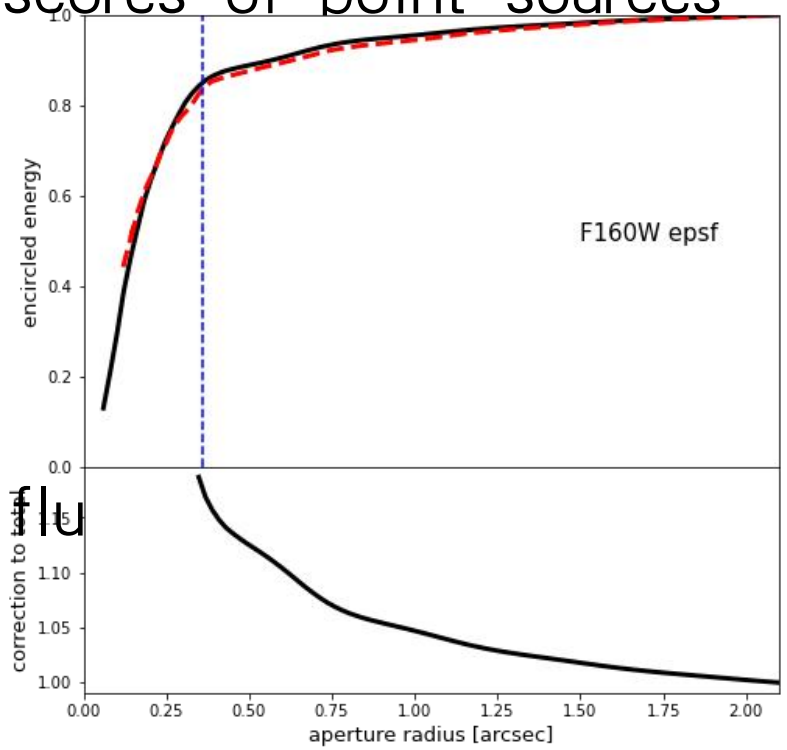
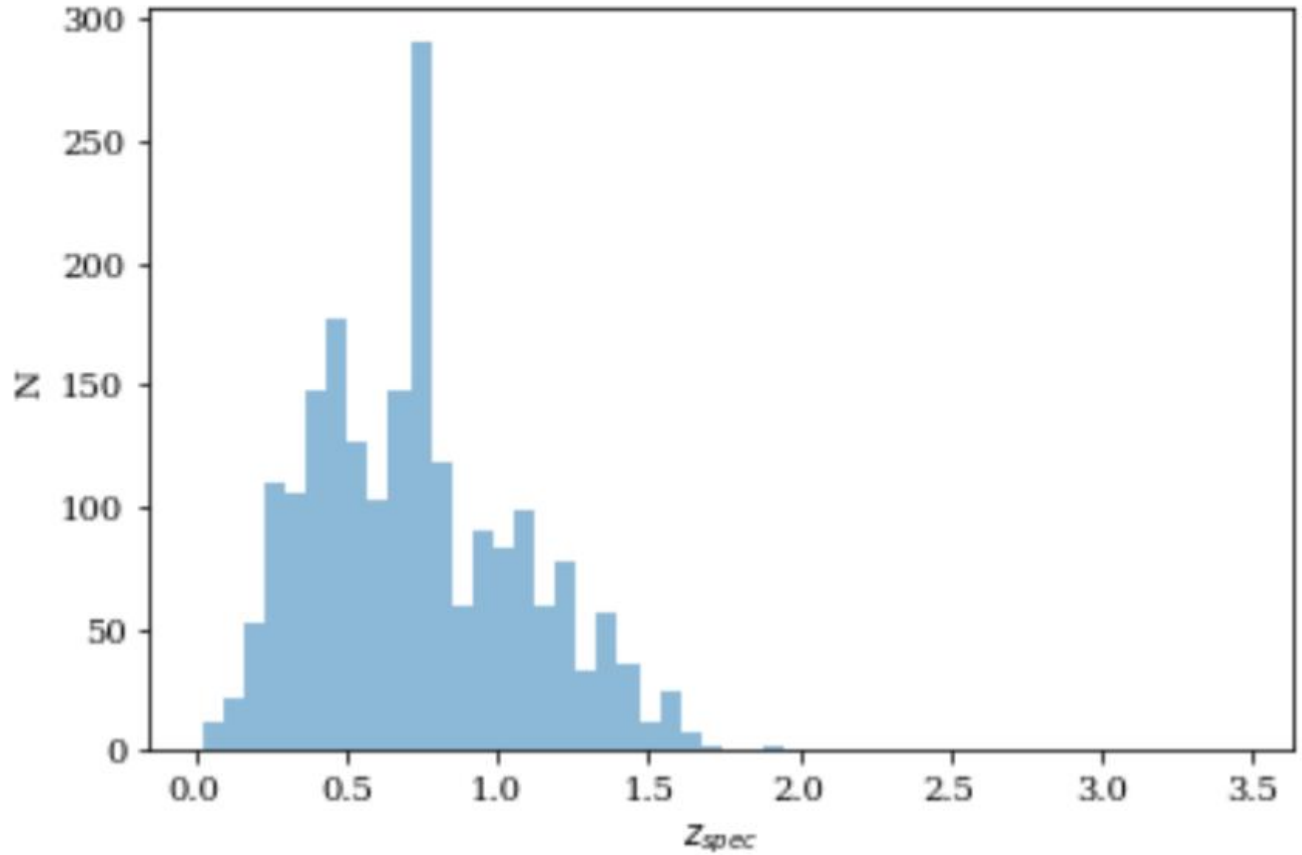
Photo-z comparison

Aperture Flux

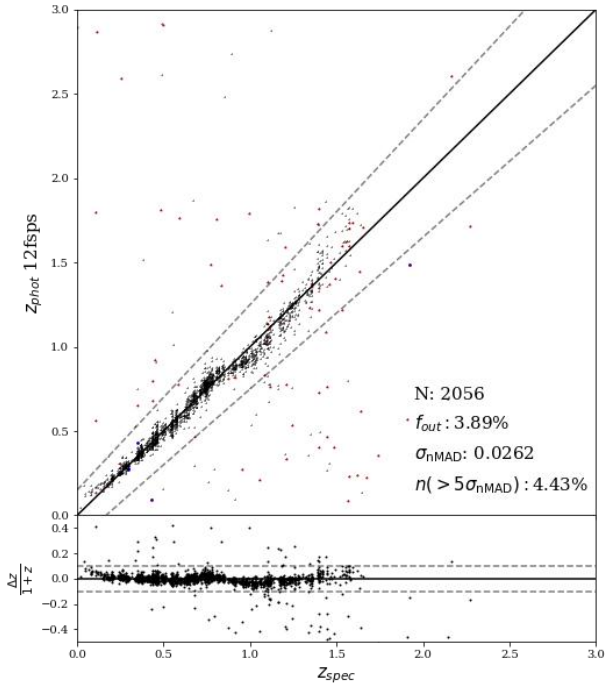
- PSF：constructed by the median value of scores of point sources
- aperture flux：flux in adaptive aperture
  - min_aper：determined by FWHM of PSF
- total flux：aperture flux corrected by PSF
- Flux error：$\sigma = \sqrt{\sigma_{bkg}^2 + \frac{f_{aper}}{gain}}$
- Total flux error：same correction as total flu

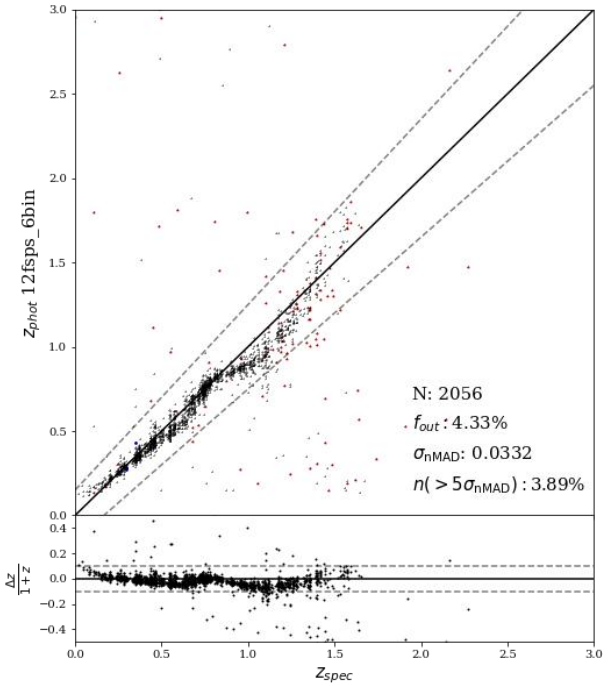


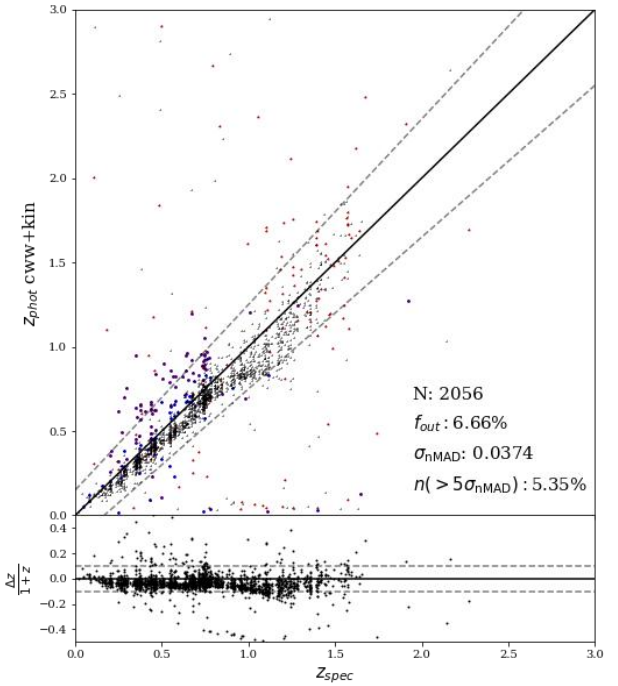
- Outlier fraction: $\left|\frac{z_{phot}-z_{spec}}{1+z_{spec}}\right| > 15\%$
- $\sigma_{nMAD} = median\left(\left|\frac{z_{phot}-z_{spec}}{1+z_{spec}}\right|\right)$

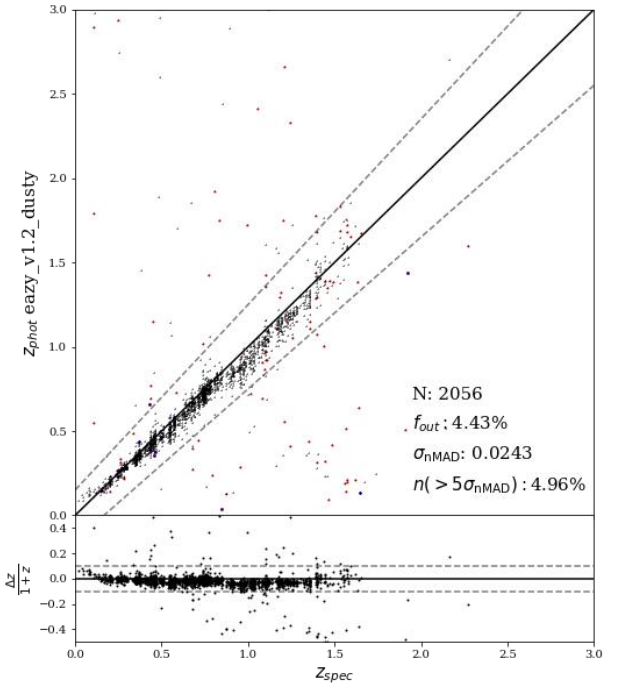

300
250
200
N 150
100
50
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
z_{spec}

Photo−z with aperture flux

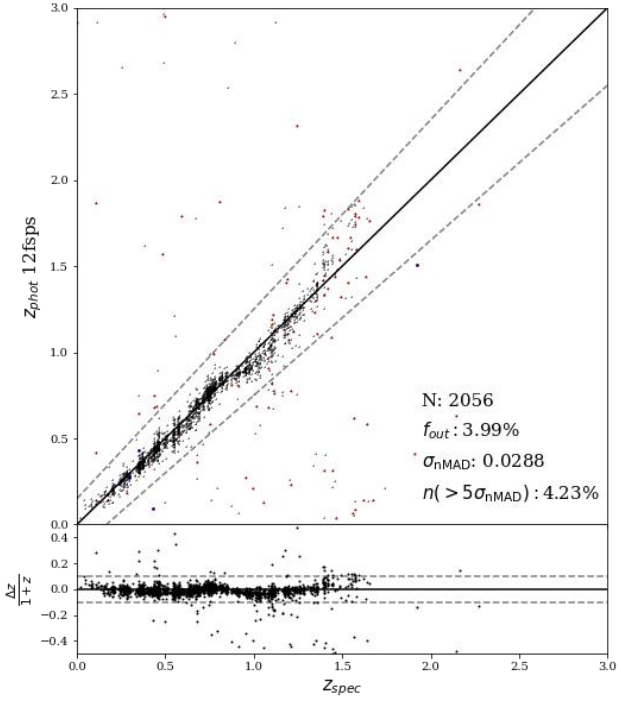


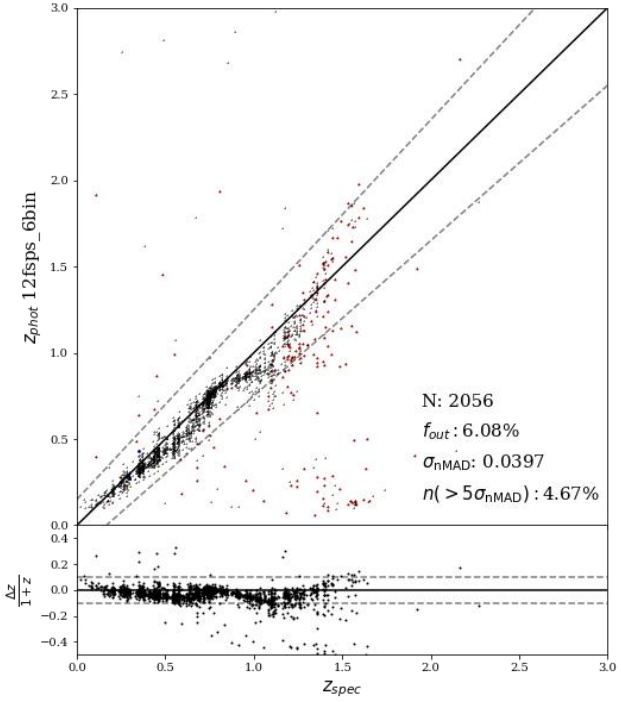


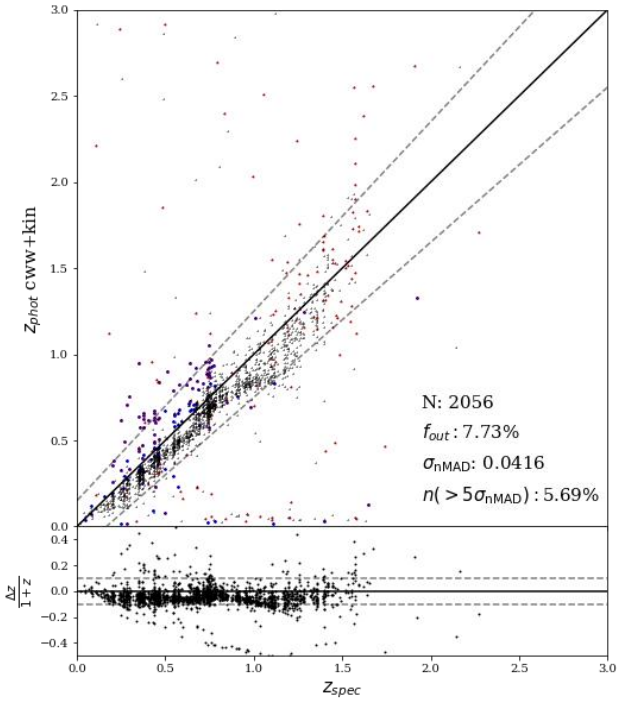


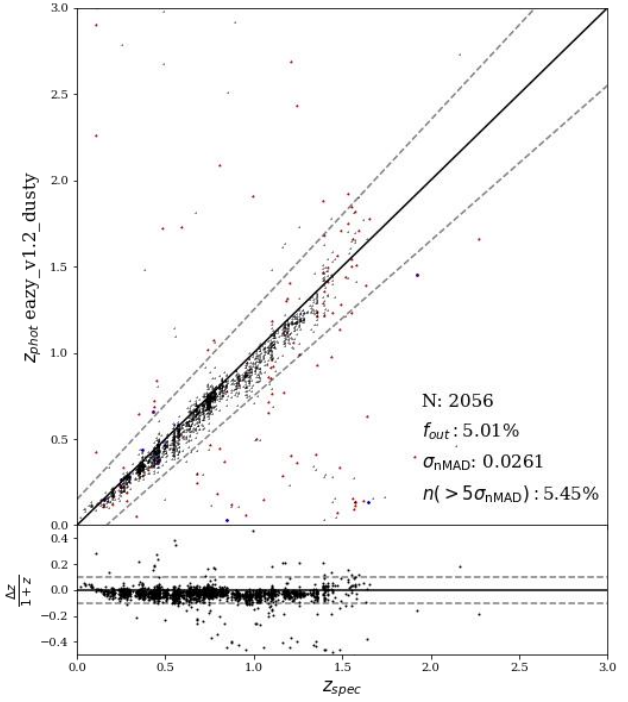


Photo−z with aperture flux no prior

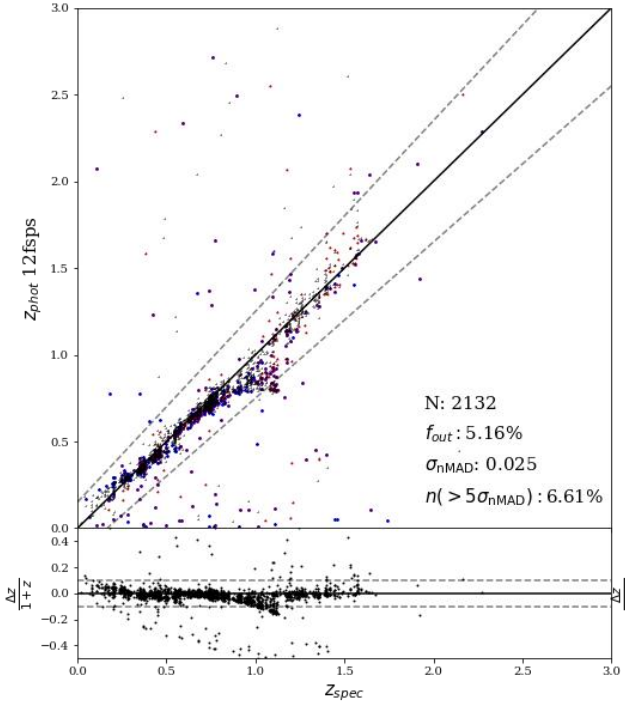


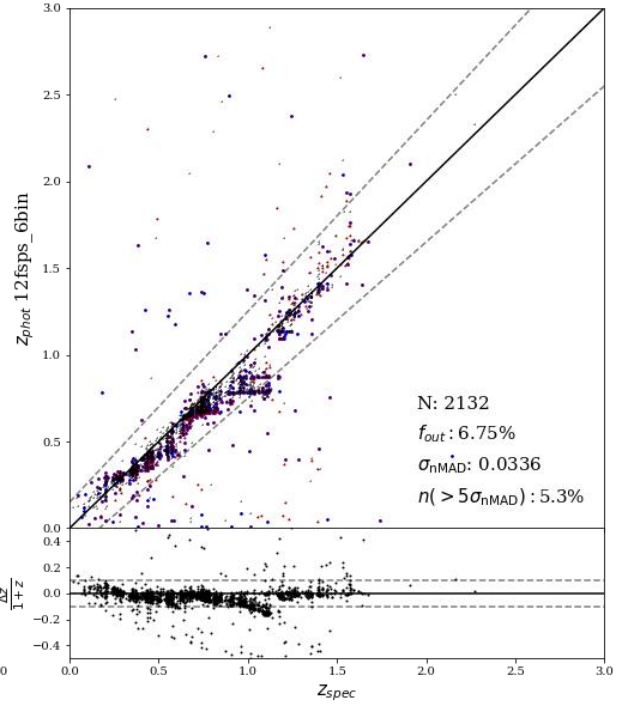


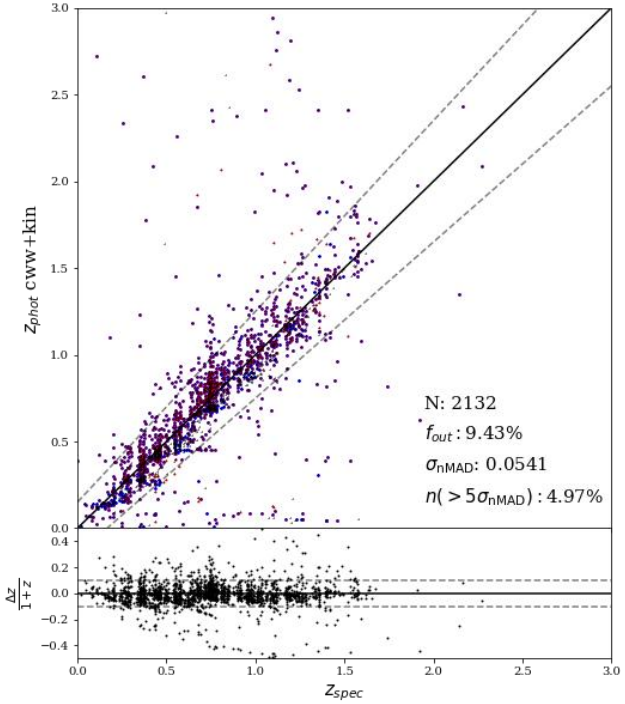


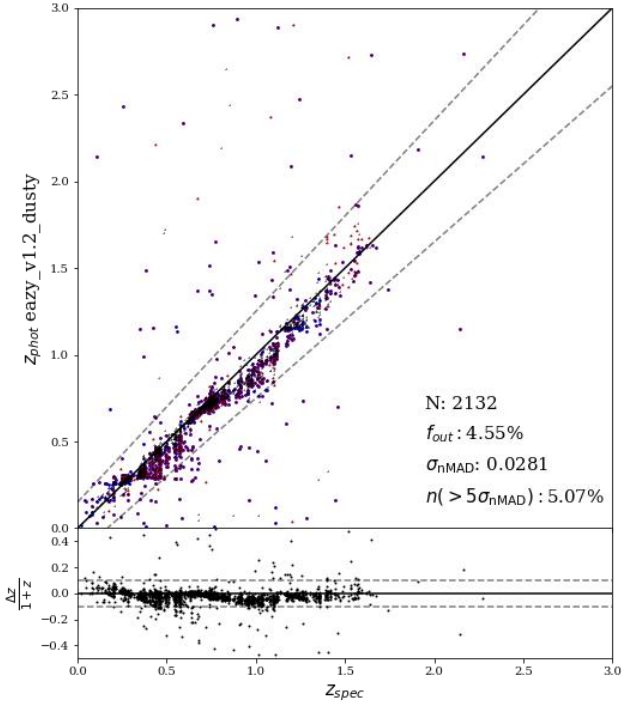


Photo−z with Stefanon+2017 flux catalog

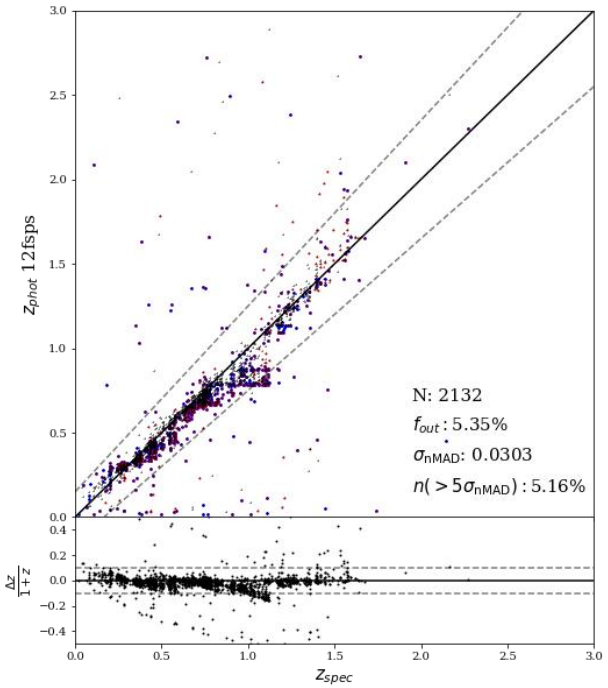


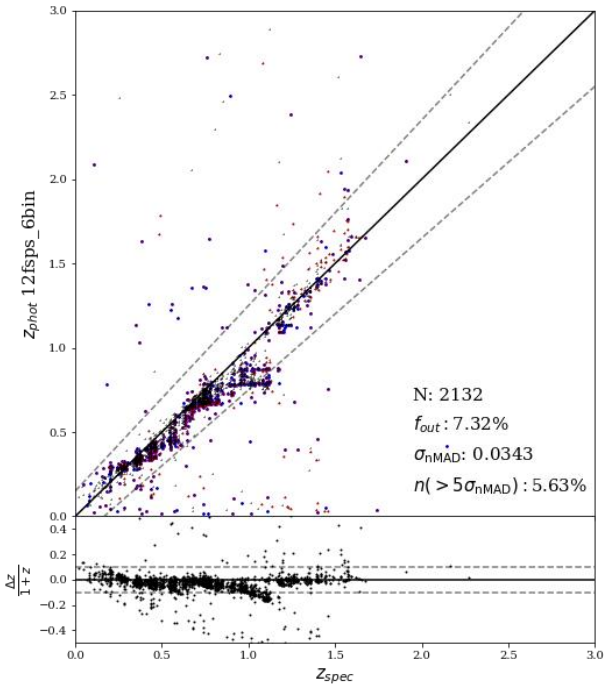


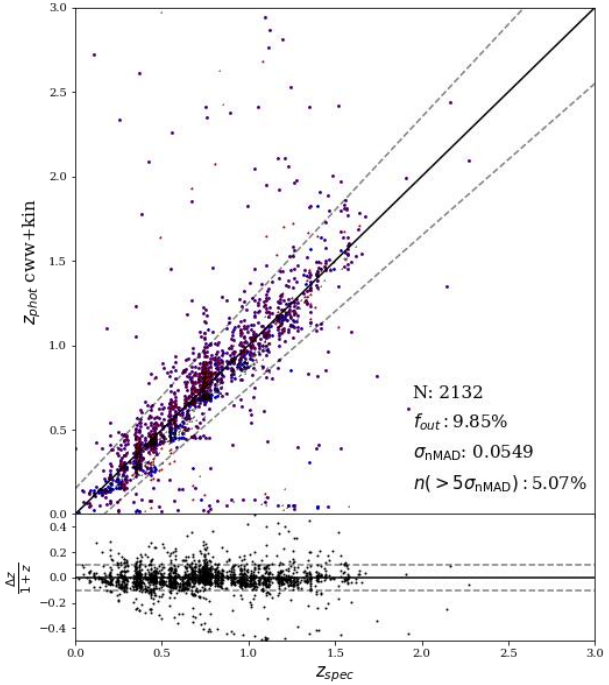


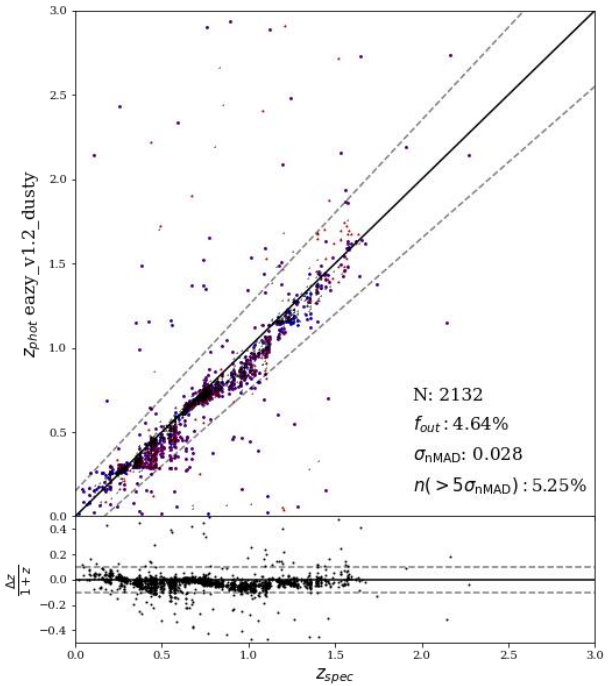


Photo−z with Stefanon+2017 flux catalog no prior

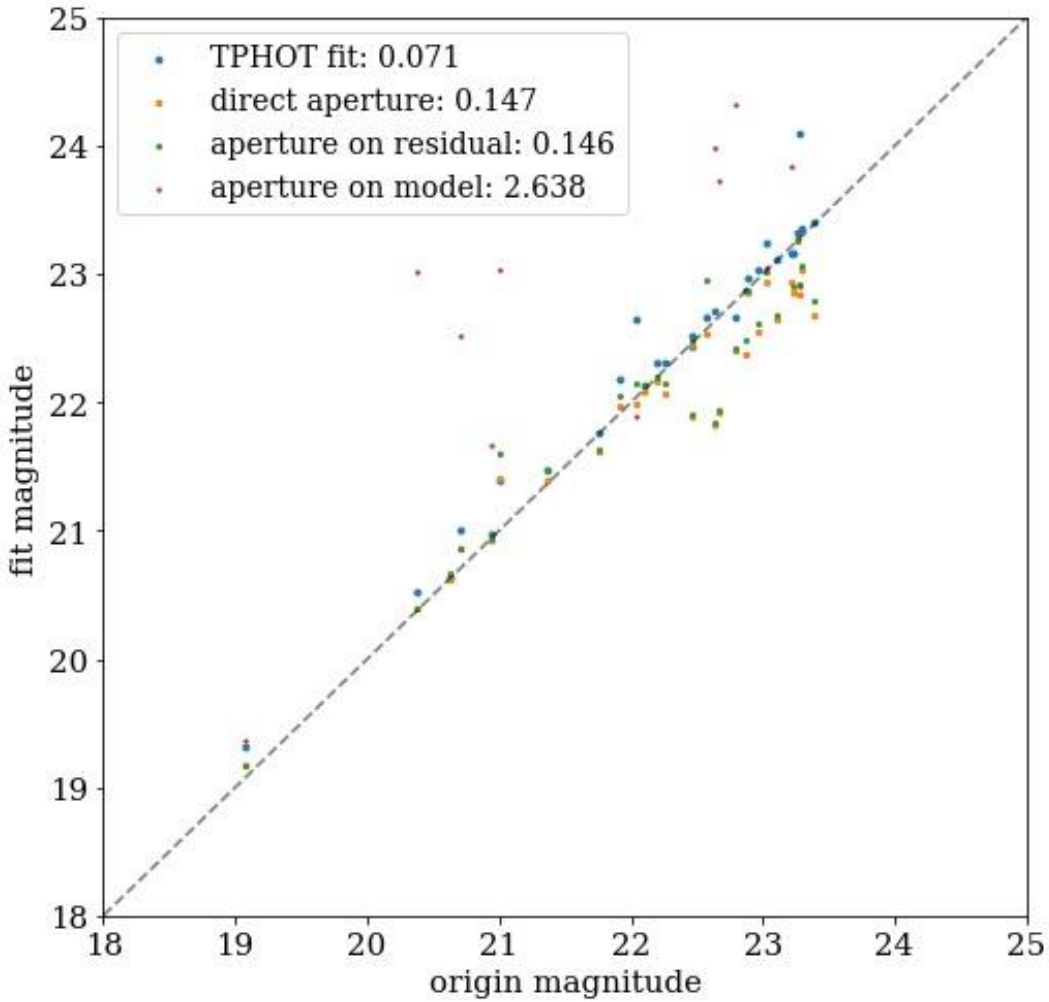


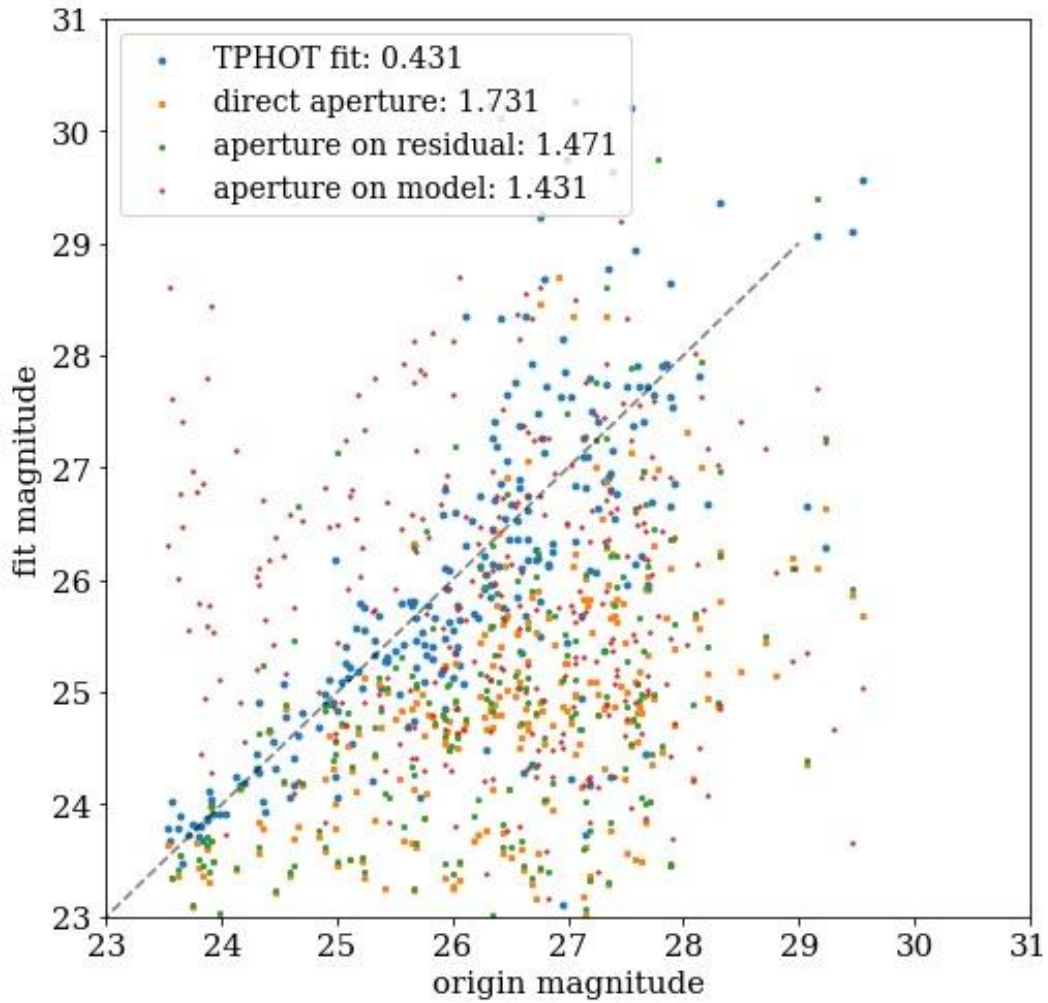




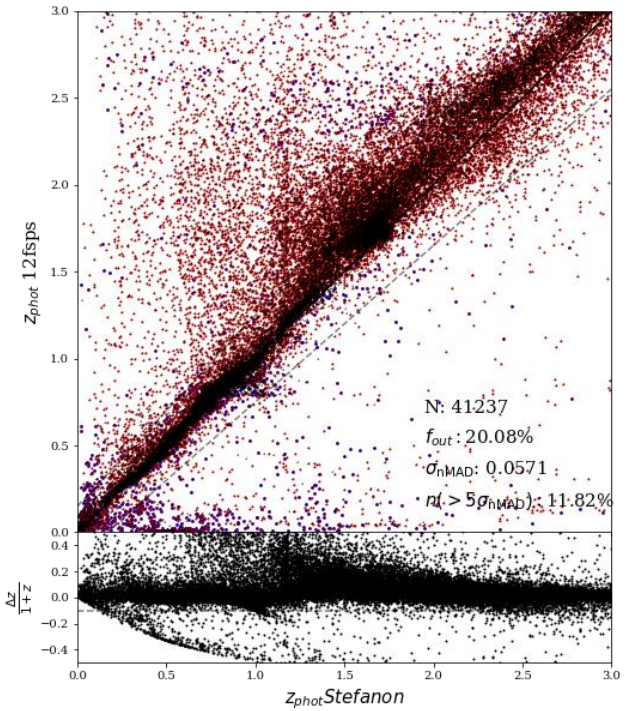


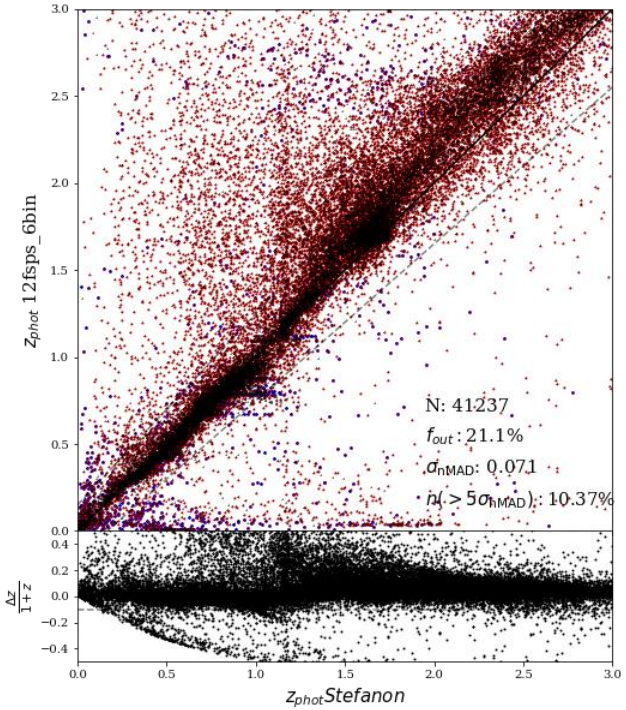
Outlier fraction σ_{nMAD}	With f160w prior		Without f160w prior	
	Stefanon+17	Aperture flux	Stefanon+17	Aperture flux
12FSPS	5.16% 0.0250	3.89% 0.0262	5.35% 0.0303	3.99% 0.0288
12FSPS+6bin	6.75% 0.0336	4.33% 0.0332	7.32% 0.0343	6.08% 0.0397
CWW+KIN	9.43% 0.0541	6.66% 0.0374	9.85% 0.0549	7.73% 0.0416
Eazy_v1.2_dusty (default)	4.55% 0.0281	4.43% 0.0243	4.64% 0.0280	5.01% 0.0261

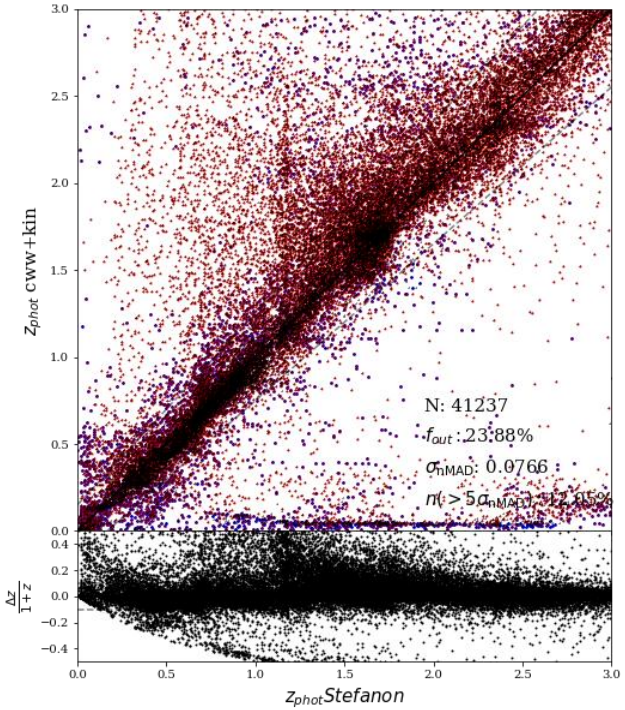

TPHOT fit: 0.071
direct aperture: 0.147
aperture on residual: 0.146
aperture on model: 2.638
fit magnitude
origin magnitude
25
24
23
22
21
20
19
18
18
19
20
21
22
23
24
25

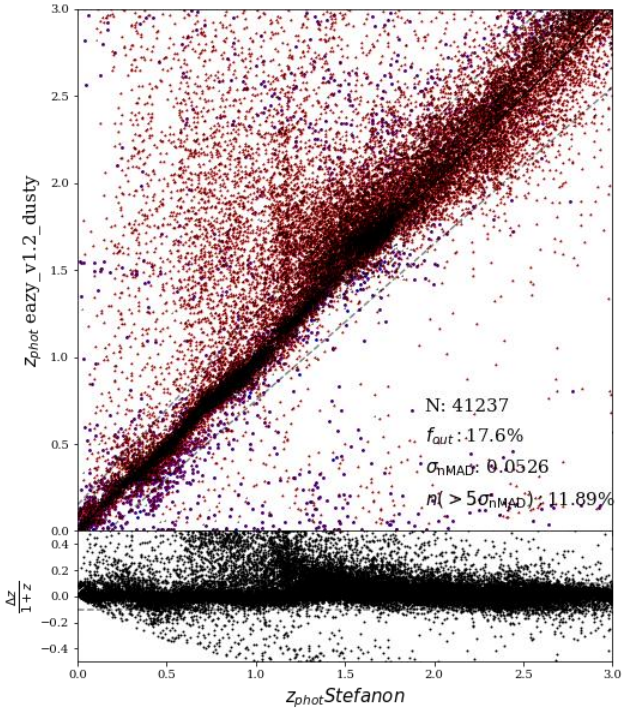

TPHOT fit: 0.431
direct aperture: 1.731
aperture on residual: 1.471
aperture on model: 1.431
fit magnitude
origin magnitude
31
30
29
28
27
26
25
24
23
23
24
25
26
27
28
29
30
31

Eazy photo—z from Stefanon flux catalog v.s. Stefanon photo—z catalog





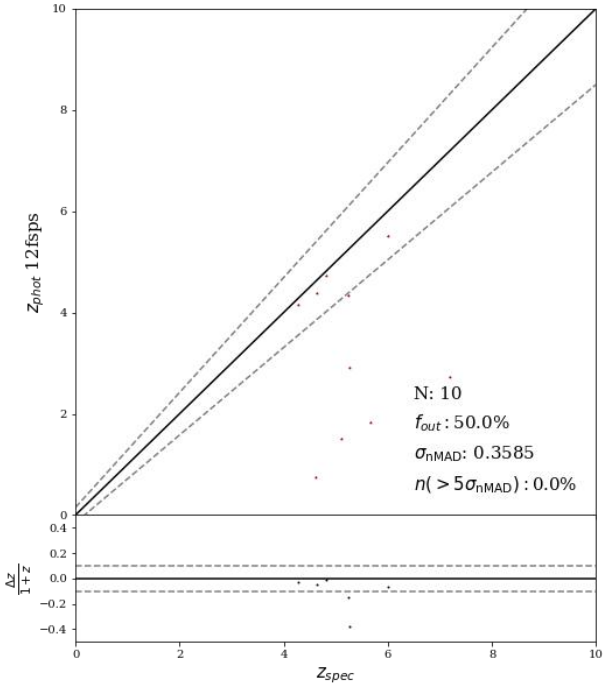


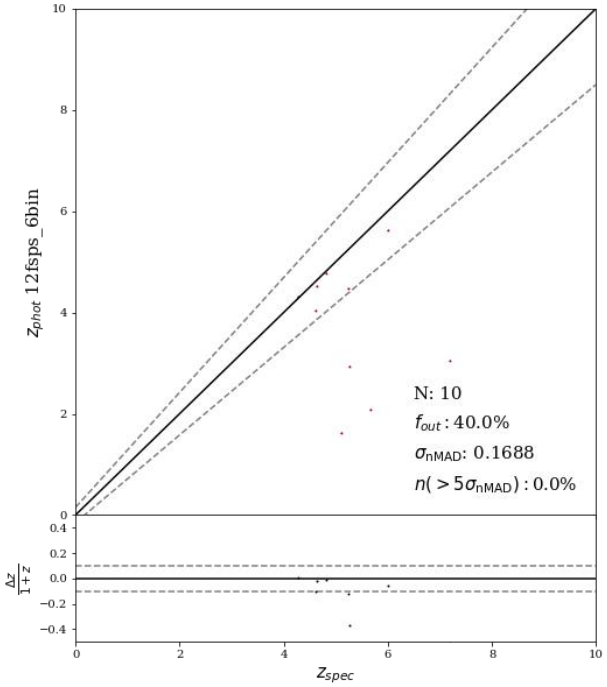


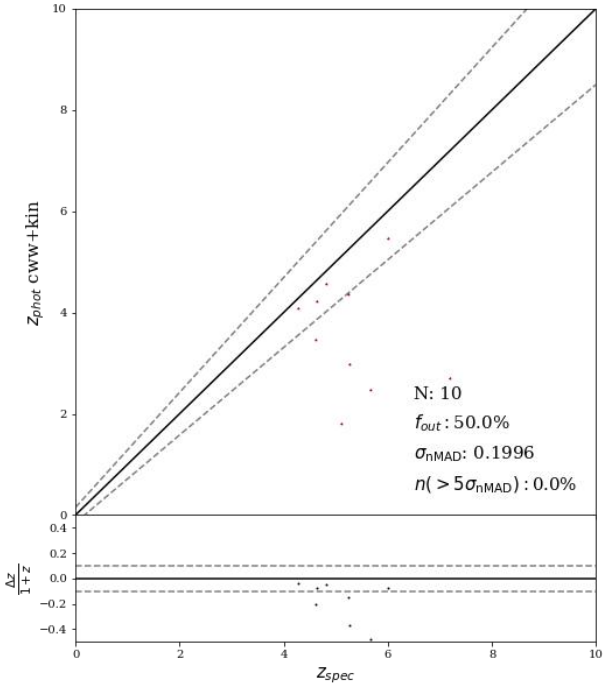
Blue point means high chi—square;
Red point means high q_z.

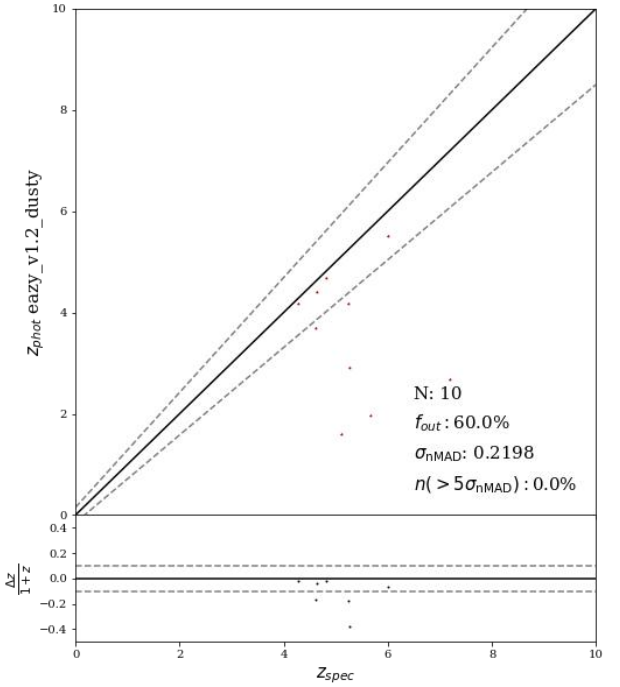
High specz objects

Photo−z with aperture flux

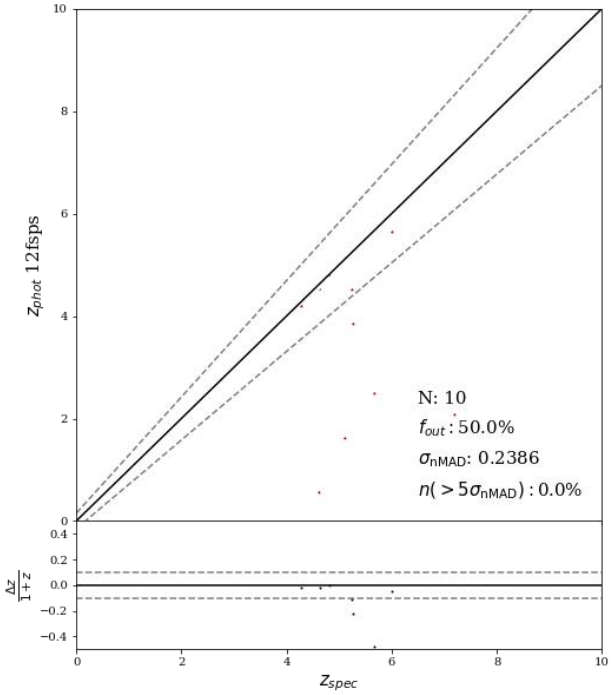


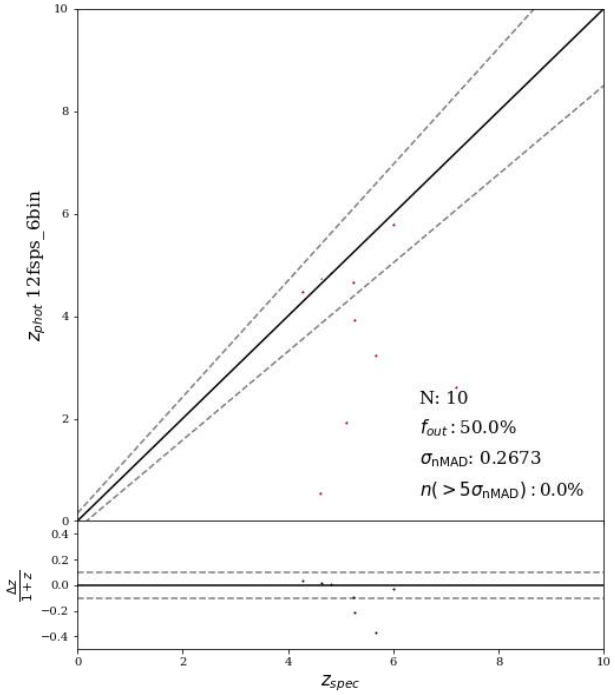


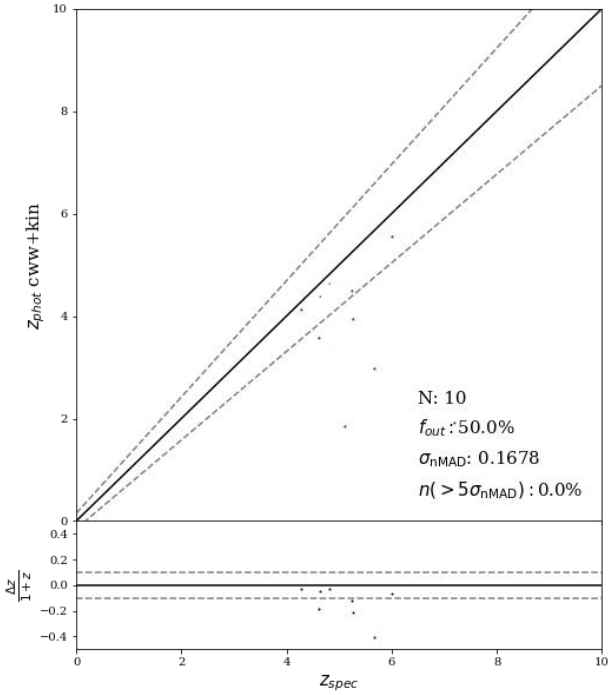


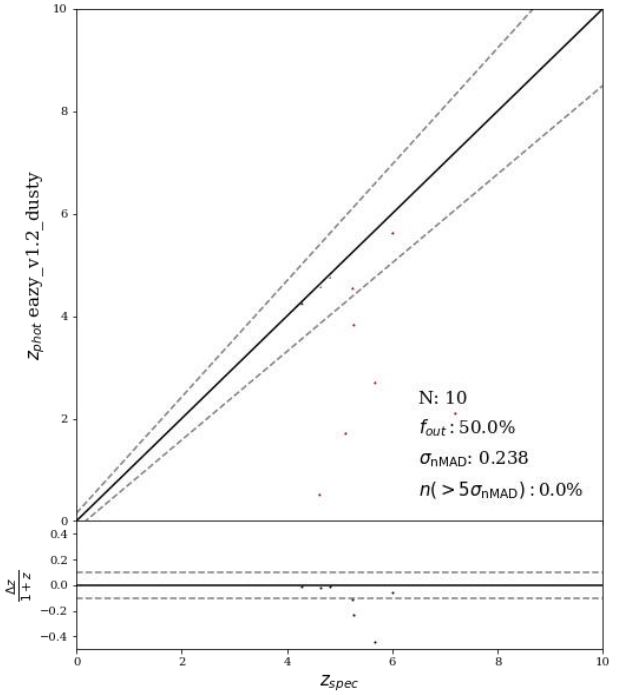


Photo−z with aperture flux no prior

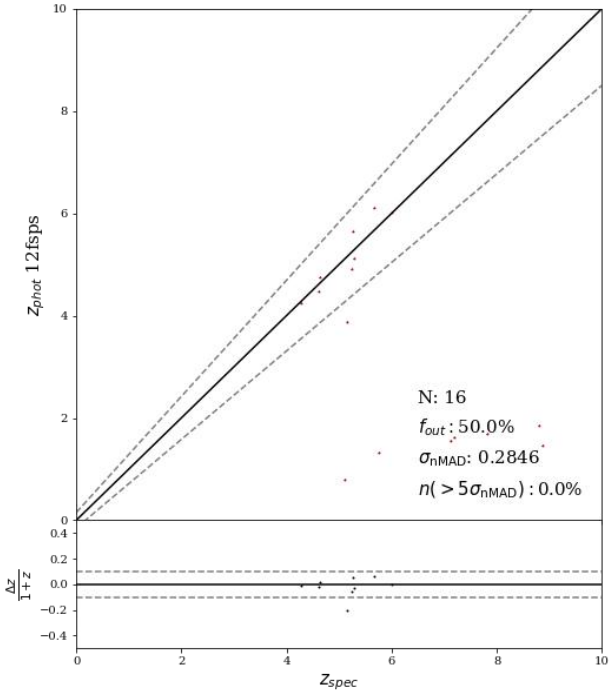


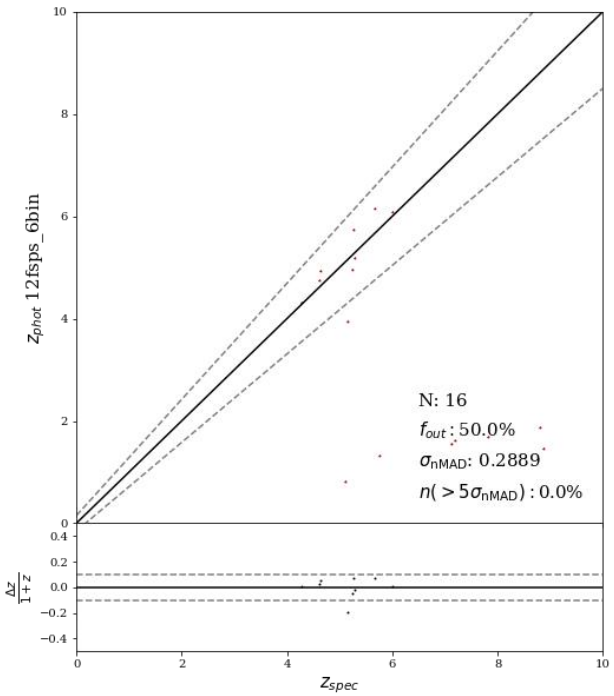


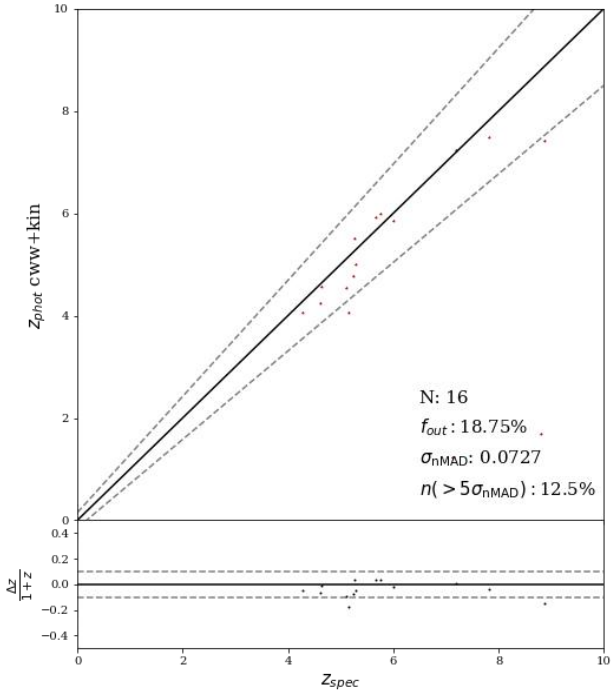


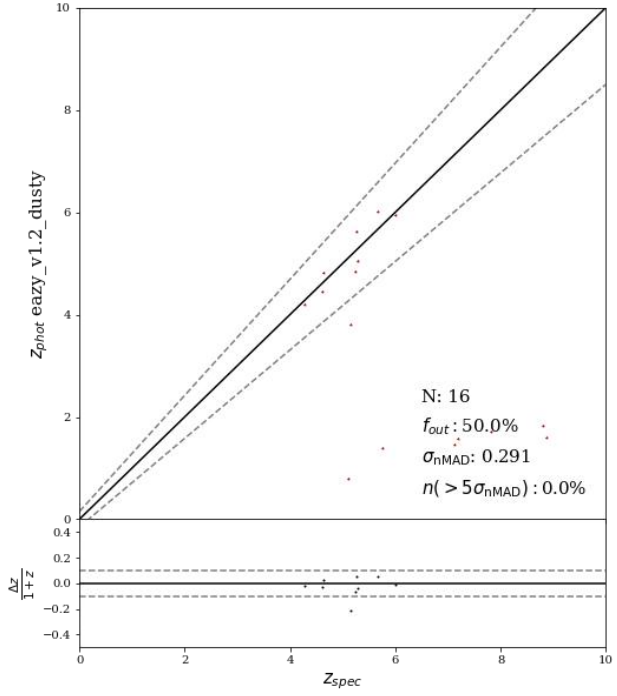


Photo−z with Stefanon+2017 flux catalog

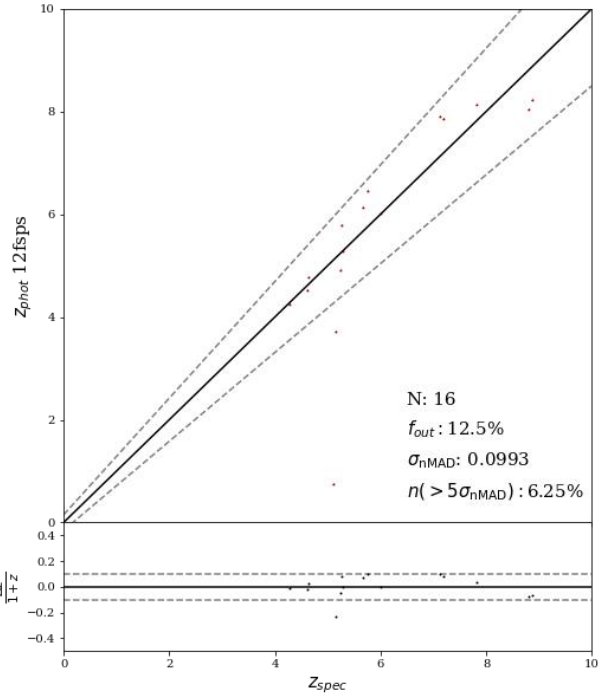


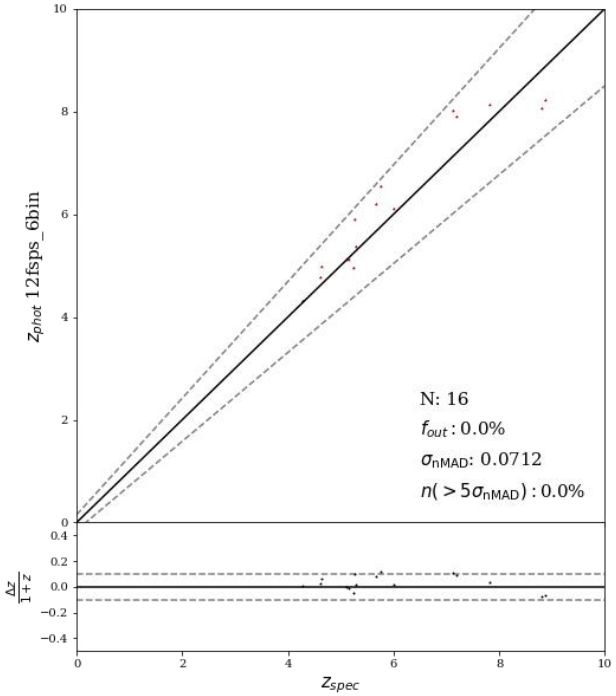


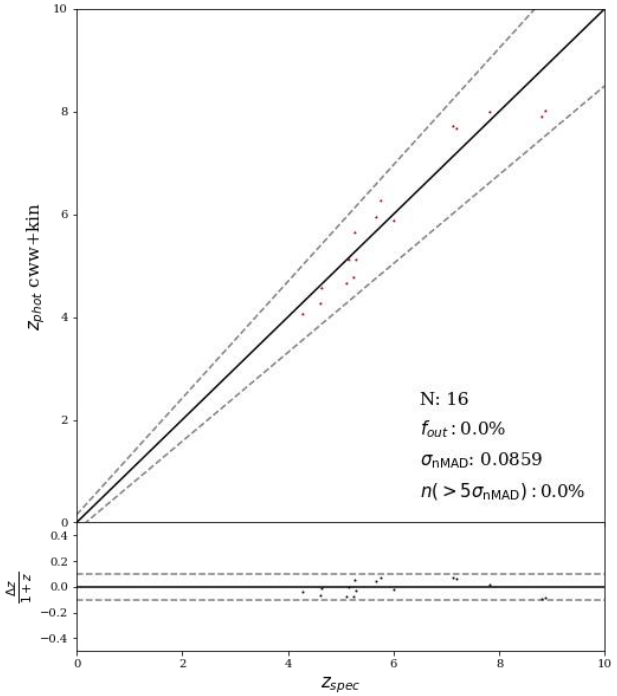


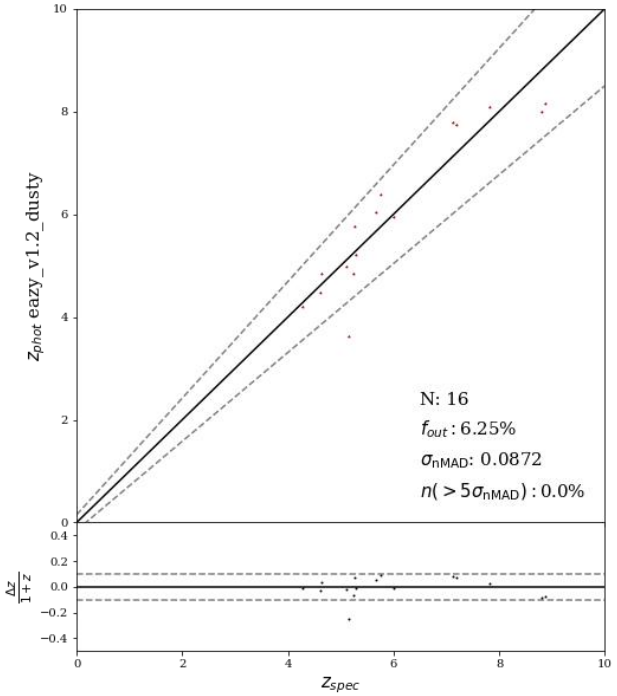


Photo−z with Stefanon+2017 flux catalog no prior





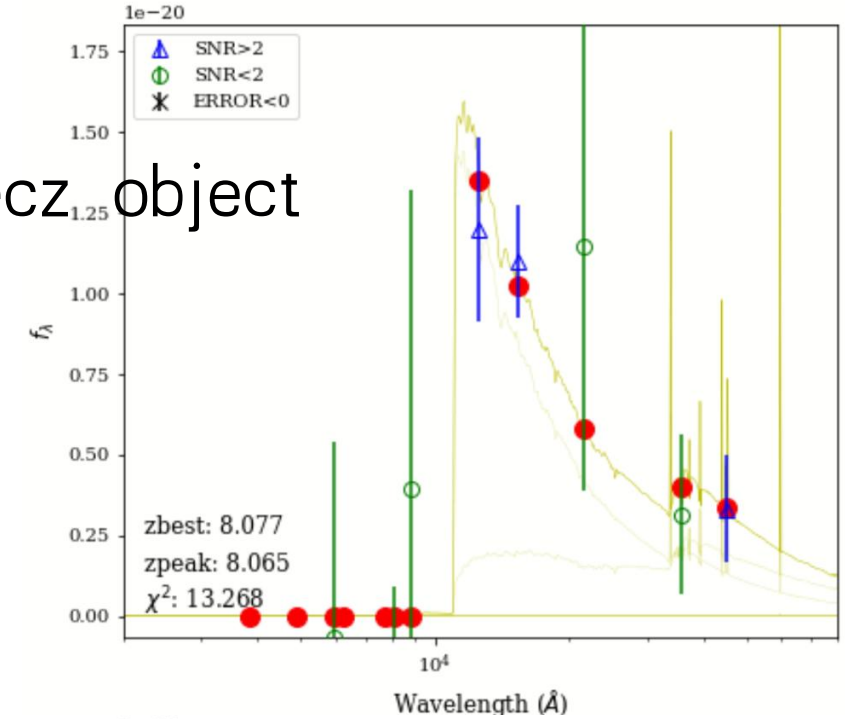


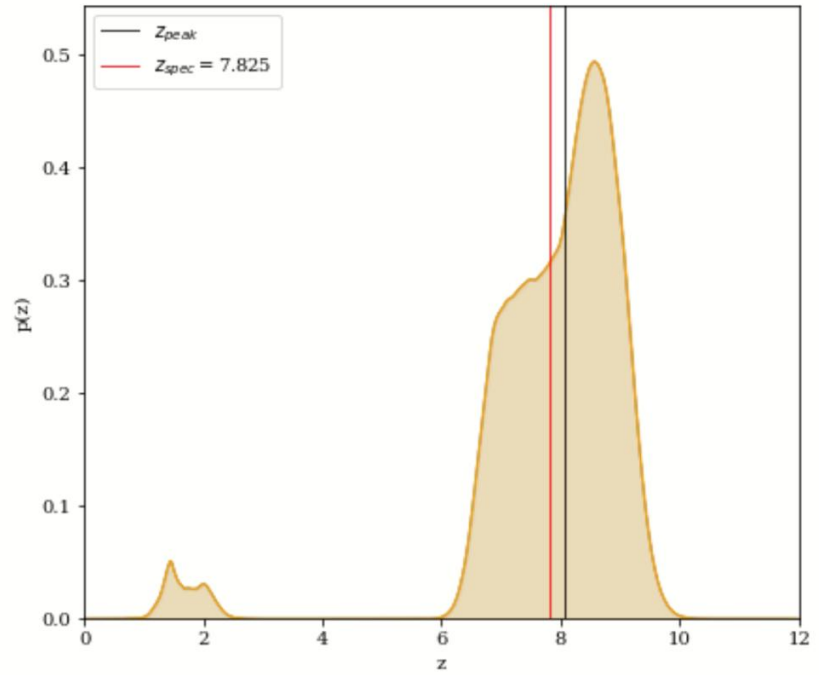


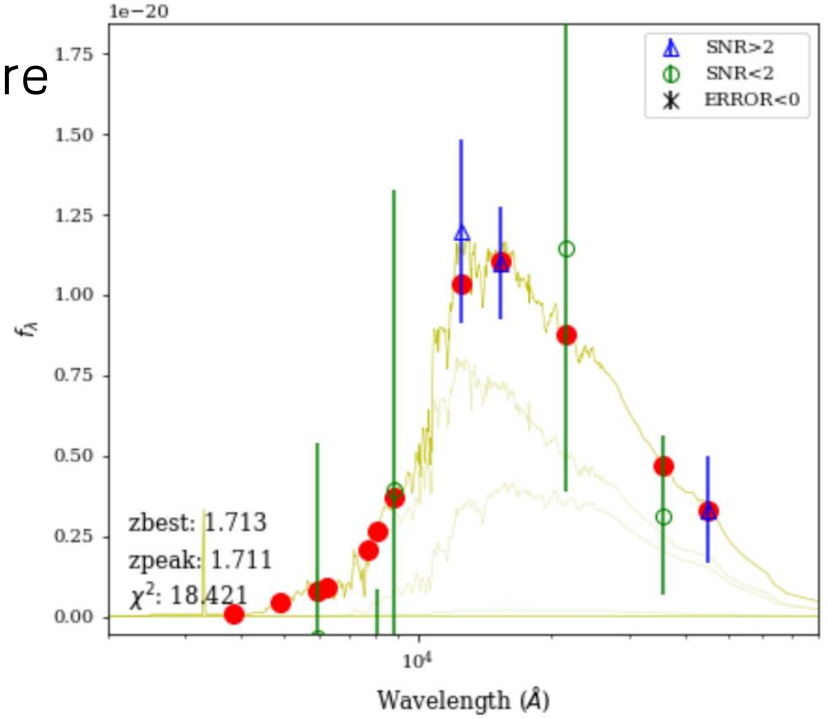
A example of high-specz object

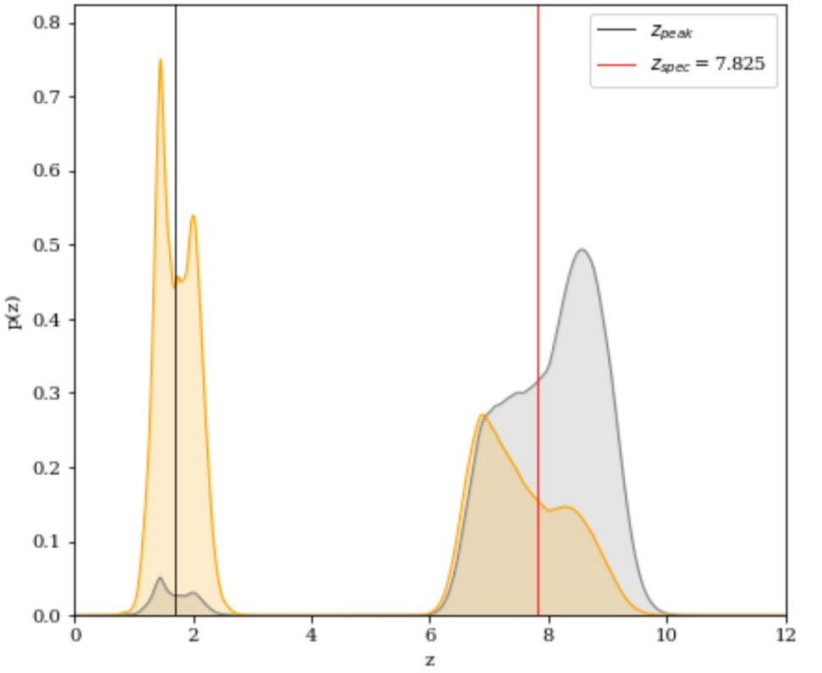
Upper panel: without prior
Lower panel: with prior

Maybe we can use chi-square to choose better photo-z.









- For faint source in HST image, we need use TPHOT or other software to fit the flux;
- For bright source, aperture flux and fitting flux have no significant difference.

- For faint sources we need calculate photo—z with/without prior at the same time, to determine which one is better.