Exploring the evolution of the stellar mass function and K-band luminosity function in the redshift range z=0.5-3.5

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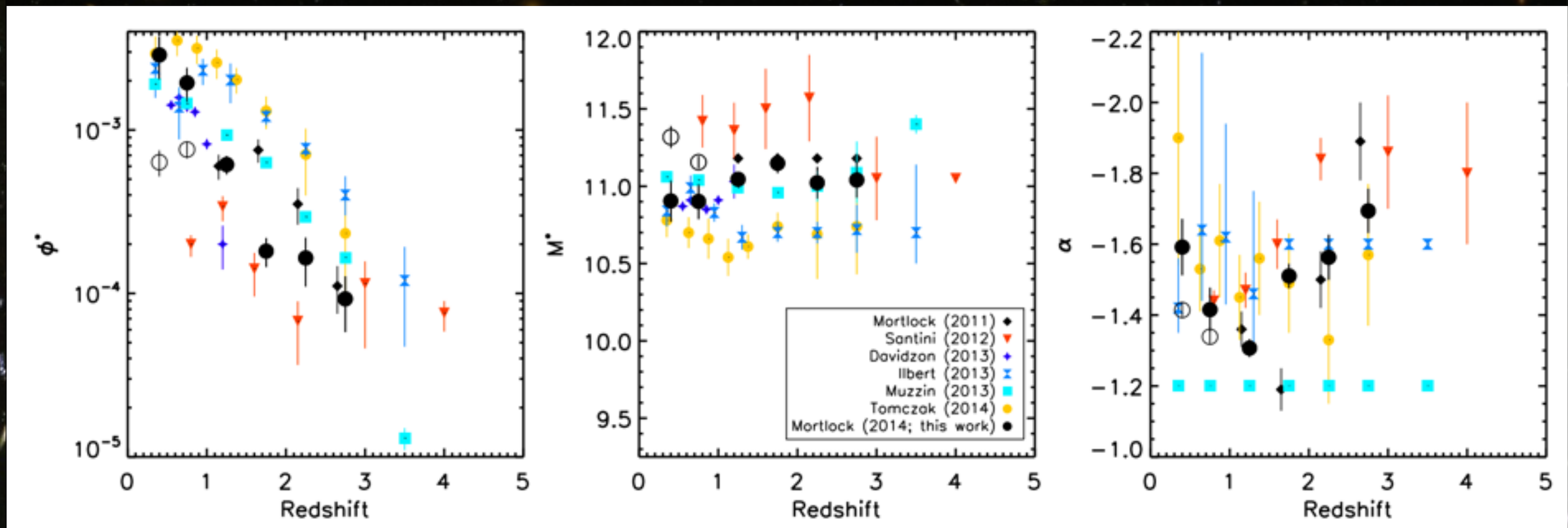
Motivation

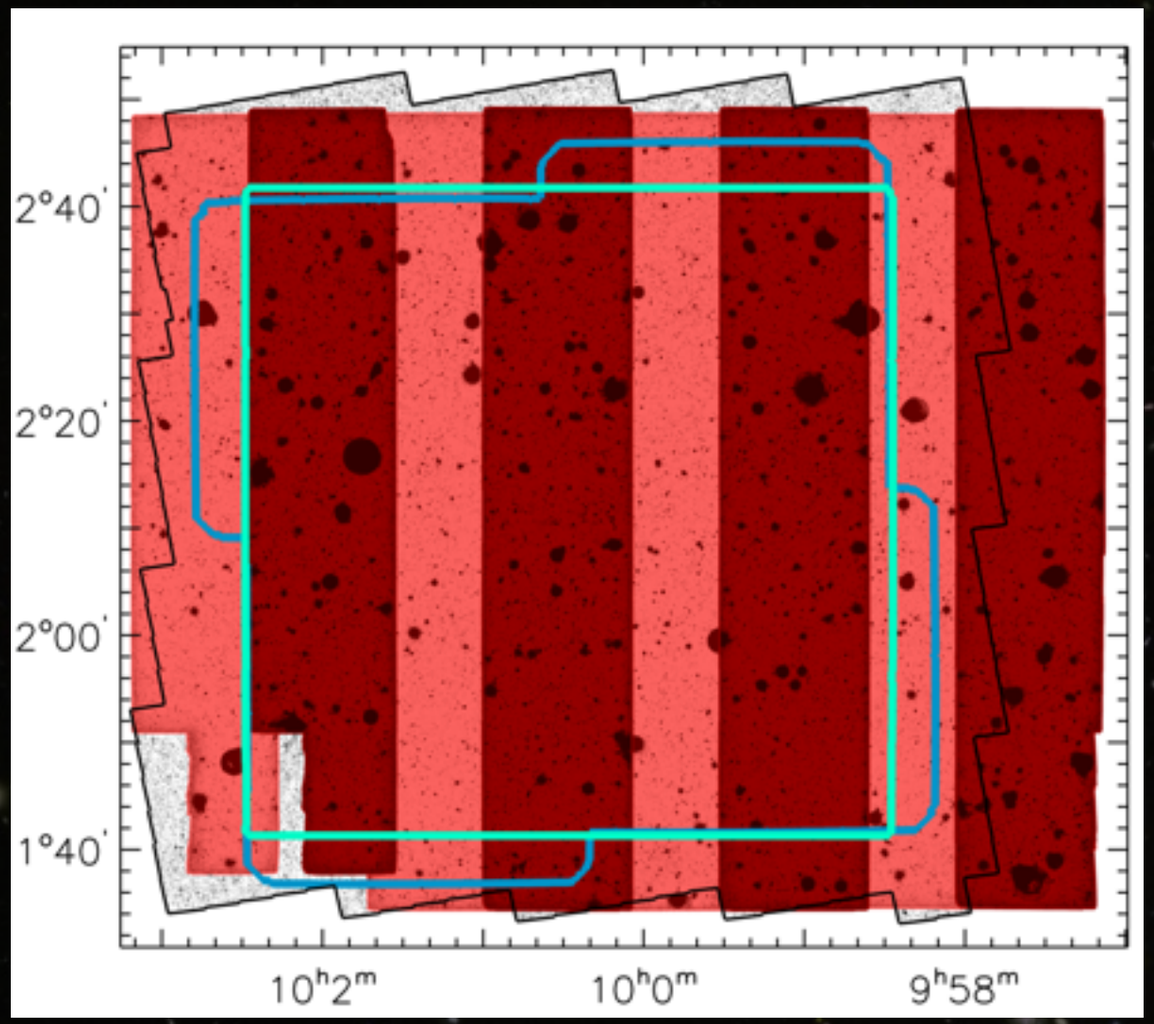
Huge amount of work in the literature, but still disagreement on the form of the MF (and LF)



Mortlock et al. 2015

- Often disagreements arise from:
  - survey area
  - depth
  - fitting the form of the LF/MF
  - differences in galaxy selection

UltraVISTA DR2 data

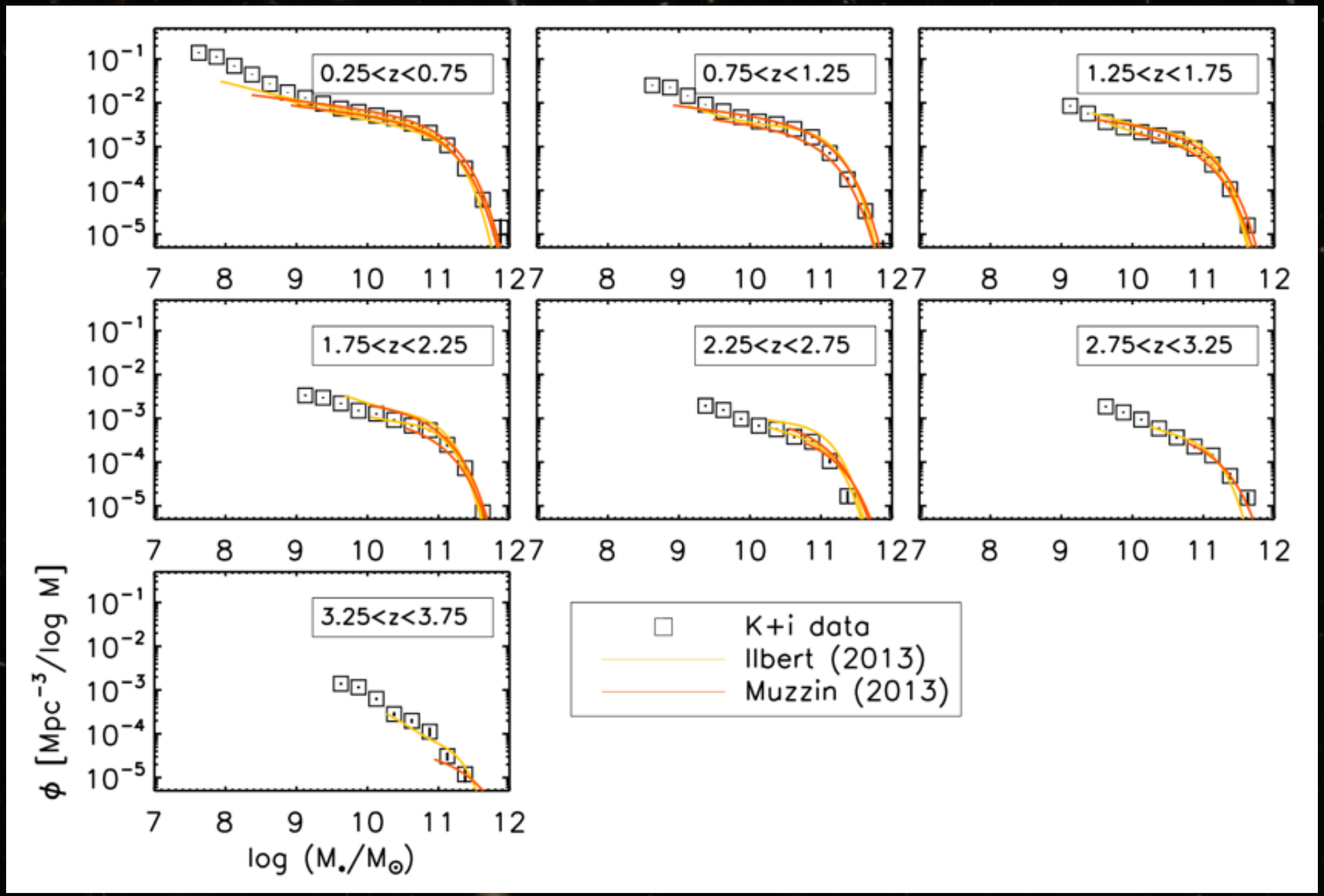


CFHT/MegaCam
Subaru/Suprime-Cam
HST/ACS
DR1
DR2

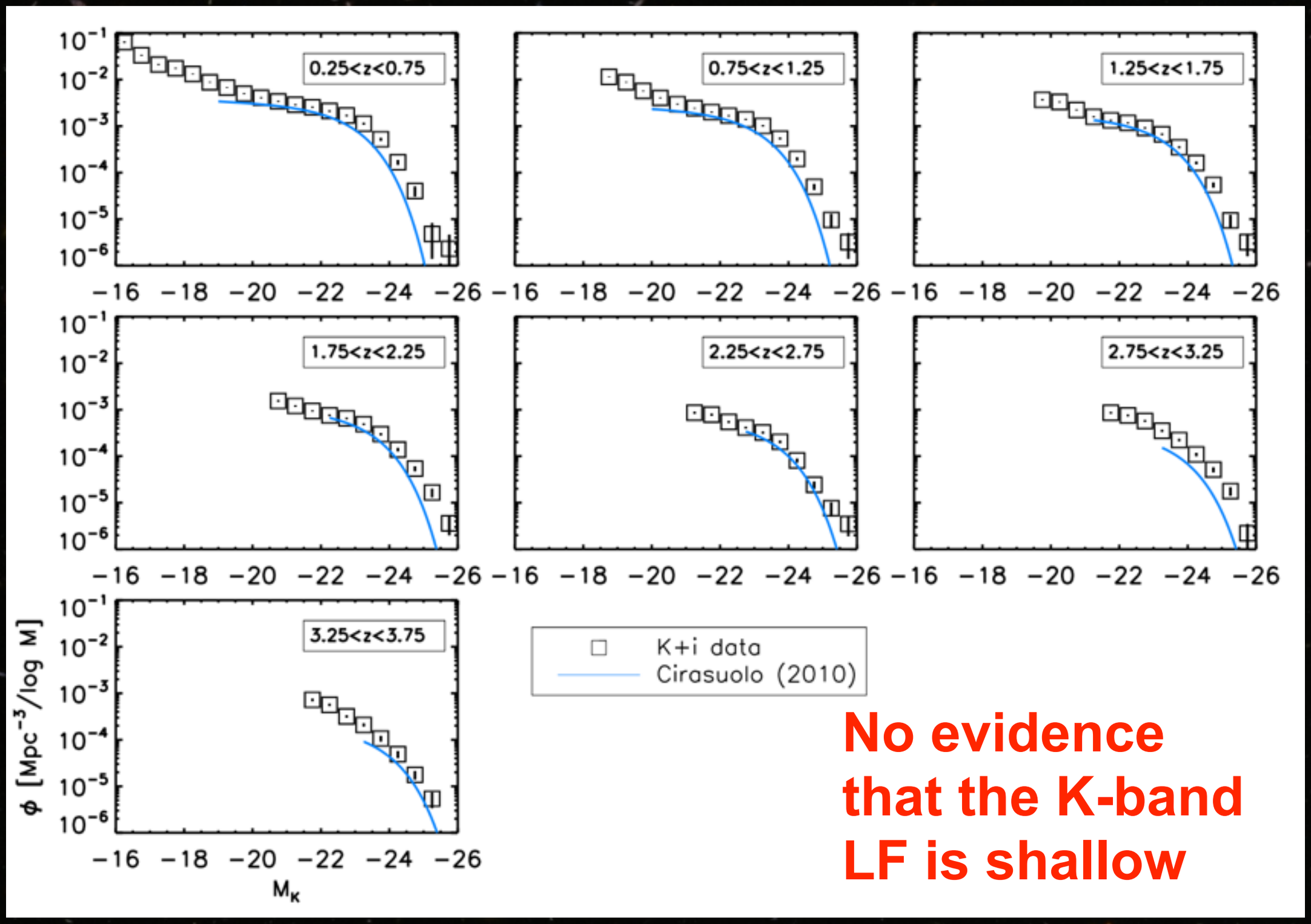
Bowler et al. 2014

- Deep strips
  - Area ~0.4 deg^2
  - K(AB)=24.5 (5σ 2”)
- Interstrip gaps
  - Area ~0.4 deg^2
  - K(AB)=23.5 (5σ 2”)
- Deep 3.6 and 4.5μm
  - SPLASH (Capak)
  - SEDS (Ashby 2013)

The K+i-band selected MF in UVISTA

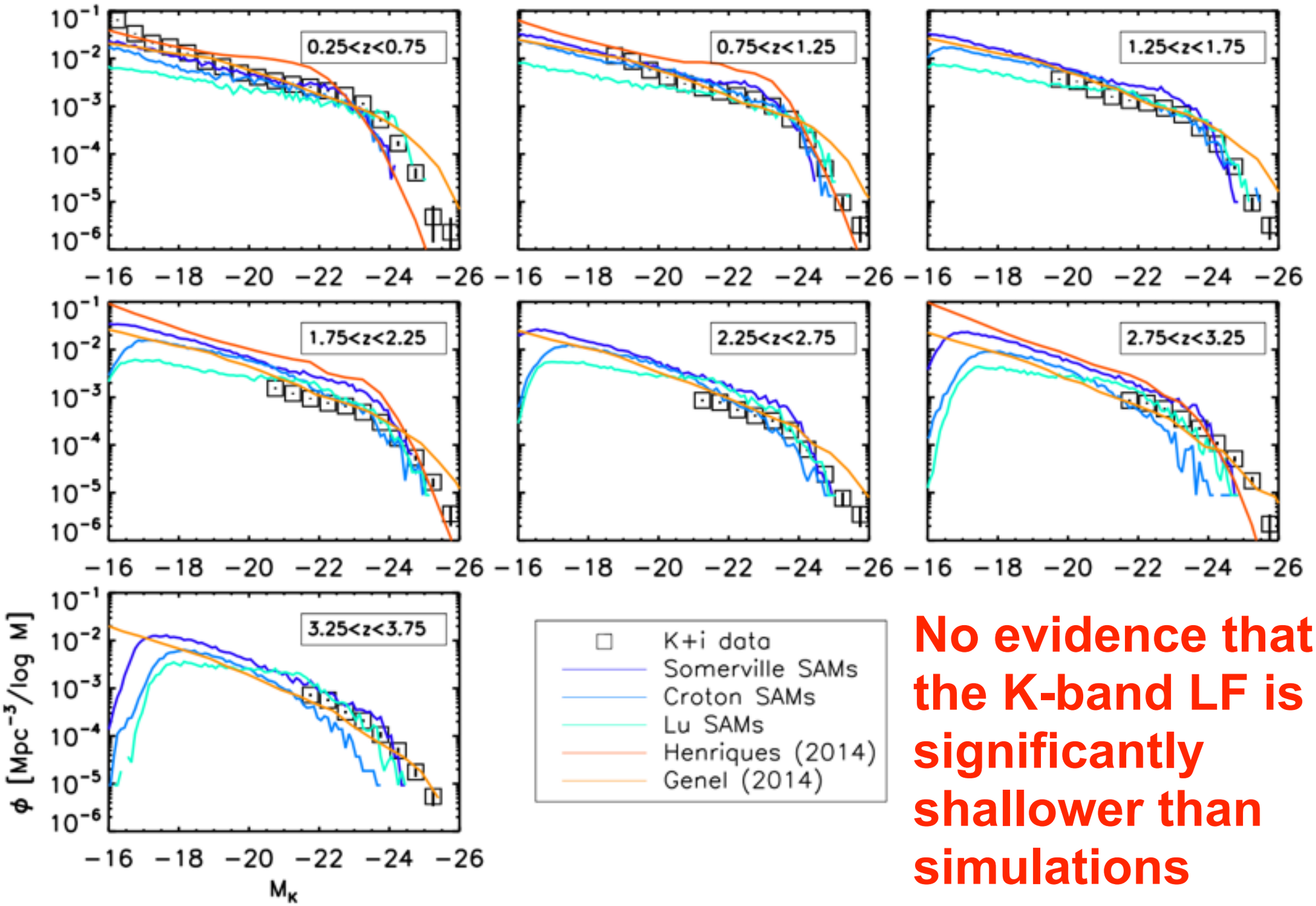


The K+i-band selected LF in UVISTA



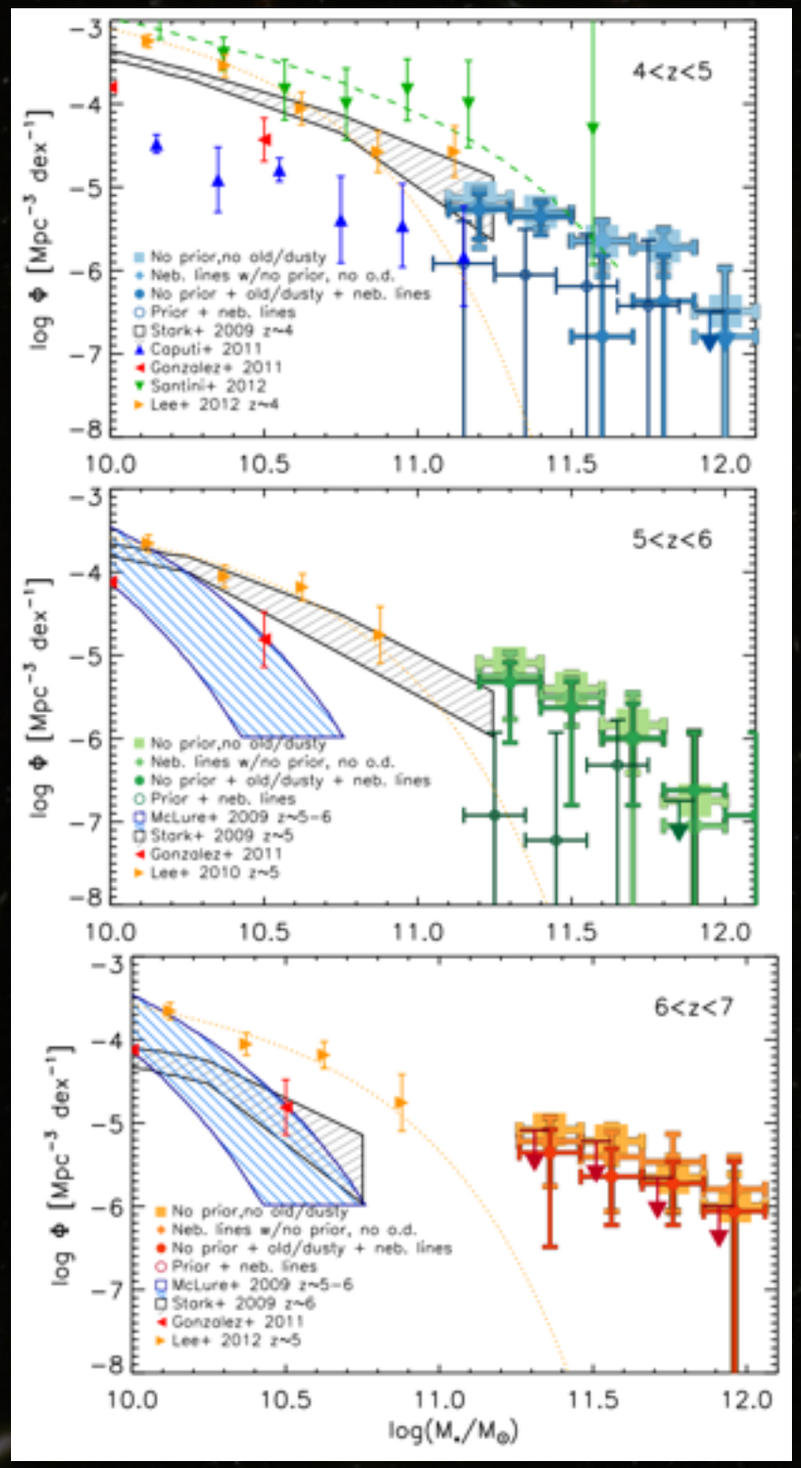
No evidence that the K-band LF is shallow

The K+i-band selected LF in UVISTA
Comparison to simulations



No evidence that the K-band LF is significantly shallower than simulations

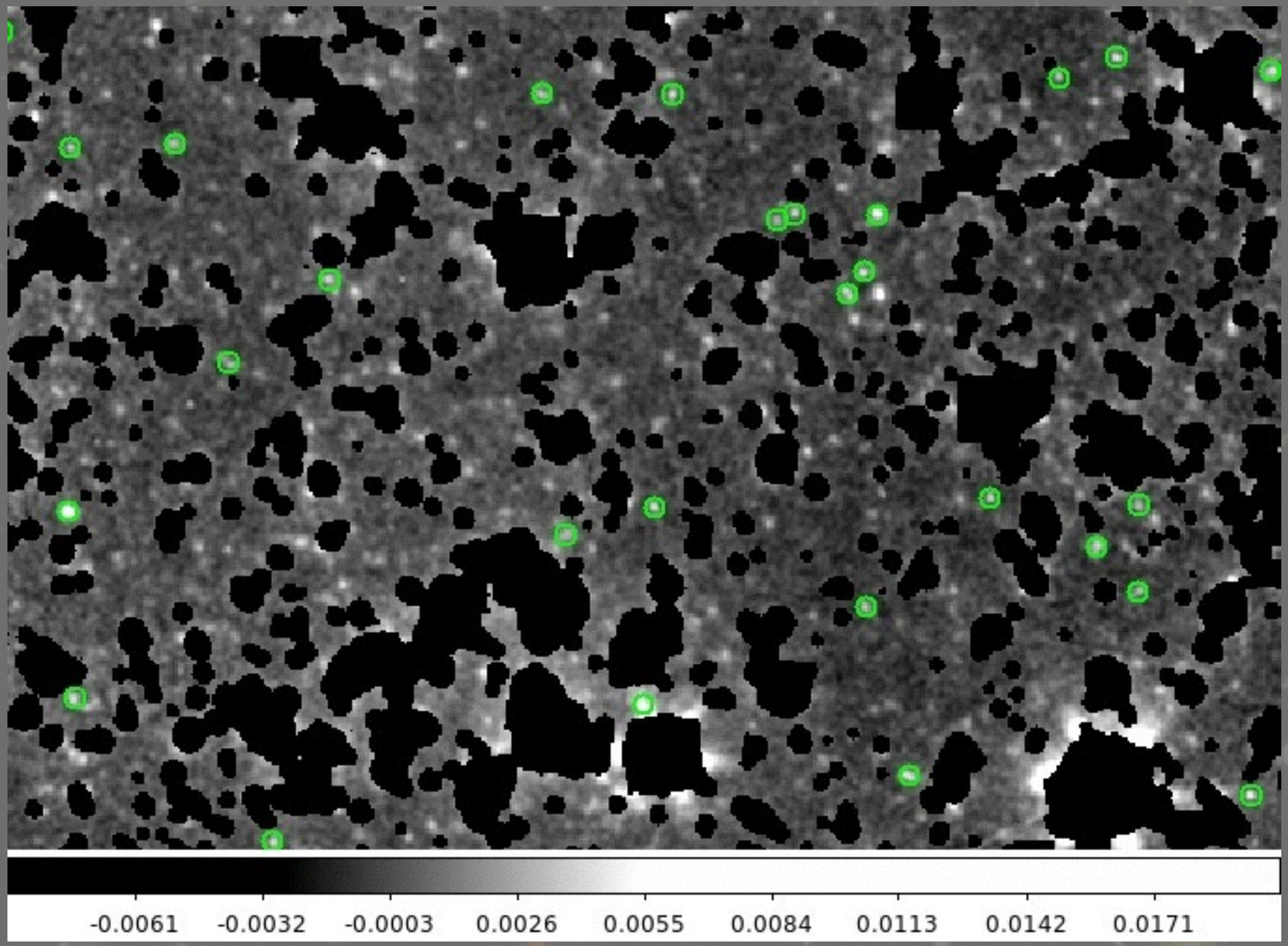
The IRAC selected MF in UVISTA
Motivation



Various studies uncovering samples of massive galaxies at high-z detected at wavelengths redder than K.

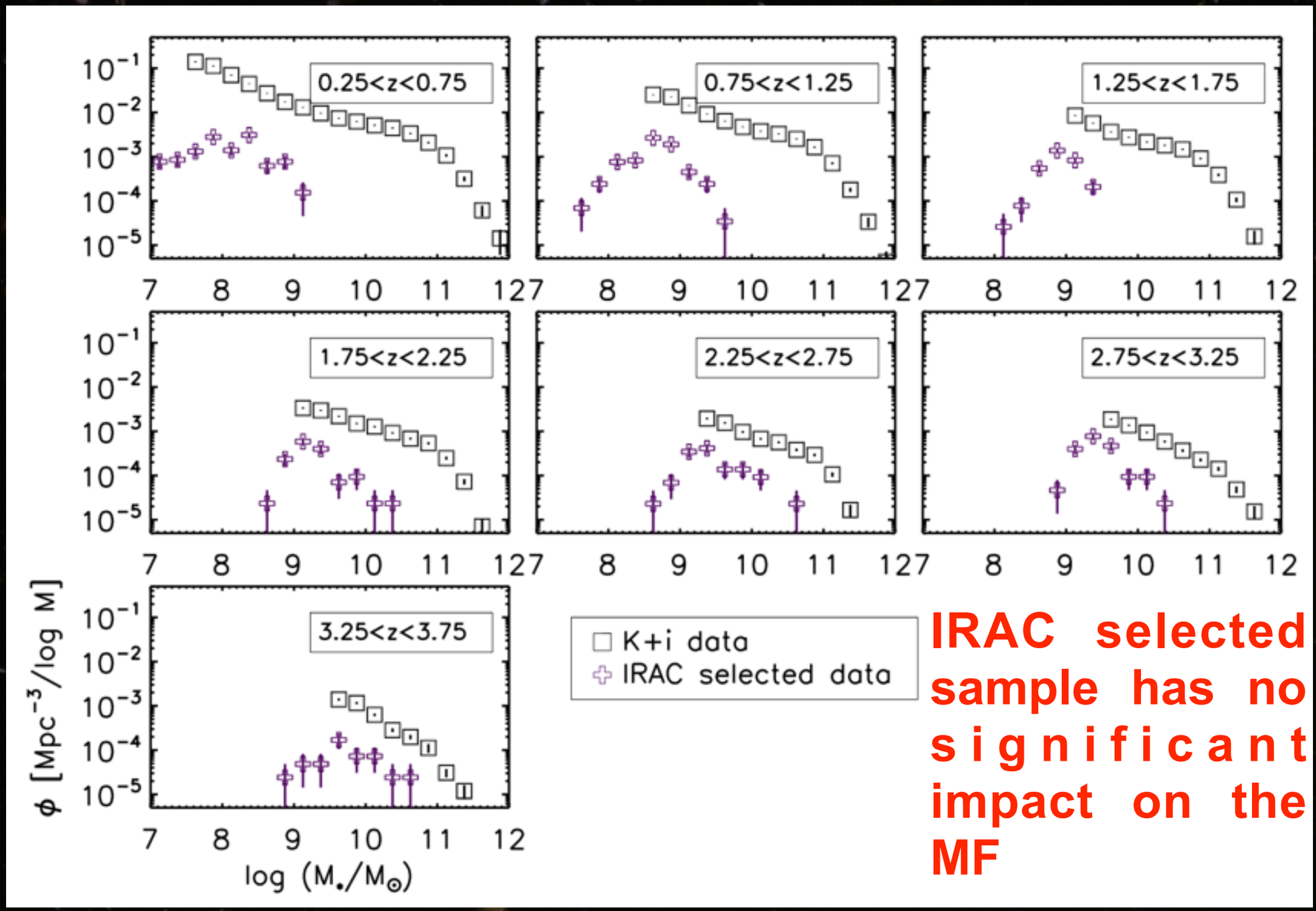
e.g. Caputi (2011)
Caputi (2012)
Stefanon (2014)

The IRAC selected MF in UVISTA



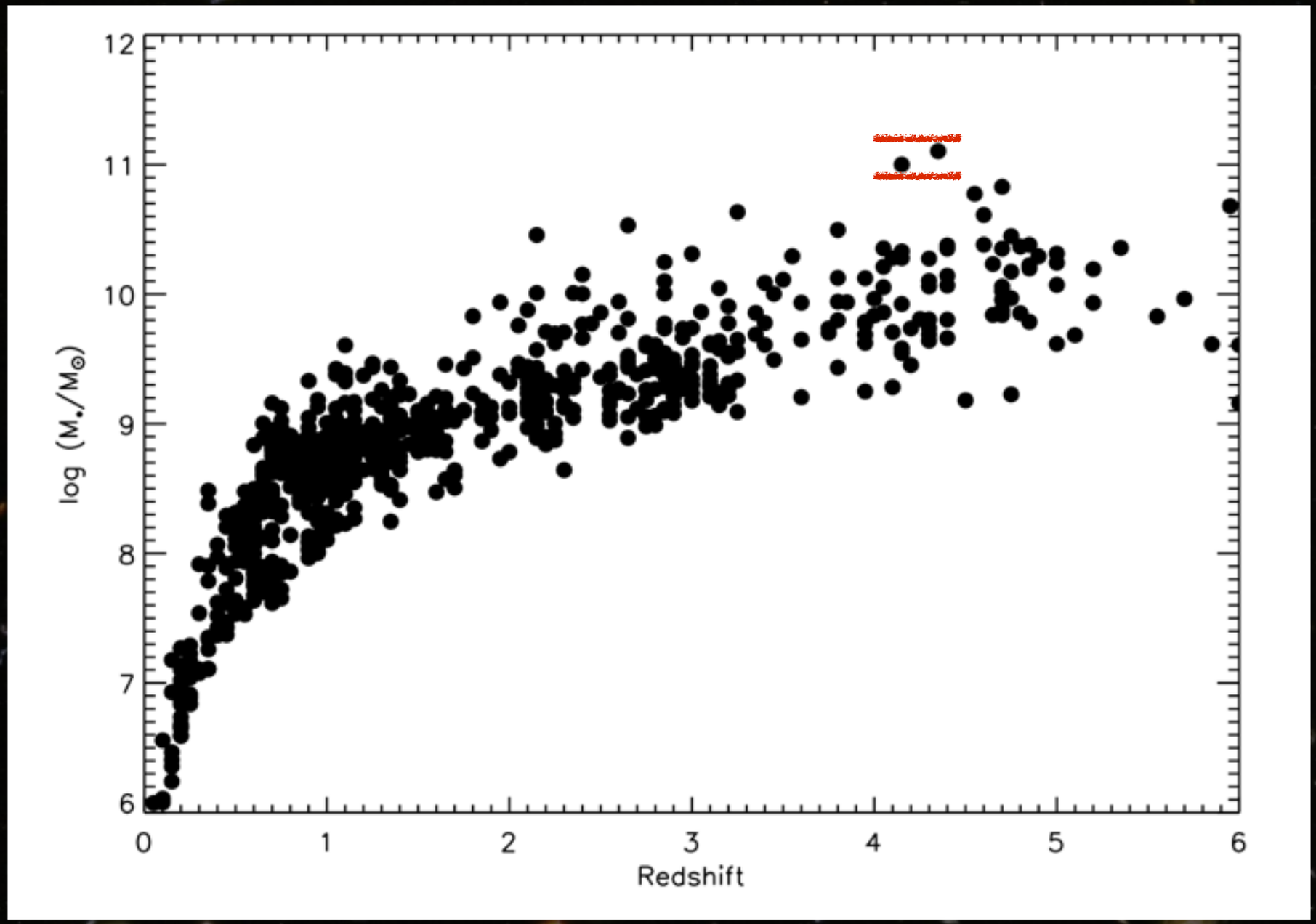
IRAC 3.6μm (SEDS; Ashby 2013), TPHOT Merlin et al. (in prep.)

The IRAC selected MF in UVISTA



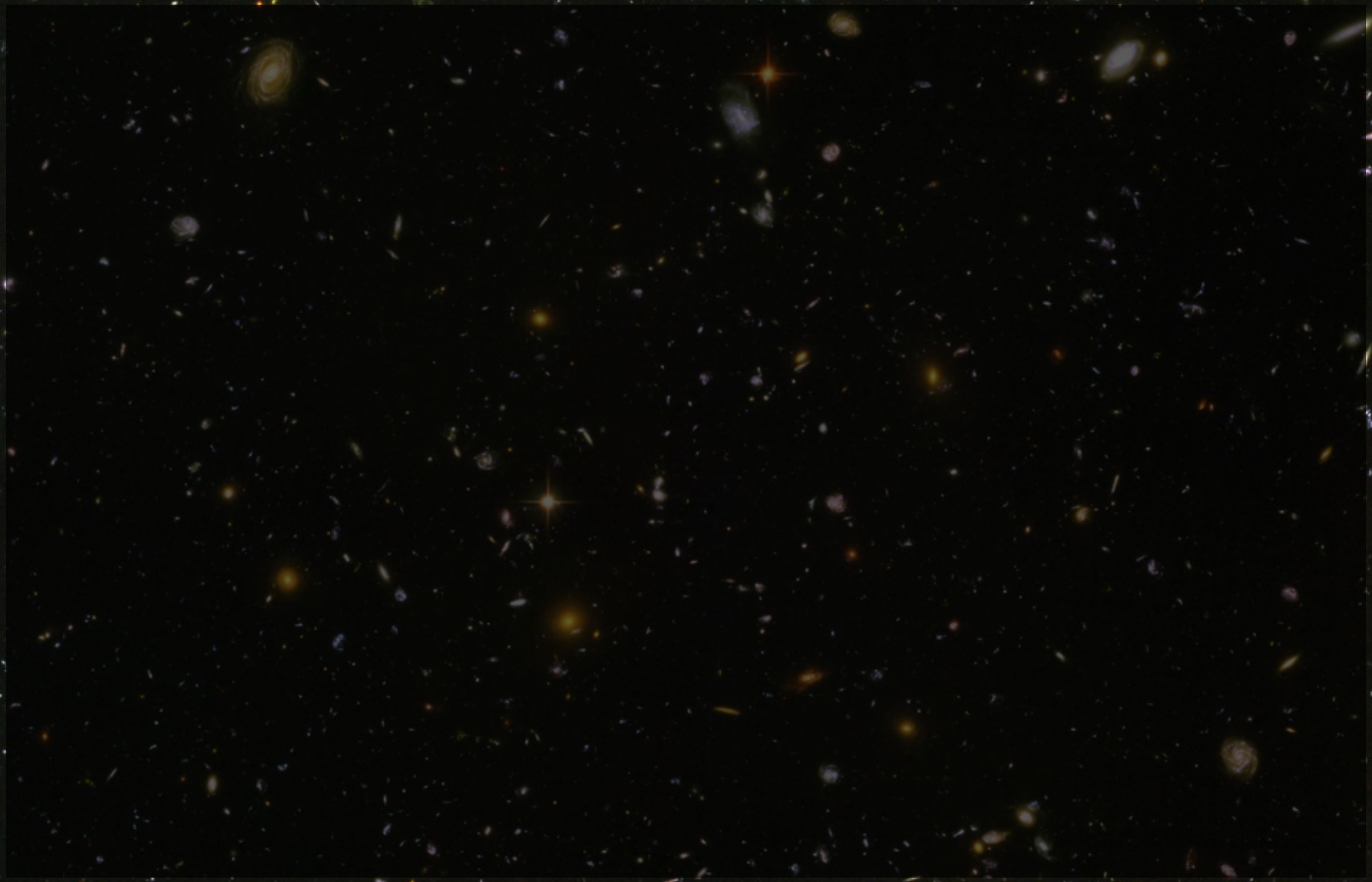
IRAC selected sample has no significant impact on the MF

…maybe some massive objects at higher redshift?



Summary

- A combination of K+i band selected samples allows us to push further down the MF and LF using the DR2 UltraVISTA data set.
- The K-band LF looks steeper than previously thought.
- No evidence for the K-band LF being shallower than simulations predict.
- Our IRAC selected sample does not contribute strongly to the MF/LF at $z<3$.



The K+i-band selected MF in UVISTA