An alternative to “standard” photo-z codes: clustering redshift

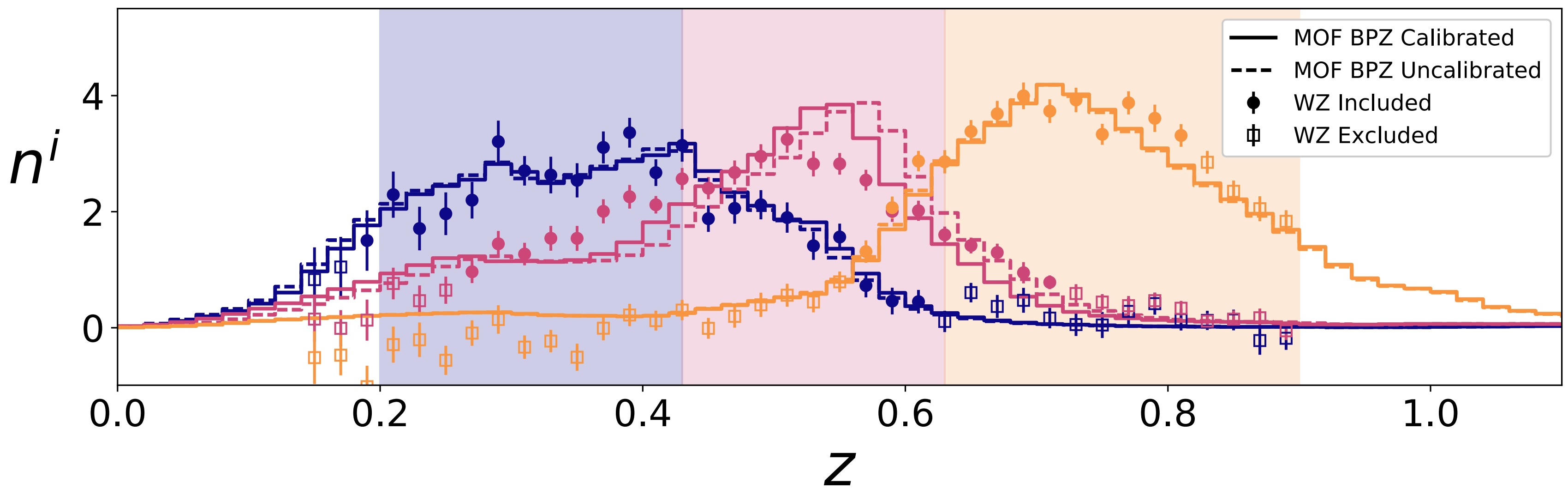
M.Gatti (IFAE Barcelona)

$$n(z) \sim \bar{w}_{ur}(z)\frac{1}{b_r(z)}\frac{1}{b_u(z)}\frac{1}{\bar{w}_{DM}(z)}$$

“u”: science sample.
“r”: reference sample (spec-z or high quality photo-z) divided into thin redshift bins

Why clustering redshift? : doesn’t suffer standard photo-z limitations (unrealistic SED templates/ unrepresentative training and validation samples) -> key for LSST!

current method in DES: n(z) recovered with clustering redshift, used to put constraints on the mean of photo-z n(z). **The method is currently systematics dominated!**



Gatti,Vielzeuf+18, Davis+18, Cawthon+18

modeling challenges/methodology choices:

- reference sample: spec-z (cosmic variance) vs high quality photo-z (uncertainties in the reconstruction)
- modeling: negative tails/points (lensing magnification/forward modeling)
- modeling: bias evolution (autocorrelation of the samples/breaking degeneracy with other probes Prat,Sanchez+17)
- tailor the science sample to accomodate some of these problems

future: including cross-correlation measurements in the full cosmological analysis?

(see e.g. Hoyle&Rau 18, McLeod 17)

- the larger the data vector, the larger the covariance matrix…
- is that necessary? -> clustering redshift uses smaller scales wrt cosmological analysis, covariance is small/ potentially negligible. One might also use different patches in the sky