

The observable (ignoring luminosity-dependent bias)

the galaxy density contrast
we want to measure

galaxy number counts

sample completeness

noise maps

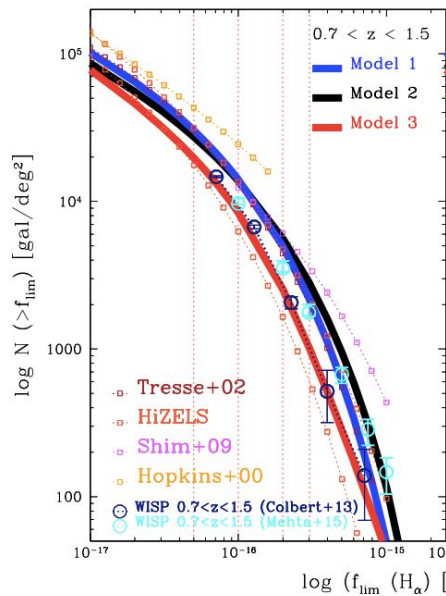
$$n_{ot}(\vec{x}) = \int_0^\infty [1 + \delta_g(\vec{x})] \Phi(f|z) C(f, z, \{N_i\}) df$$

$$1 + \delta_o(\mathbf{x}) = [1 + \delta_g(\mathbf{x})] [1 + A(\vartheta, z)]$$

$$n_o(\vec{x}_o) = n_{ot}(\vec{x}) * P(z_o|z) + \sum_i n_{oi}(\vec{x}_o)$$

redshift error

interlopers



Systematics in Galaxy Clustering

Ground-based observatories

Fiber collision
Imaging (angular)
Instrumental sys.

**completeness harder for ground-based*

COMMON

Milky Way Extinction
Astronomical foregrounds
(*stars, zodiacal light, nearby galaxies...*)
Redshift accuracy

Reconstruction
Estimator
Model validity, scale cuts
Window estimation & convolution
Wide angle effect
Covariances (analytic v. mocks)
Super-sample covariance ?
Noisy?

Likelihood shape
Projection effect
Prior volume, Prior weight
HOD prior

Space-based observatories

Interlopers
Spectral confusion
Instrumental sys.

**z-accuracy harder for space-based*

- What are the scales affected: small scales, BAO scale, fNL scales ?
- Limiting science measurements for Stage IV, Stage V ? i.e. DESI, DESI-II, Euclid, SPHEREx, SPEC-S5, WST
- What are the hurdles to mitigate Data/Model/Likelihood systematics ?
- Folks that are leading the analyses: what do you need that you do not have from the Theorists ?
- Folks that are on the theory side: what do you feel needs more investigation in the Surveys main analyses ?
- Are there systematics that the community is ignoring, unaware of ?

Cross correlations, probe combination, tensions

Cross correlations of probes that have different systematics can help extracting the signal, are we ready to exploit them?

e.g. optical vs radio, clustering vs lensing

Probe combination needs control of systematics and cross covariances, are we ready for the “cross correlation feast”?

Uncontrolled systematics will lead to tensions -

ready to blind yourself?
is blinding the way to go?