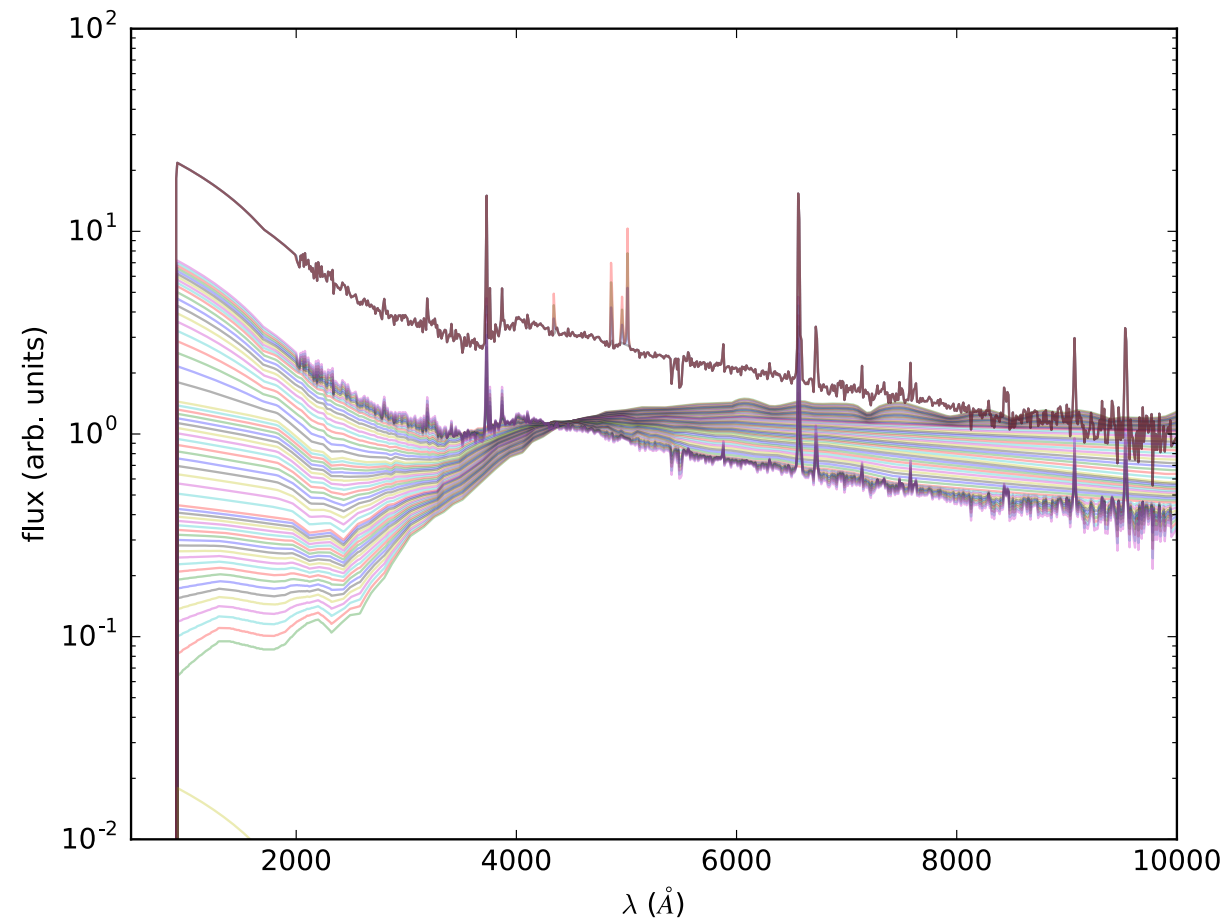


Testing template libraries with CFHTLS for photo-z reconstruction

Cécile Roucelle, APC

« CWW » library for CFHTLS



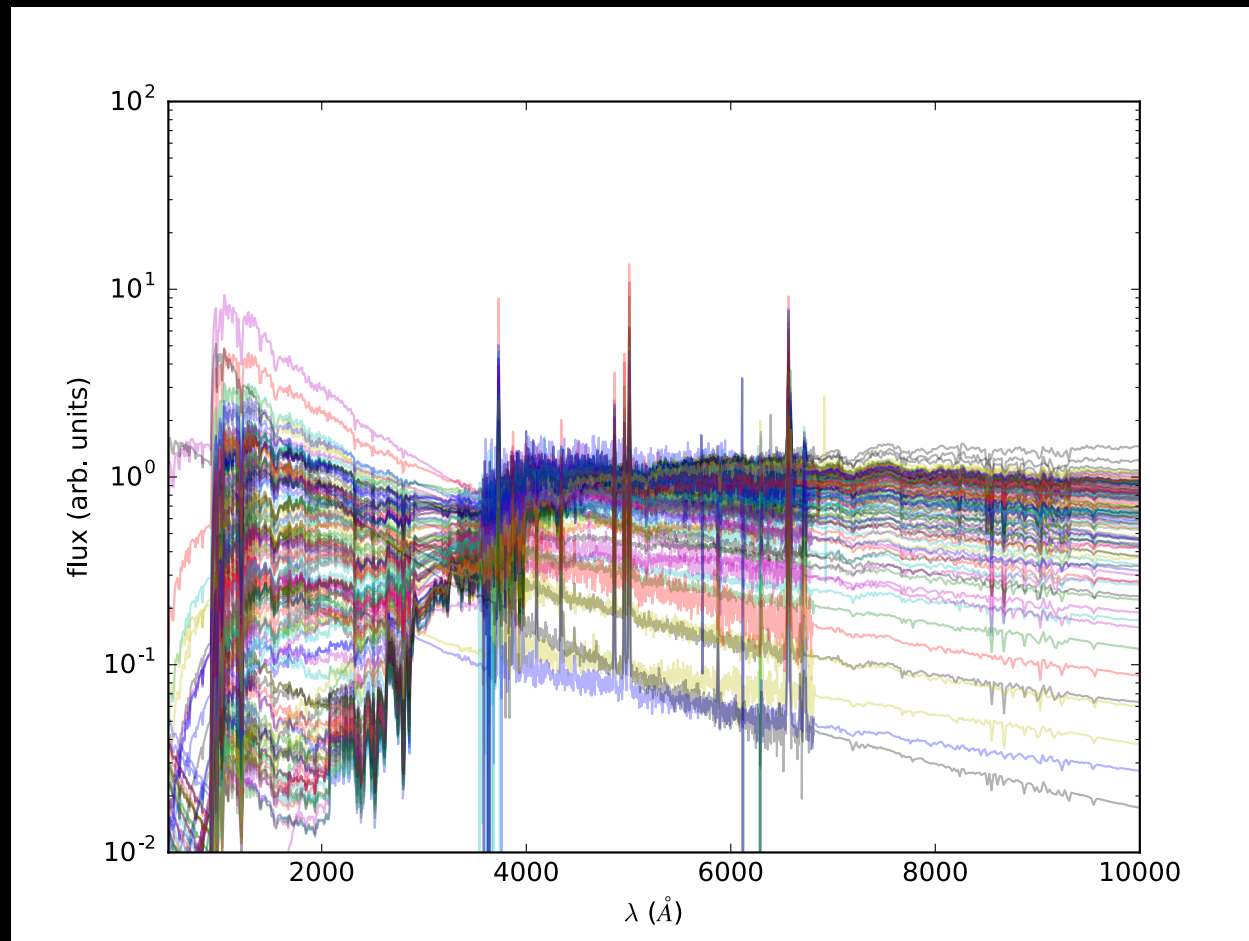
66 spectra interpolated
from Coleman, Wu & Weedman
(1980) + Kinney (1996)

extended in IR with Bruzual &
Charlot stellar models

Widely used

Elliptical, sb, Im

Brown library

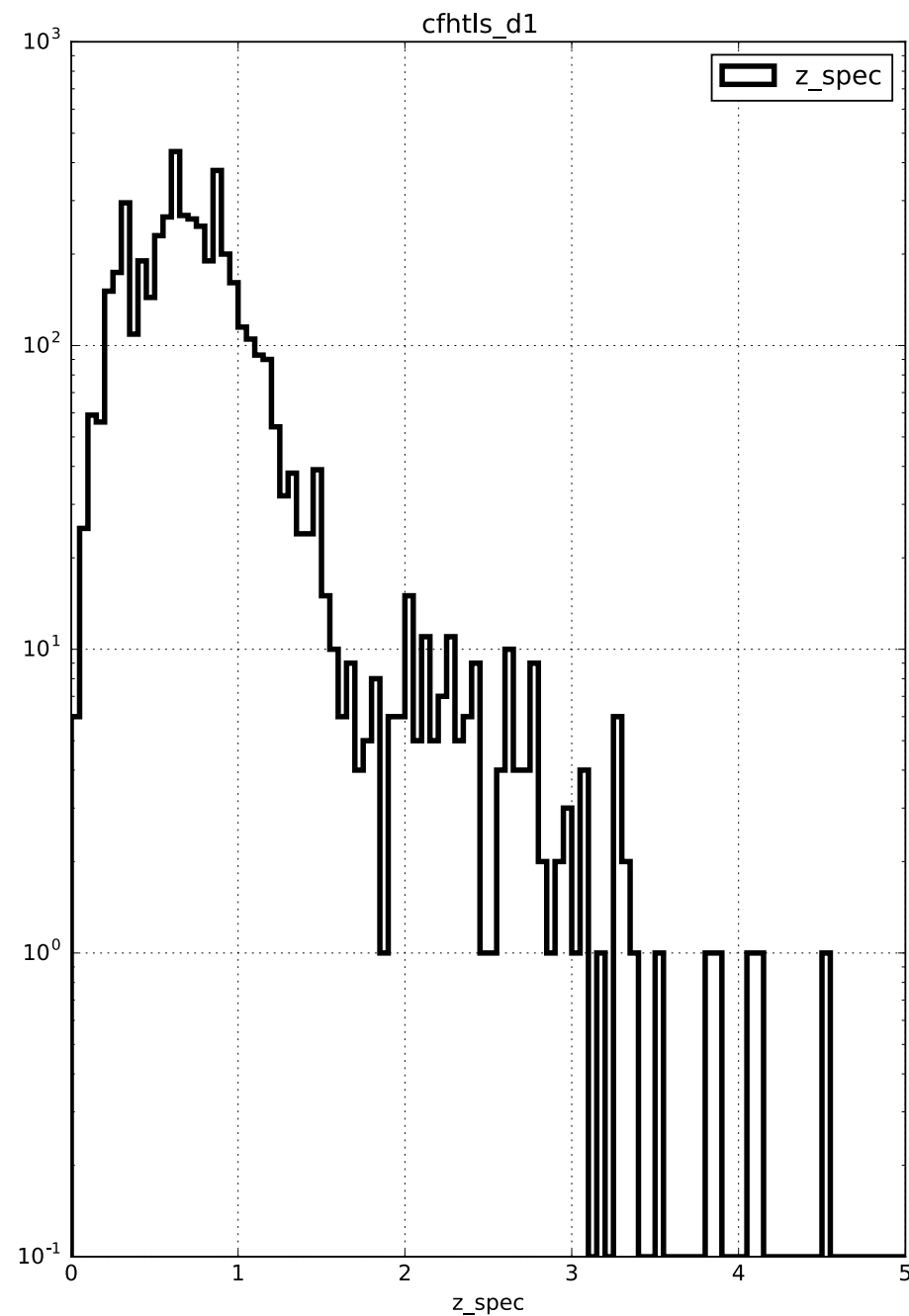


129 spectra of nearby galaxies
($z < 0.05$)
spectrophotometry + Akari -
Spitzer (spectro IR)

wide variety of galaxies :
ellipticals, spirals, merging
galaxies, blue compact dwarfs,
luminous infrared galaxies

Combining both libraries can lead to better reconstruction (better color color space mapping) but also gives different degeneracies

Tests on CFHTLS data deep I



4663 galaxies

CFHTLS – DI

U, G, R, I, Z

DEEP + Ultra DEEP field

$17.5 < \text{Magnitude } I_{AB} < 24.5$

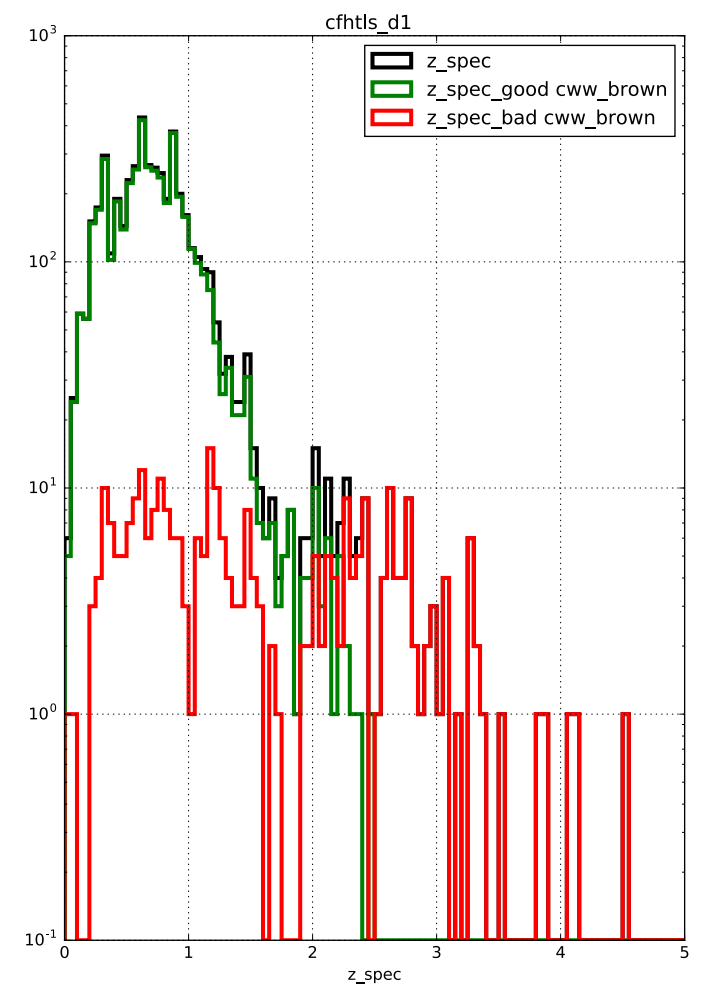
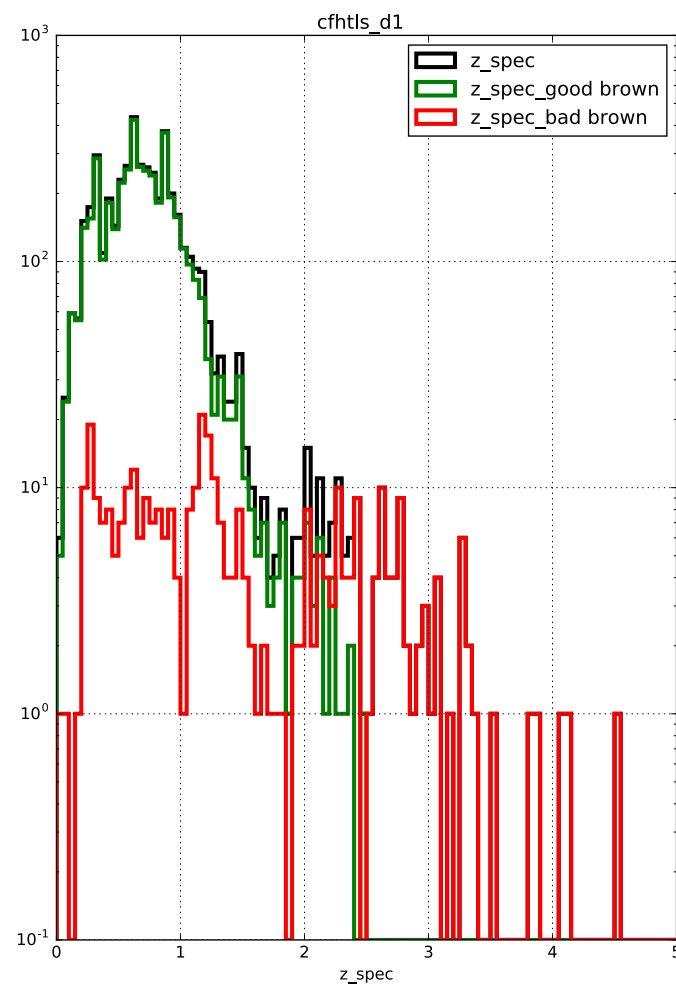
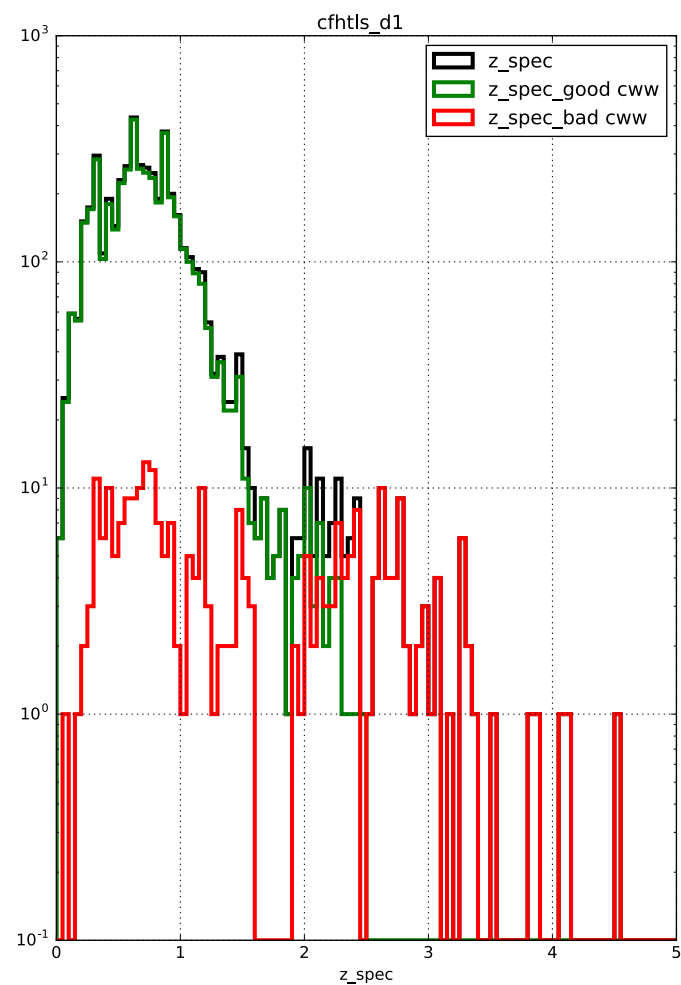
$0 < z < 6$

VVDS spectro data

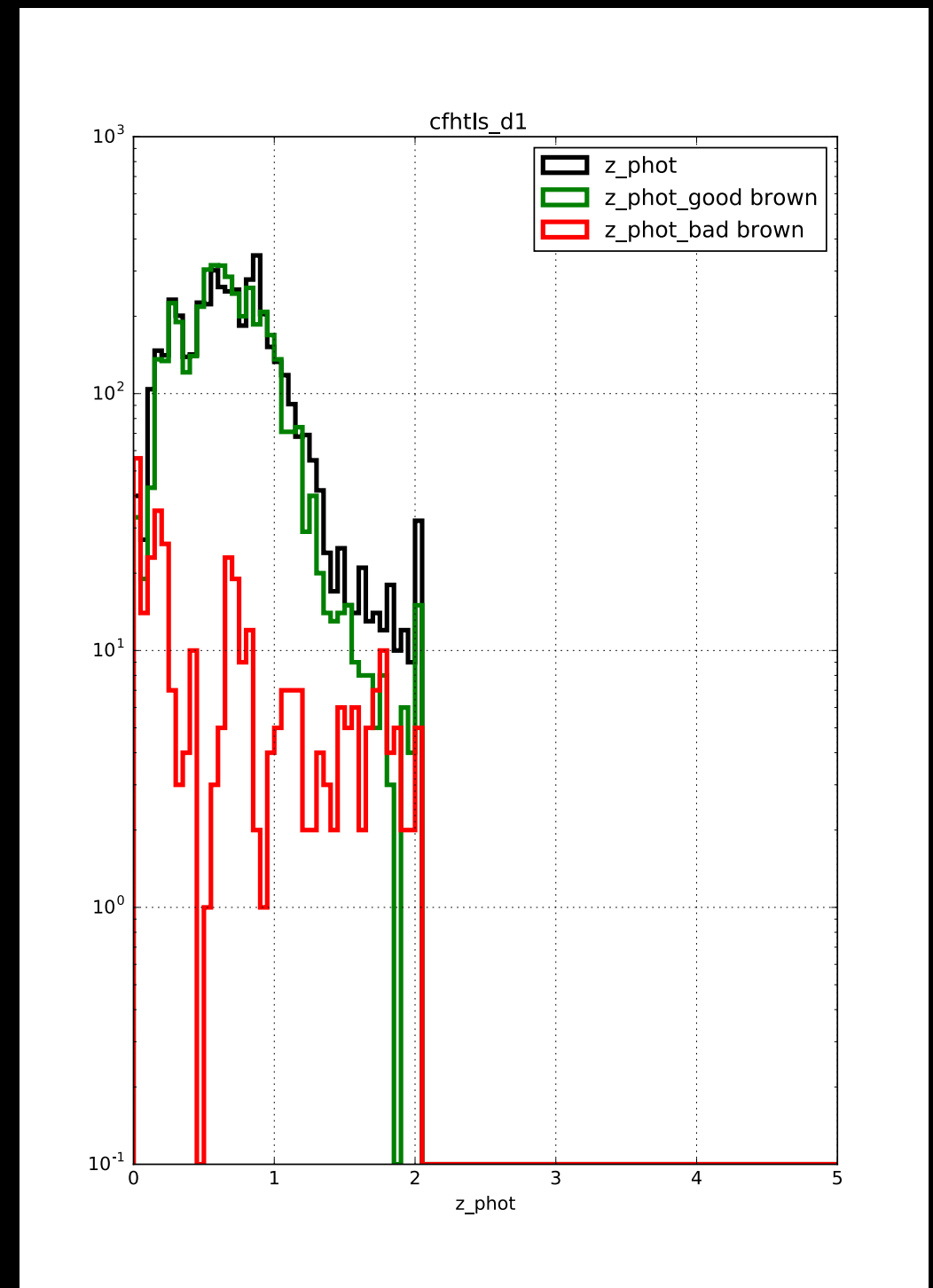
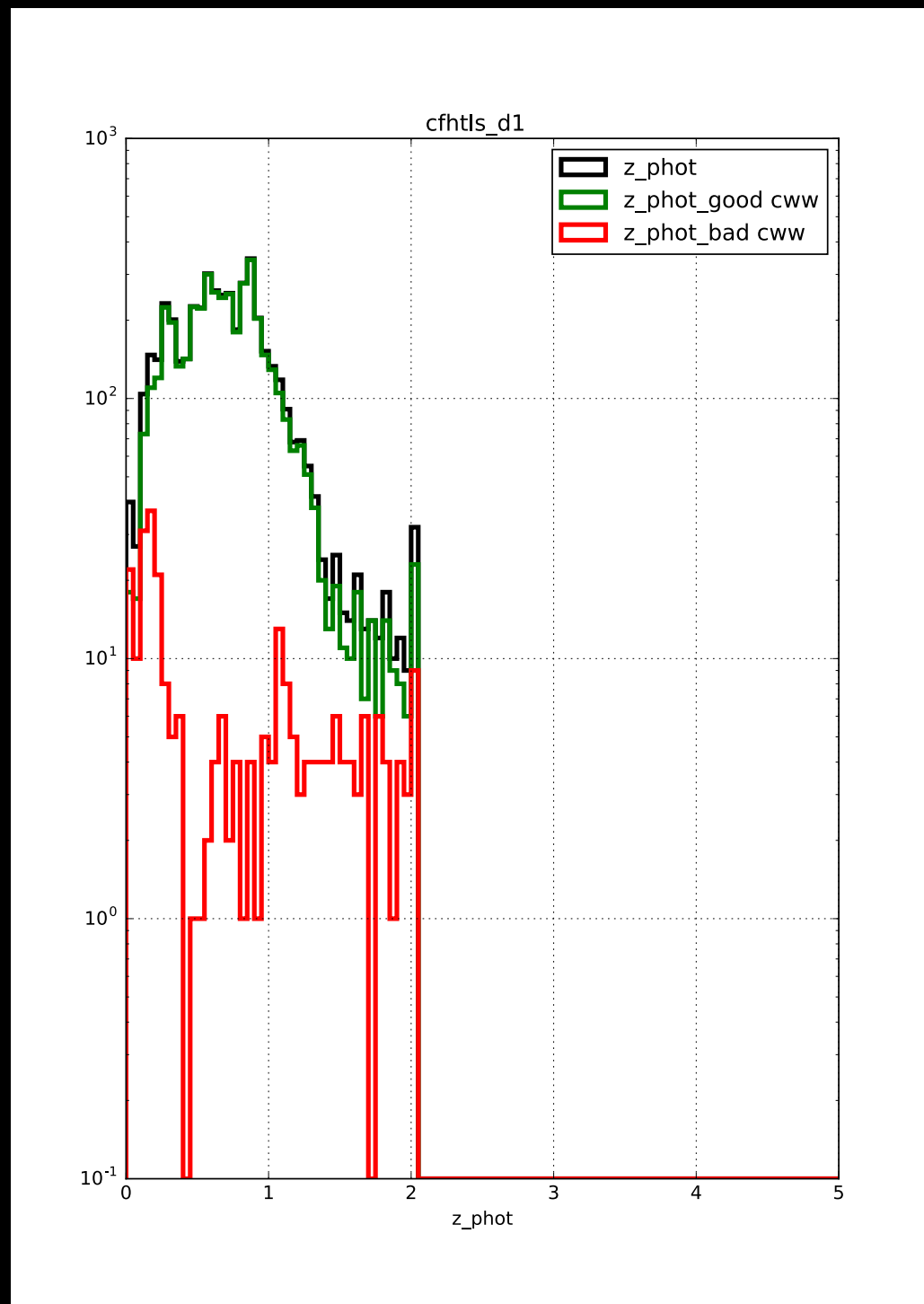
$(3 < \text{redshift quality flag} < 4)$

Reconstruction with combined libraries

$(z_s - z_p) \times 1/(1 + z_s) > 0.15 = \text{bad reconstruction}$

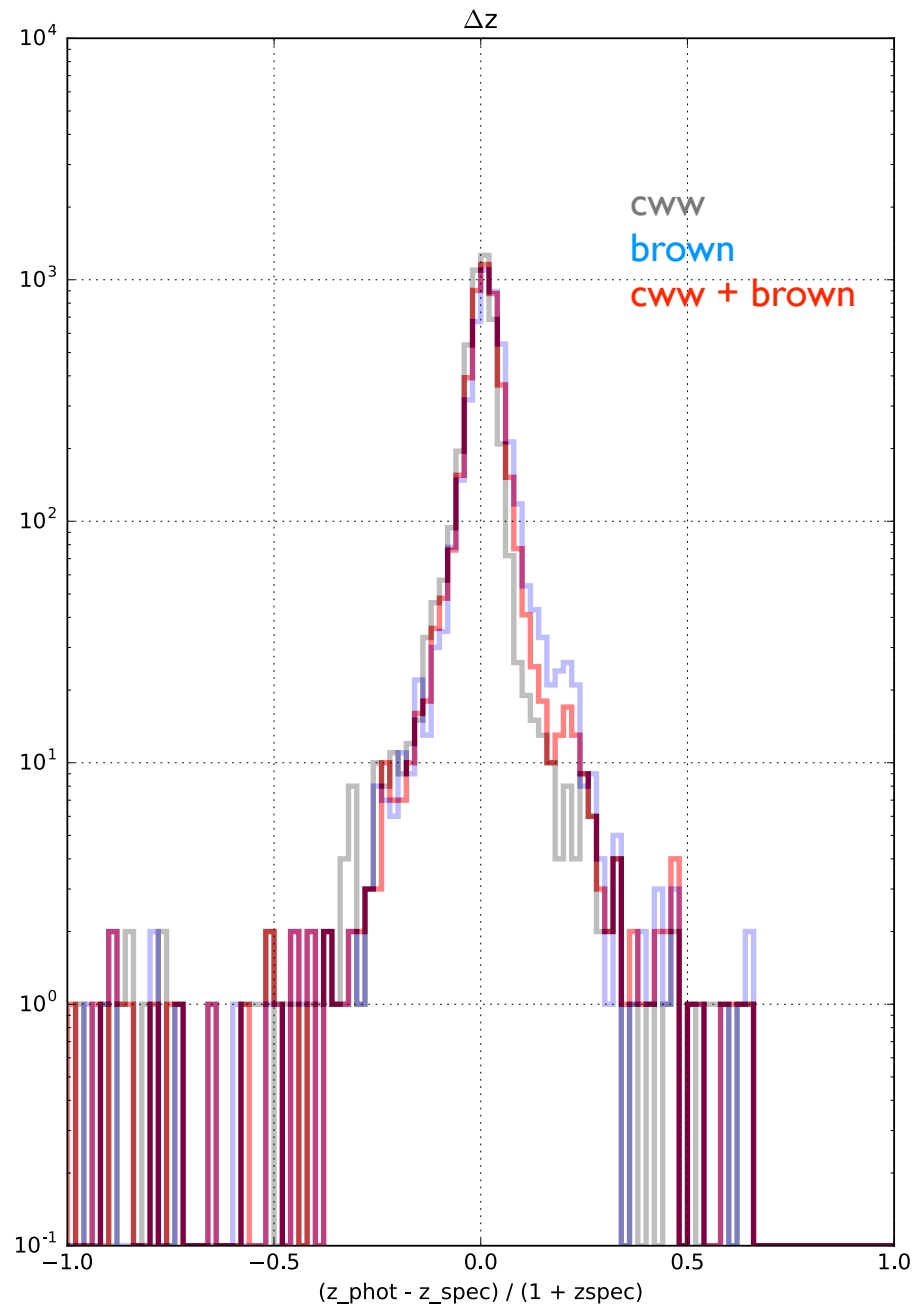


Reconstruction pb for $z > 2$ (initial LePhare configuration)



Temporary cut for $z_{\text{spec}} < 2$ Keeping 4527 galaxies

Reconstruction with combined libraries



Brown slightly more biased

Comparable fraction
of outliers

CWW : 3.71 % - 168 gal.

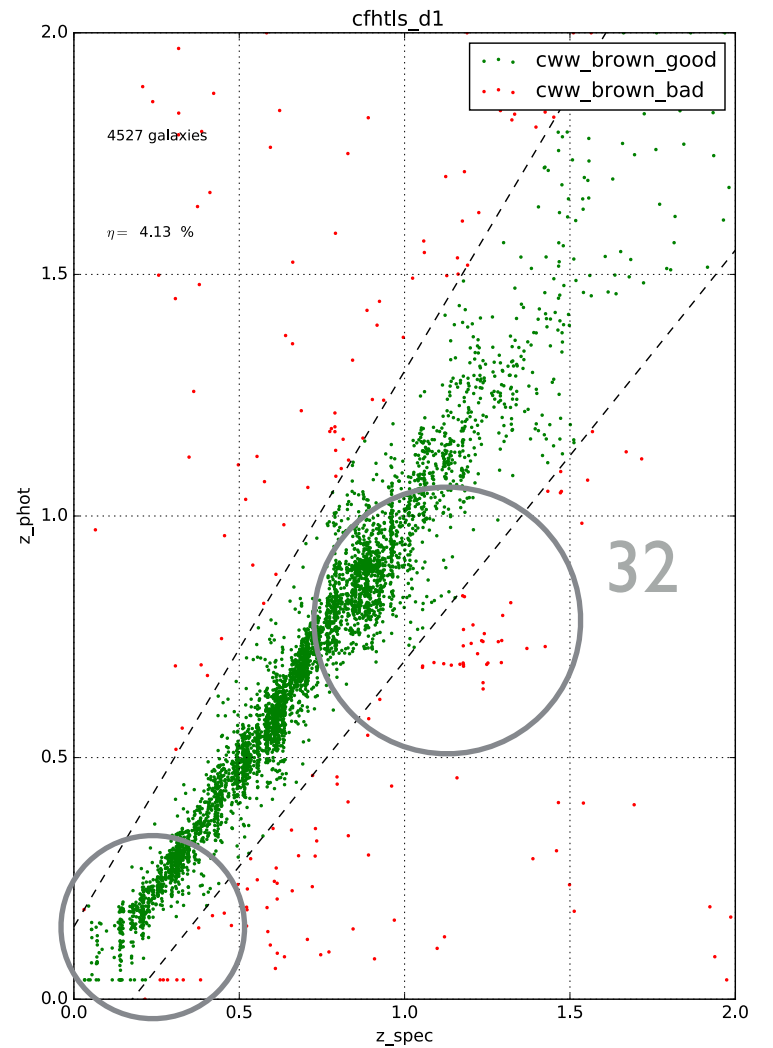
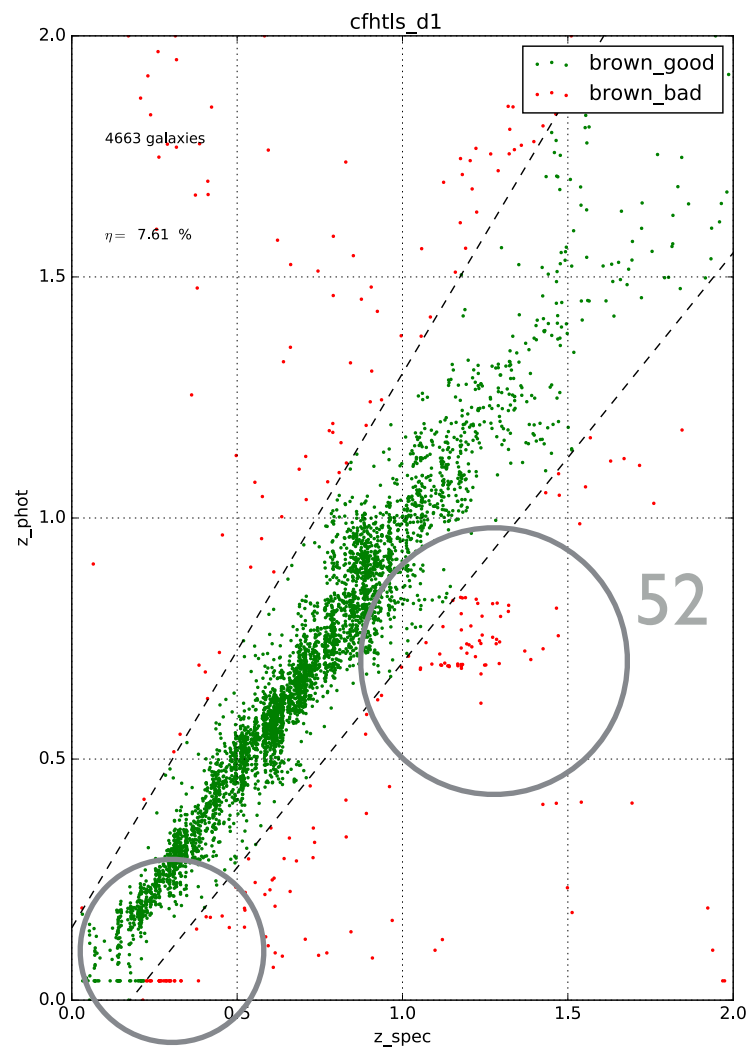
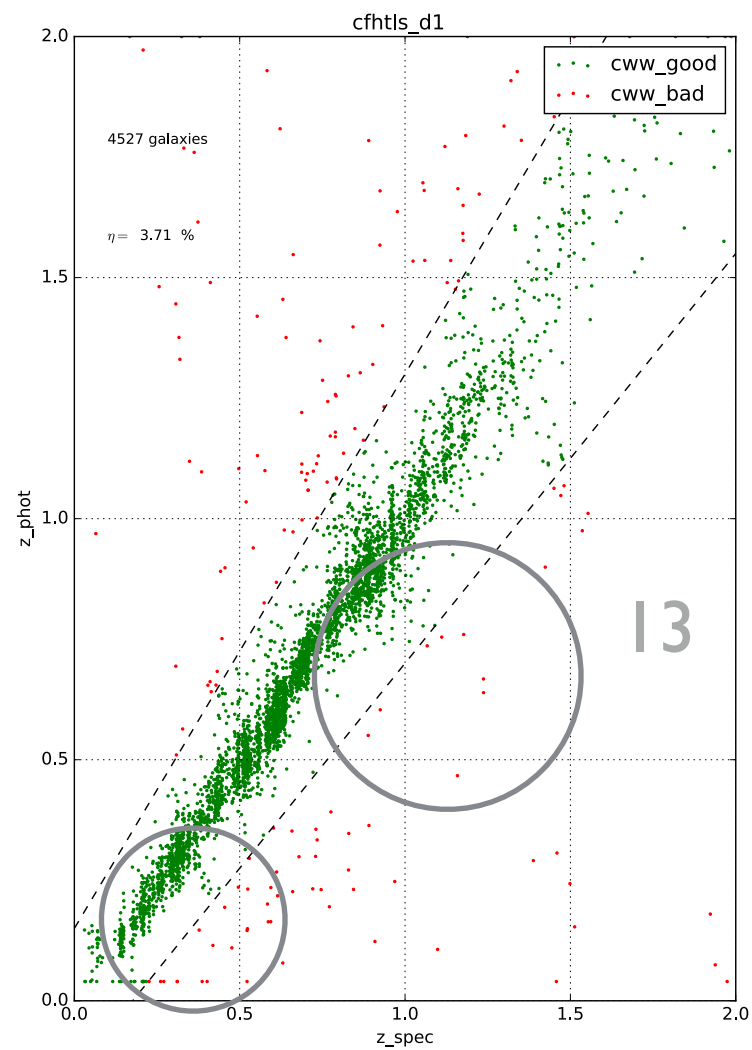
Brown : 5.41 % - 245 gal.

CWW + Brown : 4.13 % - 187 gal

$z_s < 2$ cut only

no a posteriori selection on
reconstruction quality

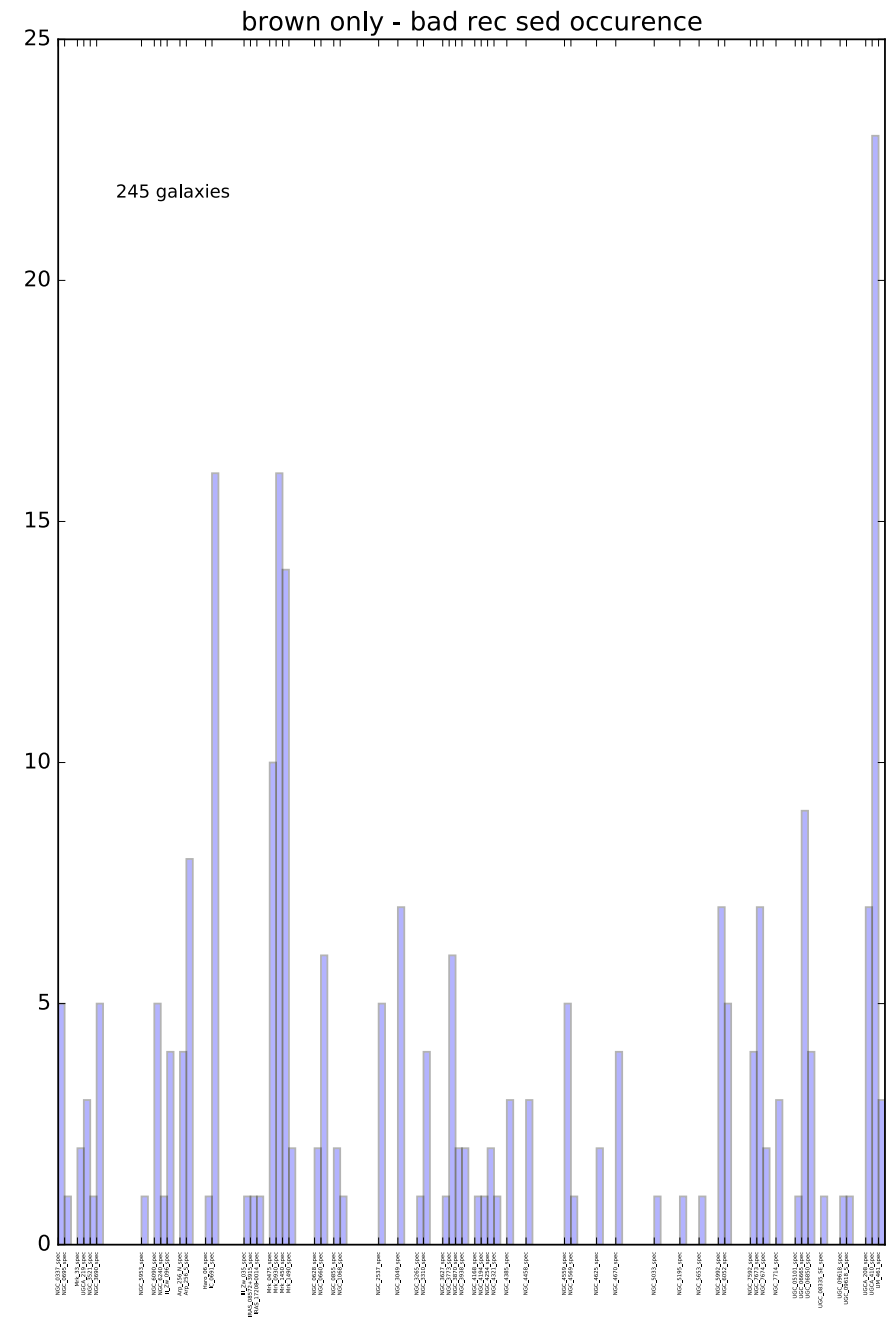
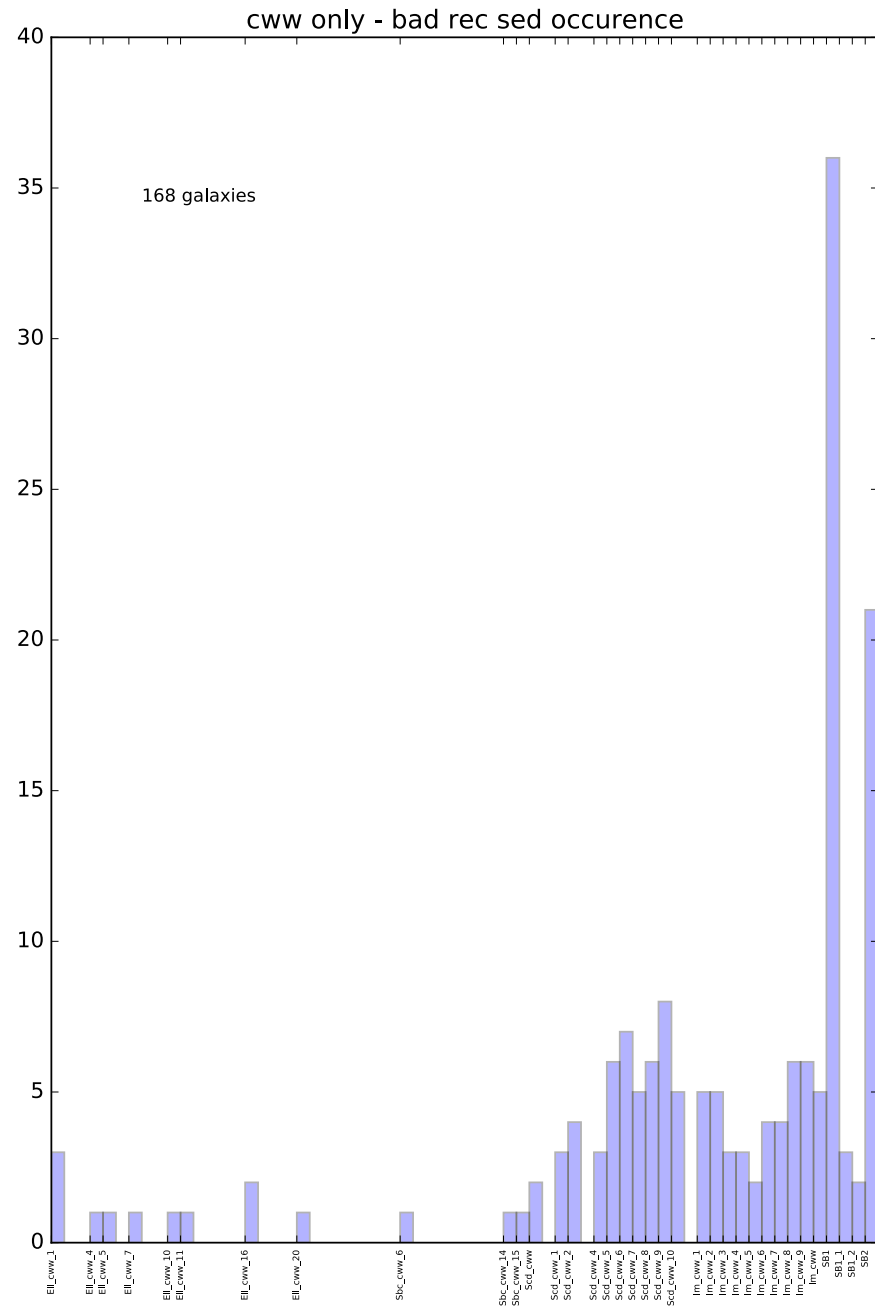
Reconstruction with combined libraries



No drastic reduction of outliers by cww addition

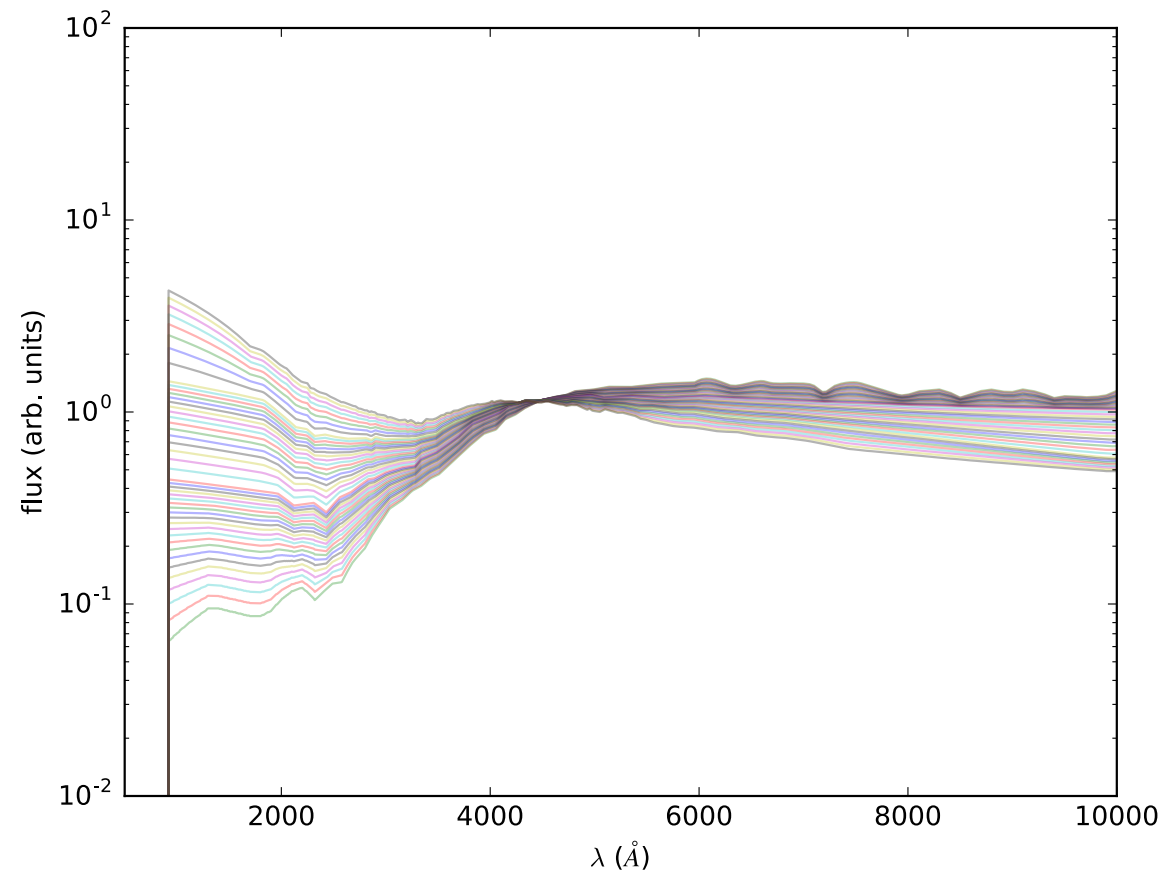
Individual study shows some recoveries and modification of errors

Occurrence of SEDs for badly reconstructed zphotos

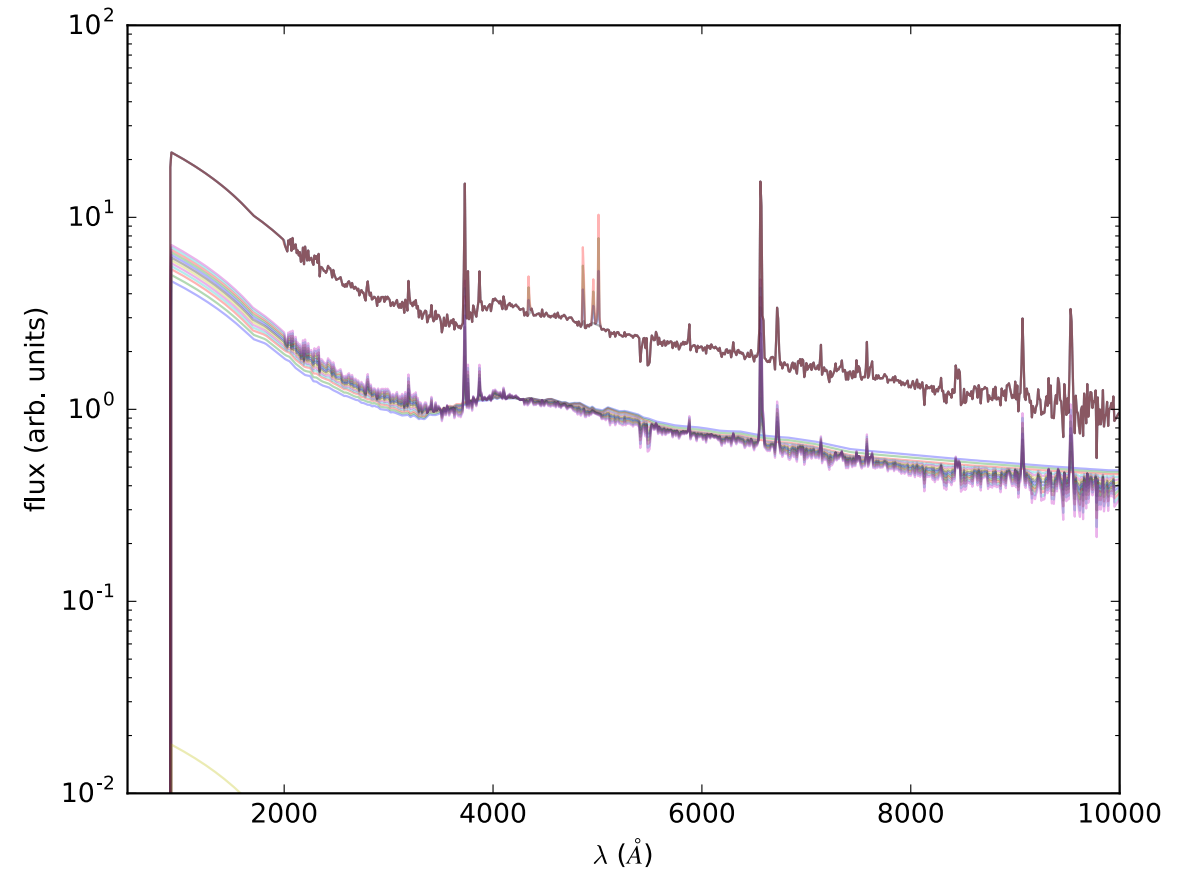


Impact of emission lines

CWW 0-50

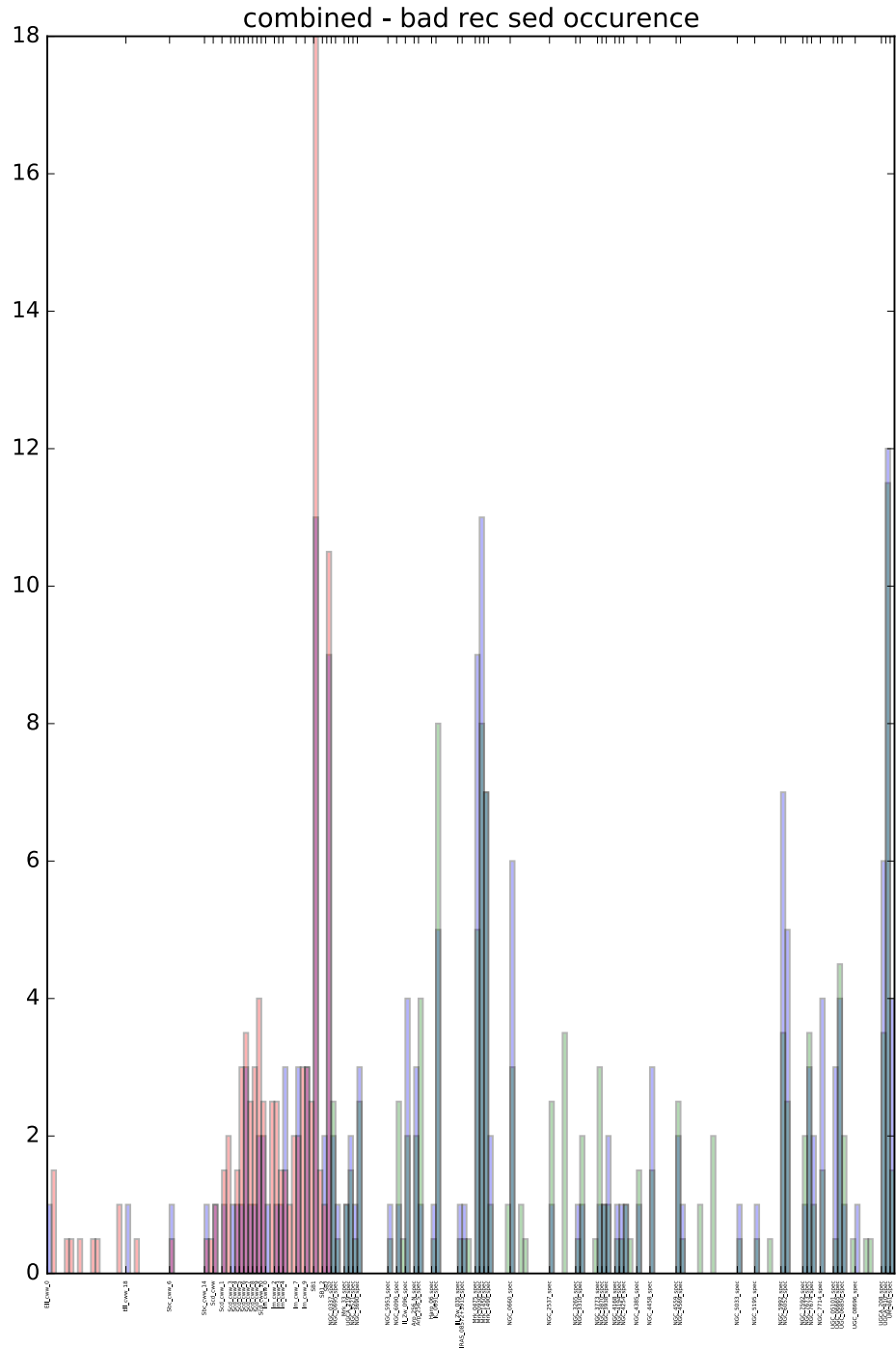


CWW > 50



Emission lines create more degeneracies > worse reconstructions are related to these SED

Occurrence of SEDs for badly reconstructed zphotos

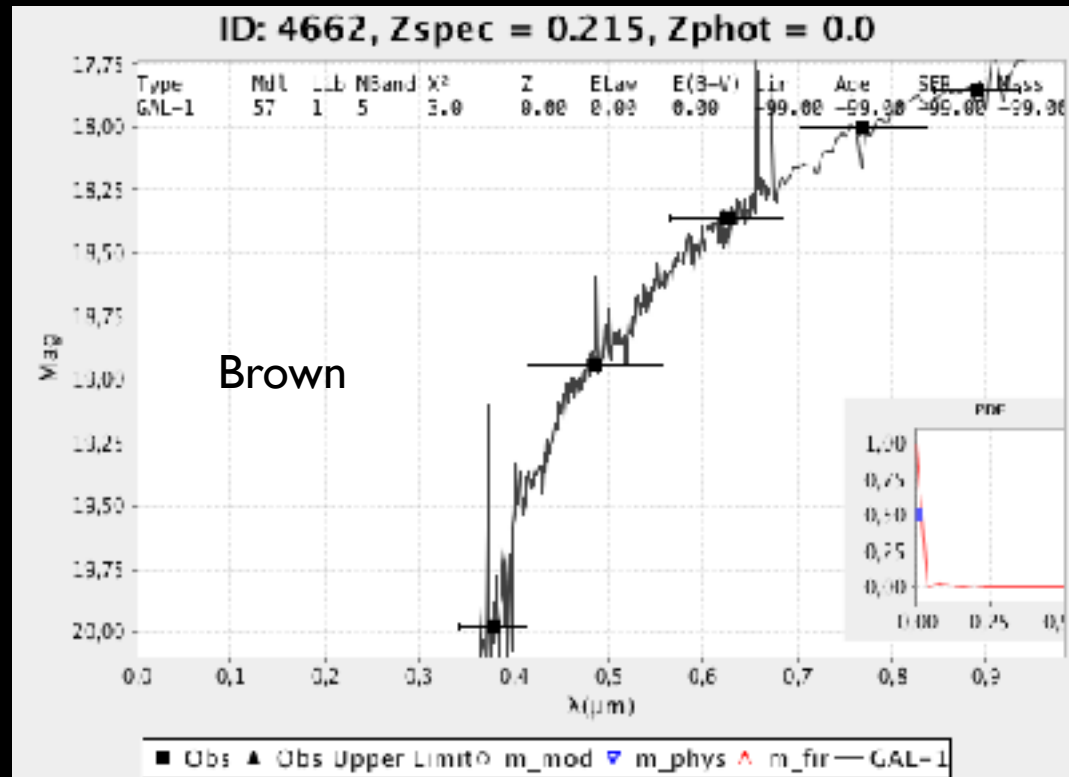


Part of the « bad zphotos » of cww
is reassessed with the addition of
Brown templates.

other degeneracies occur

> global outlier fraction stays similar

Individual spectra : reconstruction artefact ?



Reconstruction

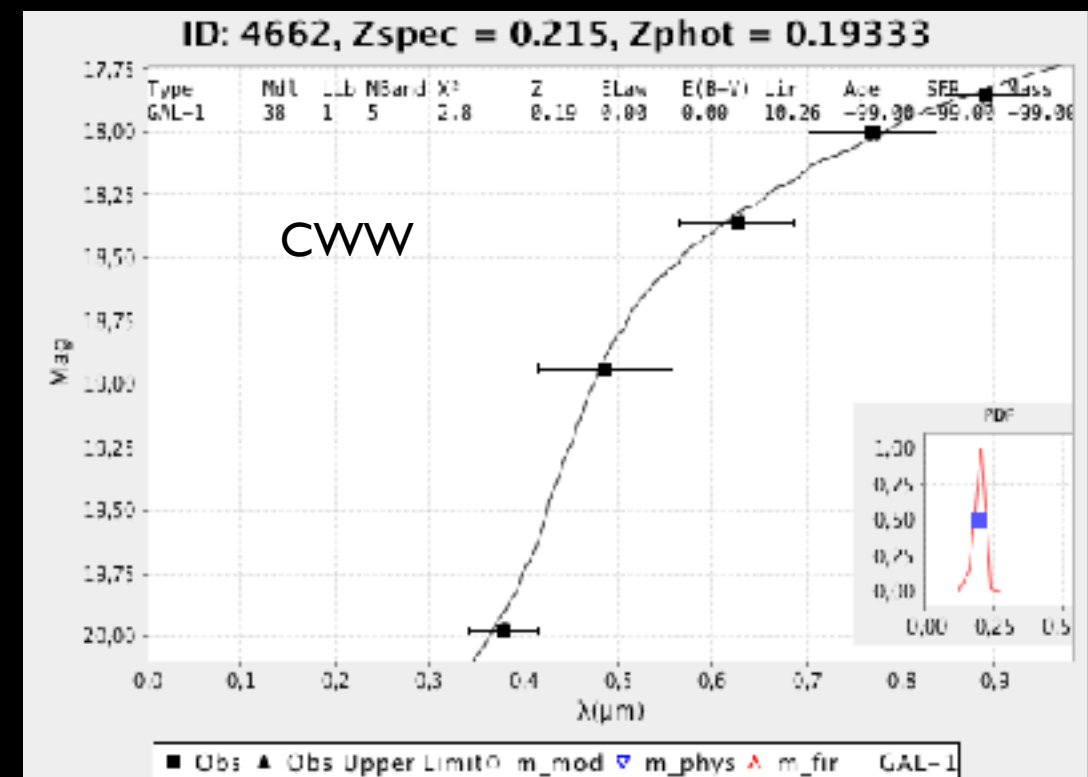
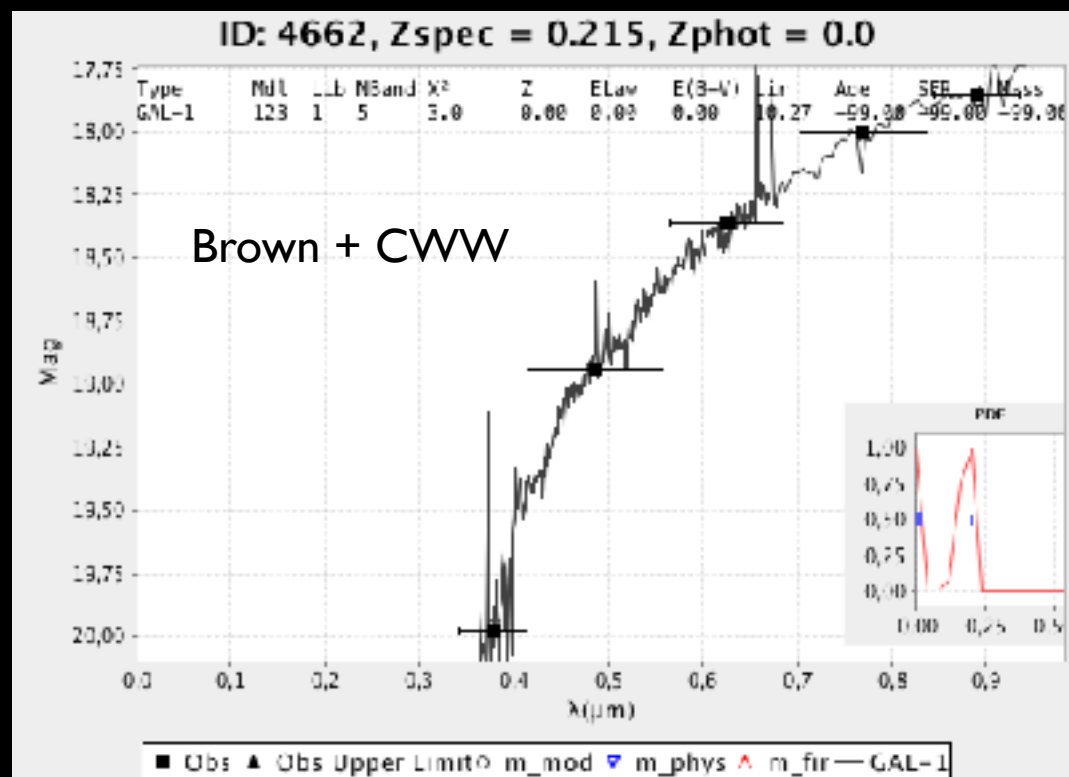
3 zphot = 0

89 zphot = 0.04 for Brown

40 zphot = 0.04 for CWW

48 zphot = 0.04 for CWW + Brown

Pb of LePhare interpolation
on first (and last) zstep ?



Conclusion

- Both cww & Brown have initially good color-color space mapping (careful with the quality of extrapolations)
- Consequence : their combination doesn't bring any major improvement to the reconstruction. Some recoveries are drowned in new degeneracies brought by the combination of SED libs. To explore on larger statistics to get
- Emission lines have a major impact on the difficulties of reconstruction - investigation of their treatment in LePhare ?

En +