Evolution of galaxy dynamics over the last 10 Gyrs with MUSE/VLT

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Galaxy evolution

Morphology at $z > 0.5$ different from the local Universe.
Kinematics more disturbed.
Why ?

- ▷ Impact of the environment on the kinematics ? On the morphology ? How do they scale with each other ?
- ▷ Which physical processes are shaping galaxies ?
  - · Which is/are dominant ?
  - · How to identify them ?
- ▷ Origin of quenching ?
- ▷ Ancestors of local giant spirals ?

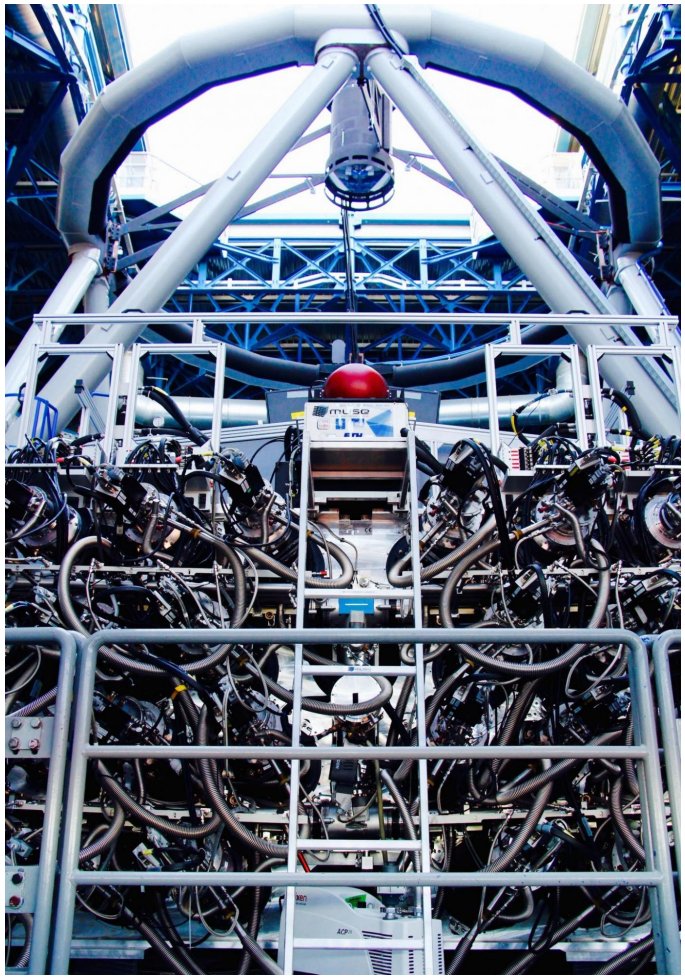
Integral Field Spectroscopy & MUSE

IFS:

- ▷ 3D cubes (2D spatial + 1D spectral)
- ▷ photometry + kinematics

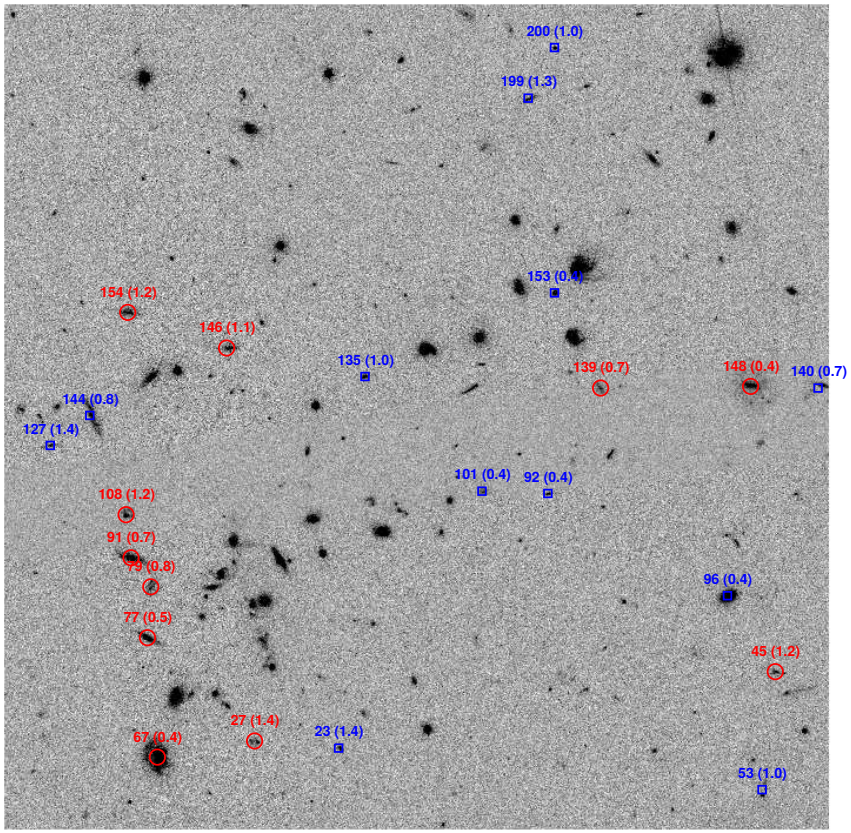
MUSE:

- ▷ $1 \times 1\,\mathrm{arcmin}^2$ FoV
- ▷ 0.2 arcsec spatial sampling
- ▷ spectral range $[4650\,\text{Å}, 9300\,\text{Å}]$
- ▷ seeing-limited or AO observations



MUSE instrument. Credit: Contini Thierry (IRAP)

Our sample



HST image of COSMOS group CGr30

- ▷ 16 MUSE fields in COSMOS area
- ▷ exposures from 1 to 10 hr
- ▷ seeing-limited (FWHM $\lesssim 0.7$”) or AO (FWHM $\lesssim 0.5$”)
  - · *deep* and *best_seeing* observations
- ▷ ~ 500 field galaxies with [OII] detection
  - · HST-ACS counterparts
  - · $0.4 \leq z \leq 1.4$

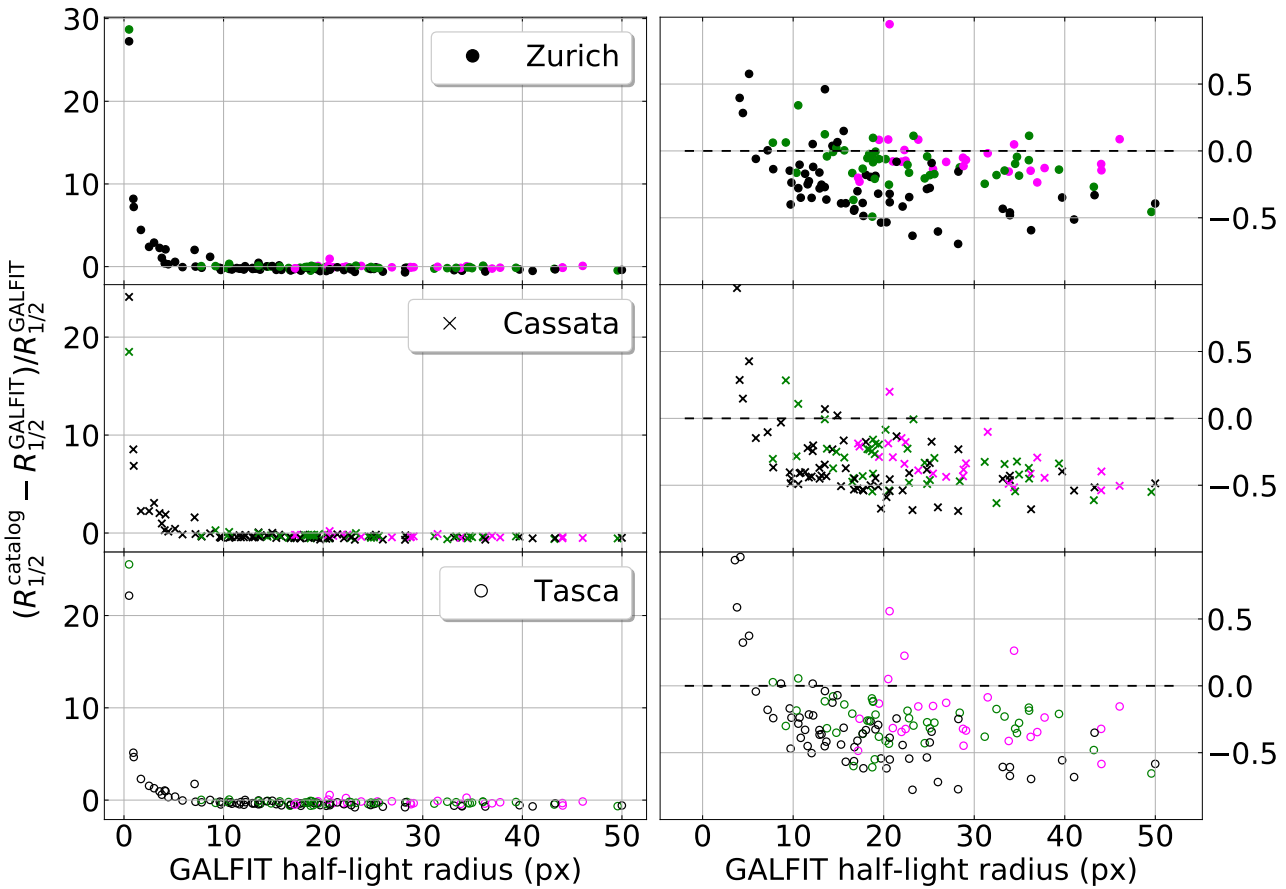
Morphological parameters are useful for

- ▷ the morpho-kinematics comparison
- ▷ **the kinematical model**

The two most important are

- ▷ a size measure to select resolved galaxies
  - · half-light radius $R_{1/2}$
- ▷ the ellipticity
  - · compute the inclination from $\cos i = 1 - e$
  - · used as a fixed input for the kinematical model

Checking a couple of parameters
Half-light radius

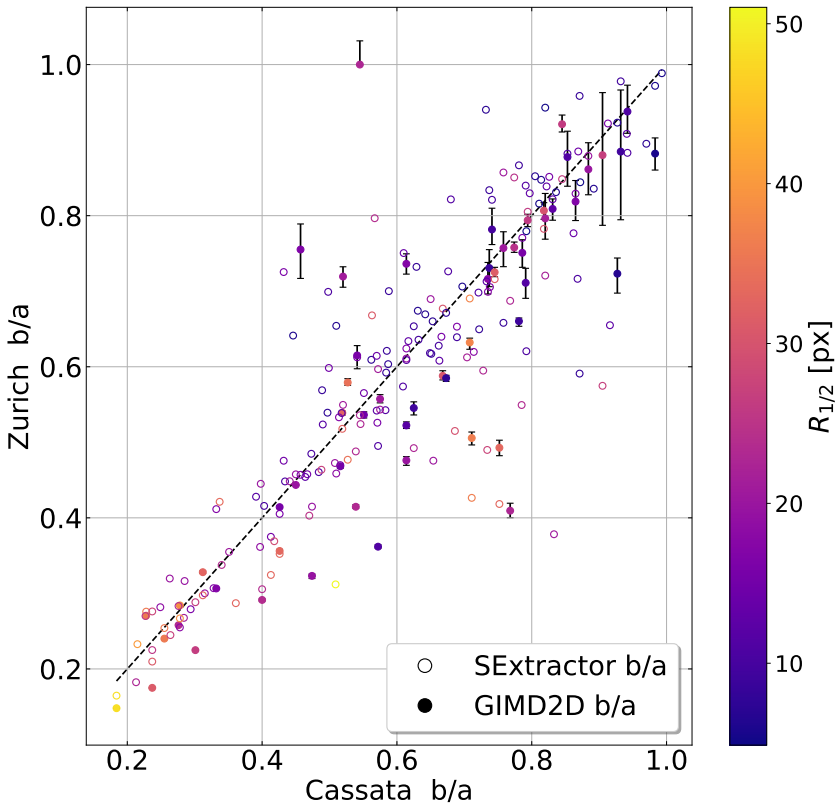


GALFIT run by V. Abril-Melgajero (LAM) on structure galaxies

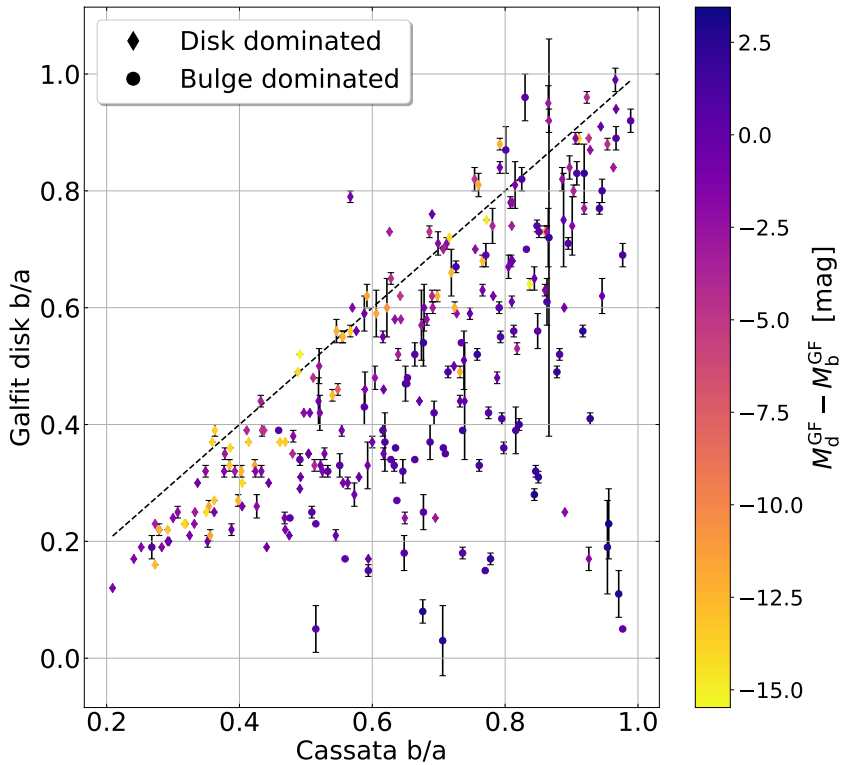
- ▷ GALFIT radius used as a reference

spheroidal disk-like irregulars

Checking a few parameters
Ellipticity

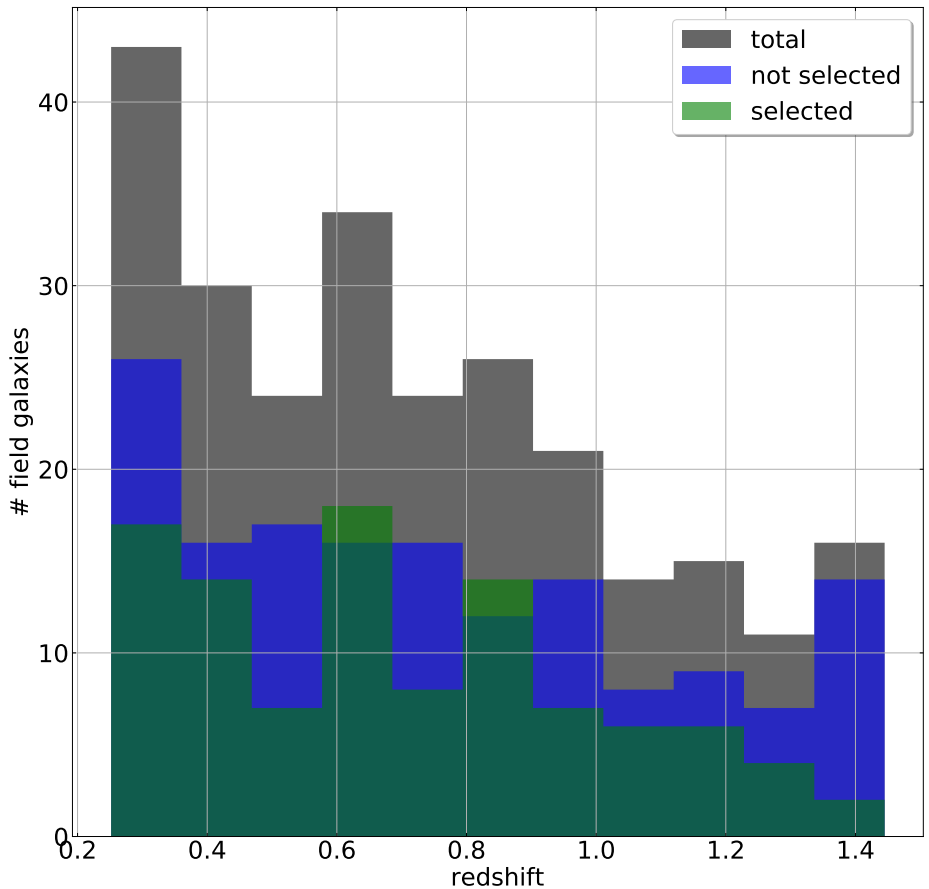


▷ values are consistent between catalogues



▷ scatter is due to bulge dominated (spherically symmetric) systems

Characteristics of our sample
Redshift distribution

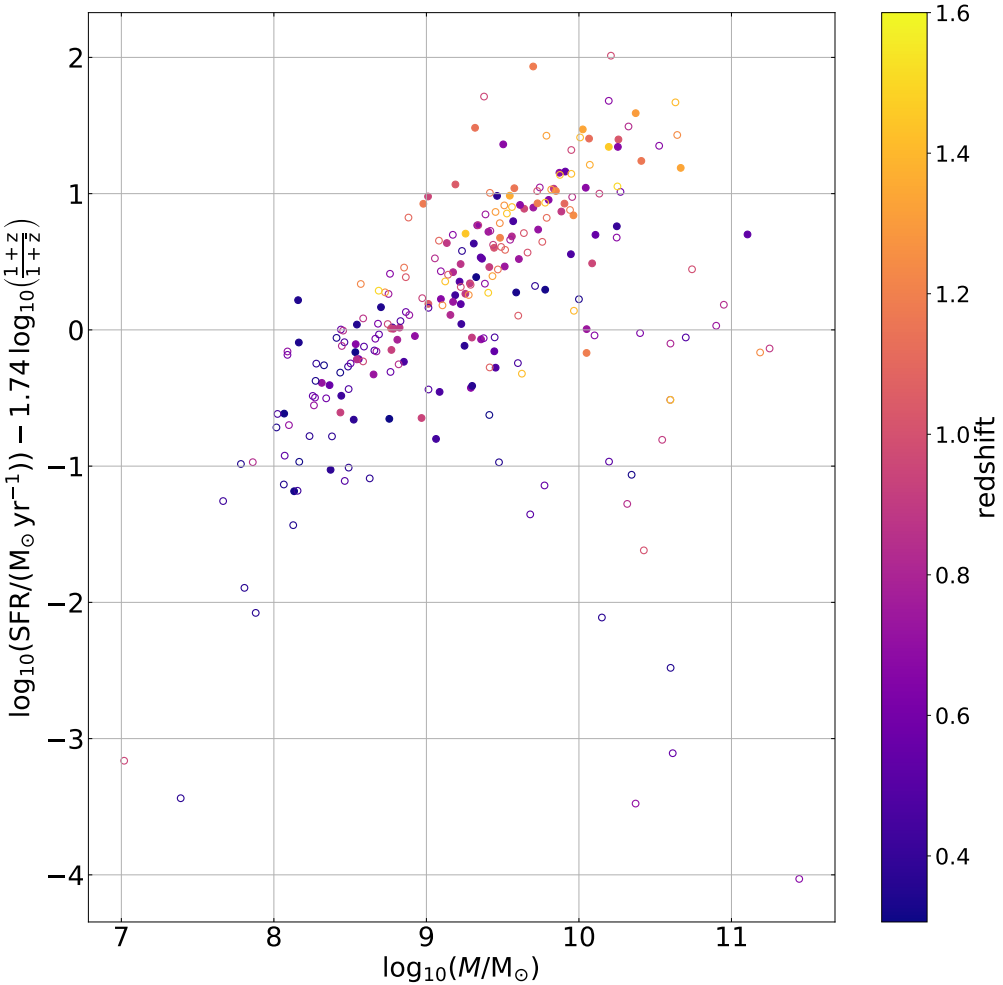


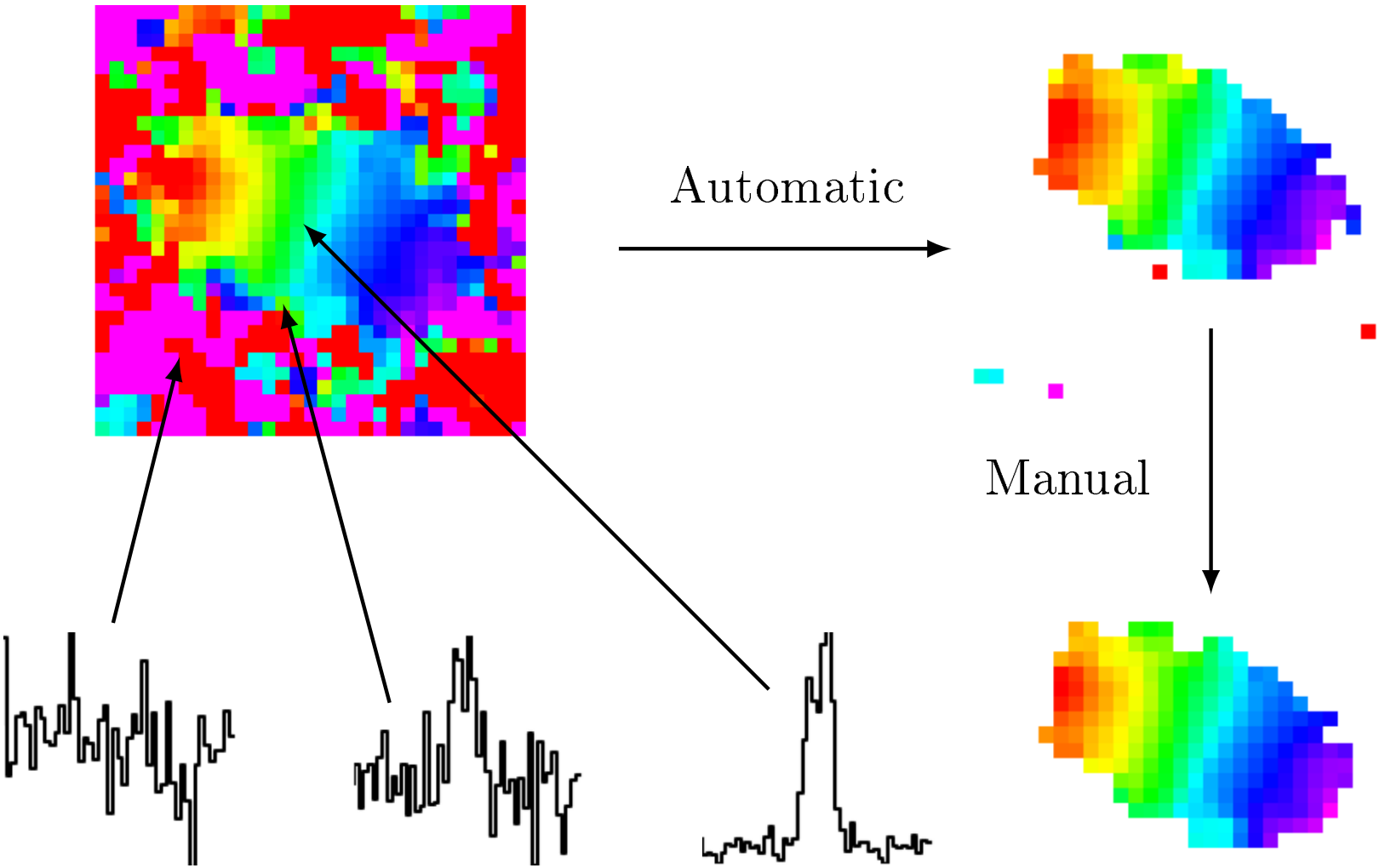
The total number corresponds to galaxies with an HST counterpart in Cassata and/or Zurich catalogues.

- ▷ sample of **103 galaxies** with $R_{1/2} > 0.35$" and SNR > 5
- ▷ we loose galaxies at $z \approx 1.4$
- ▷ redshift distribution is not drastically changed

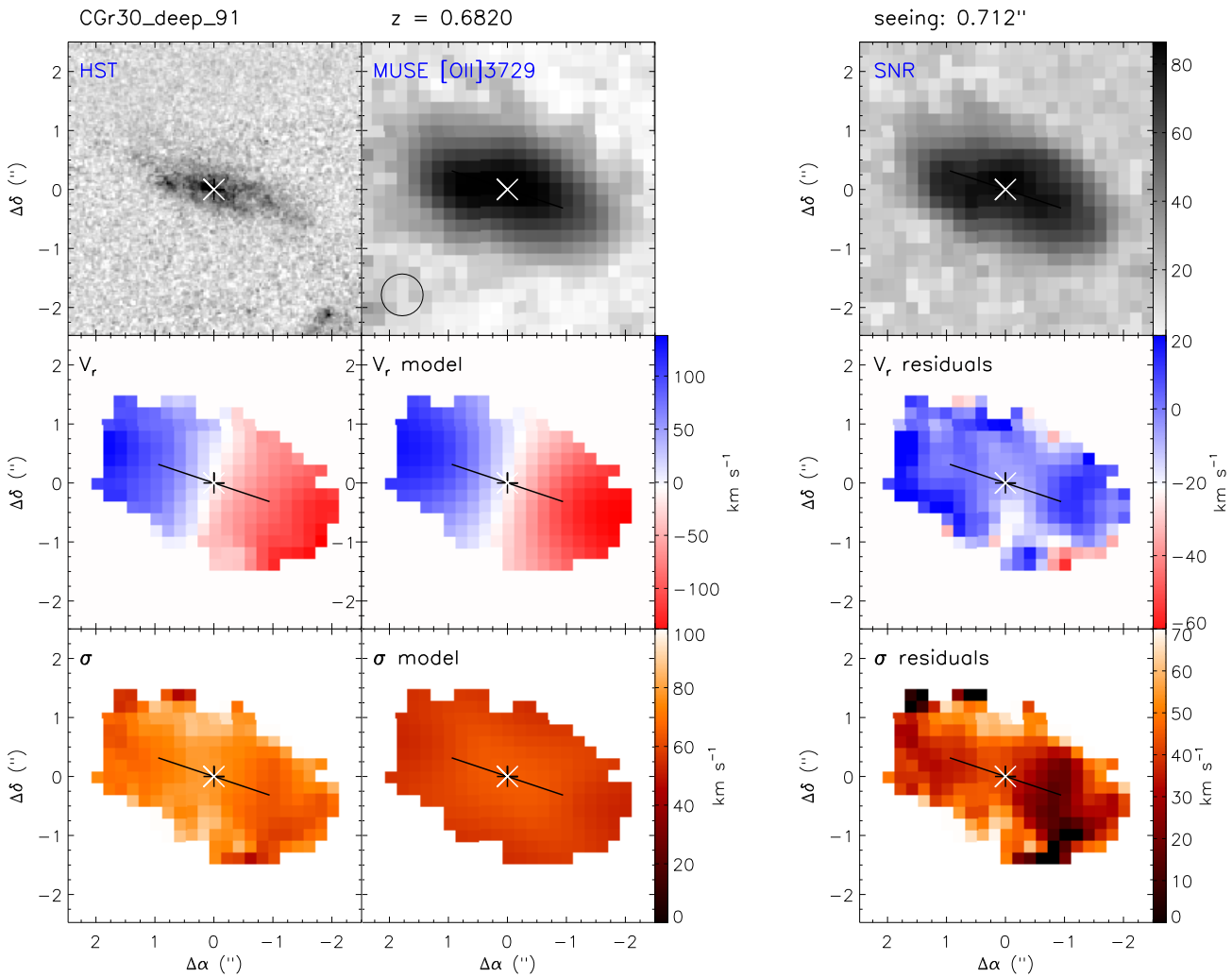
Characteristics of our sample
Mass-SFR relation

- ▷ Most of our sample galaxies are on the main sequence
- ▷ massive quiescent, low [OII] and very low mass galaxies are lost




Automatic
Manual

Kinematical modelling
Fitting a model



First results
$V_{\mathrm{max}}/\sigma_{\mathrm{v}}$ distribution

Bibliography I