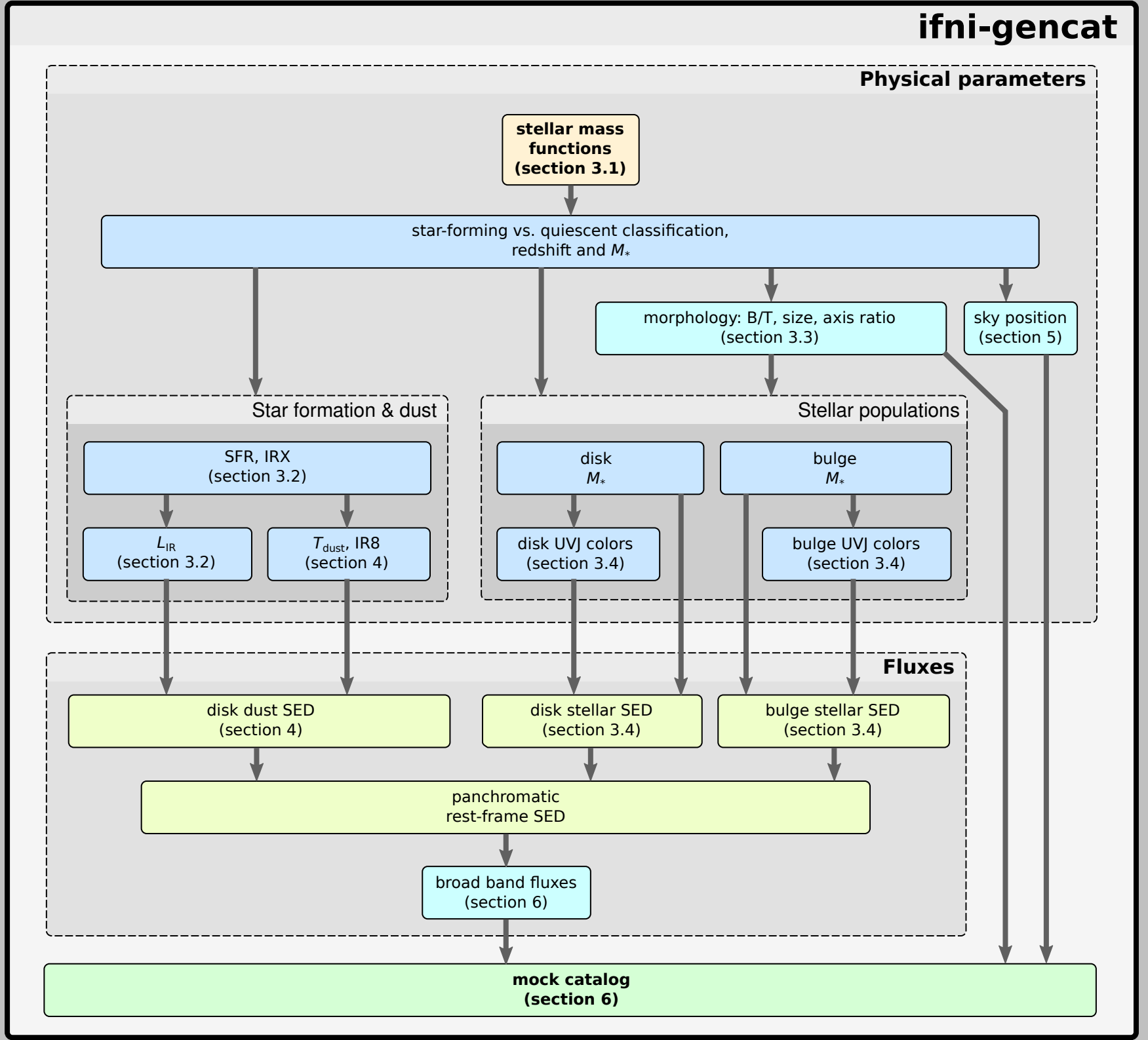
EGG/MUG/lfni/gencat ...

An empirical simulation of the Universe

Corentin Schreiber

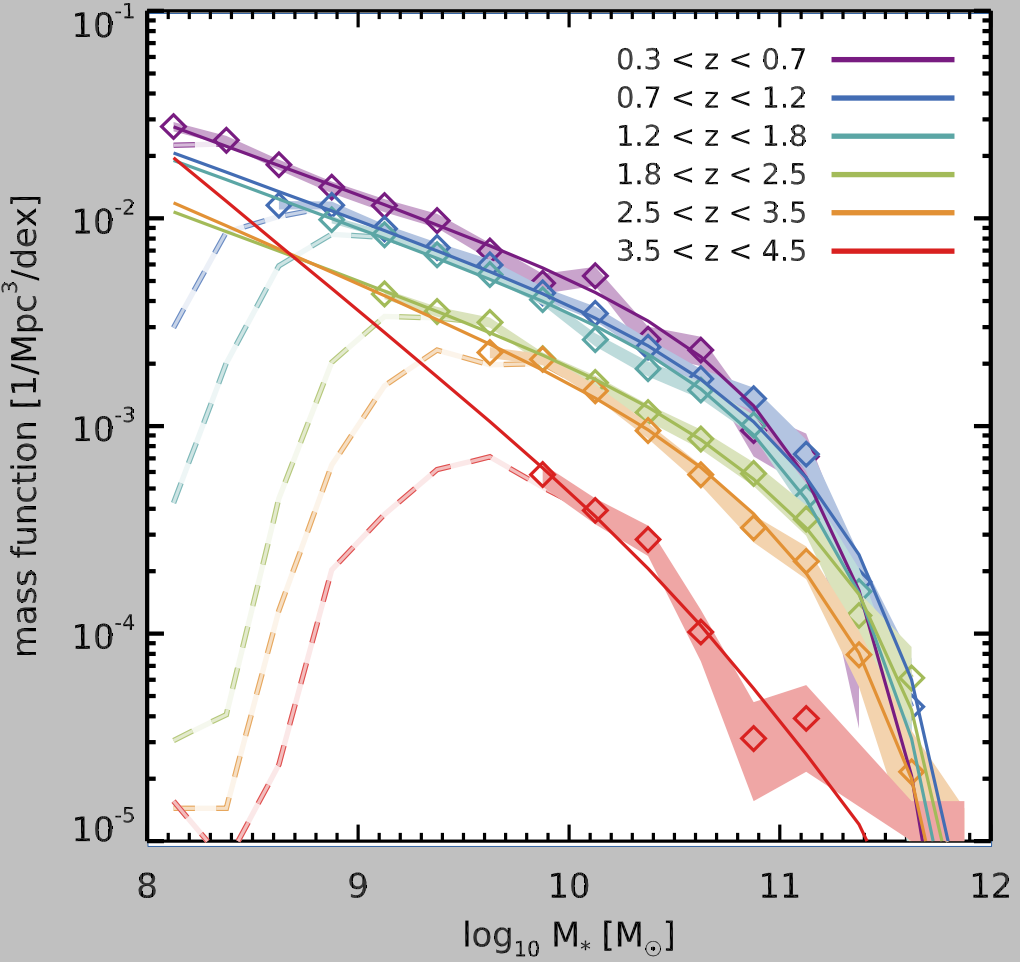




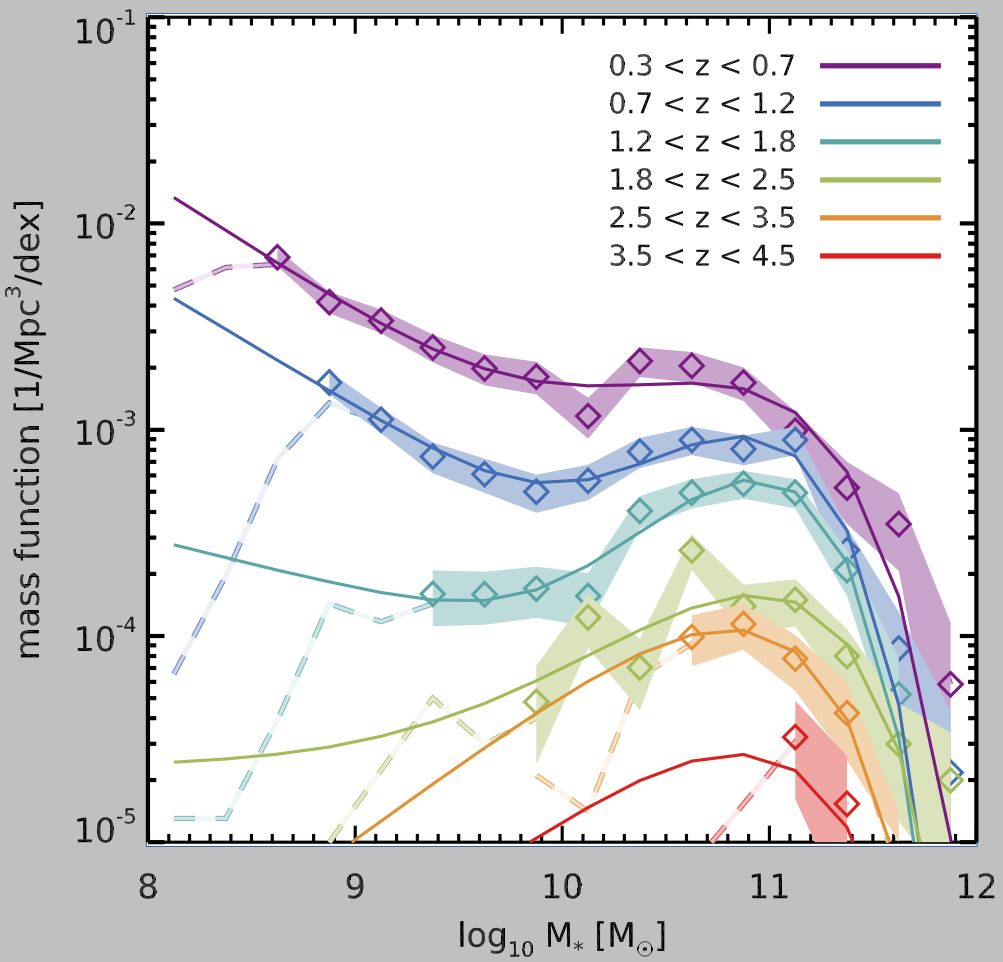

ifni-gencat
Physical parameters
stellar mass functions (section 3.1)
star-forming vs. quiescent classification, redshift and M_*
morphology: B/T, size, axis ratio (section 3.3)
sky position (section 5)
Star formation & dust
SFR, IRX (section 3.2)
L_{IR} (section 3.2)
T_{dust}, IR8 (section 4)
Stellar populations
disk M_*
bulge M_*
disk UVJ colors (section 3.4)
bulge UVJ colors (section 3.4)
Fluxes
disk dust SED (section 4)
disk stellar SED (section 3.4)
bulge stellar SED (section 3.4)
panchromatic rest-frame SED
broad band fluxes (section 6)
mock catalog (section 6)

Stellar mass functions

from CANDELS H-band catalogs (H<26)



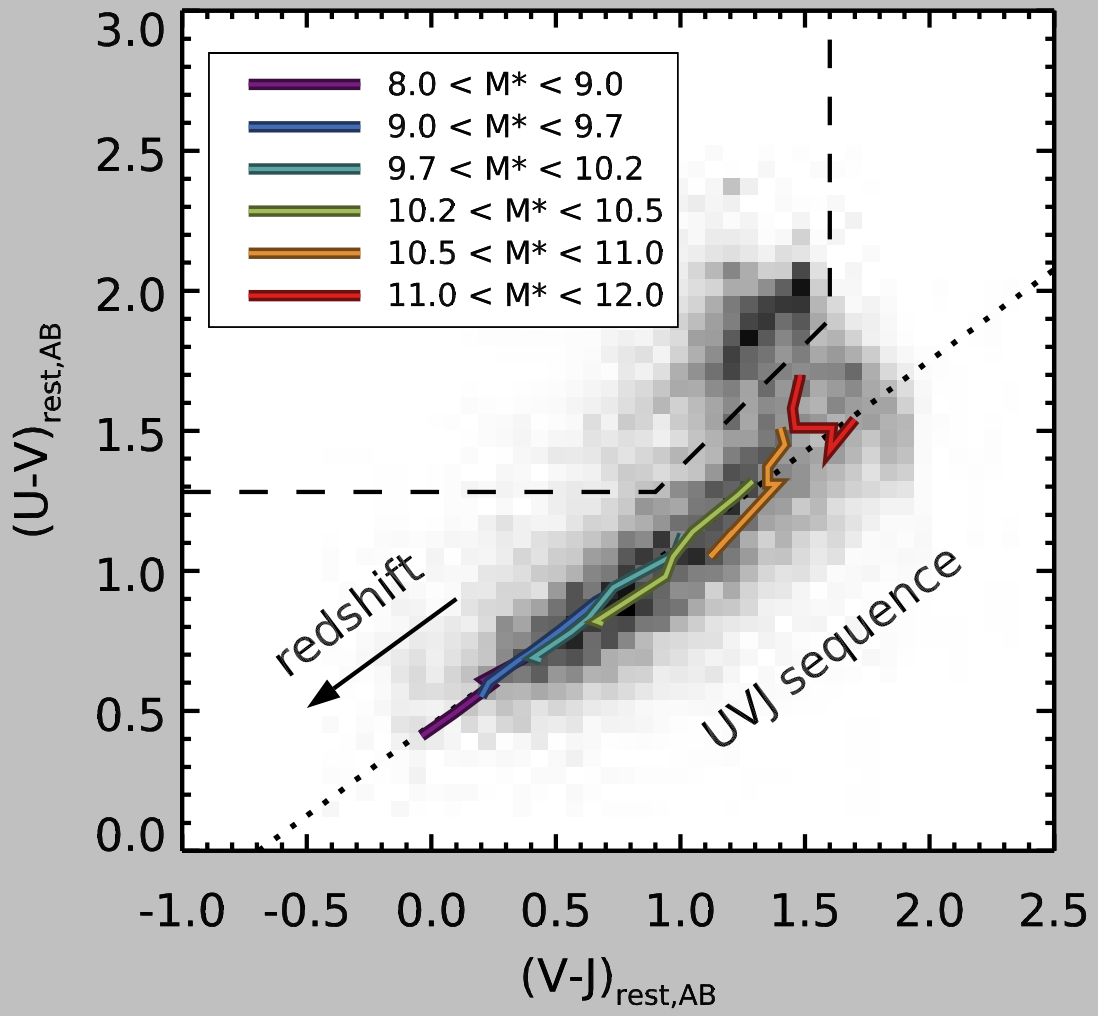
stellar mass

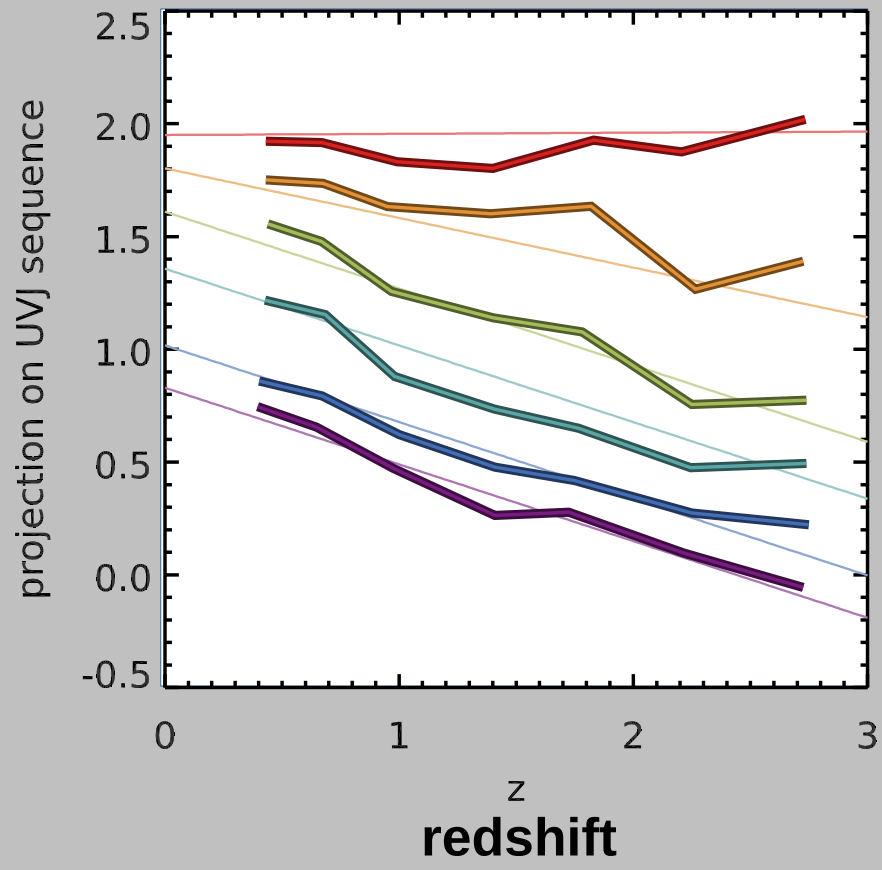


stellar mass

Generating UVJ colors & picking stellar SED

from CANDELS catalogs again, binning galaxies in mass and redshift



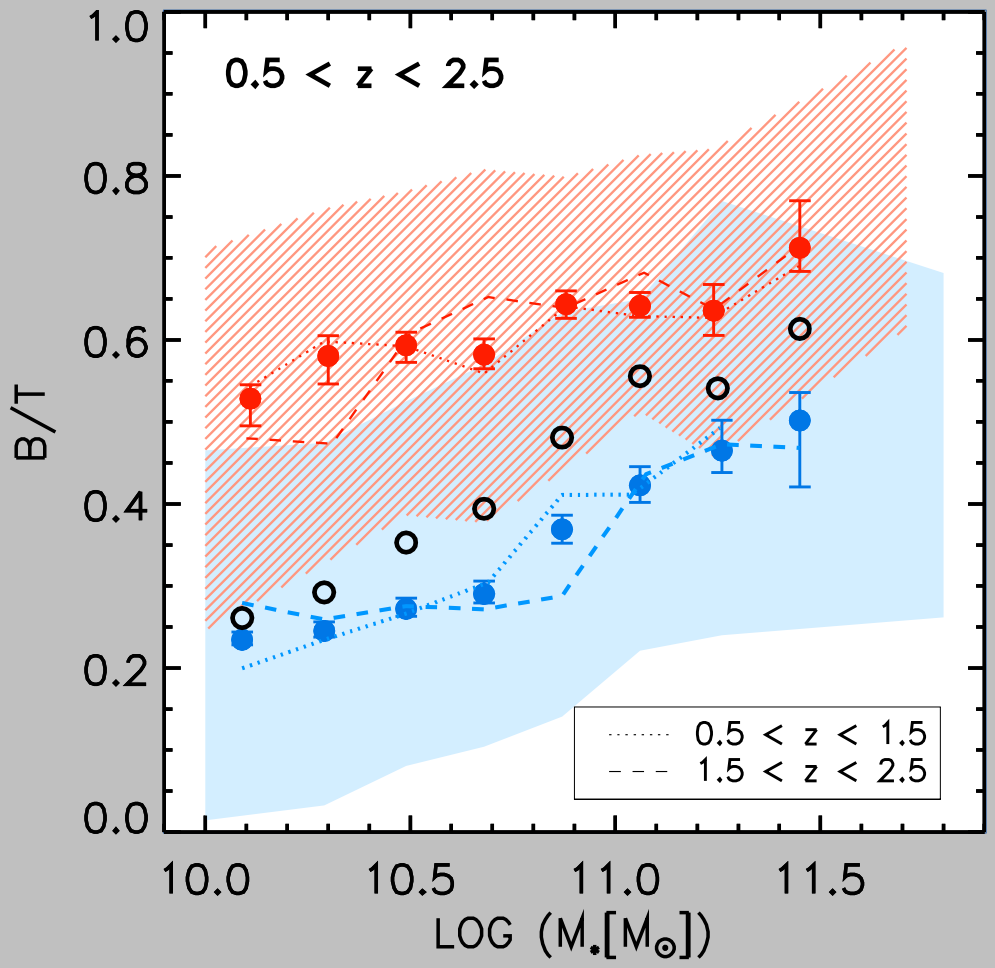


→ associate one Bruzual & Charlot SED (taken from FAST) to each position on the UVJ diagram

Generating morphologies

bulge-to-total ratio, sizes, axis ratios, ...

Lang et al. (2014)

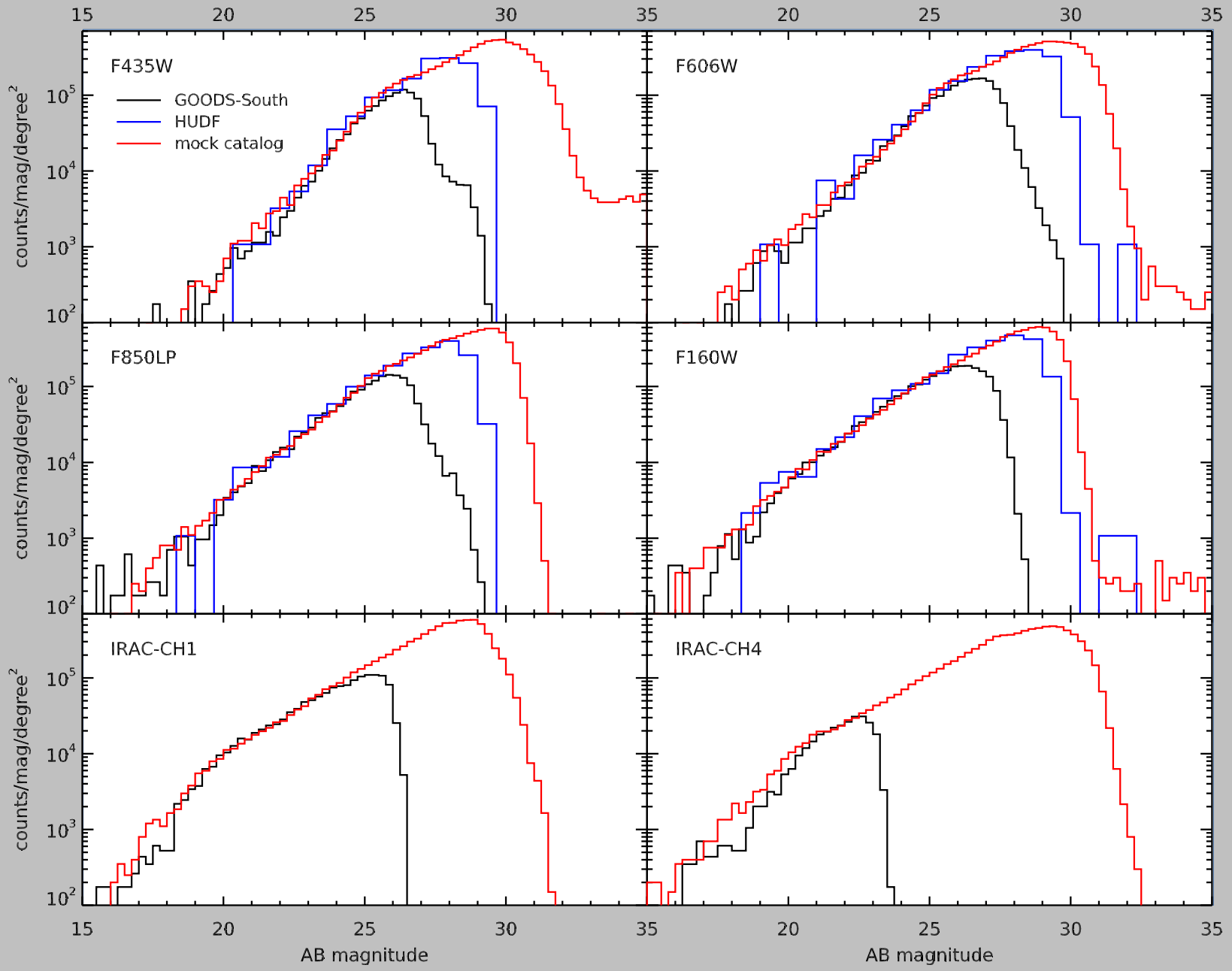


UVJ quiescent:
bulge & disk on the red cloud

UVJ star-forming:
disk on blue cloud, bulge red or blue

Resulting number counts from B to IRAC

compared to GOODS-South & HUDF



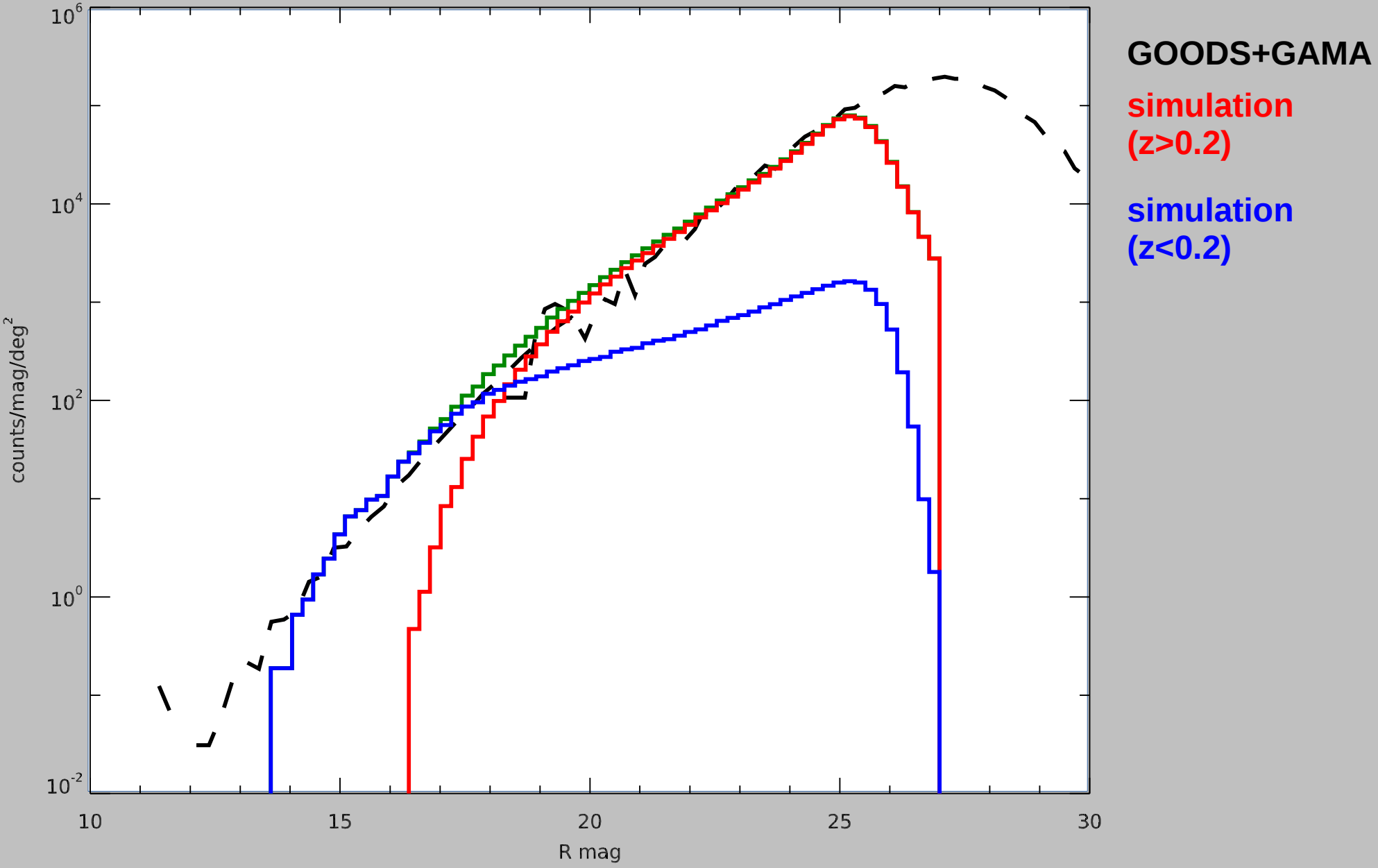
GOODS-S

HUDF

simulation

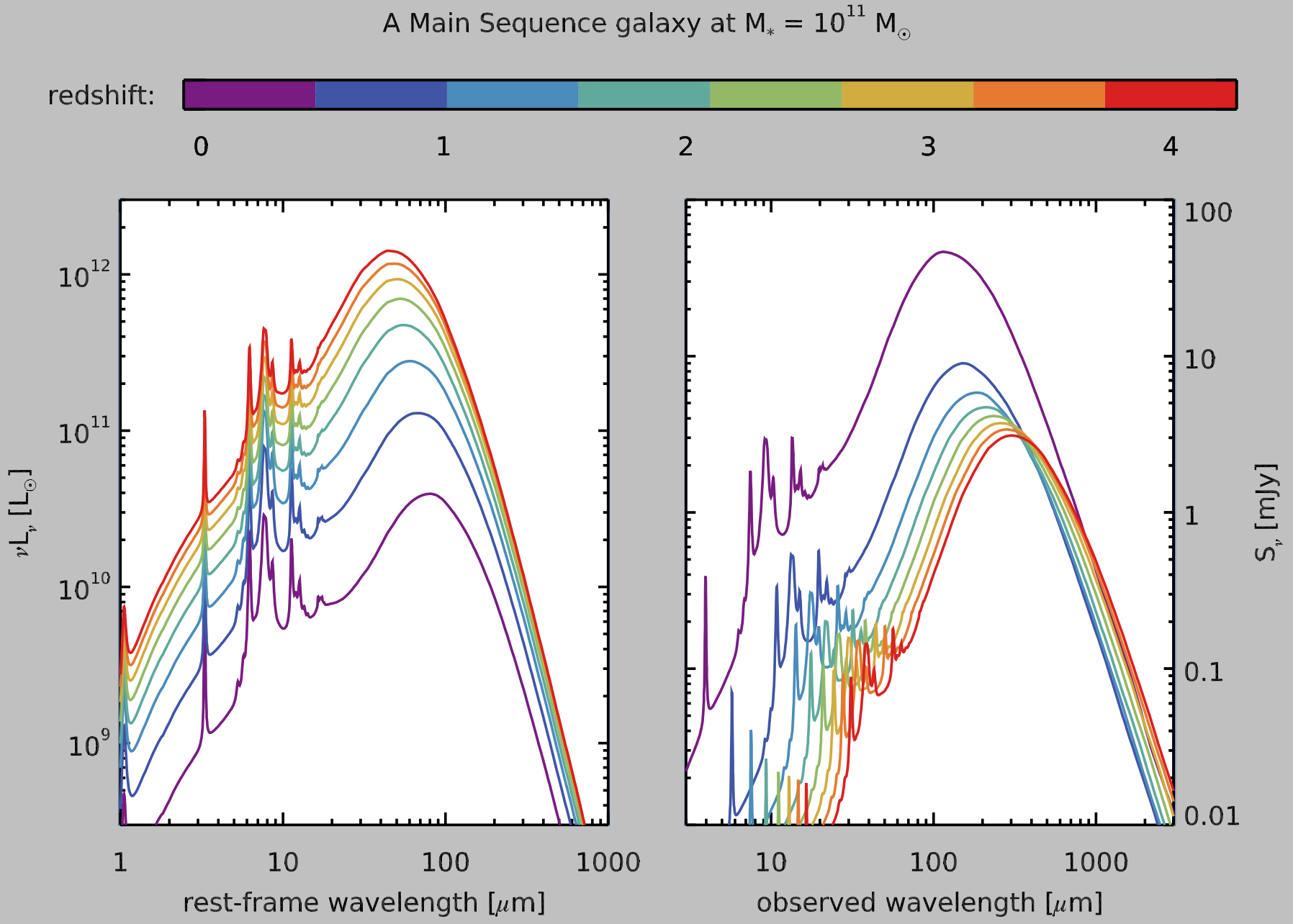
Resulting number counts from B to IRAC

compared to GOODS-South (faint end) + GAMA/SDSS (bright end)

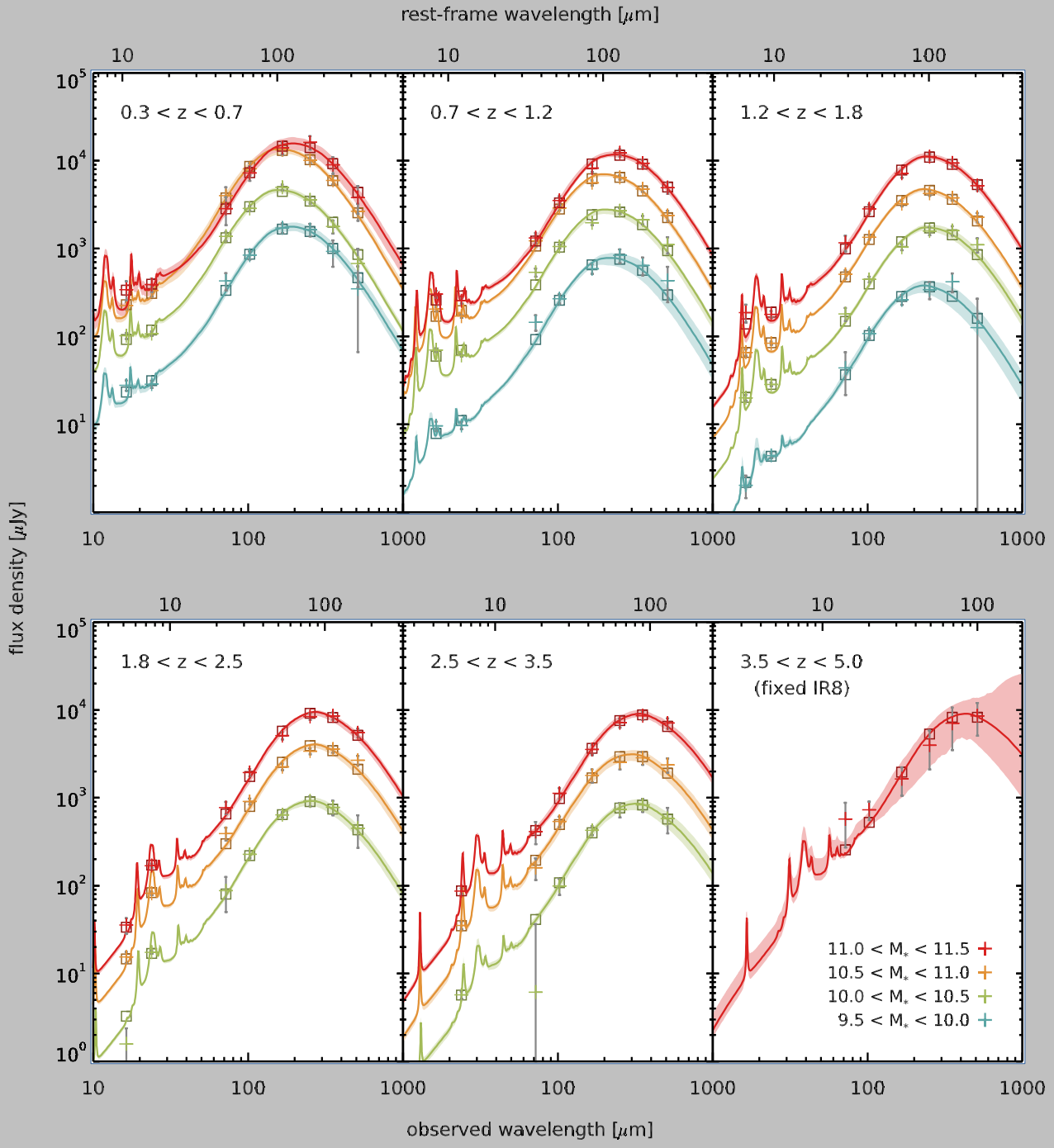


Plugging dust emission

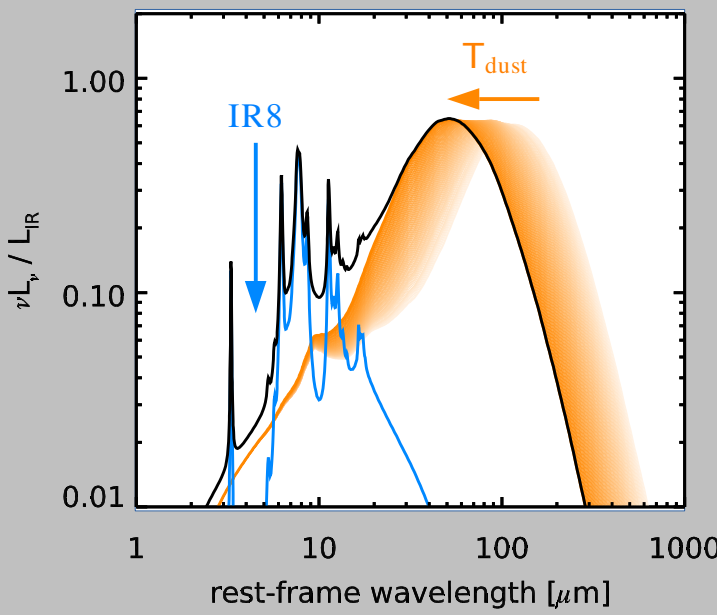
using stacks of Herschel & Spitzer images in CANDELS (Schreiber + 2015)



A new model to interpret the IR photometry



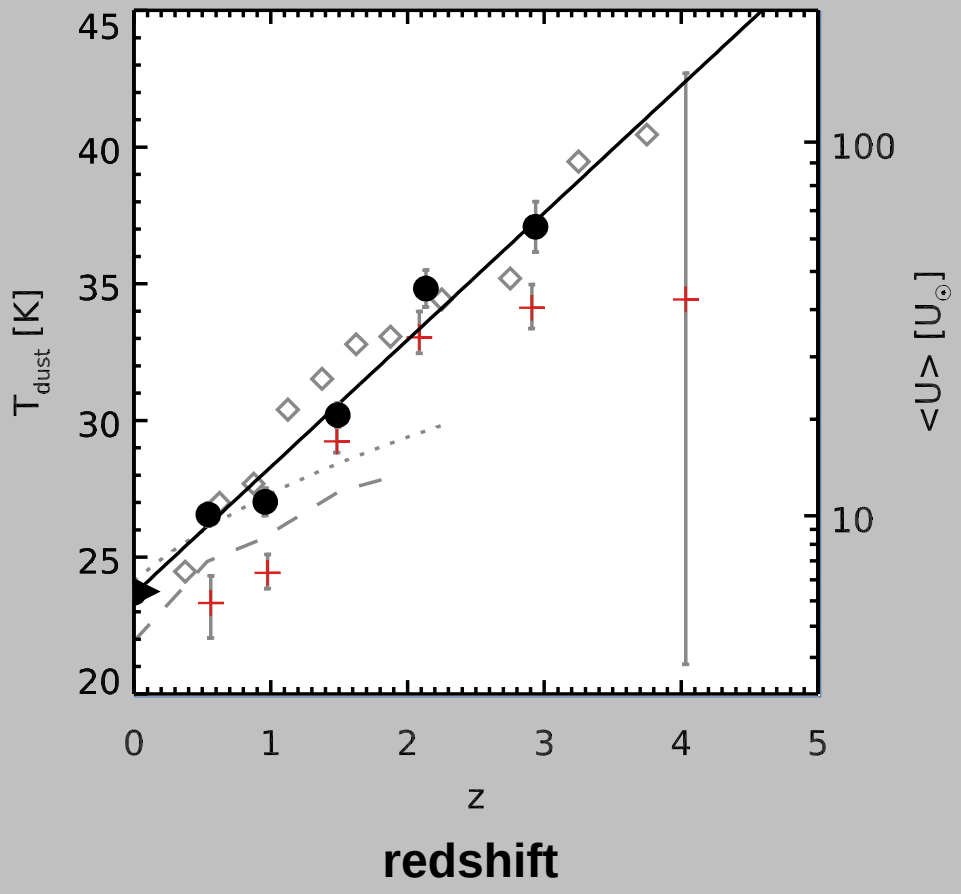
varying Tdust and IR8 = LIR/L8



Calibrate evolution of Tdust and IR8 with redshift

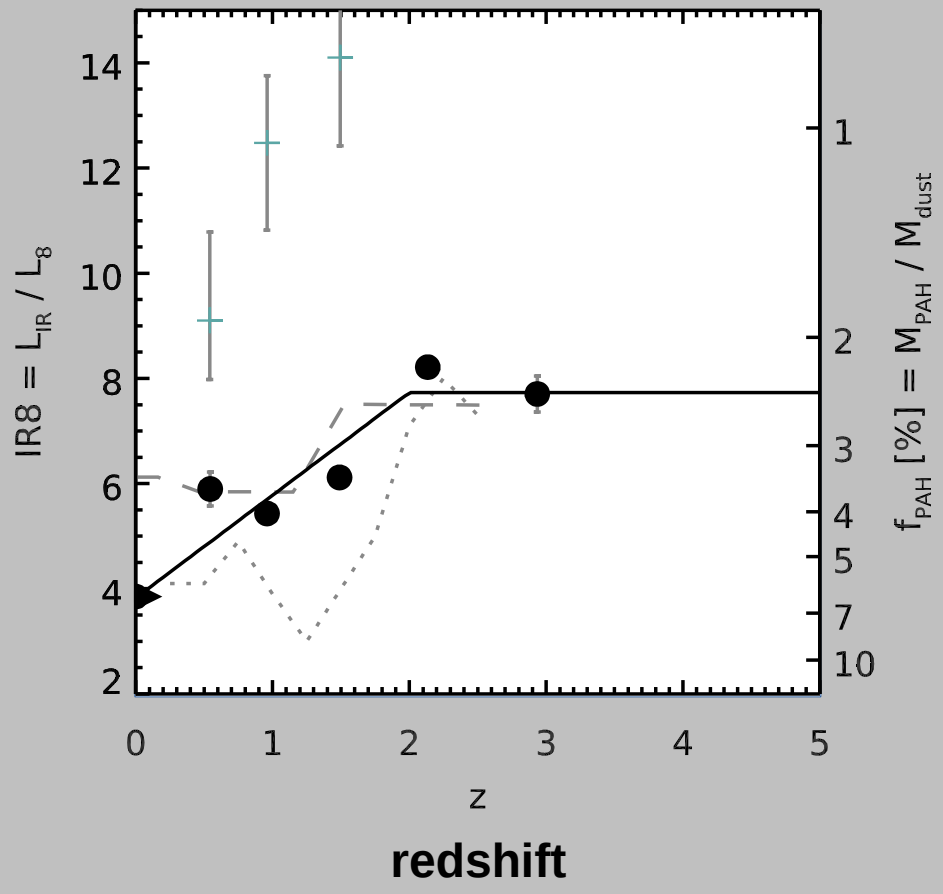
using stacks of Herschel & Spitzer images in CANDELS (Schreiber + 2015)

dust temperature:



redshift

IR8 = LIR/L8:

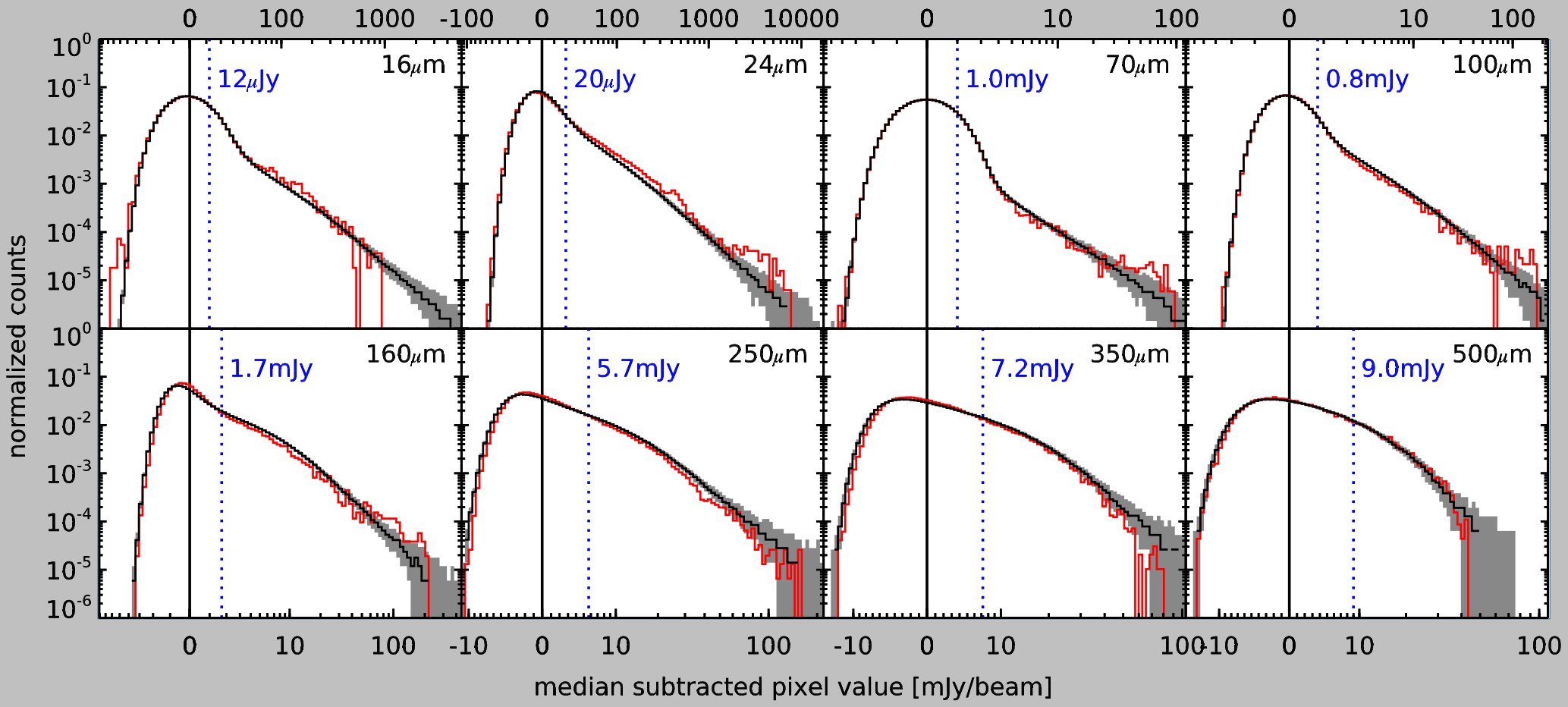


redshift

→ plus additional variation depending on position wrt. MS

Resulting pixel distributions

takes into account number counts + blending & clustering

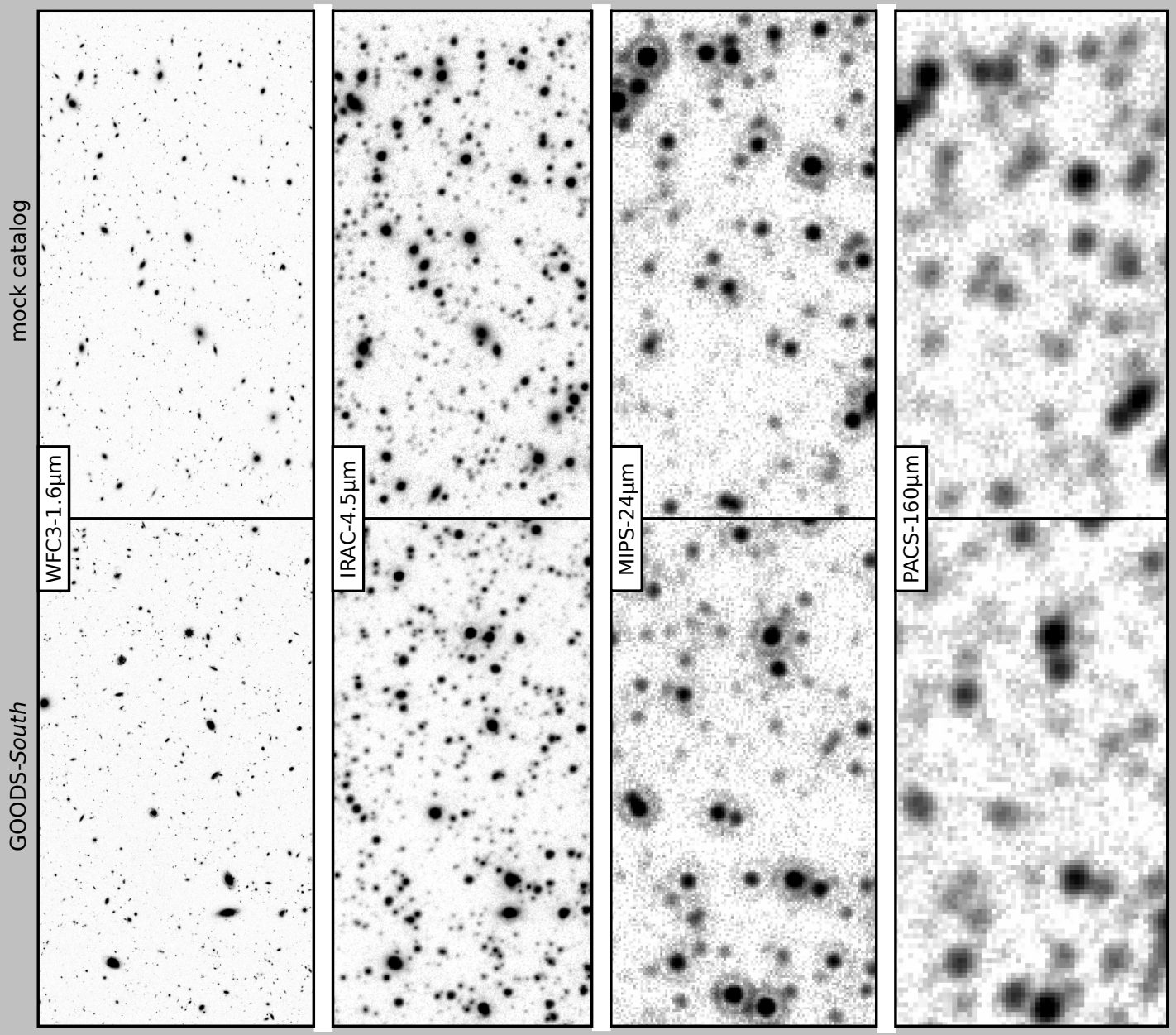


GOODS-S

simulation

A global overview of the simulated images

a simulated GOODS South field



What can you do with these simulations?

From images:
test source extraction codes.

From extracted catalogs:
test photo-z codes, search and quantify systematics, etc...

Can be tuned to your needs

You can choose:
- the position of the field on the sky
- the area of the field (must be a square)
- the depth to reach (either in terms of flux or stellar mass)
- the photometric bands for the simulated fluxes

For advanced usage:
- disable stellar or dust SED component
- input your own redshift, masses, positions and SF/quiescent classification
- output the full (high resolution) SED for each galaxy

NAME

gencat - generate a formatted message catalog

gencat

SYNOPSIS

[XSI] ⌦ gencat *catfile msgfile...* ⌫

DESCRIPTION

The *gencat* utility shall merge the message text source file *msgfile* into a formatted message catalog *catfile*. The file *catfile* shall be created if it does not already exist. If *catfile* does exist, its messages shall be included in the new *catfile*. If set and message numbers collide, the new message text defined in *msgfile* shall replace the old message text currently contained in *catfile*.

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Evaporating gaseous globule

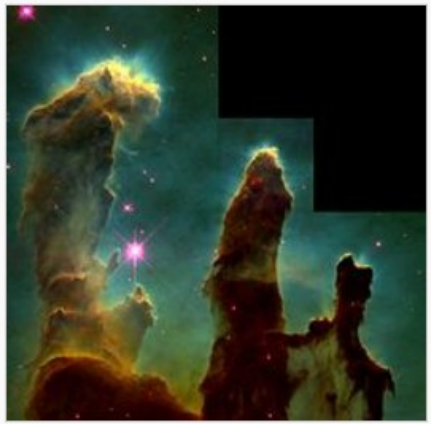
EGG

From Wikipedia, the free encyclopedia

An **evaporating gas globule** or **EGG** is a region of hydrogen gas in outer space approximately 100 astronomical units in size, such that gases shaded by it are shielded from ionizing UV rays.[2] Dense areas of gas shielded by an evaporating gas globule can be conducive to the birth of stars.[2] Evaporating gas globules were first conclusively identified via photographs taken by the Hubble Space Telescope in 1995.[2]

EGG's are the likely predecessors of new protostars. Inside an EGG the gas and dust are denser than in the surrounding dust cloud. Gravity pulls the cloud even more tightly together as the EGG continues to draw in material from its surroundings. As the cloud density builds up the globule becomes hotter under the weight of the outer layers, a protostar is formed inside the EGG.

A protostar may have too little mass to become a star. If so it becomes a brown dwarf. If the protostar has sufficient mass, the density reaches a critical level where the temperature exceeds 10 million kelvin at its center. At this point, a nuclear reaction starts converting hydrogen to helium and releasing large amounts of energy. The protostar then becomes a star and joins the main sequence on the HR diagram.[3]



The "Pillars of Creation", in the Eagle Nebula contain EGGs, leading to the formation of incubating stars.[1]

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MUG



Evaporating gaseous globule

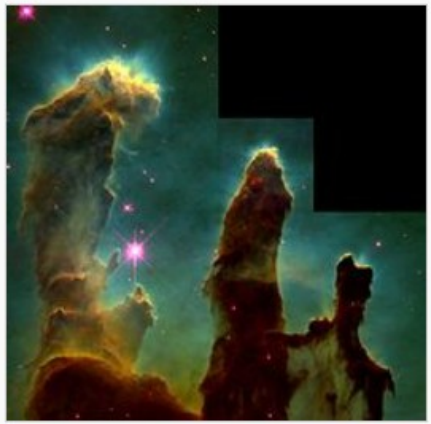
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