The assembly of stellar mass during the last 10 Gyr: VVDS results

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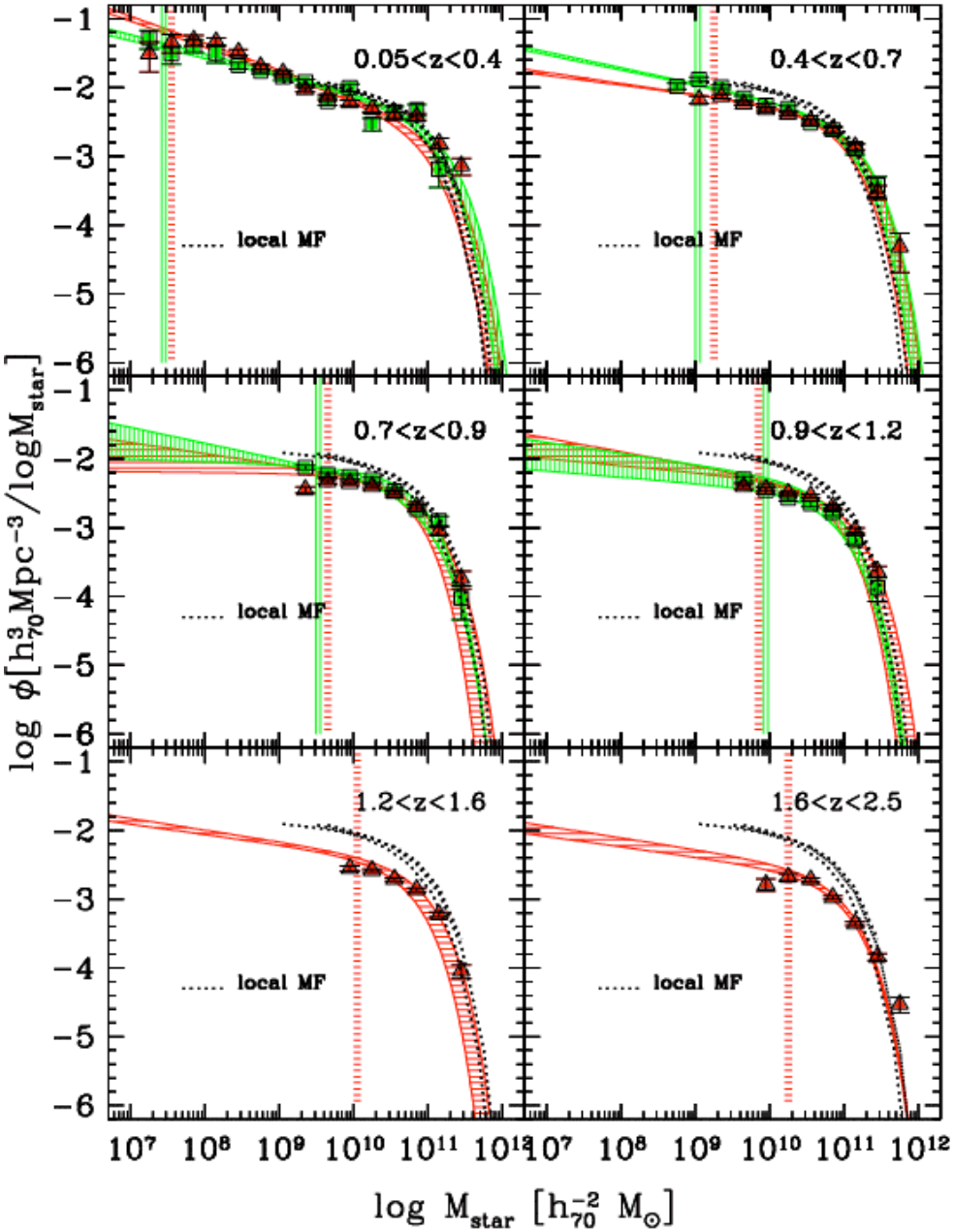
1 topic, 4 approaches, concordant results

UBVRI+JK+u*g'r'i'z'
Stellar Mass via SED fitting

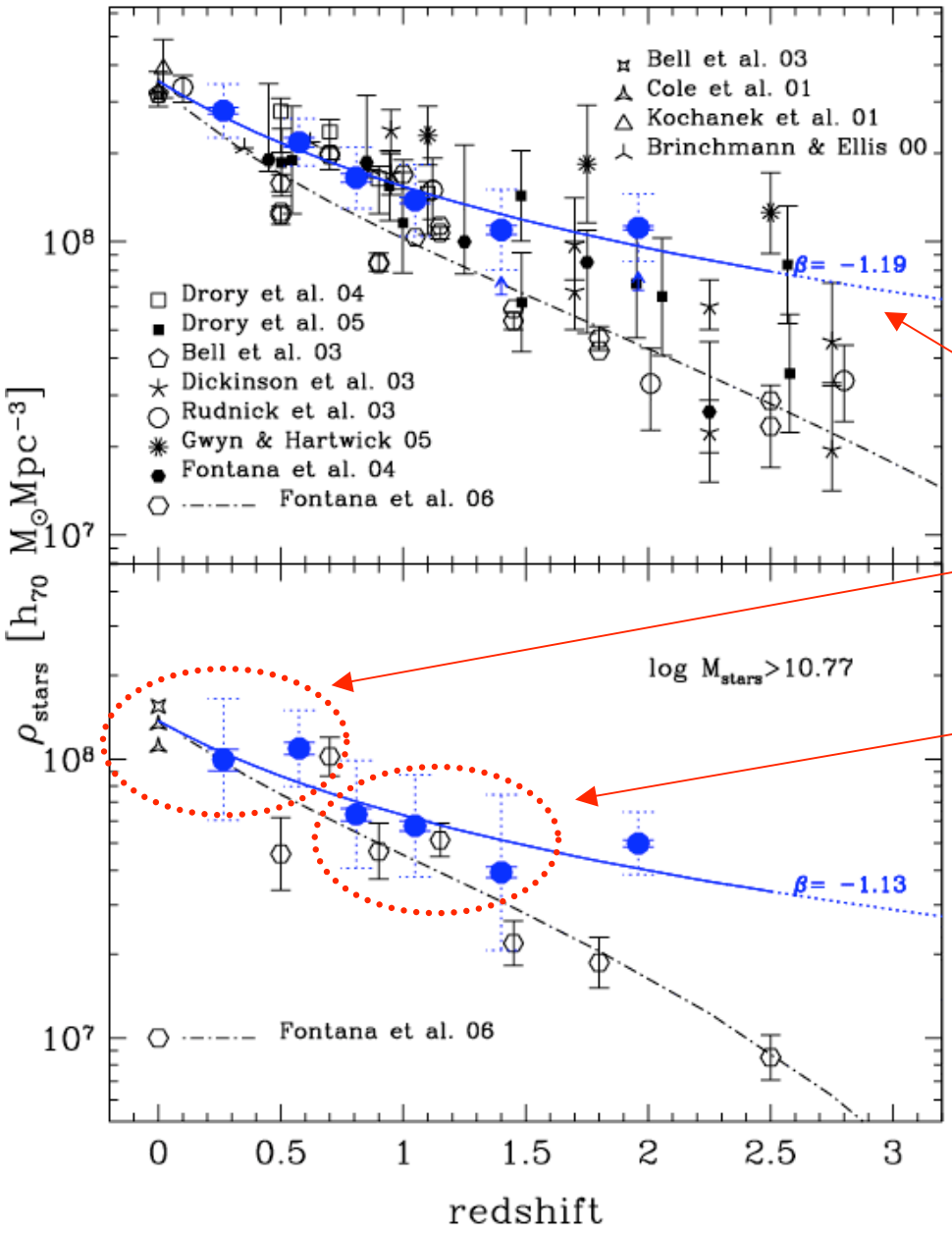
Pozzetti et al. arXiv:0704.1600	Pozzetti et al. arXiv:0704.1600	Arnouts et al. arXiv:0705.2438	Vergani et al. arXiv:0705.3018
I-selected sample	**K-selected sample**	**SWIRE selected sample**	**Spectroscopic sample**
$17.5<I_{AB}<24$	$K_{AB}<22.34$ + $K_{AB}<22.84$	F(3.6μ) ≥ 9μJy	$17.5<I_{AB}<24$
~1750 arcmin2	~600 (440+170)	~3000 arcmin2	~1750 arcmin2
Galaxies ~6400	galaxies~10200	galaxies~21000	galaxies~4300
Spectro-z	photo-z	photo-z	Spectro-z
0<z<=1.2	0<z<2.5	0<z<2	0.5<=z<=1.3
Low mass tail	High mass tail	Early and late type galaxies classification (via SED fitting)	Spectroscopic classification into active and passive galaxies

I and K sel. Samples: Mass function



- compatible results from the two samples in the common z range
- Mild evolution up to z<0.9
- Stronger evolution at z>0.9 in particular for intermediate mass galaxies
- MF remain relatively flat up to z=2.5
- Massive tail is present up to z~2. (population of red gal. M_I-M_K~0.8)

Pozzetti et al. arXiv:0704.1600



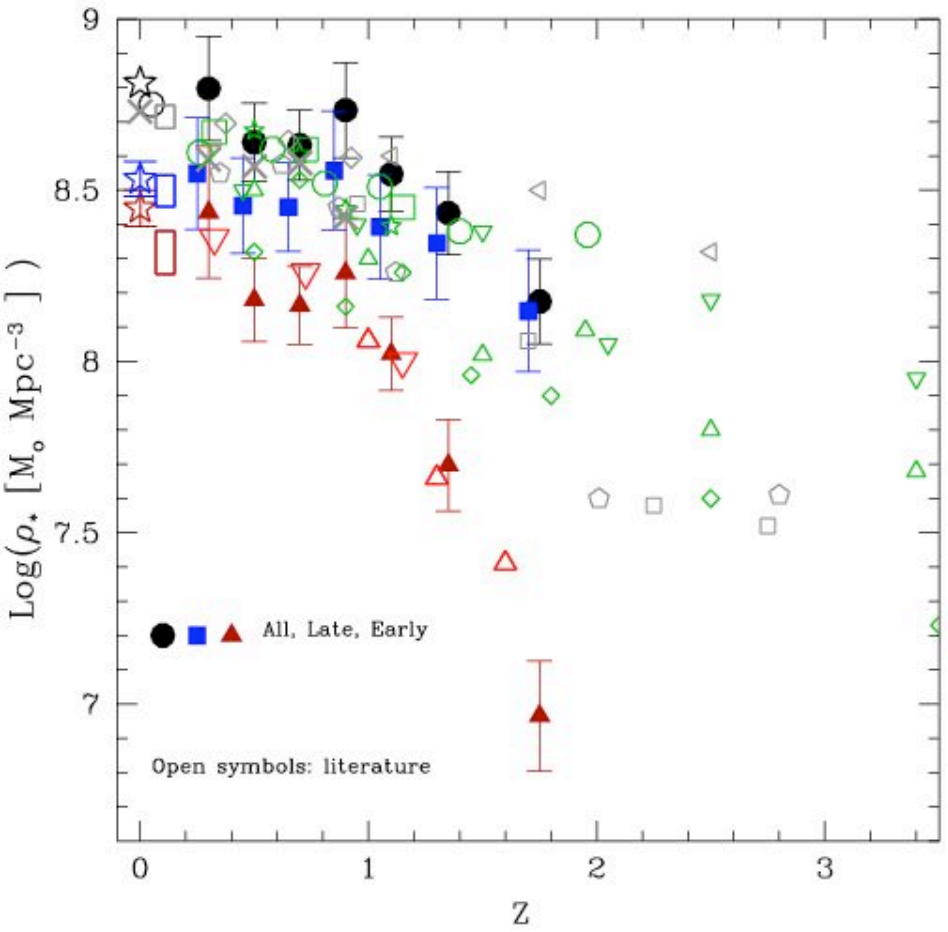
I and *K* sel. *Samples*: Mass density

- **Mild** evolution of the **global** sample
- **Negligible** evolution for **massive** galaxies up to z~0.7
- **Evolutionary** trend for **massive** galaxies up to z~1.5

Most massive galaxies seem in place up to z=1, formed stars at z>1, less massive have assembled mass later

Pozzetti et al. arXiv:0704.1600

SWIRE sel. Sample: Mass density per type



Arnouts et al. arXiv:0705.2438

Above z~1

late galaxies: **Mild** increase in mass density

early galaxies: **Strong** increase

Many galaxies ending their star formation activity and moving from active to passive phase

Below z~1

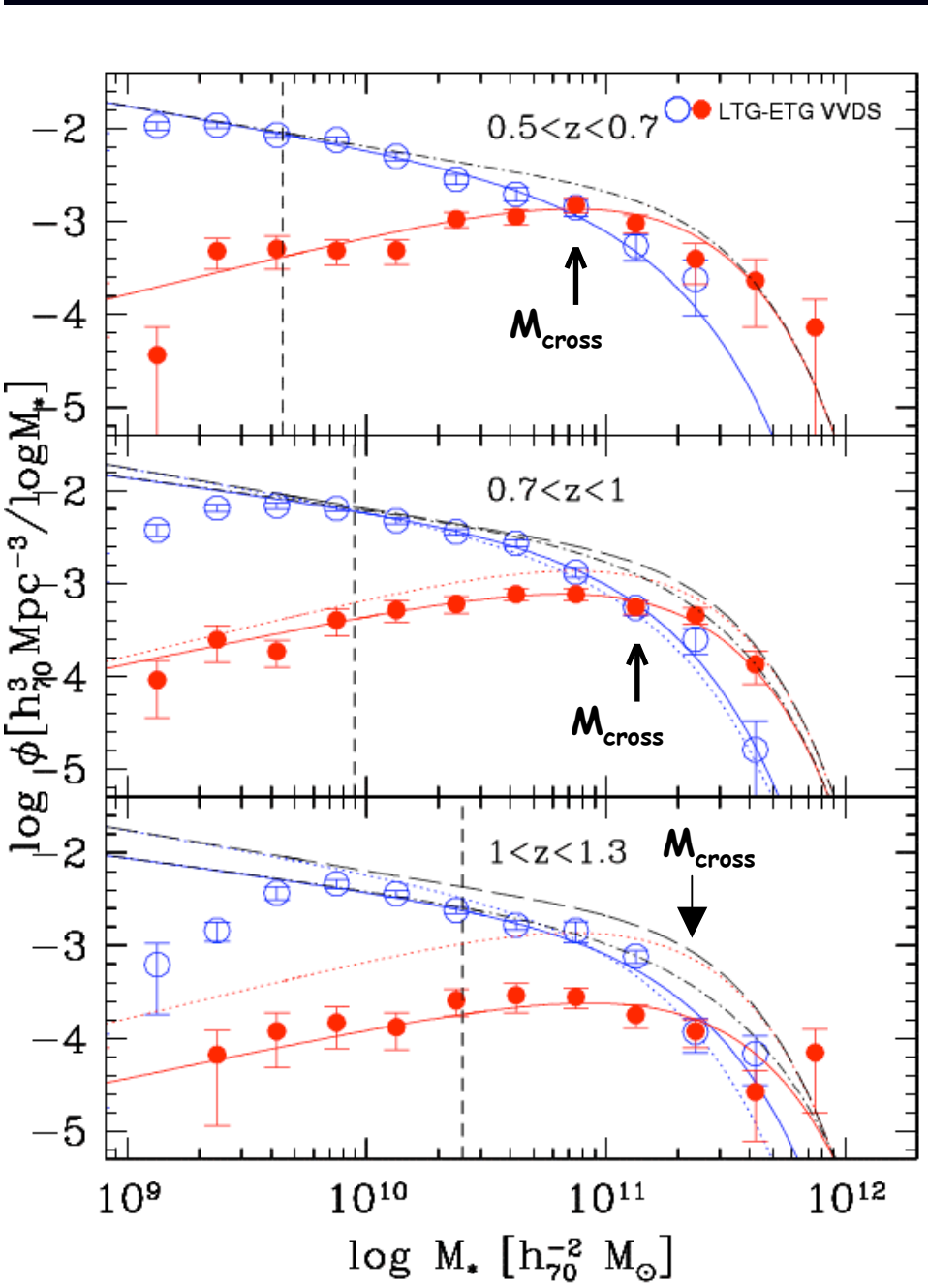
Globally, mild decline

Stellar mass density of **late** population consistent with **no evolution**

Stellar mass density of **early** population **increases** by a factor of 2

Galaxies move from active to passive state via quenching

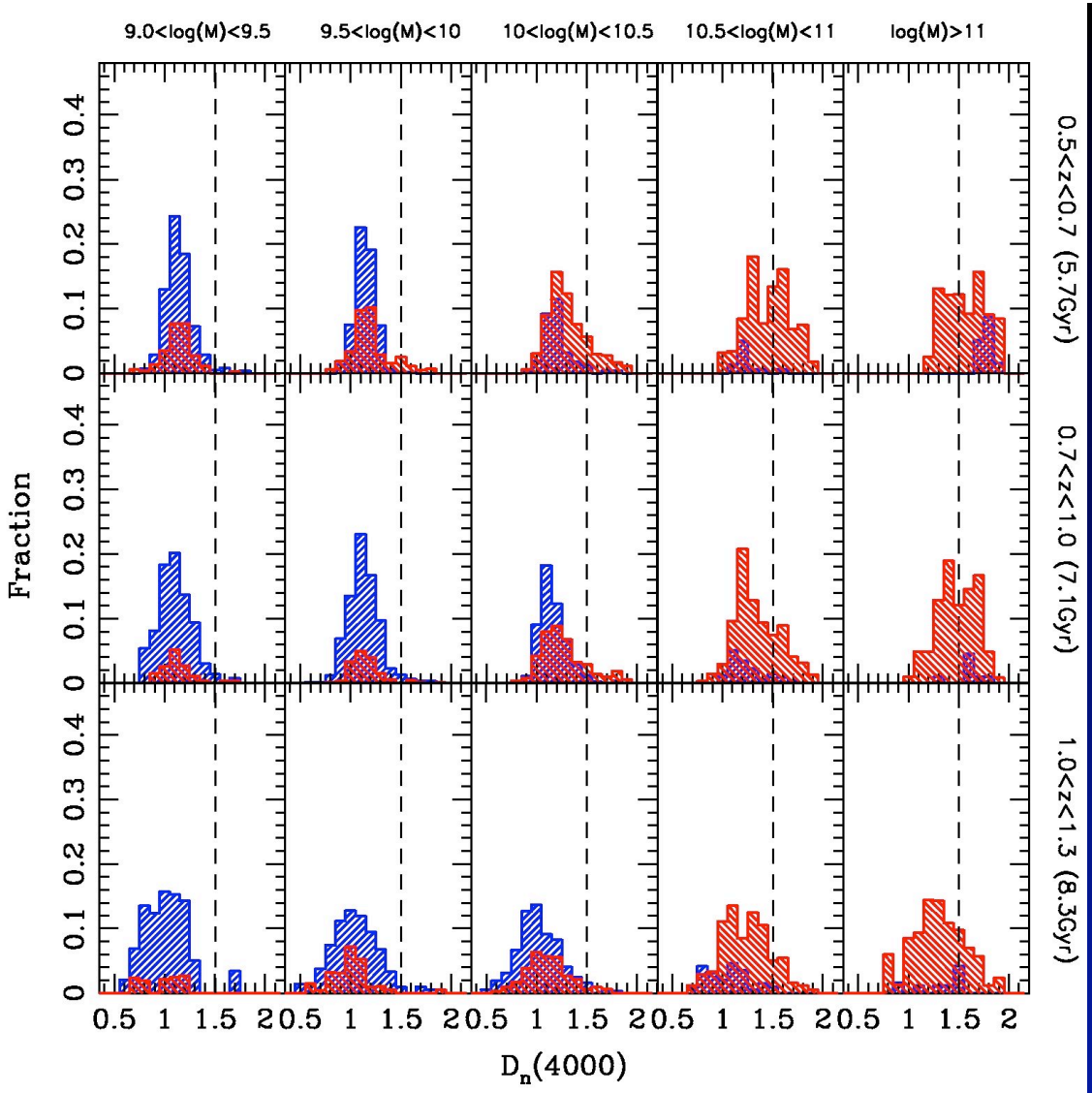
Spectroscopic sample: Mass function



- No global evolution below z~1
- ACTIVE gal. dominate at low-masses
- Small increase of intermediate-mass PASSIVE gal. with cosmic time. Massive tail present up to z=1.3
- M_{cross} evolves with redshift

Transformation with cosmic time from active to passive galaxies

Vergani et al. arXiv:0705.3018



Spectroscopic sample: mass assembly

can progenitors justify assembled mass without dry mergers?

Blue histogram: galaxies with SFR high enough to move to next mass bin in next z bin

Red histogram: galaxies with low SFR

The lower the mass, the more galaxies can efficiently assemble mass. At high mass, they stop (lack of fuel?)

Number of progenitors can account for 80% of galaxies, almost 100% for high mass galaxies

No big need for mergers below z~1

Vergani et al. arXiv:0705.3018

Summary

Mass and type dependence evolution of the mass density

Most massive galaxies seem in place up to z=1, formed stars at z>1

Many galaxies ending their star formation activity and moving from active to passive phase

Less massive galaxies have assembled mass later

Below z~1. : Galaxies move from active to passive state via quenching

Star formation activity moves from high to low mass galaxies

Number of progenitors can account for 80% of galaxies, almost 100% for high mass galaxies, no big need for mergers below z~1