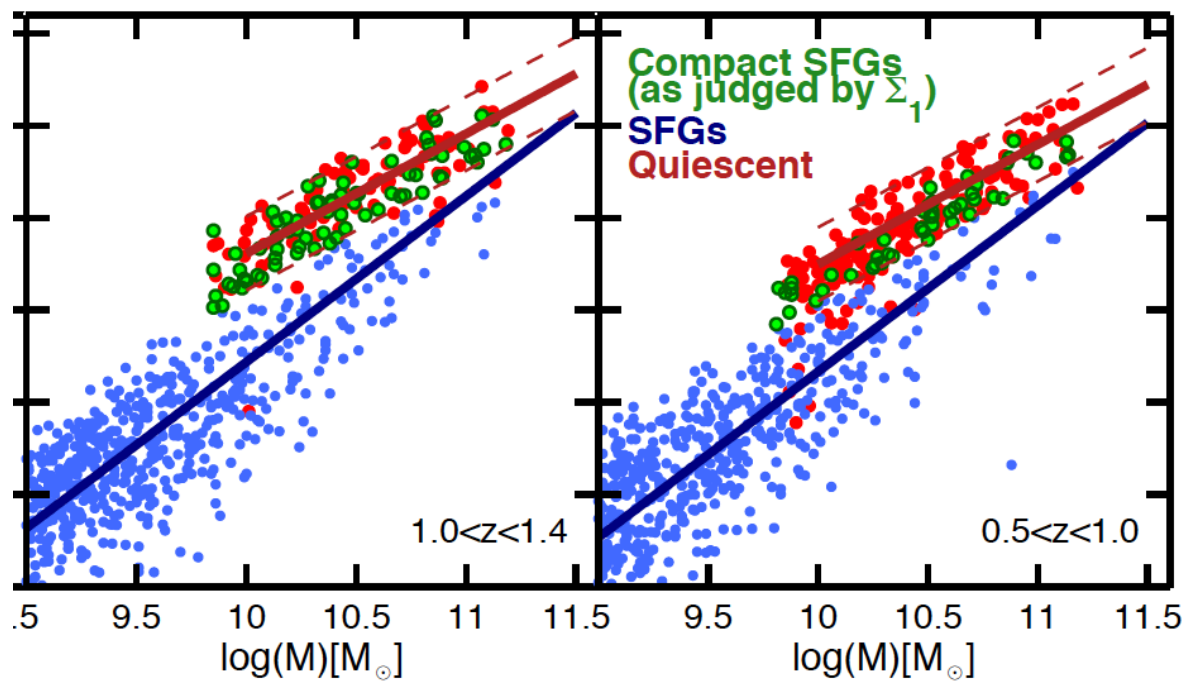
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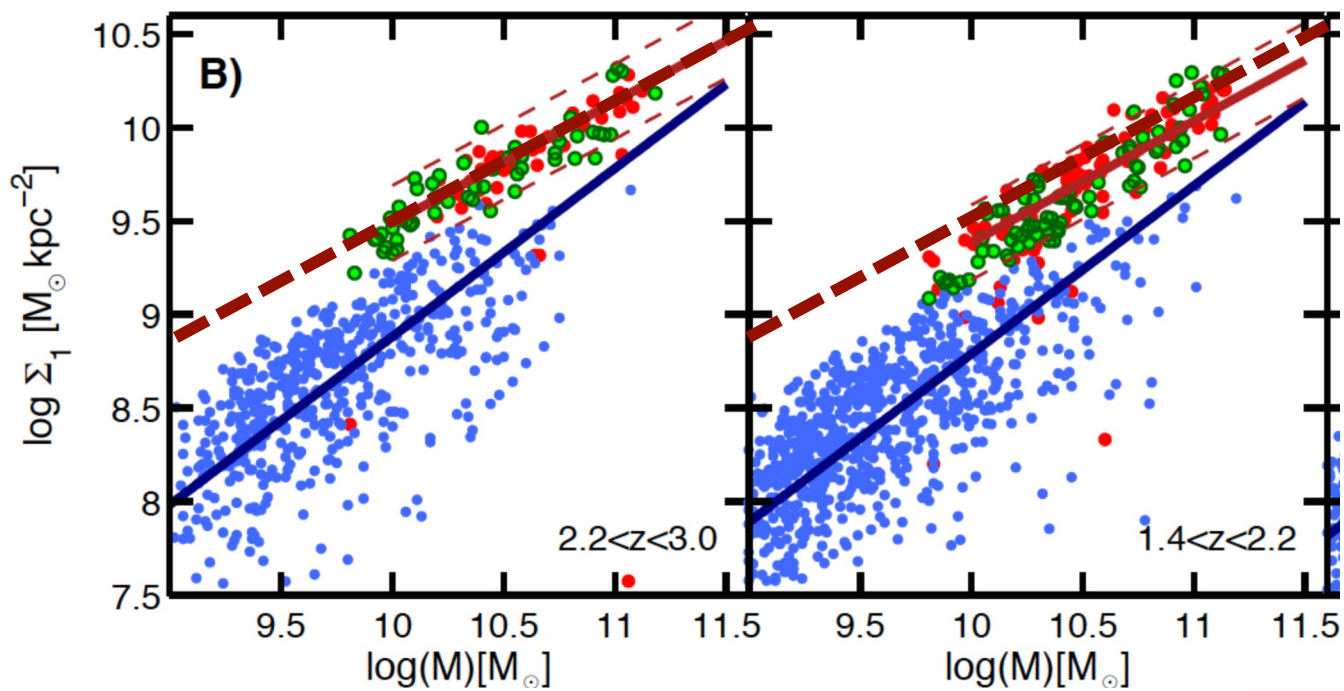




The  $\Sigma_1$ - $M^*$  relation is same at all  $z$ 's except for declining zerpt by 0.3 dex

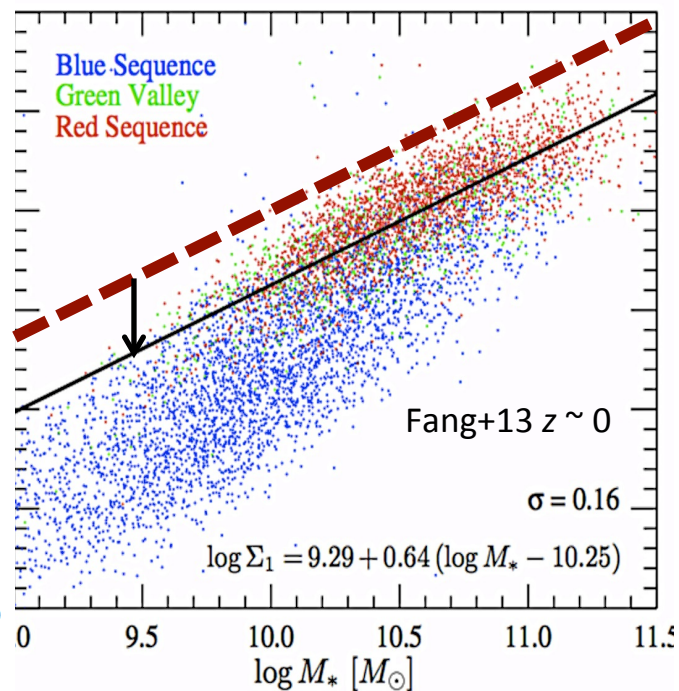
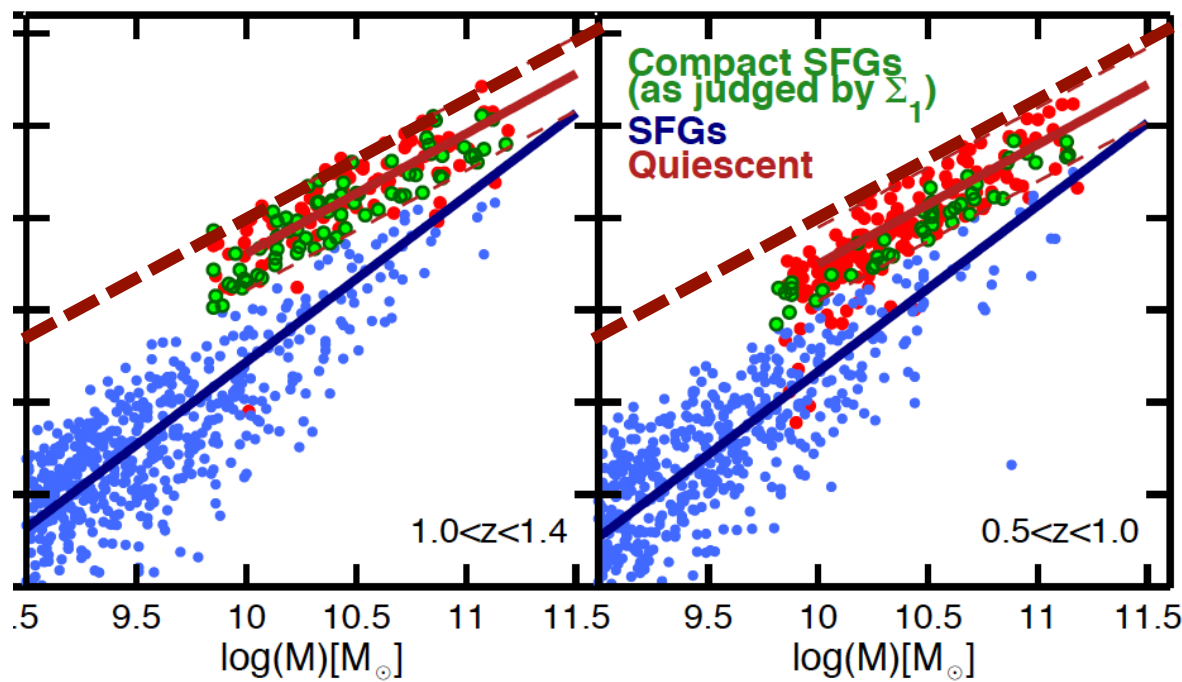
*Barro et al. 2017*



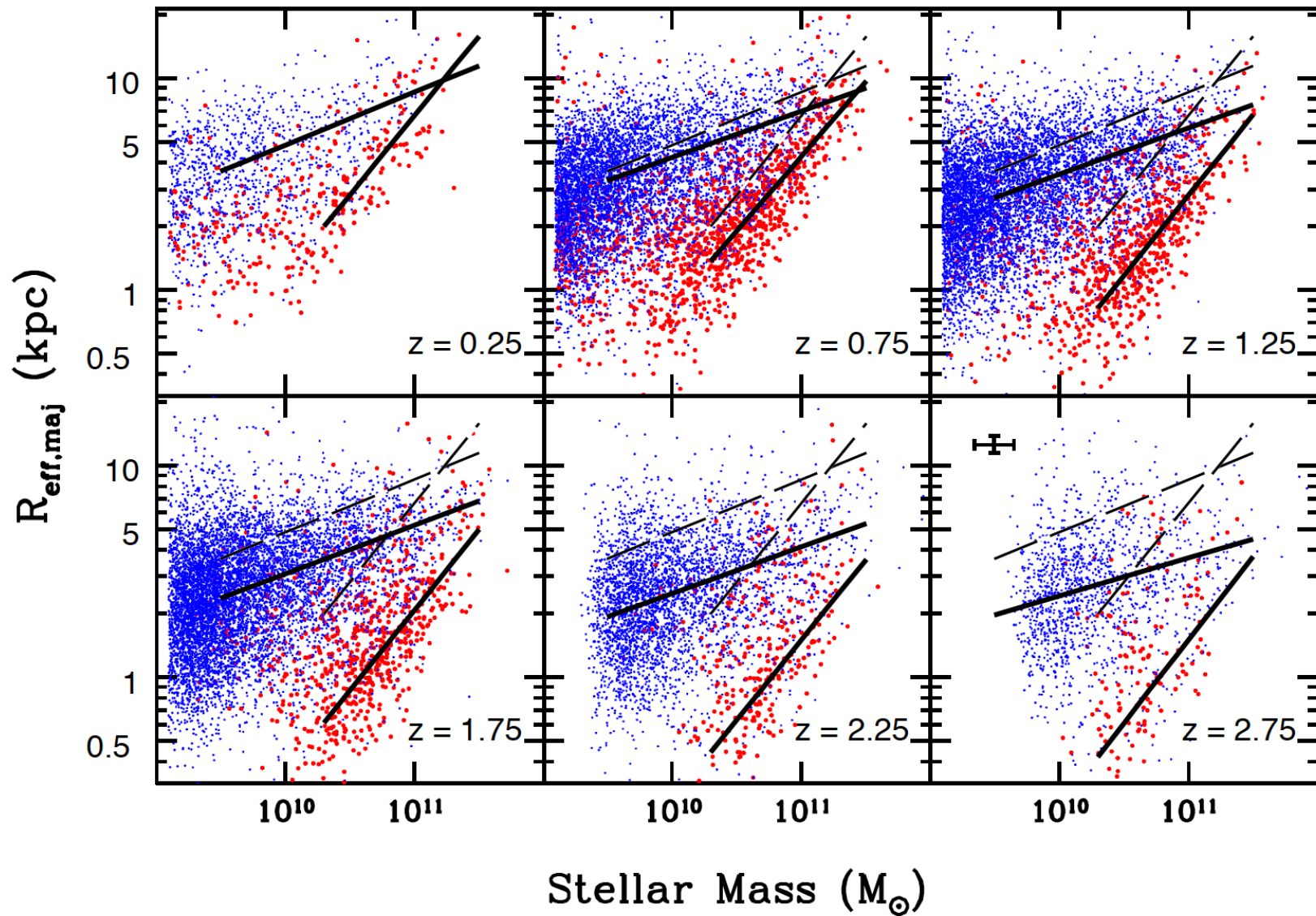


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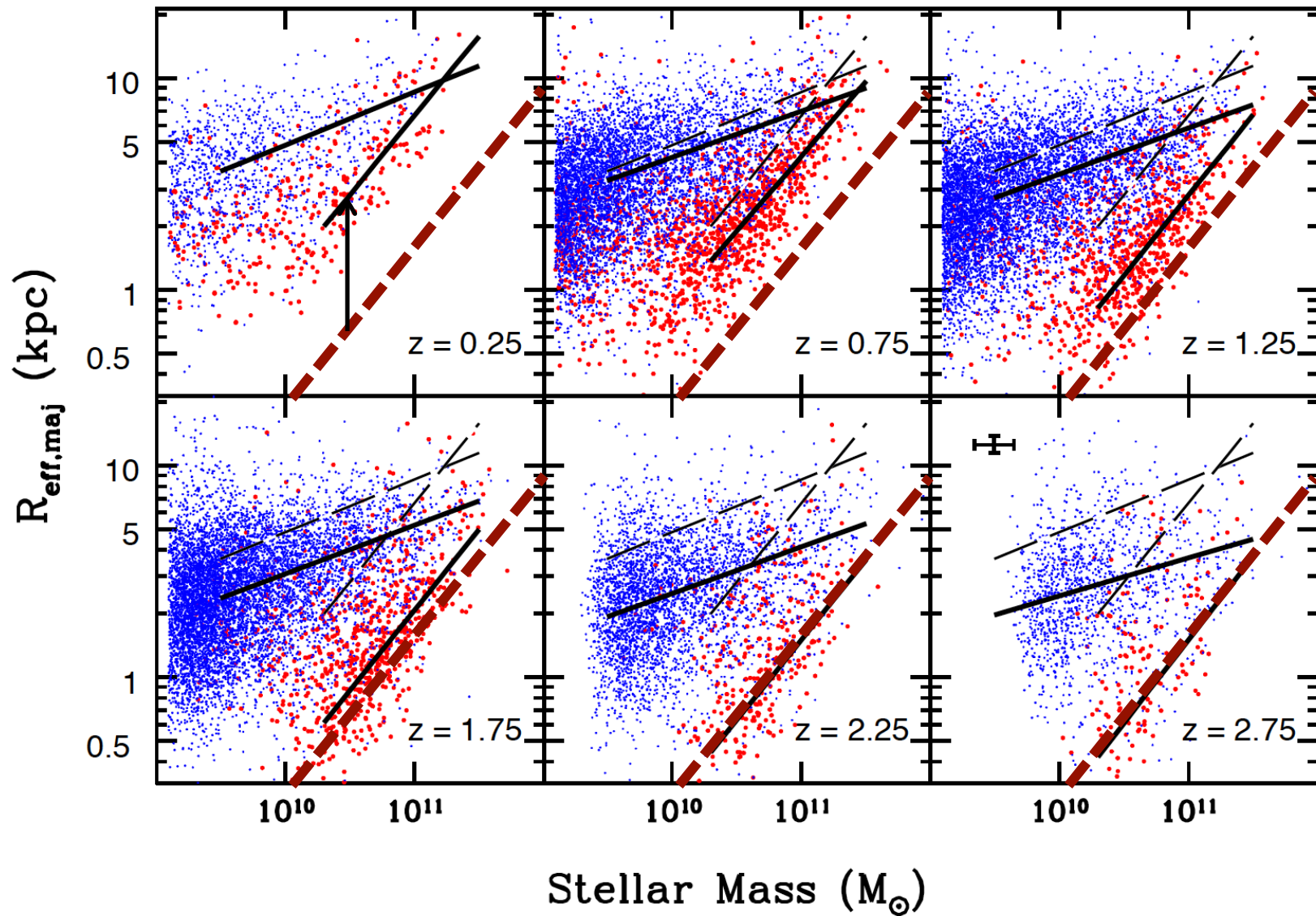
*Barro et al. 2017*



The ridgeline in  $R_e$  is evolving up.

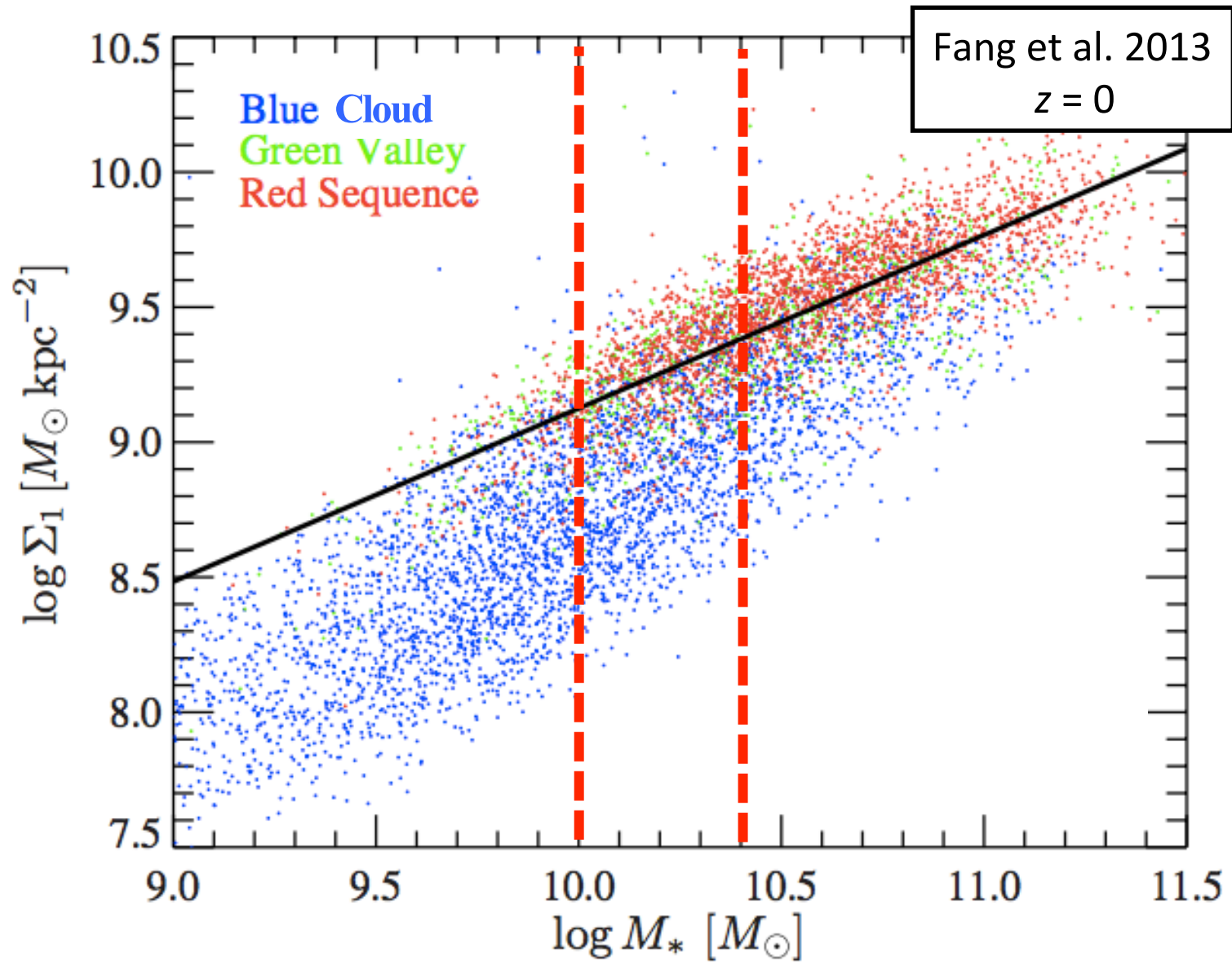


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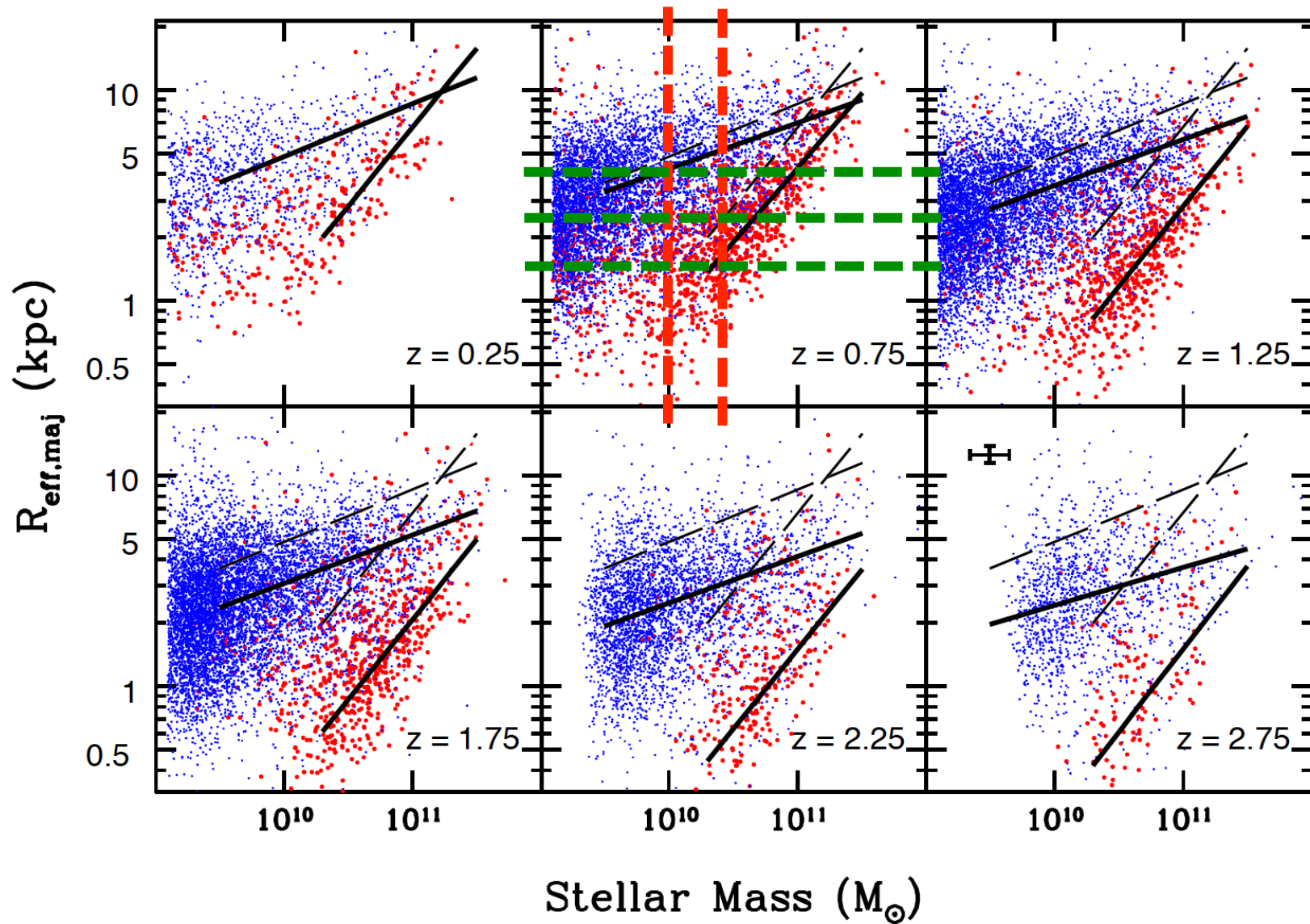




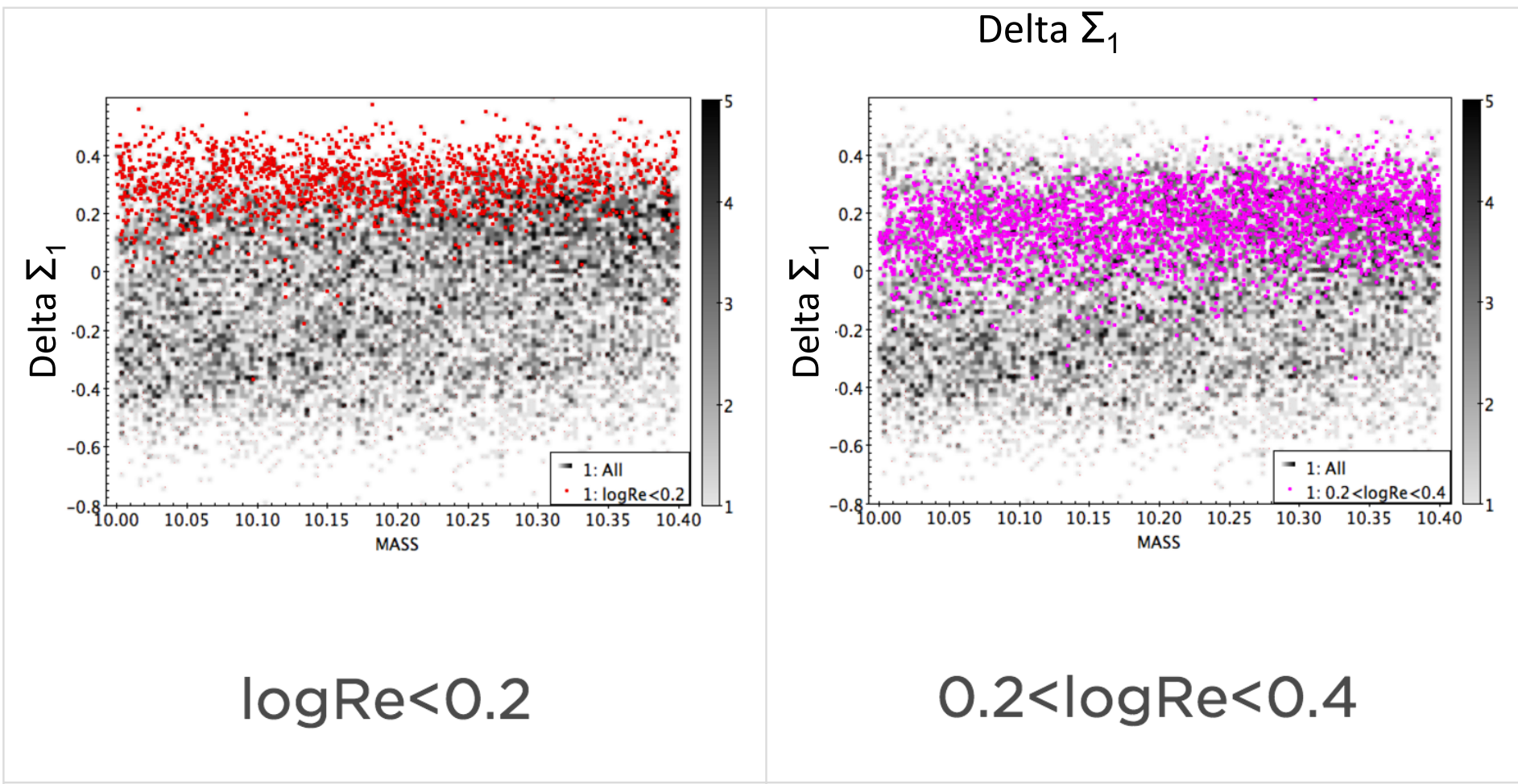
## Confirm mapping between ridgelines



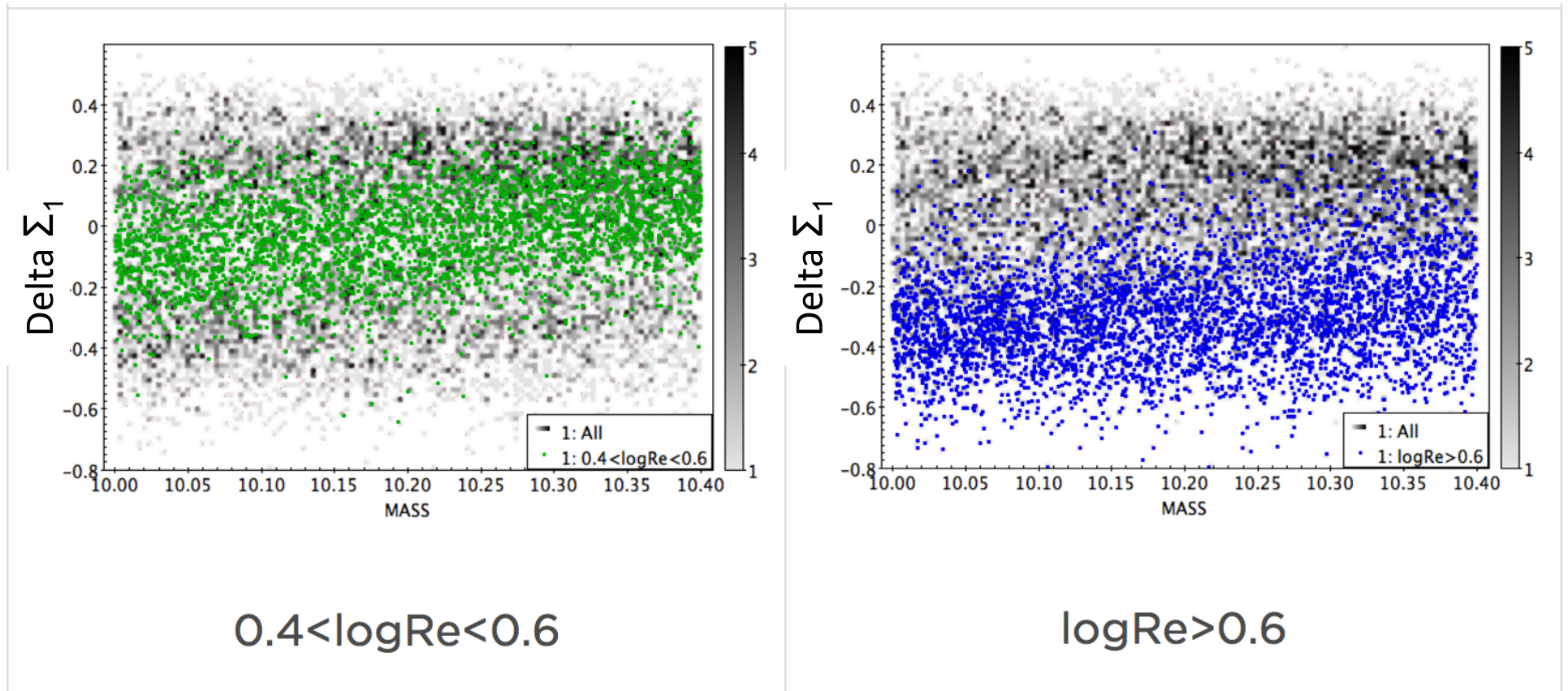
# Confirm mapping between ridgelines



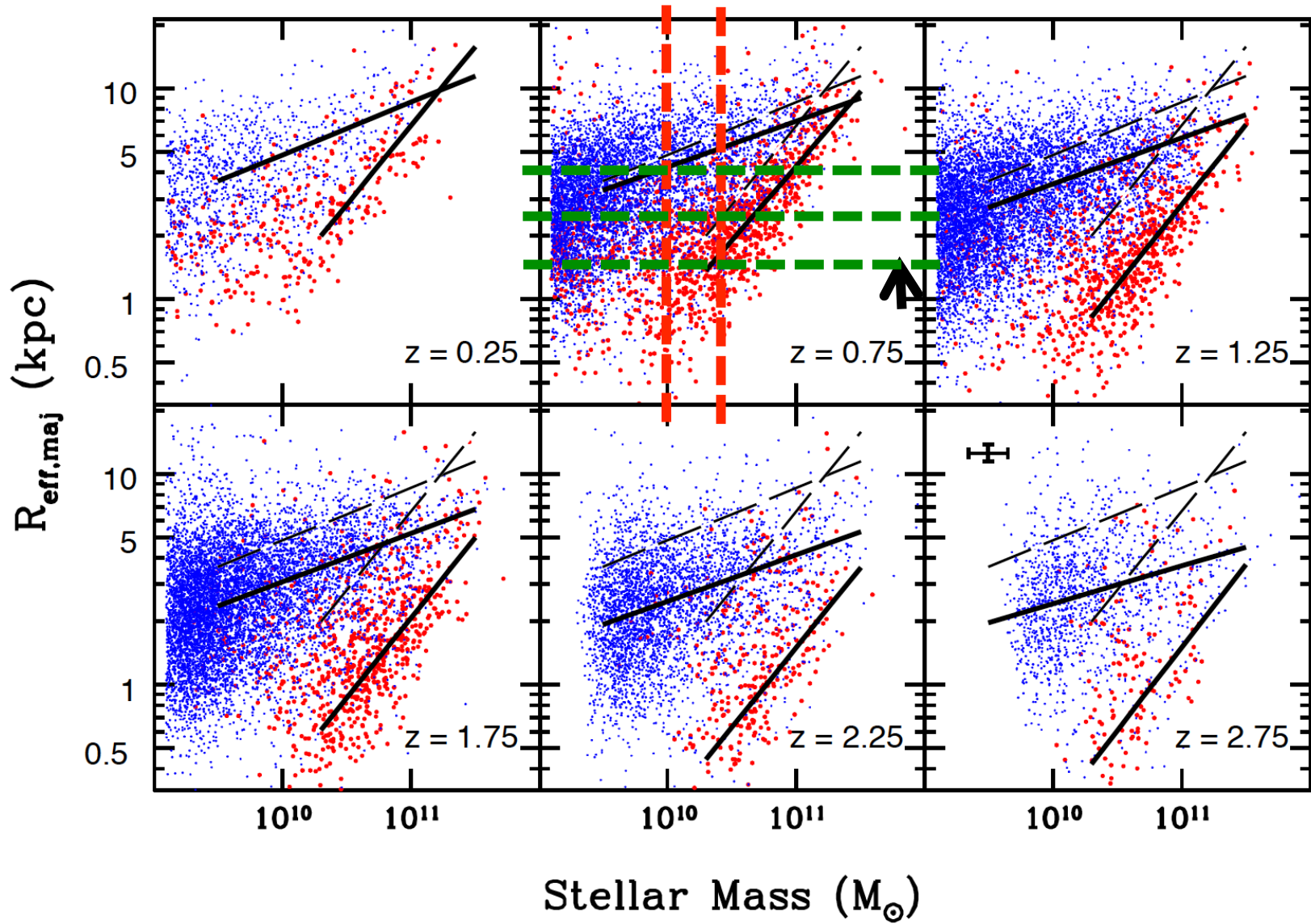
Higher  $\Sigma_1$  galaxies have smaller  $R_e$

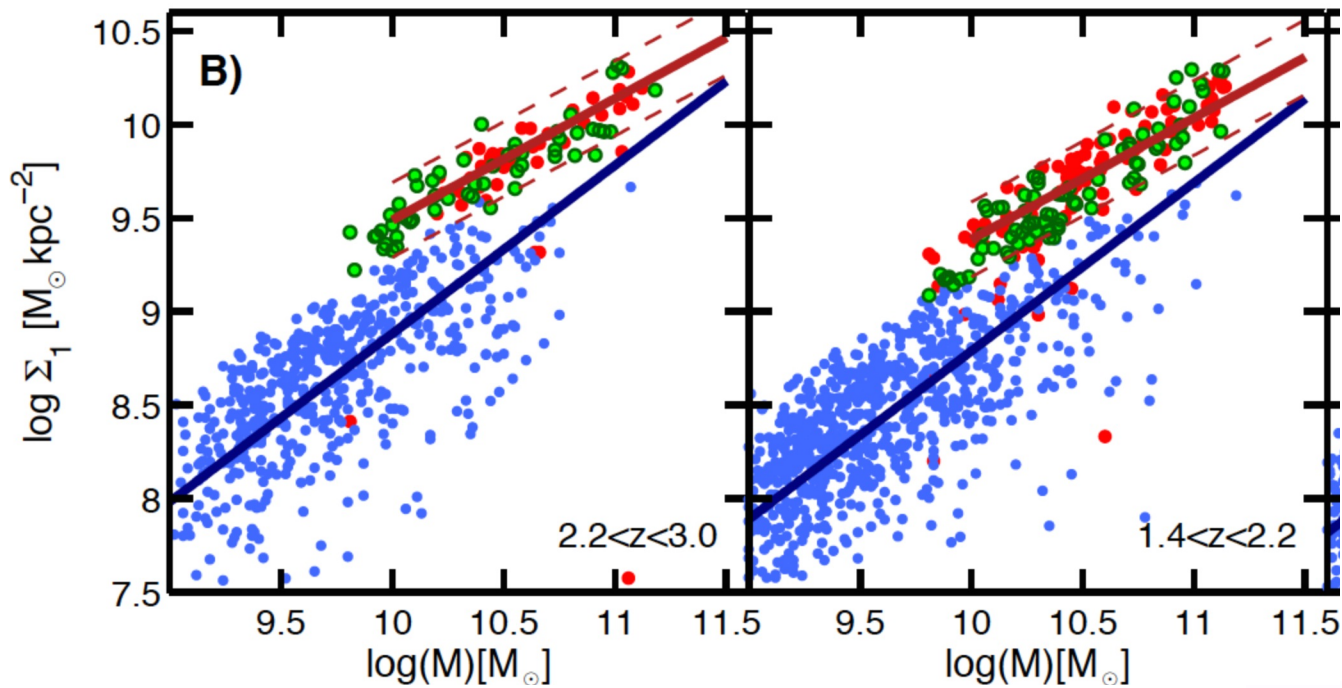


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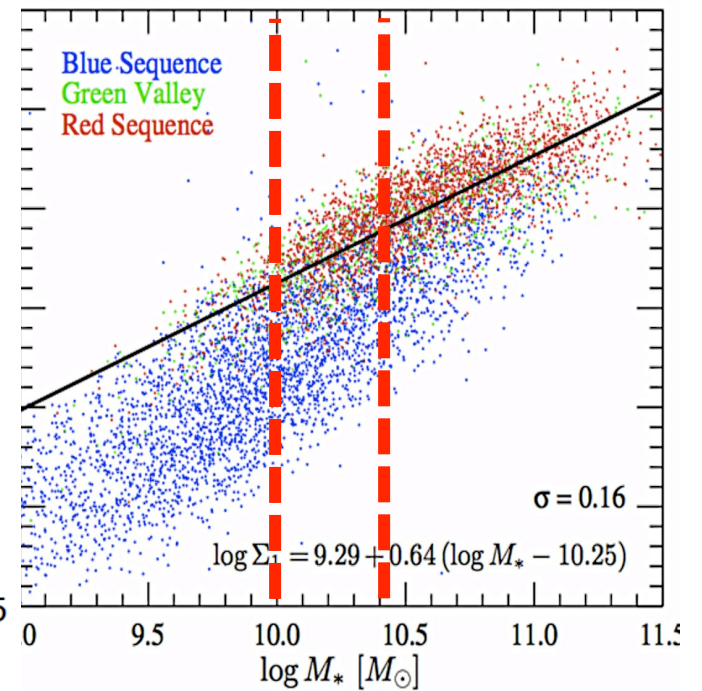
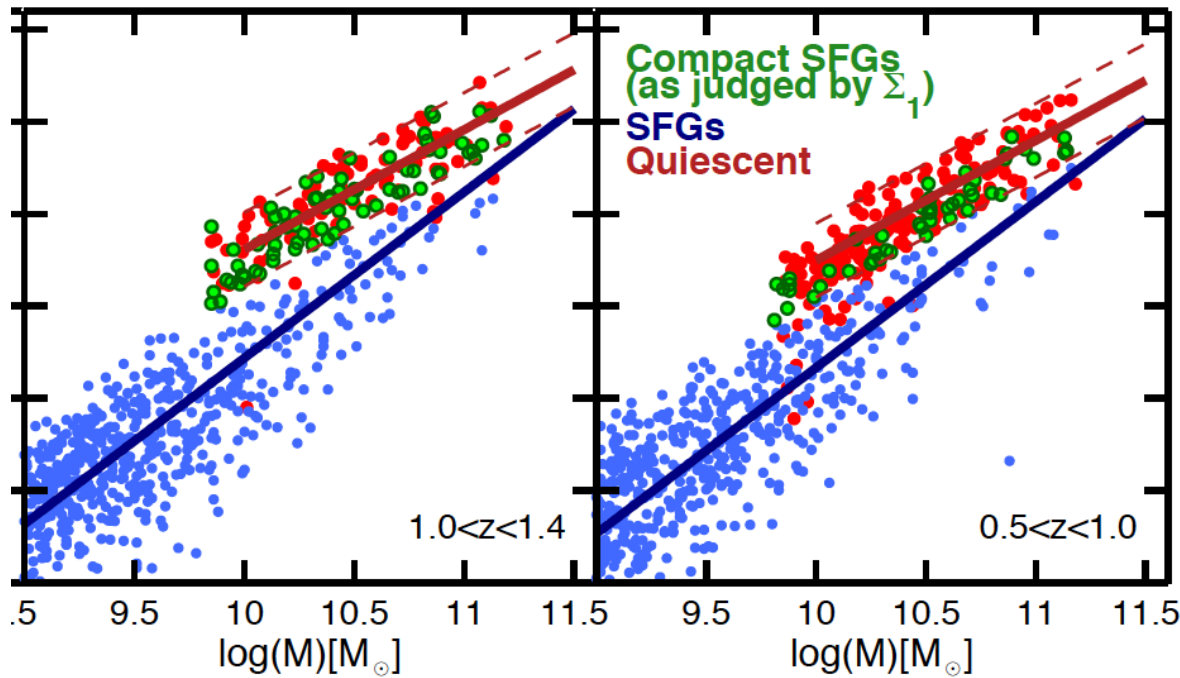


Hypothesis:  $R_e$  at fixed  $M_*$  on ridgeline is a clock – smaller galaxies quenched earlier

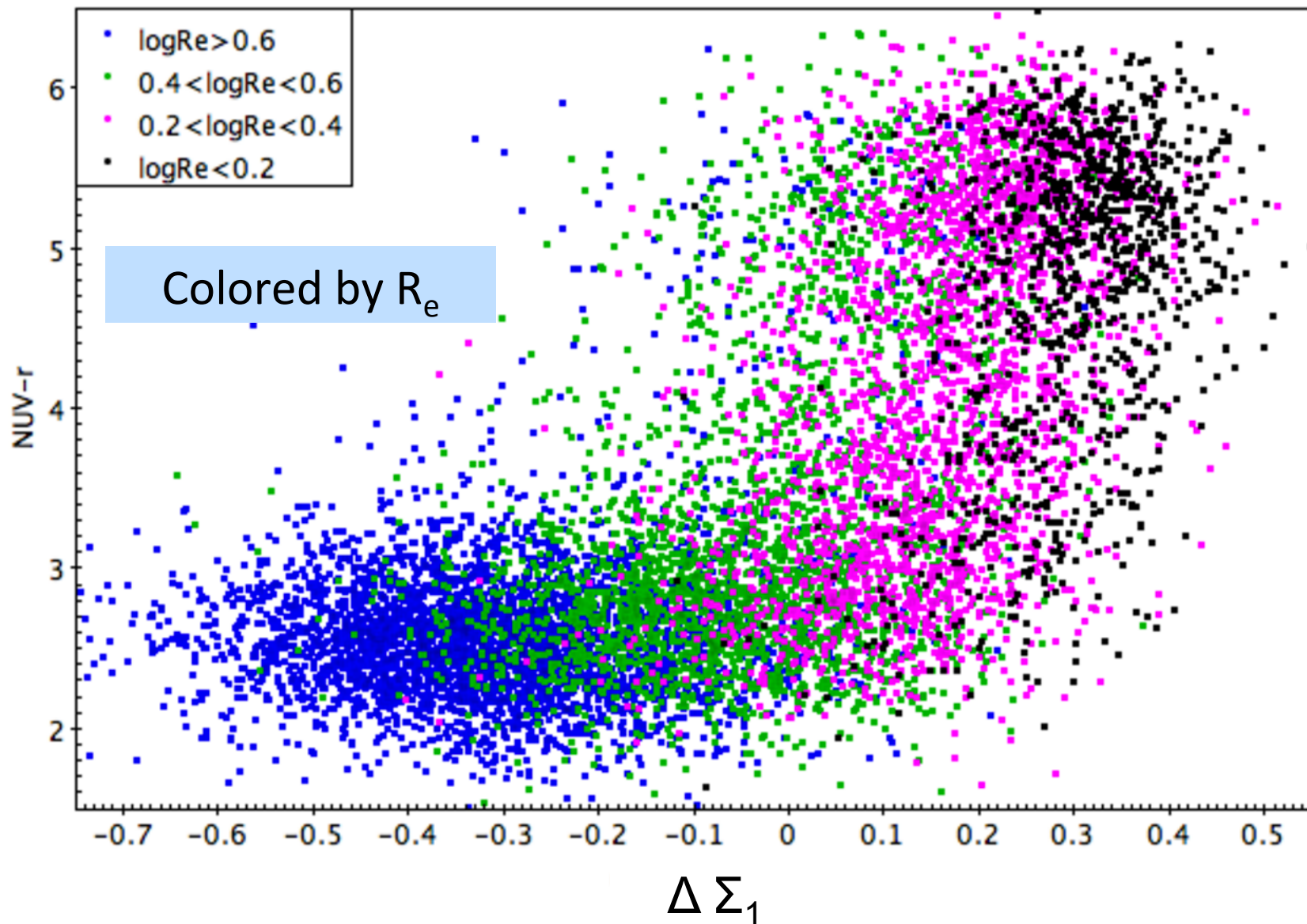




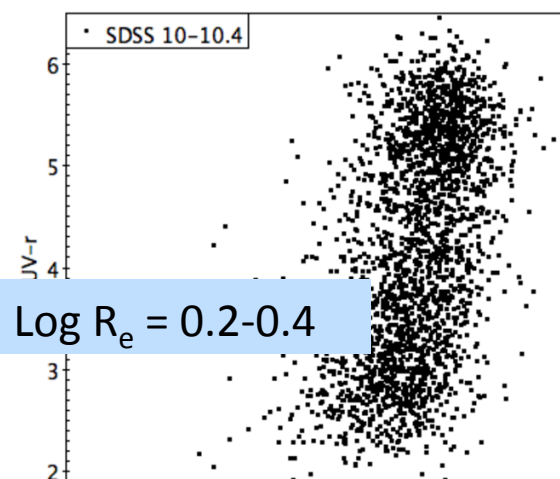
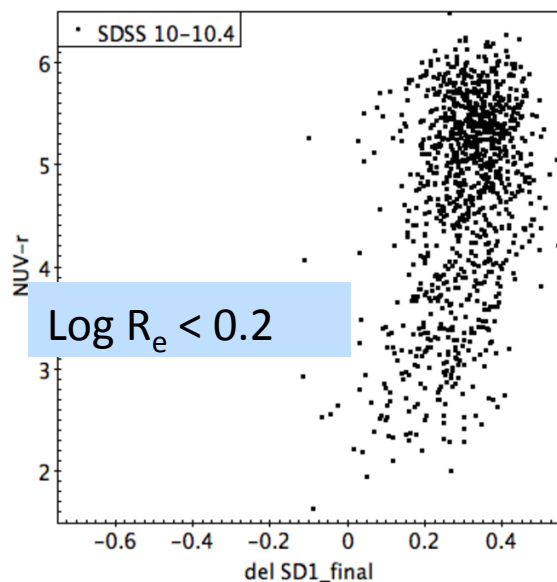
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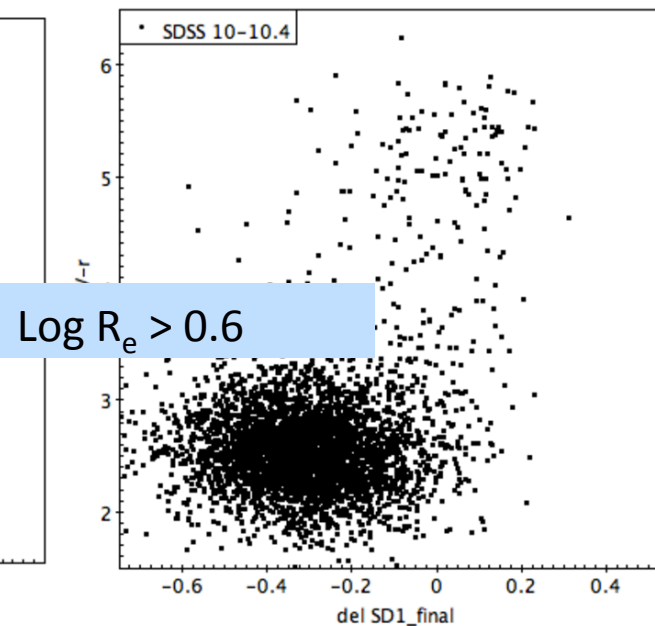
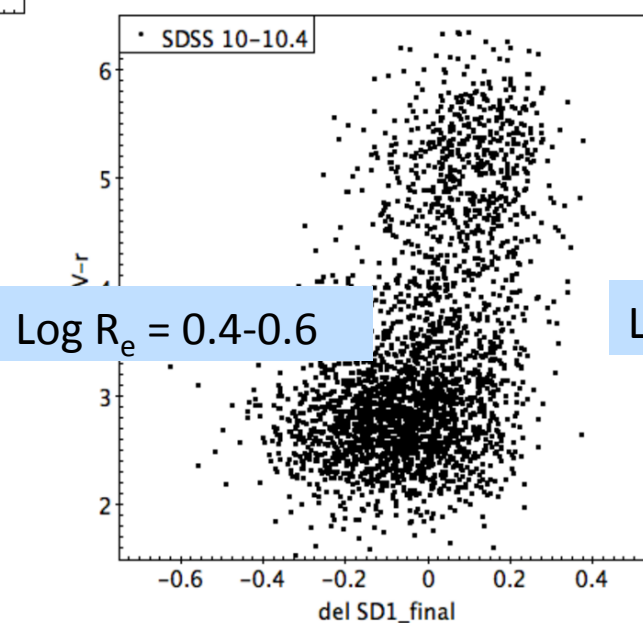
SSFR in slices through the ridgeline,  $\Delta\Sigma_1$ .  
Structure on the quenched ridgeline and in the GV.



# Smaller galaxies are more quenched

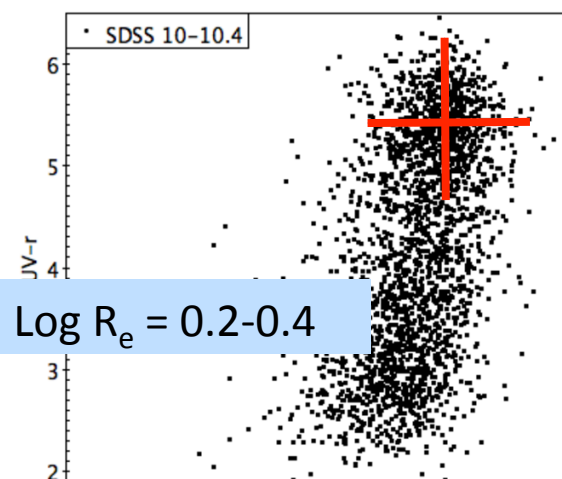
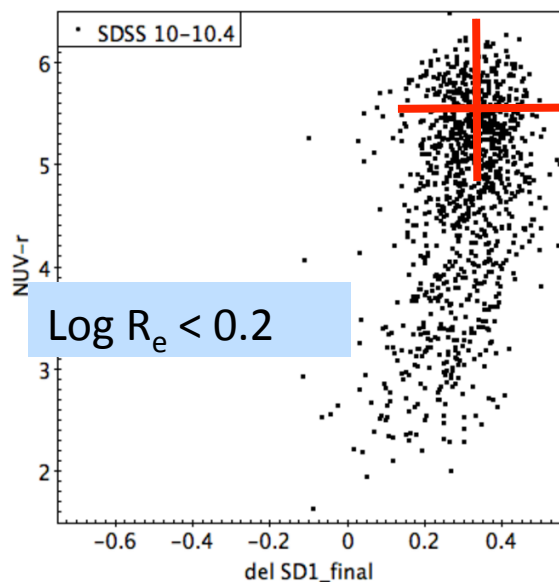


Log mass =  
10.0-10.4

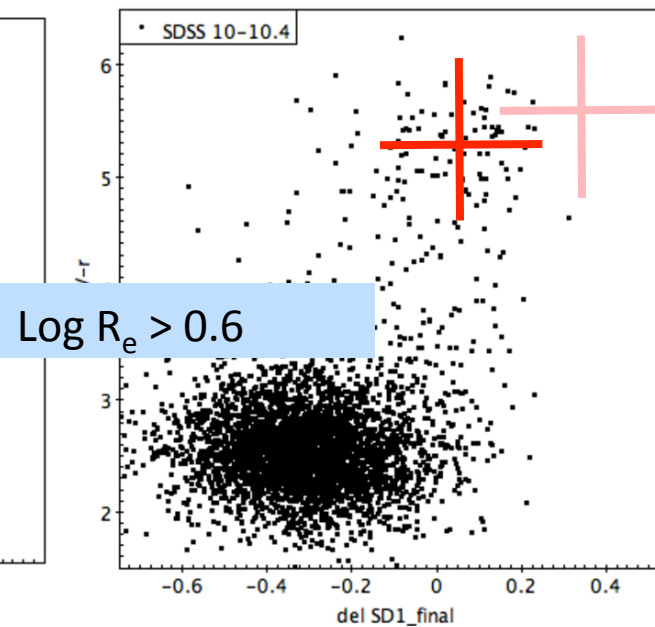
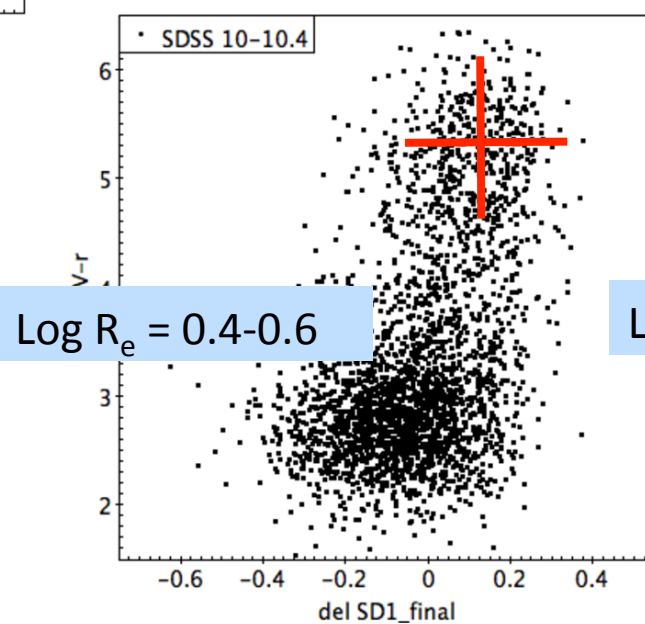




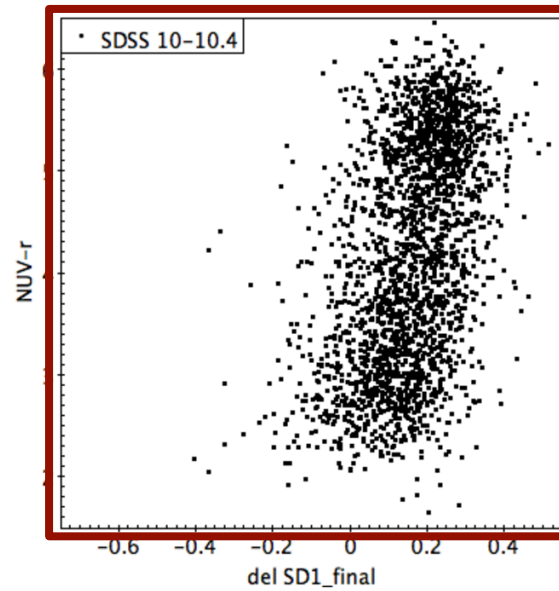
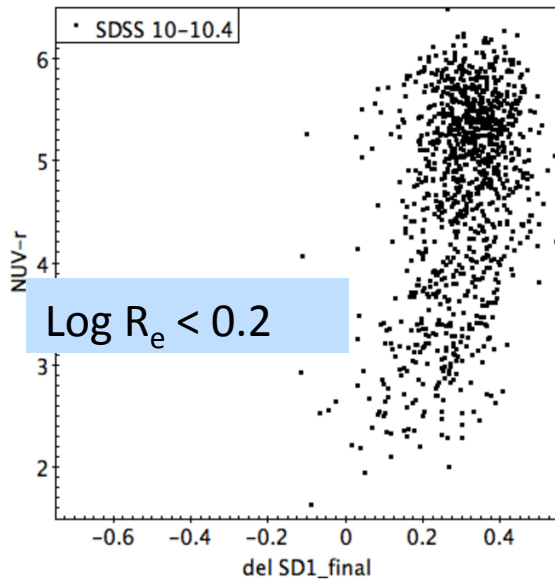
# Smaller quenched galaxies quenched earlier



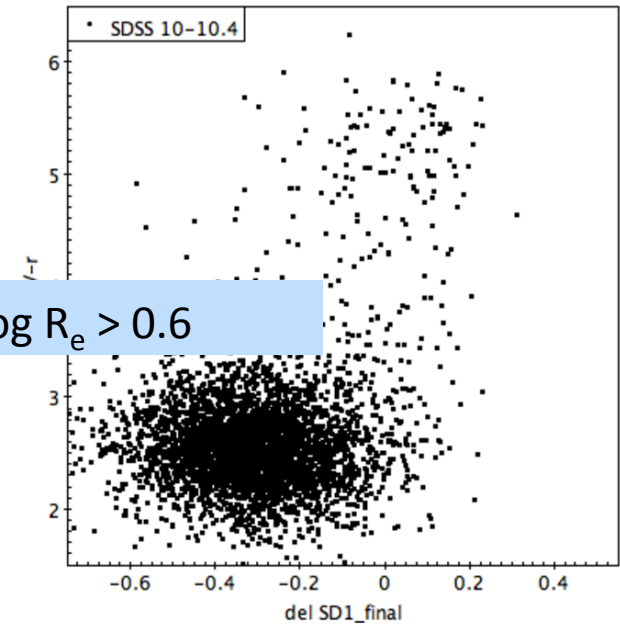
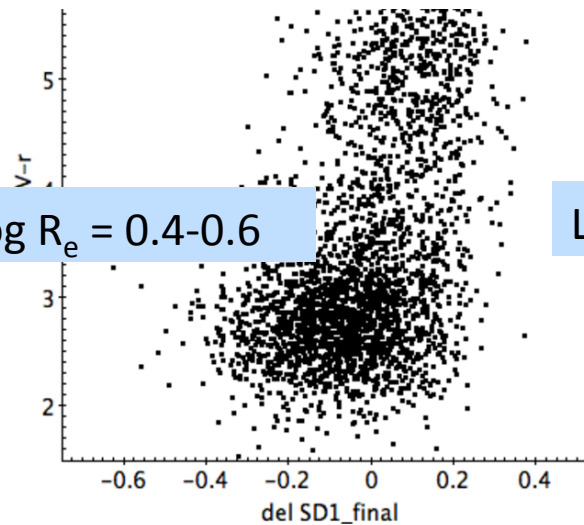
Log mass =  
10.0-10.4



# Galaxies do not rush through the GV!



Log mass =  
10.0-10.4



# Conclusions

- $R_e$ - $M^*$  maps onto  $\Sigma_1$ - $M_*$  for star-forming galaxies ( $n \sim 1$ )
- Although the quenched ridgeline is narrow, structure lurks within it.
- This structure reflects progenitor bias – the evolution of the ridgeline after quenching does not quite keep up with the locations of newly quenched galaxies
- The instantaneous ridgeline is about half as narrow (in  $\Sigma_1$  and  $R_e$ ) as the total ridgeline. Same for the GV.
- This is the second step in relating stellar population age to structure. The first was identifying the ridgelines. Now we start to resolve different quenching times within the quenched population.
- What are the implications for structure in and around the Fundamental Plane of quenched galaxies???