VVDS: PHOTOMETRIC MASS & MASS FUNCTION + NIR-LF

In progress …

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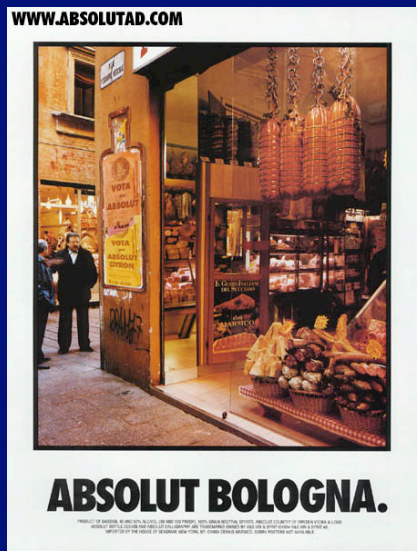
ABSOLUT BEGINNING.



PHOTOMETRIC STELLAR MASS

- **Estimate of the stellar Mass content from multi-band photometry**

Assuming a star formation history: $SFR(t) = \frac{M_{gal}}{\tau}\ e^{-(t/\tau)}$

Given a z_{spec} ➔ best fit
to model parameters (age, SFR, dust, Z ,.....)

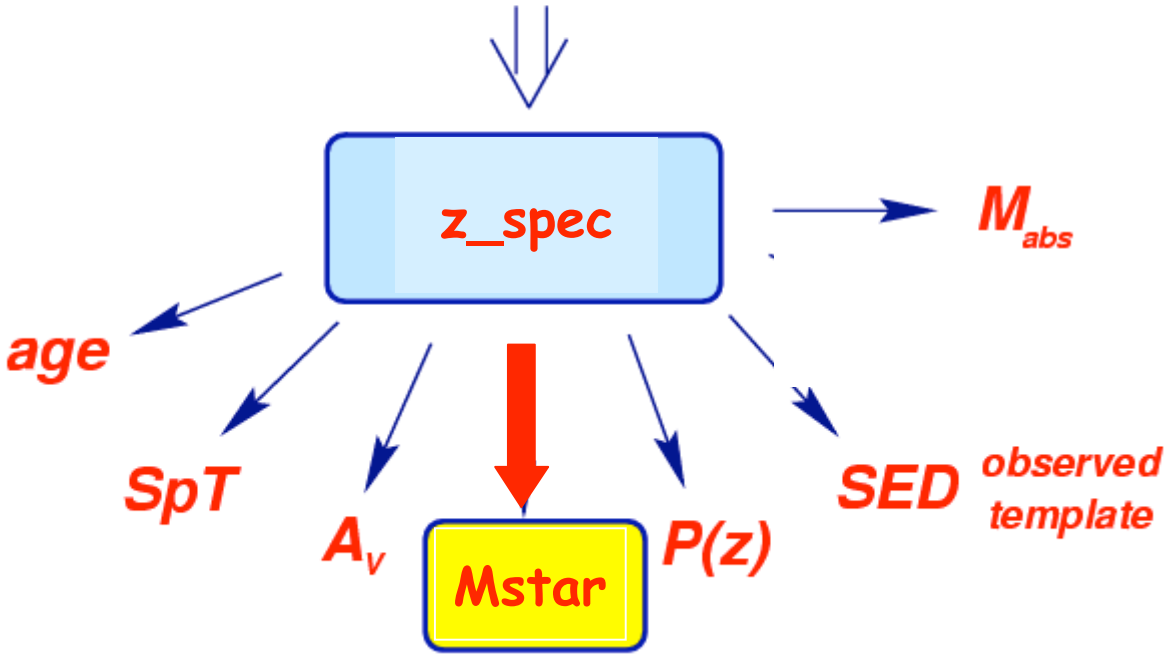
➔ Mass of galaxies: $Mass - processed(t) = \int SFR(t) * dt$

➔ Mass in stars: $Mass - star(t) = \int SFR(t) * dt * (1 - R(t))$

HyperZ

(Bolzonella, Miralles & Pello' '00)

$$\chi^2 = \sum_{filters} \left(\frac{F_{obs} - b\, F_{temp}(z)}{\sigma} \right)^2$$

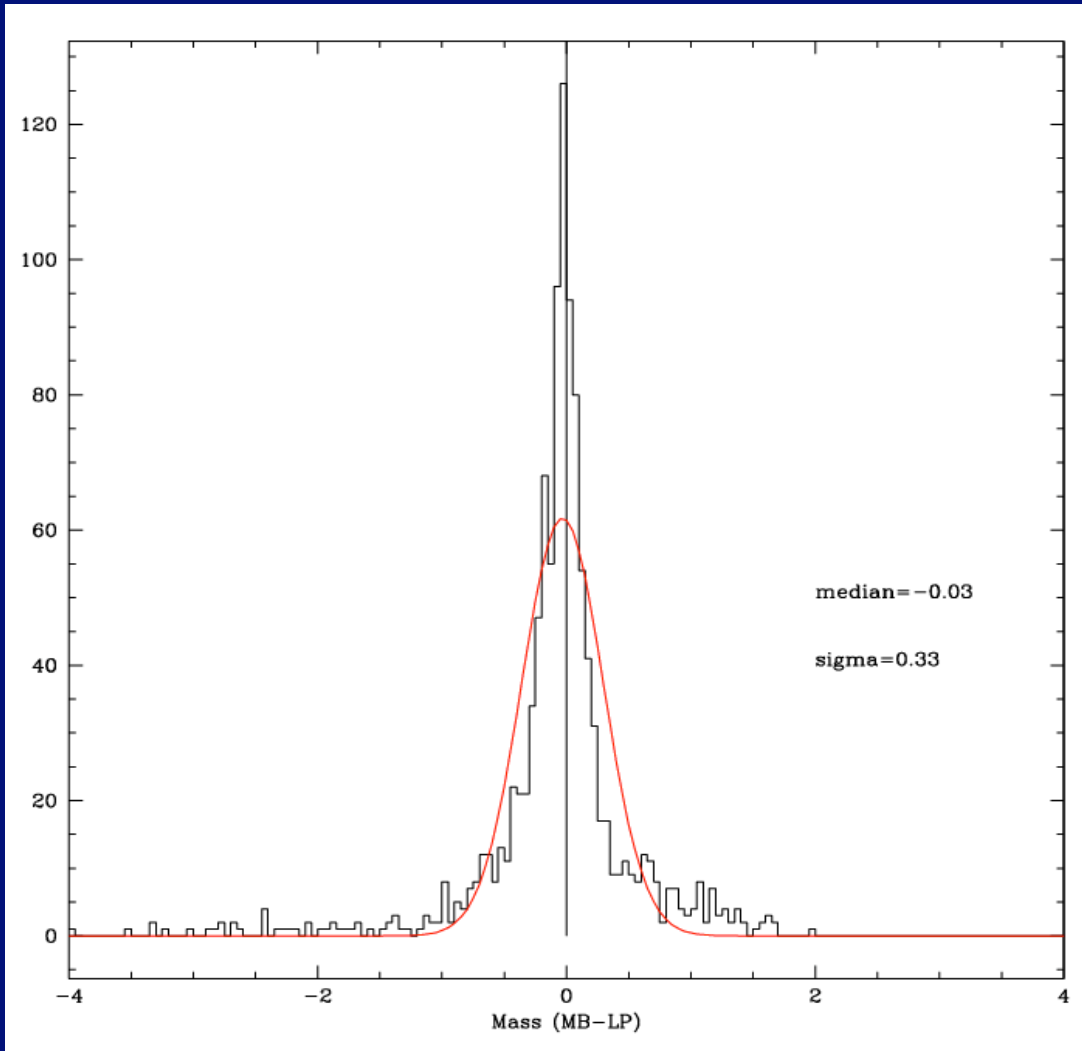


CODES

HyperZ-Mass & "Lucia-ZMass"

→ Similar results

→ Mstar within a factor 2 !



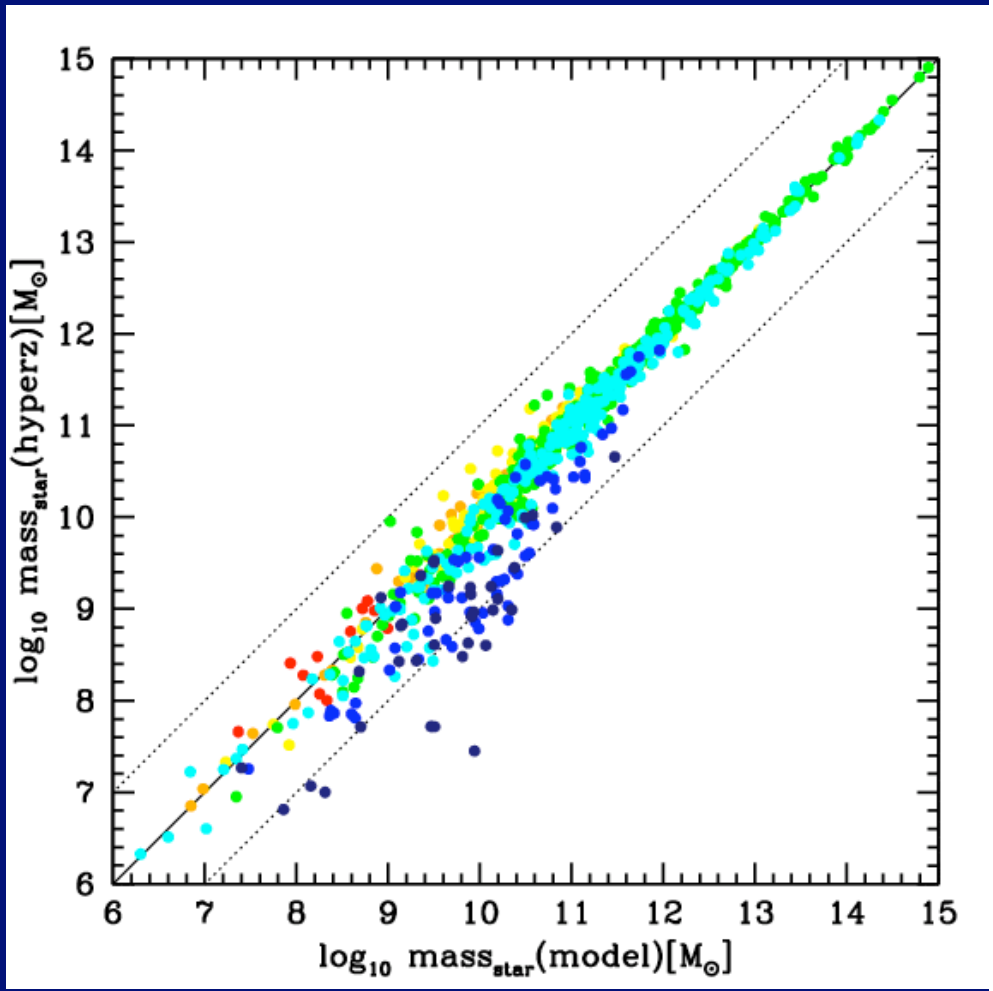
SIMULATIONS:

Hyper-Z using opt+NIR

Mass recovered

➔ *Within a factor 2*

➔ *BUT problems with age<0.1 Gyrs*



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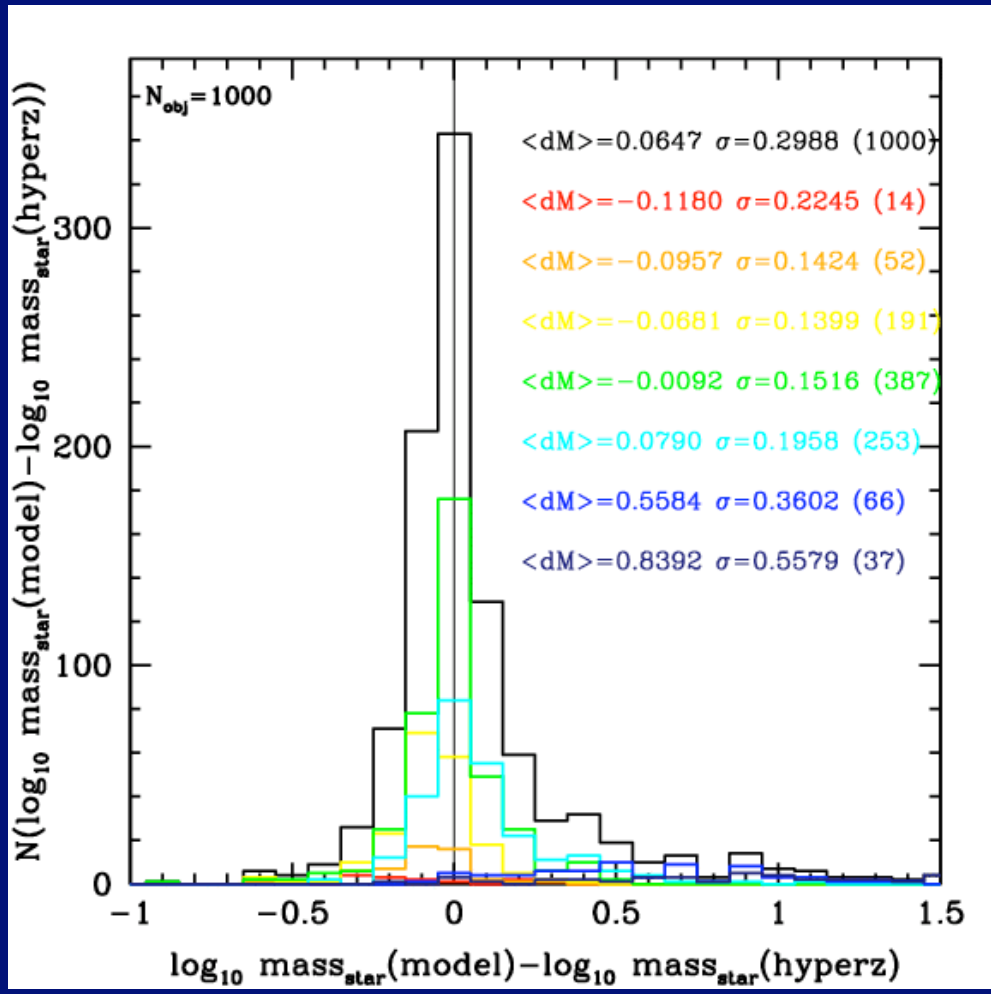


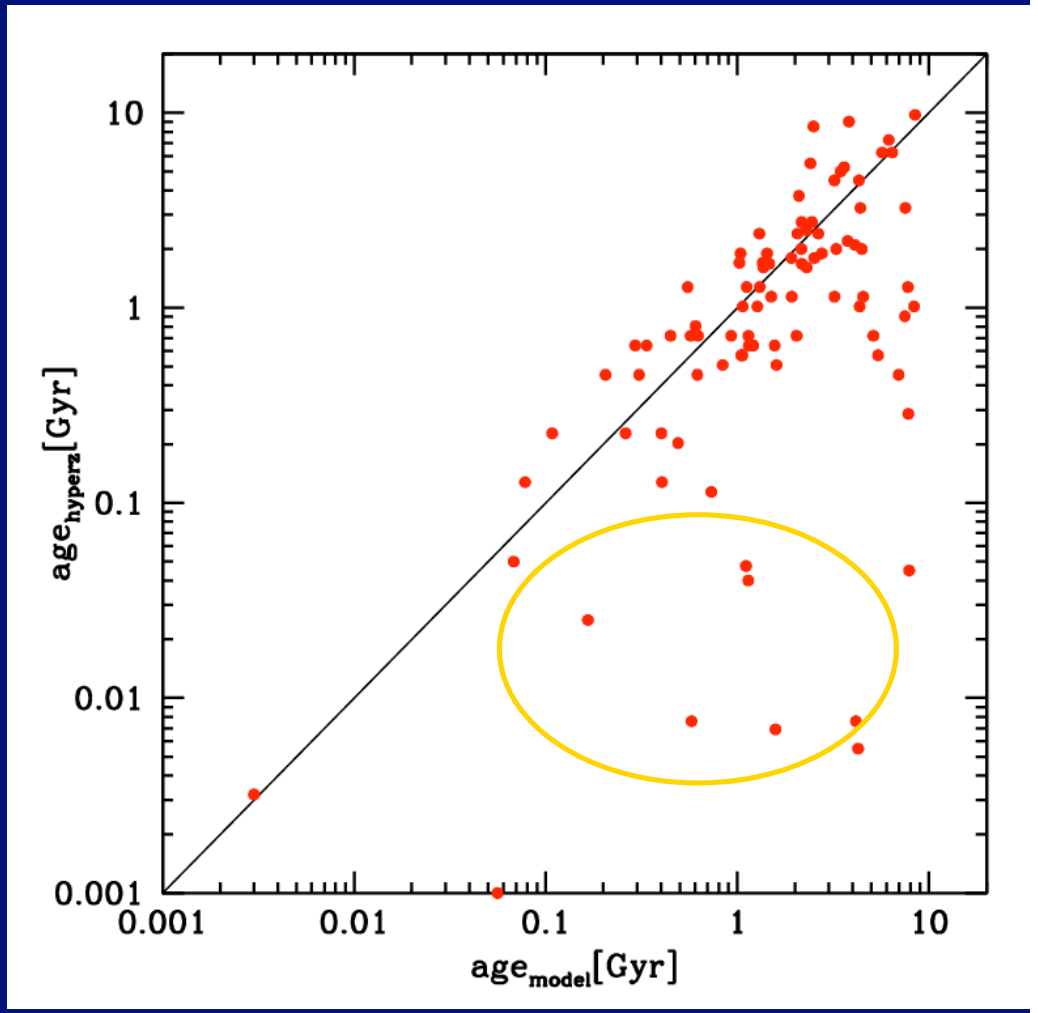
SIMULATIONS

Recovering age:

➔ *problems with age<0.1 Gyrs*

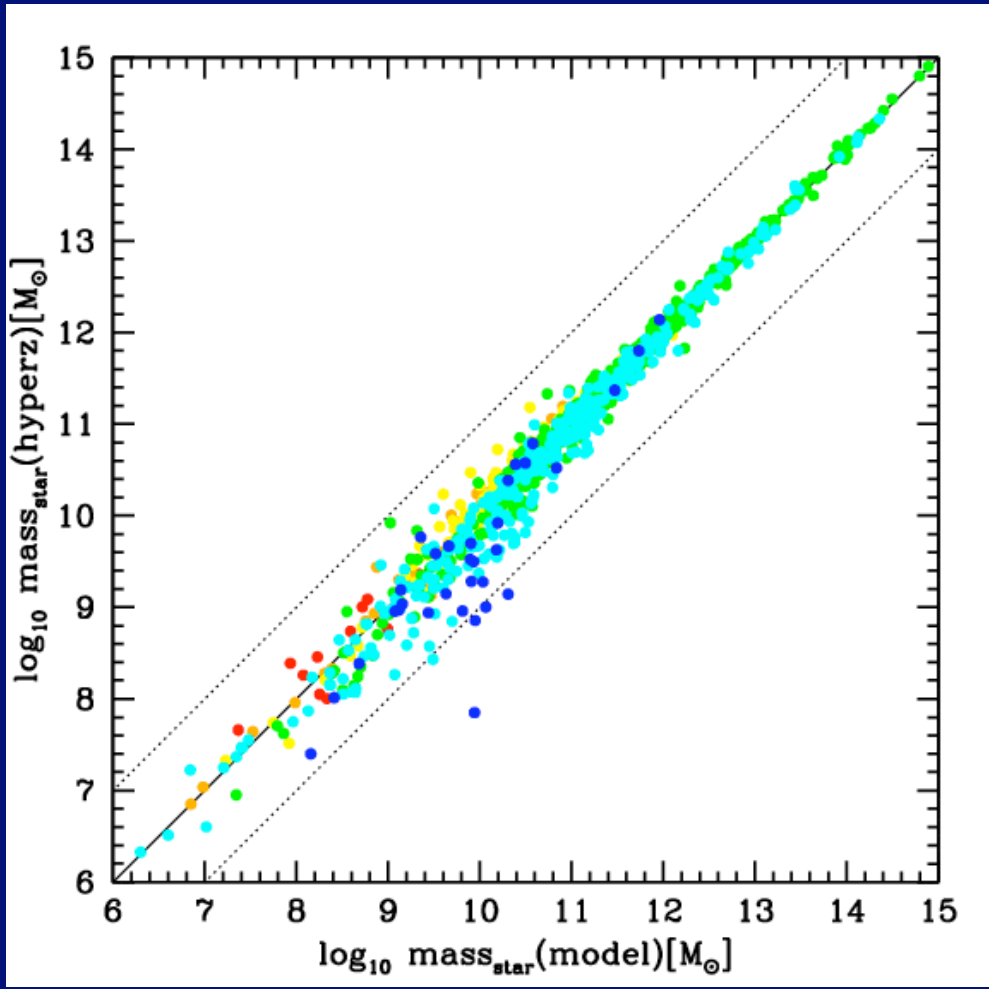
➔ *Underestimate masses*

➔ *Don't use models with age<0.1 Gyrs*



SIMULATIONS:
Hyper-Z using opt+NIR

Mass recovered without using age<0.1 Gyrs

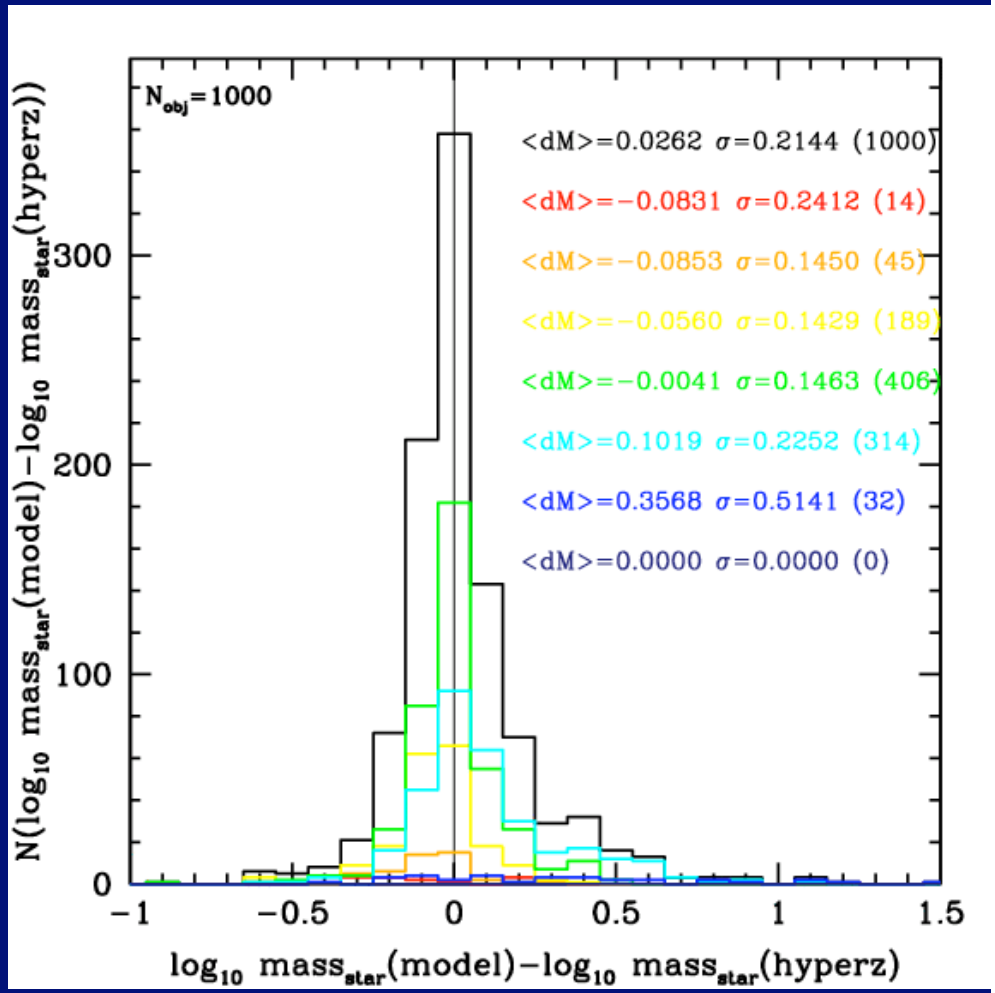


SIMULATIONS:

Hyper-Z using opt+NIR

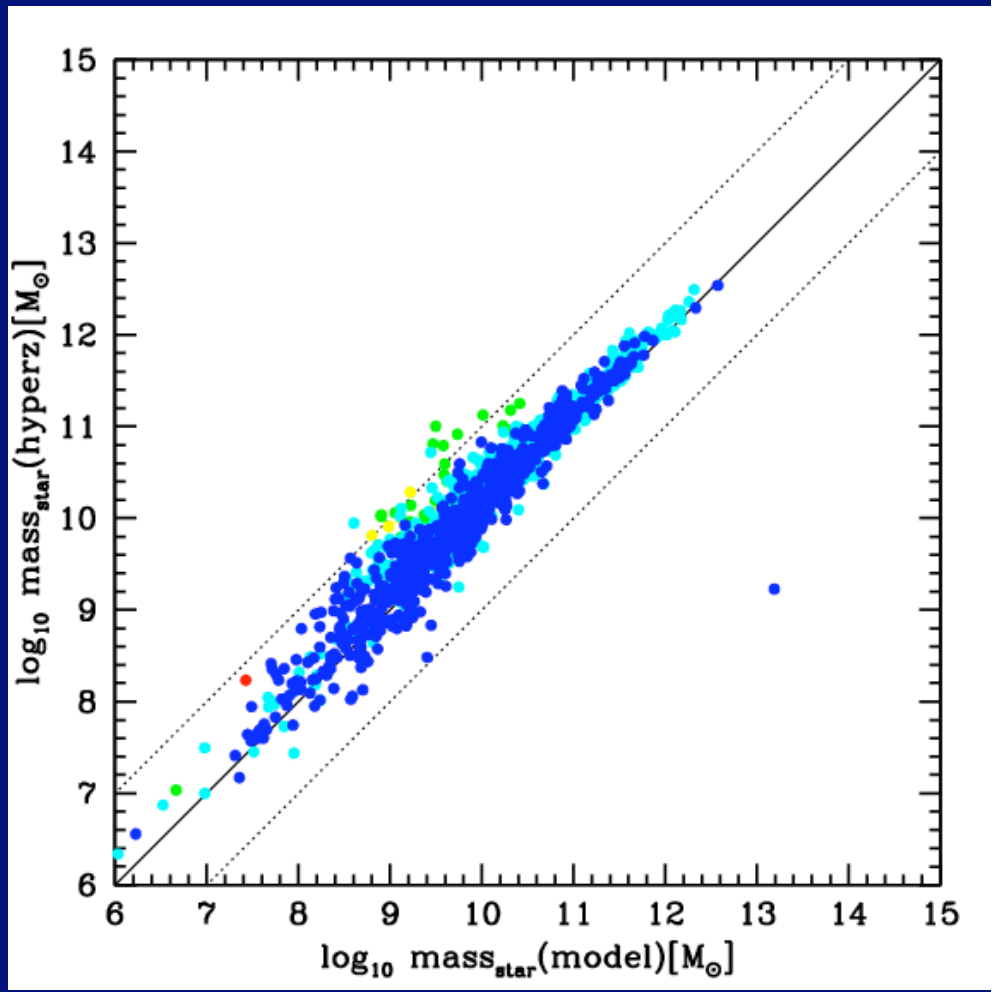
Mass recovered without using age<0.1 Gyrs

➔ *Better results*



SIMULATIONS:
Hyper-Z using opt+NIR

➔ *Able to well recover also models with age<0.1 Gyrs*

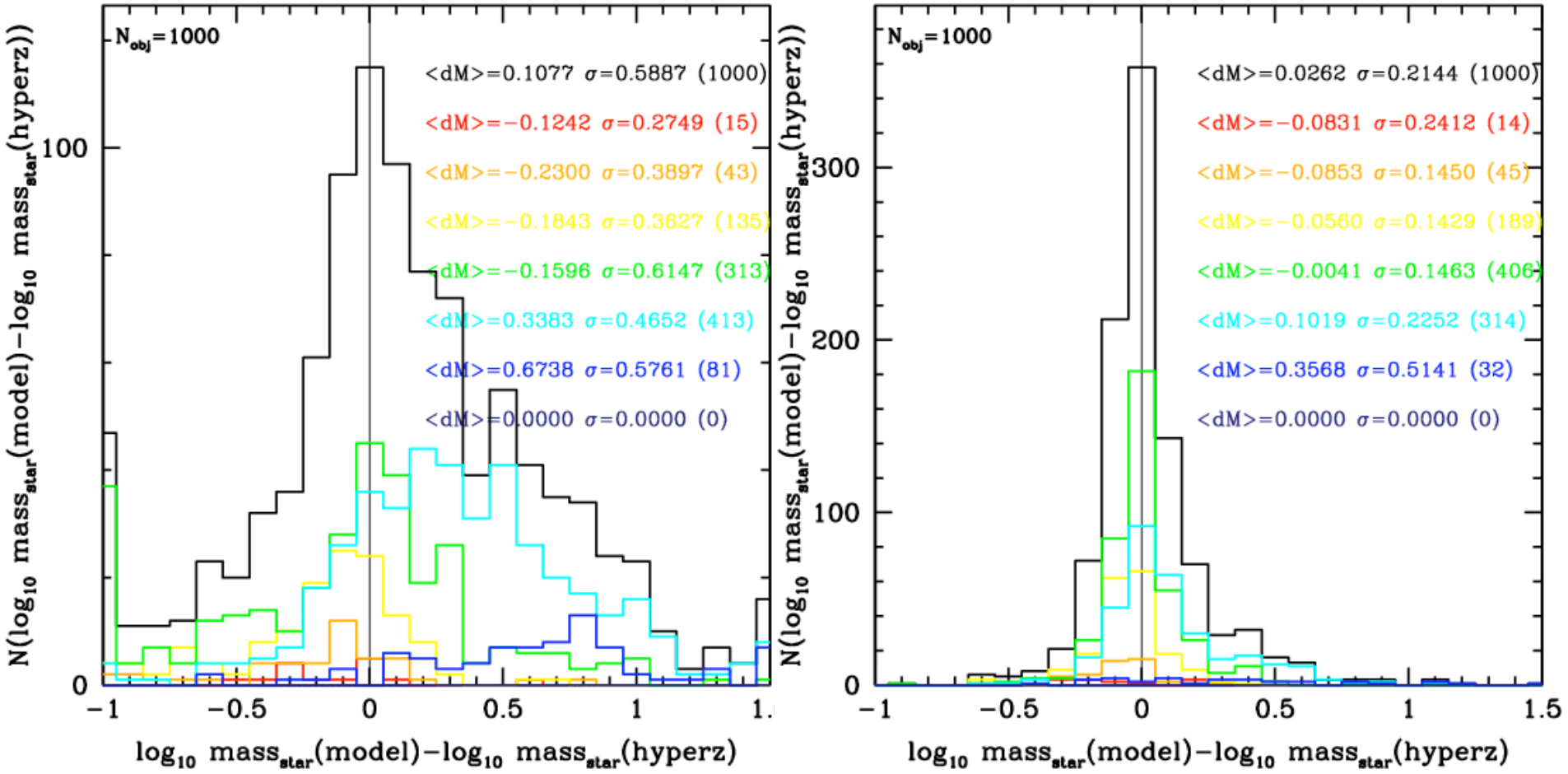


➔ *Other tests in progress …*

PHOTOMETRY

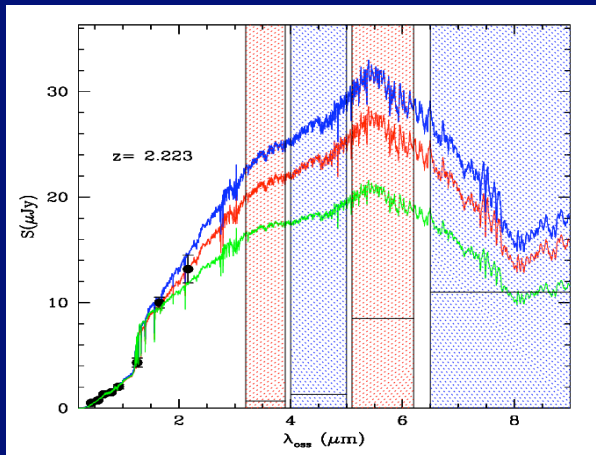
Only optical (B,V,R,I) photometric bands

Optical (U_L,U_{ESO},B,V,R,I)+ NIR (J,K) photometric bands



PHOTOMETRY

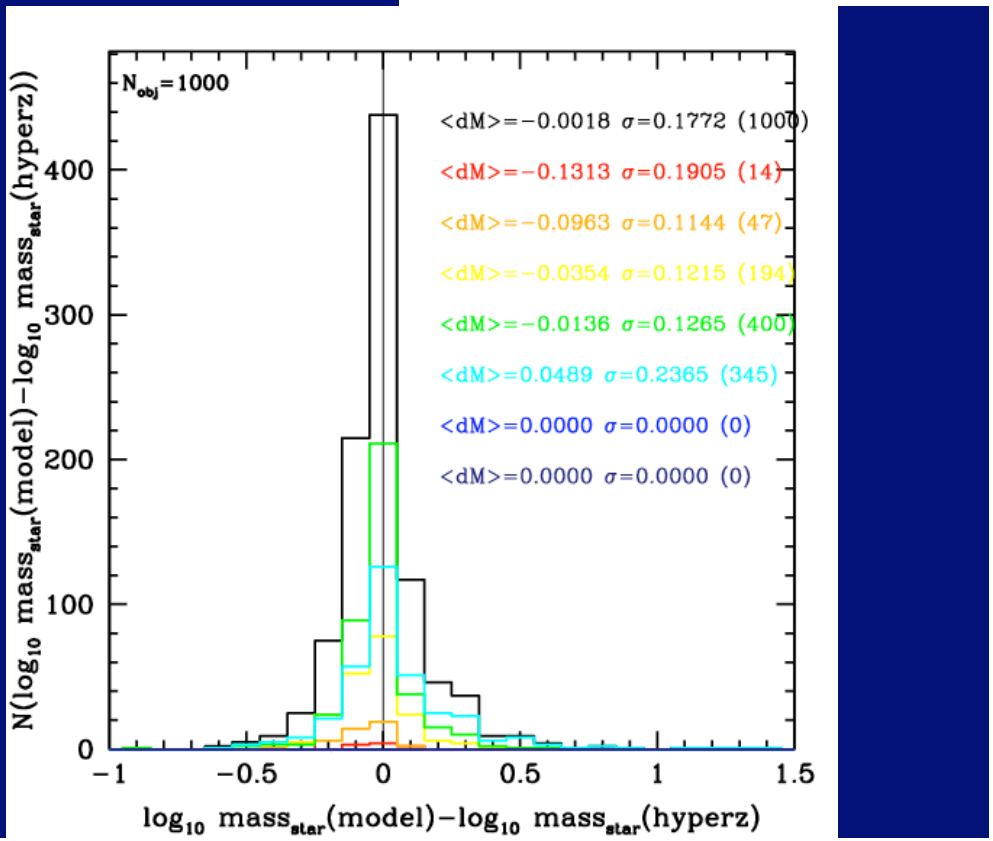
Adding SPITZER-IRAC bands (3.6, 4.5, 5.8, 8 micron) when (1+z)>IRAC/(2.2micron) i.e. z > 0.55, 0.96, 1.47, 2.46 add 3.6, 4.5, 5.8, 8 micron



➔No systematic shift

➔Dispersion decreases

➔Uncertanties decrease



RESULTS

USING "HyperZMASS"

- GISSEL (Bruzual & Charlot 2003)

  SSP,tau=0.1,0.3,1,2,3,5,10,15,30,const SF

  Zsolar, Salpeter IMF

  dust=Calzetti: A_V=0 to 1.8

  age=0.1 Gyrs to age of universe

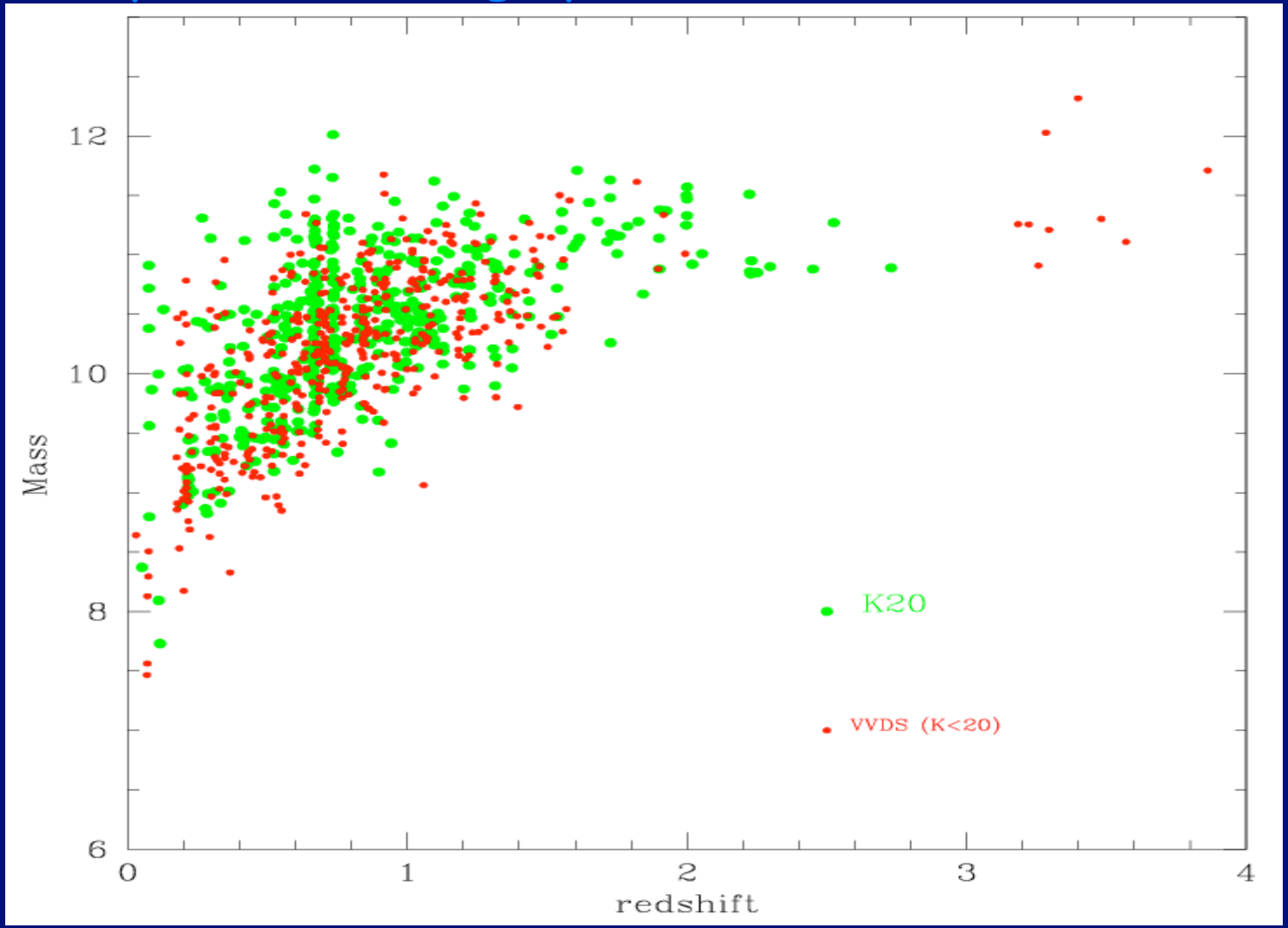
Using spectroscopic catalog where z-spec is available:

K-selected sample K_{AB}<23.5 (+ I_{AB}<24) N=835 gals

I-selected sample I_{AB}<24 → work in progress

COMPARISON TO K20-Masses

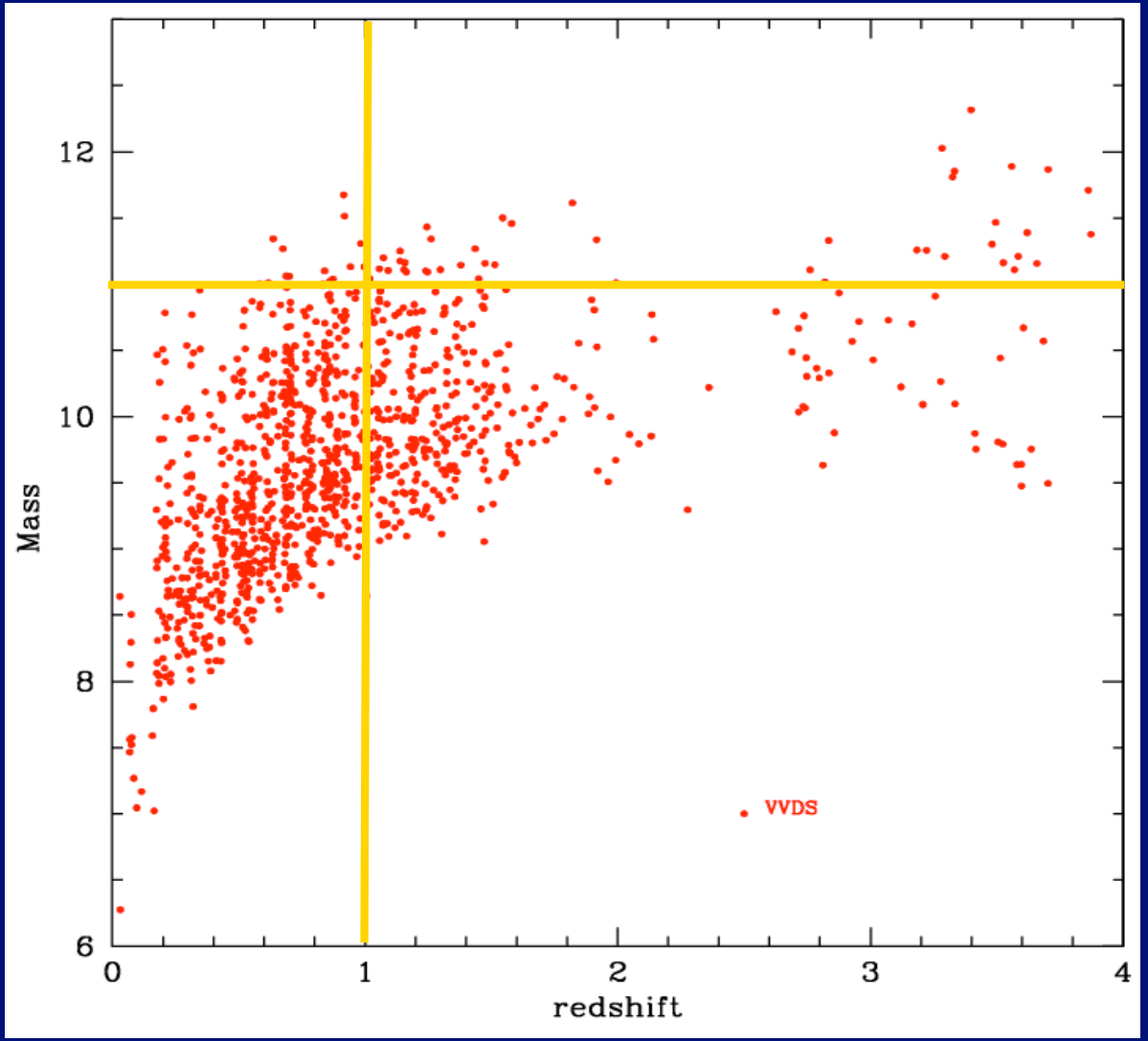
- VVDS sample: Mass using optical/NIR bands:



➔ GOOD agreement up to $K_{Vega}<20$

RESULTS: Mstar vs. z

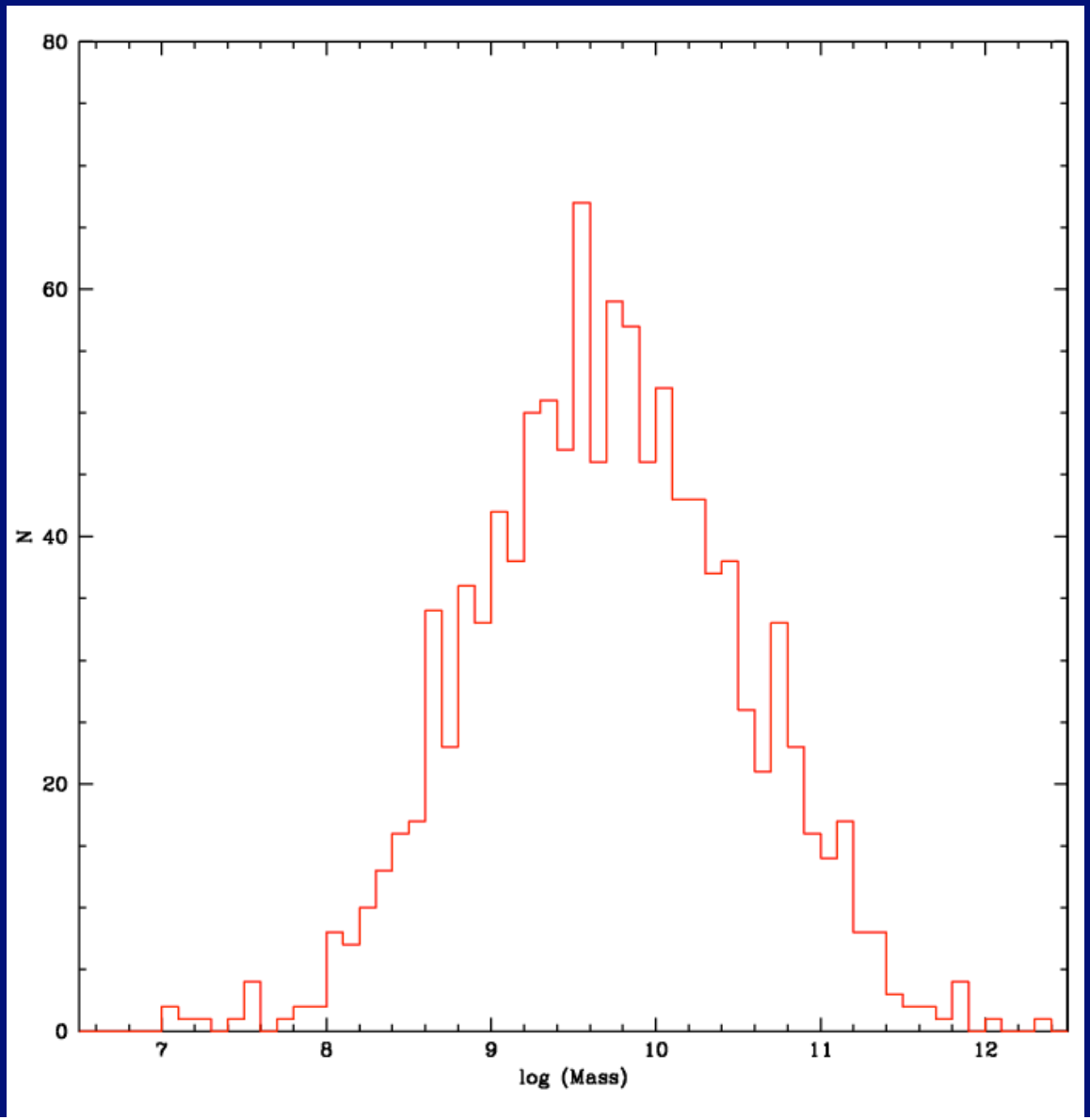
- VVDS: K-selected sample:



➔ Massive (>10^{11} solar masses) galaxies at z>1 !!

RESULTS: Mstar distribution

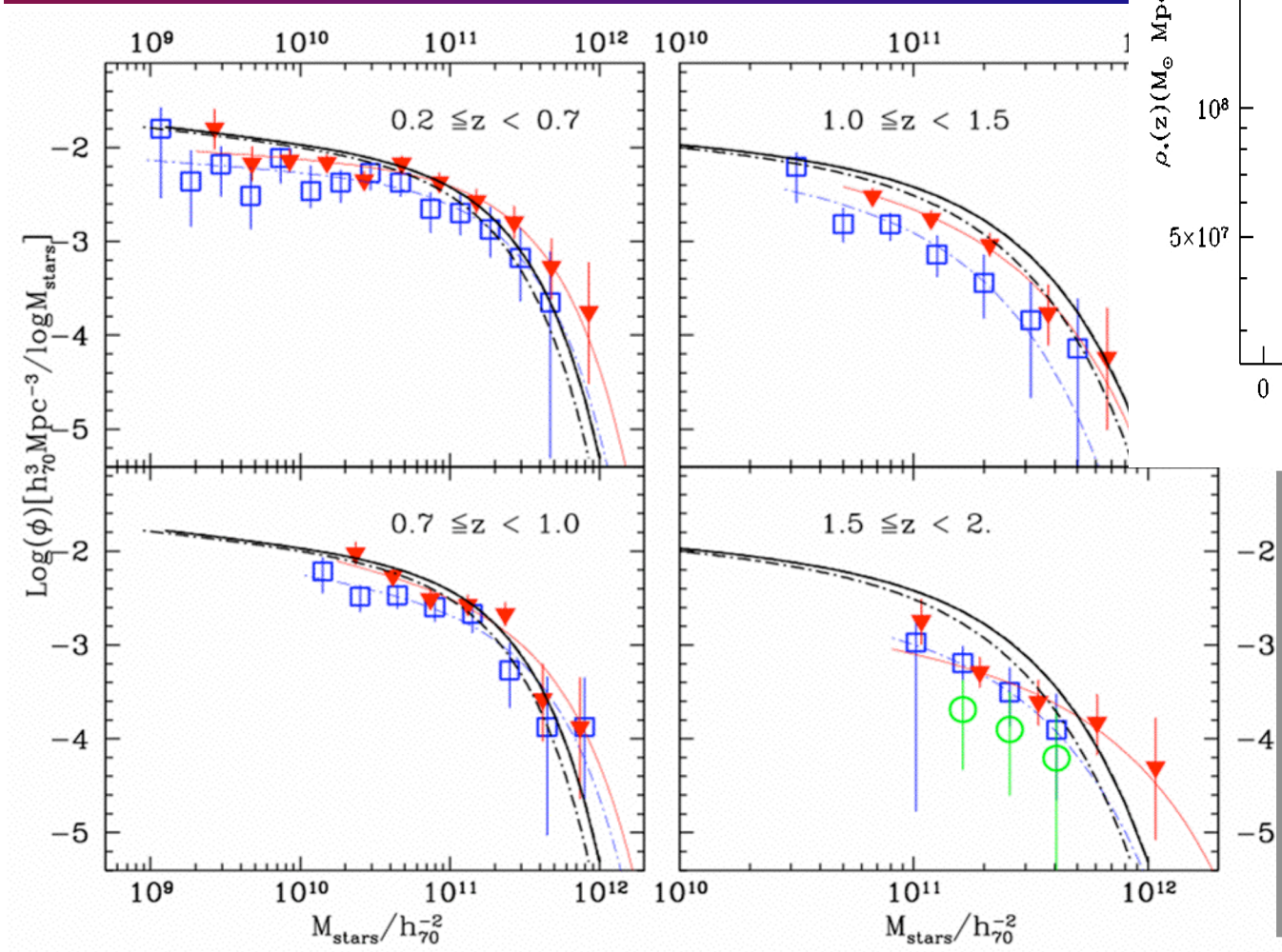
K-selected sample:

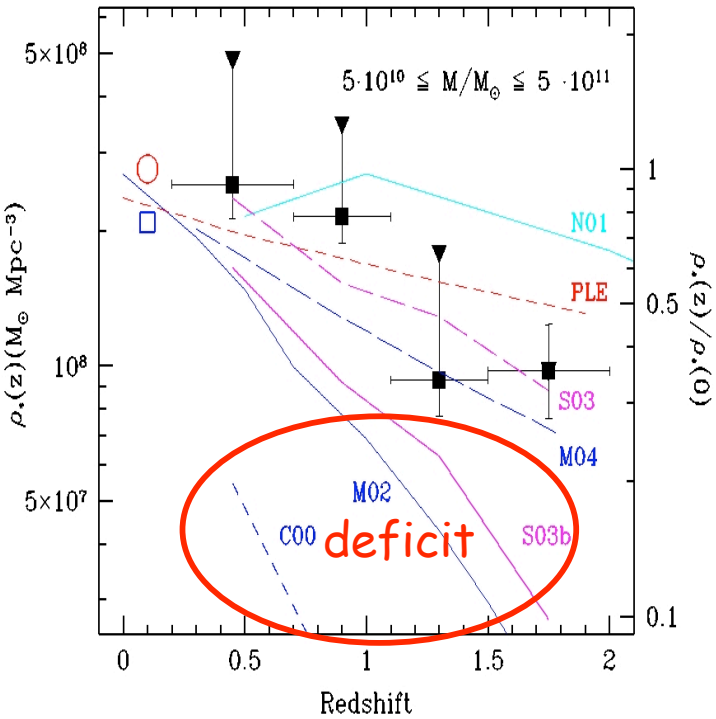


MASS FUNCTION in K20survey

Stellar Mass Function up to z~2
(Fontana, Pozzetti, al. 04) :

➔ *Slow decrease (~50%) of mass density up to z~2*

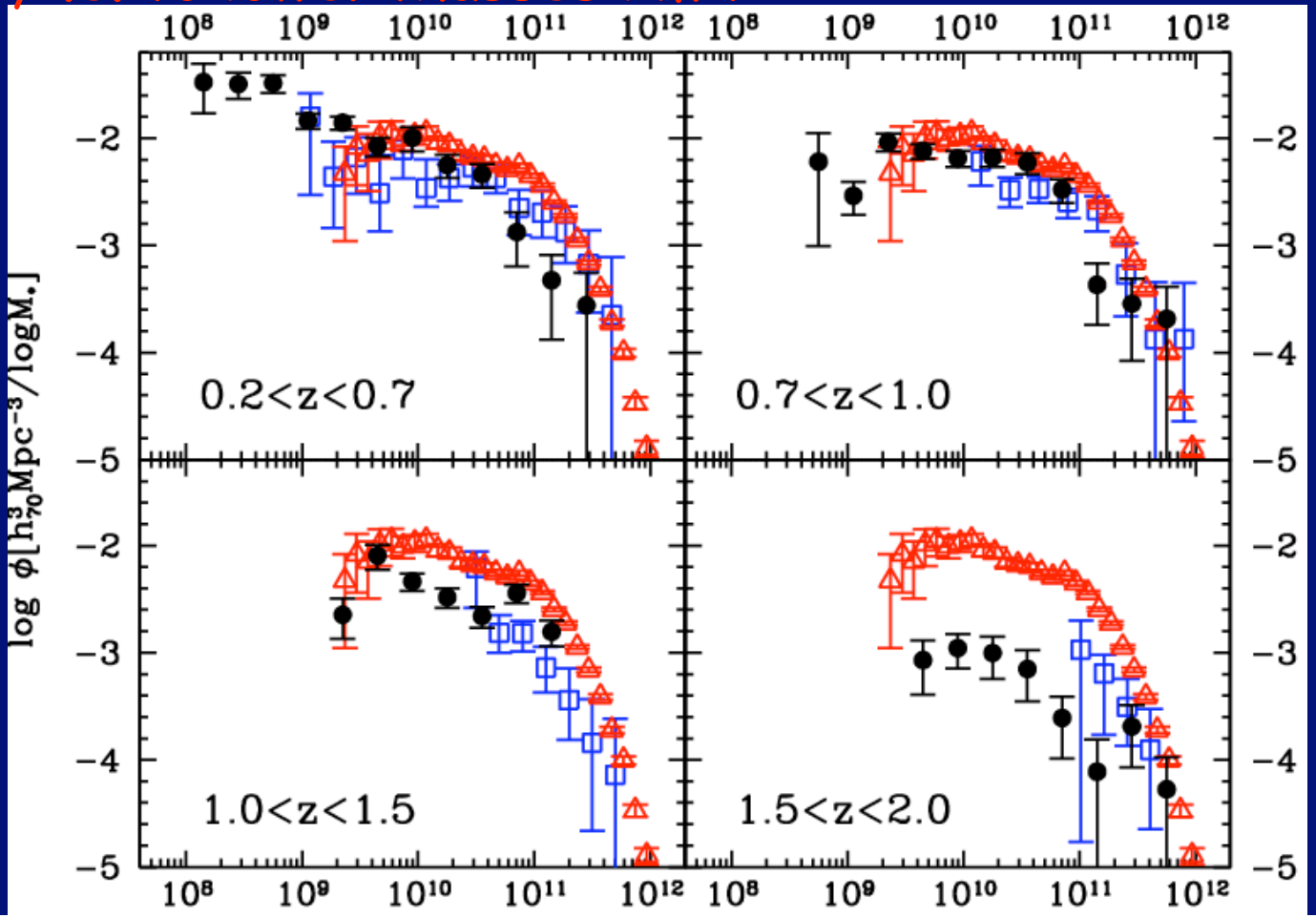




Most of current hierarchical merging models do not match the above results BUT Hydrodinamical simulations match !!

VVDS: Mass Function preliminary results

- Good agreement with K20 results BUT extended 1.5 mag. fainter, i.e. to lower Masses limit



- Confirm ONLY small decrease of massive gal. at high-z

VVDS: NIR Luminosity Function preliminary results

- Confirm mild luminosity evolution to z~2
- Luminous galaxies fully in place up to z~2, underestimated in hierarchical models
- Confirm K20 results