COMPARISON OF MASS ESTIMATES

AND

STELLAR MASS FUNCTION

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+ Mass Function WG

Methods explored:

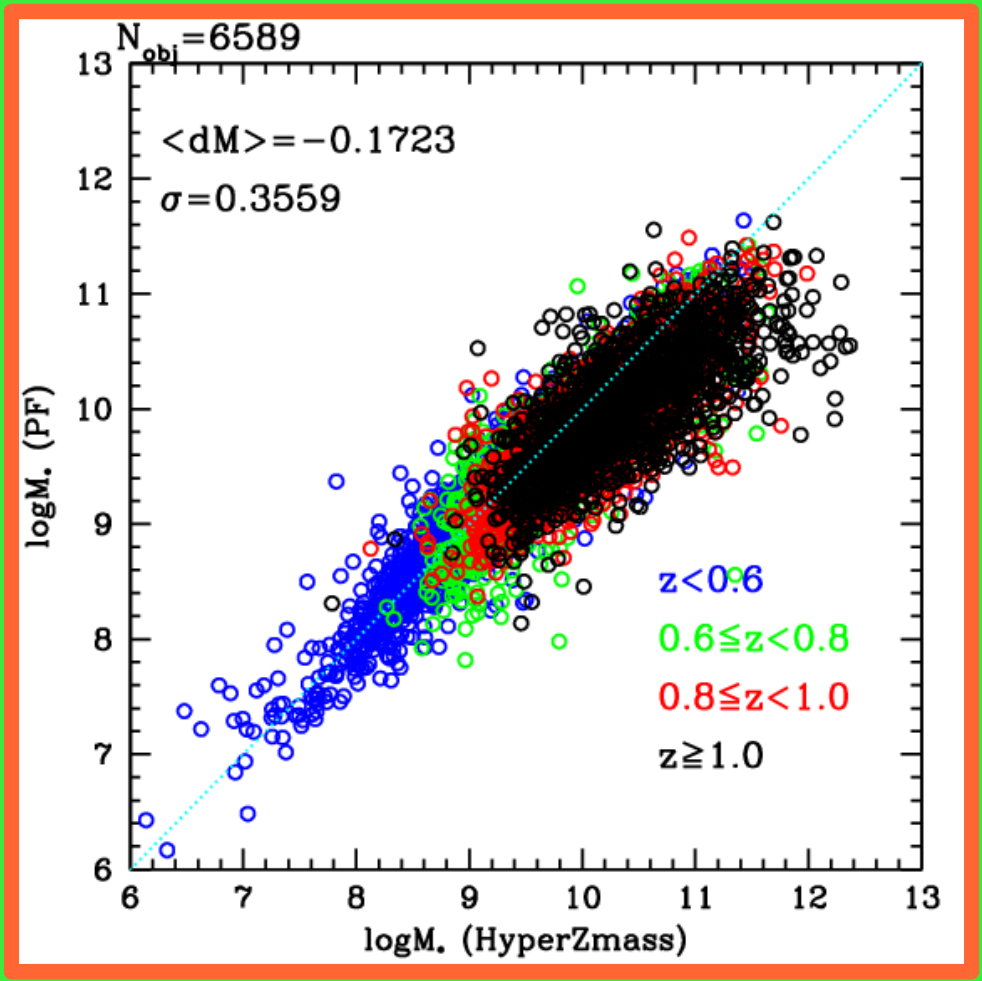
- **Pure Photometric (Lucia & Micol):** HyperZmass computes the stellar mass using BC03 synthetic models with smoothed exponential SFHs (from τ=0.1Gyr to continuous star formation), including Calzetti's extinction law, Z_{sun}, different IMFs (Salpeter or Chabrier). Best fit using minimum χ^2.

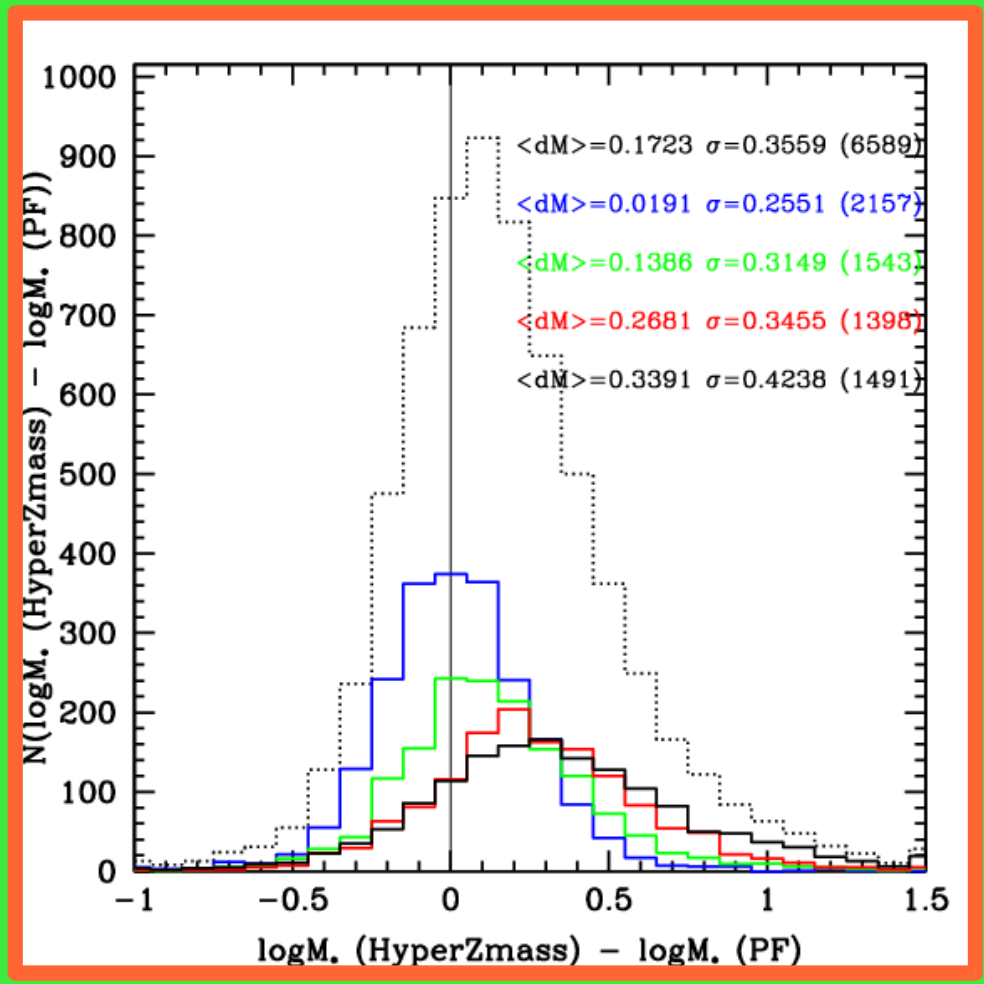
- **Photometry + spectroscopy (Paolo & Marco):** the mass is derived from the Best Fit (and Maximal Age fit) obtained using large band photometry combined with rebinned spectra. Synthetic SEDs from Pégase models, modified Sandage SFHs, self-consistent treatment of dust and evolving metallicity.

- **Spectrophotometric (Fabrice & Stéphane):** the mass is derived from photometry and/or spectroscopy (using Hδ and D4000), using the median of the likelihood distribution. The method has been used in the SDSS by Kauffmann et al. (2003) and Salim et al. (2005): it considers exponential + burst star formation histories, different metallicities and 2 component model of dust (Charlot & Fall, 2000).

COMPARISON ON REAL DATA: MB vs PF masses

SEDs we used: Salpeter IMF. MB uses BC03; PF Pégase.
Sample: spectroscopic sample with I_{AB}<23, VVDS+CFHTLS photometry (without SWIRE)

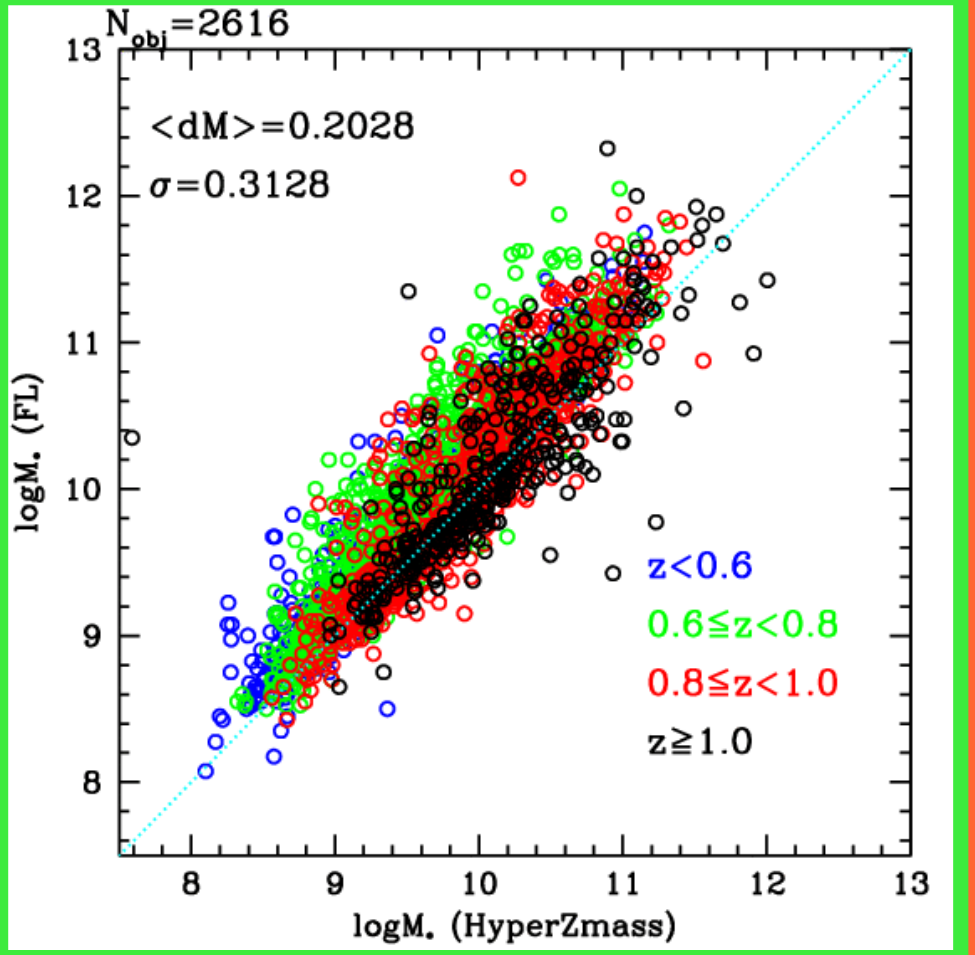


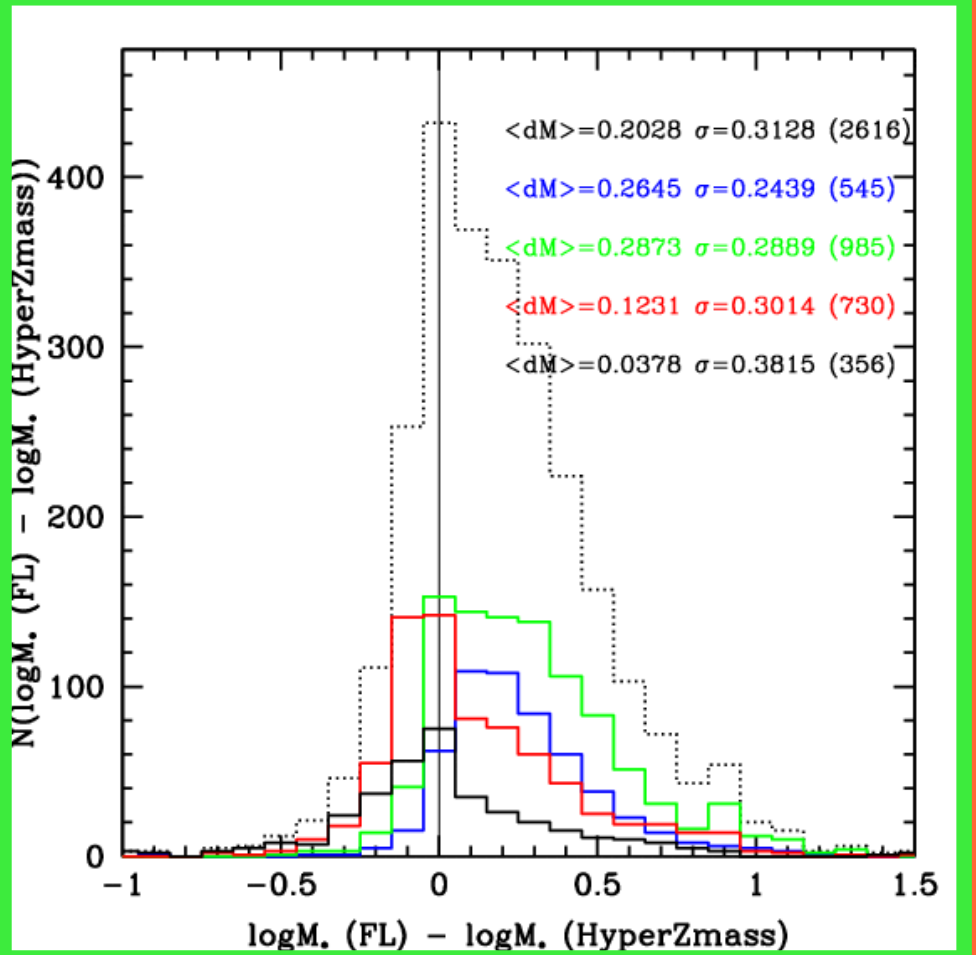


Very good agreement at low redshift, less good at higher redshift and high masses (effect of dust + metallicity, which are self-consistent in PF models? PF and MB will check).

COMPARISON ON REAL DATA: MB vs FL masses

SEDs we used: Chabrier IMF, BC03; MB: Z_{sun}, min χ^2 , smoothed SFHs; FL: Z=0.1–2 Z_{sun}
Sample: spectroscopic sample with $0.4<z_{spec}<1.3$ (~2700 objects)

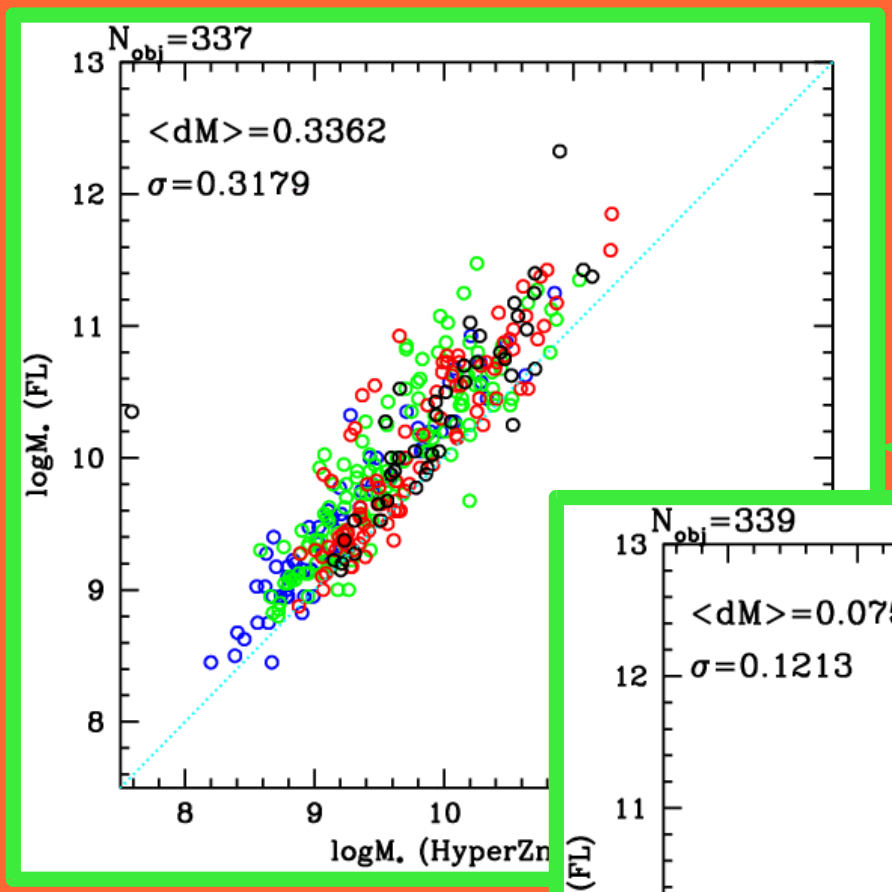




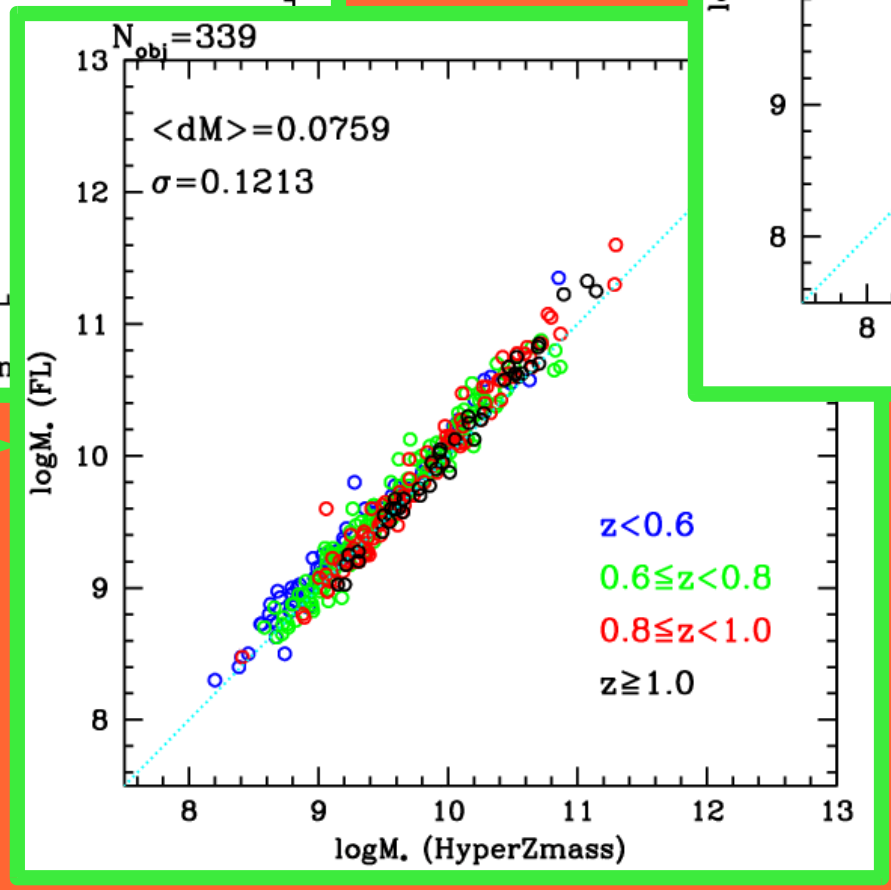
The two methods have been compared also by means of a large number of simulations and by checking each parameter involved in computation: redshift, photometry, age, photometric type, metallicity, extinction, SFHs...

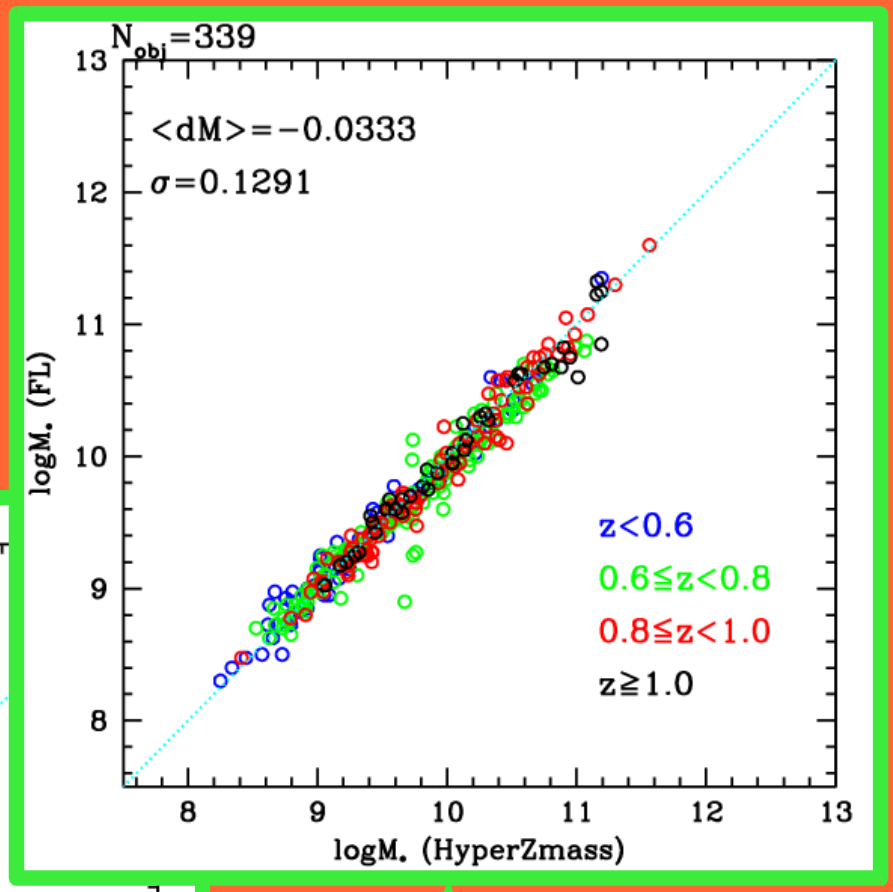
COMPARISON ON REAL DATA: MB vs FL masses

Sample: spectroscopic sample with $0.4<z_{spec}<1.3$ and K detected



Standard setup

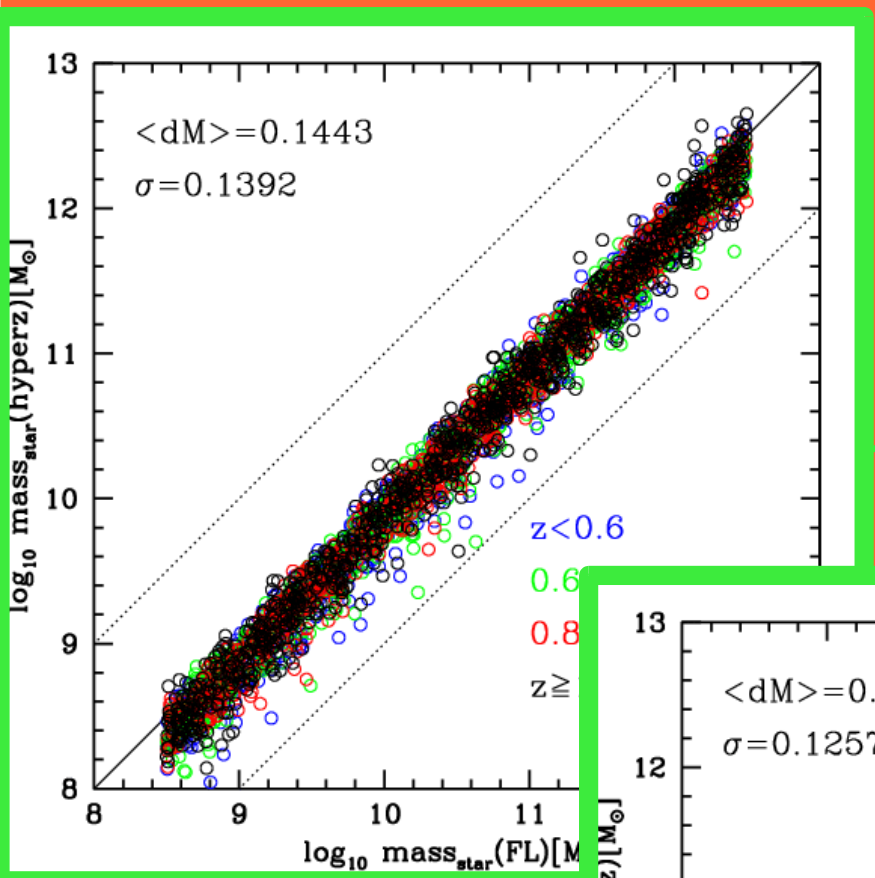




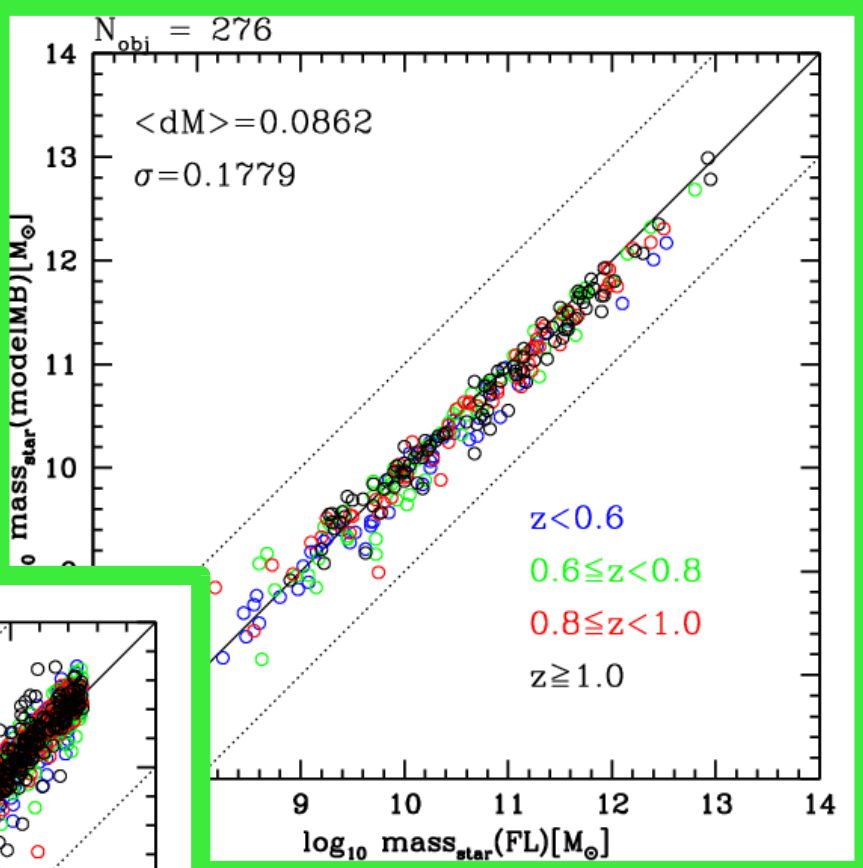
Standard HyperZmass vs FL masses without secondary bursts

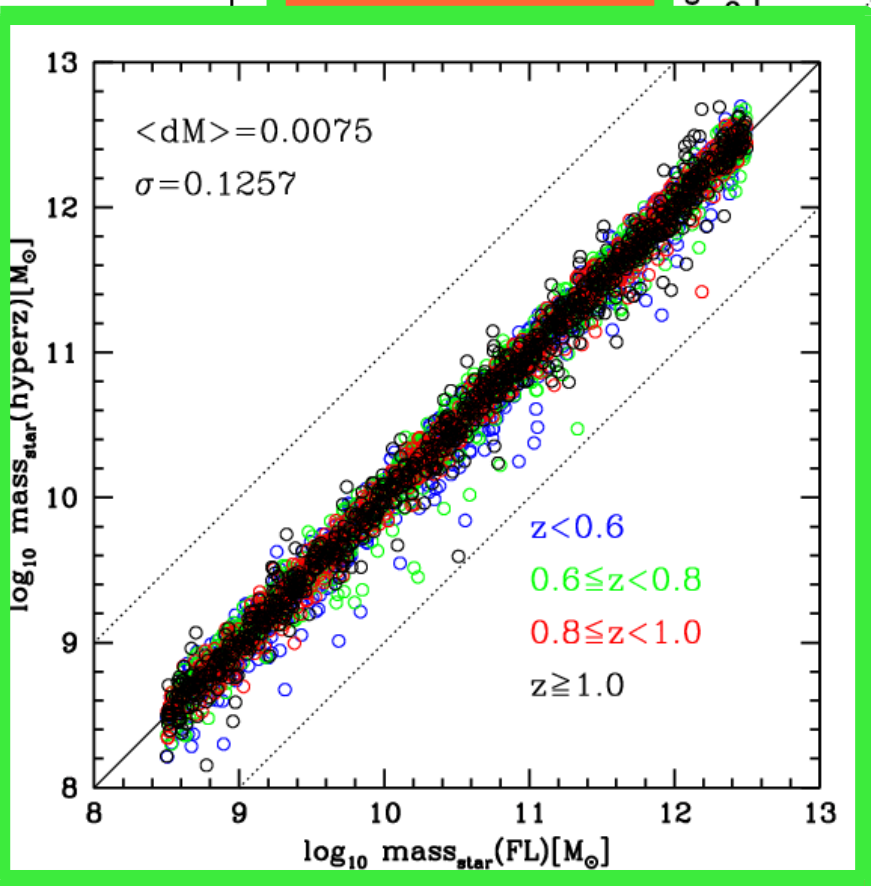
HyperZmass with 2-component dust model vs FL masses without secondary bursts

COMPARISON ON SIMULATED DATA: MB vs FL masses



Input by FL, output with "standard" HyperZmass





Input by FL, output by MB using 2-component dust model (no need of secondary bursts to reproduce simulations?)

Input by MB, output with "standard" setup by FL (only few objects because of restricted z range)

SUMMARY

Results:

- Most of the differences in mass estimates arise from the inclusion of secondary bursts in Star Formation Histories.

Actions from the last telecon (July 6th):

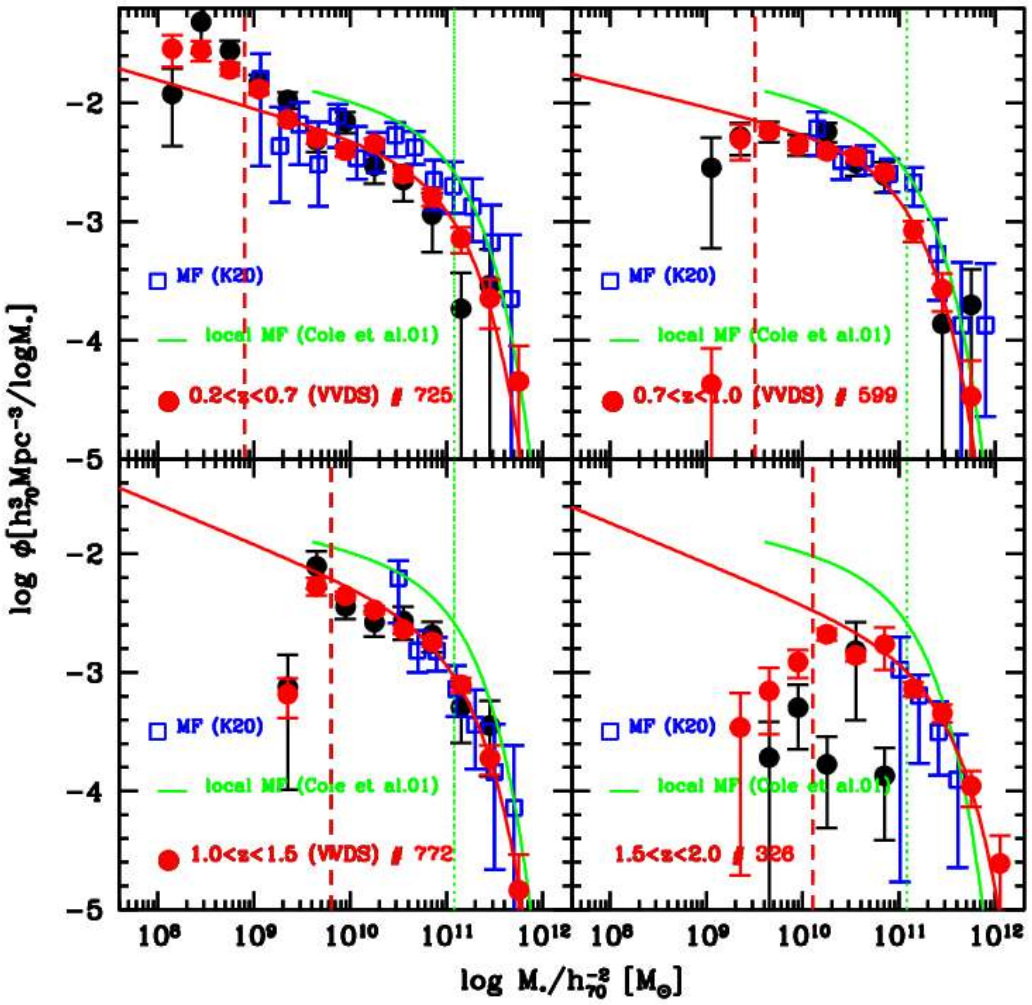
- Compute masses for all the objects taking into account complex SFHs including models with secondary bursts (SC & FL)

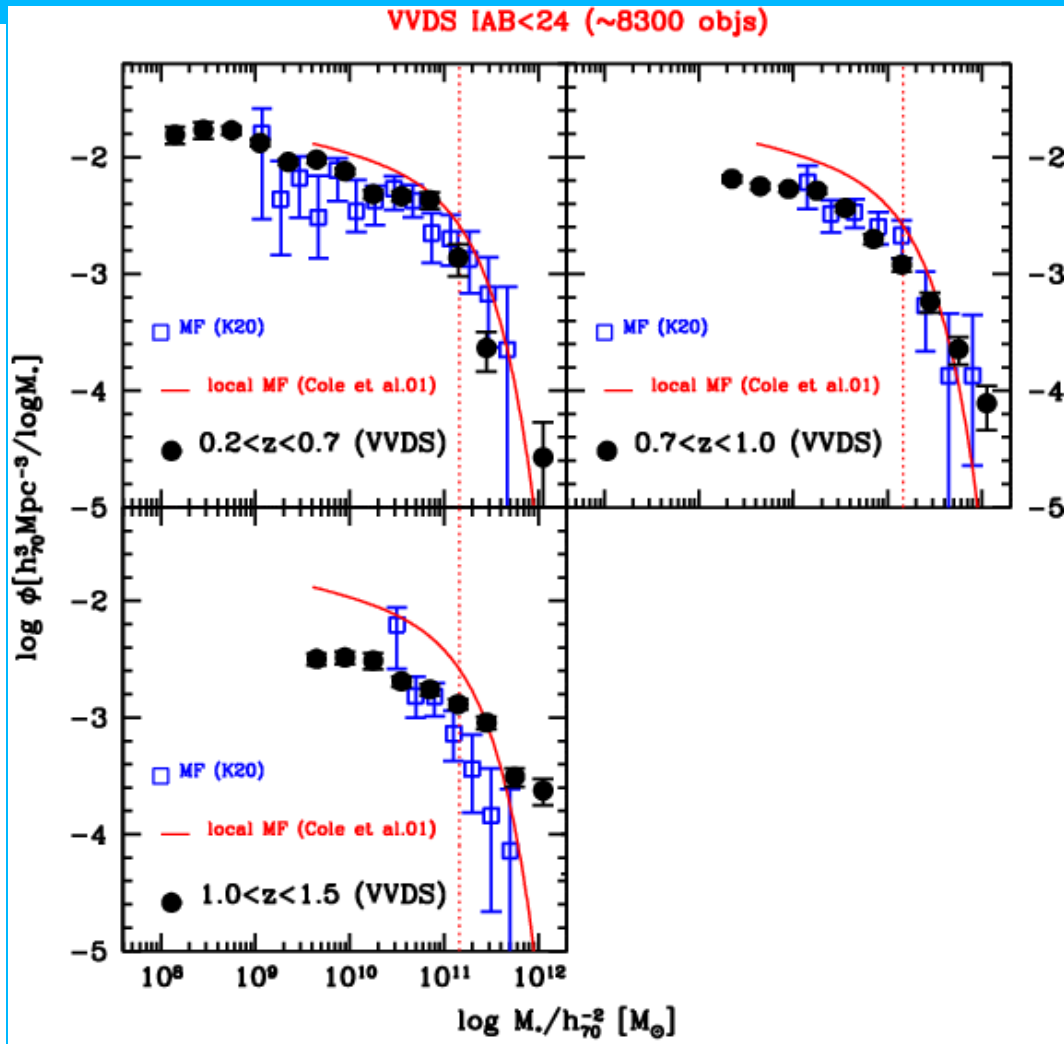
- Compute z_{min} and z_{max} for each object using these models (Jarle Brinchmann will be involved)

- Compute mass functions, using both “stochastic” SFHs and smoothed ones (used in most of the literature). Algorithms to compute masses and mass functions with HyperZmass are already in place. Try to put at least these two estimates (and possibly also the one by PF) in the first paper.

MASS FUNCTION

Preliminary results (already shown at other meetings):





K-band selected photometric z sample

I-band selected spectroscopic z sample (from simulations with smoothed SFHs masses obtained with only optical filters are reliable only up to z~1. FL has to perform simulations with his method)

WE NEED

- Final photometric catalogue, both I-selected for the spectroscopic sample and K-selected. It is important to use the same input catalogue. Is it foreseen some update of the DB? (in particular in CFHTLS data?)

- Final photometric redshifts for the K-band photometric sample using all optical and NIR available bands (+SWIRE?)

- Weights for I-selected (spectroscopic) mass function have to be computed again?

- Can we use SWIRE data (and when we will be allowed to use them) to compute the masses?