Stochastic bias of color-selected BAO tracers by joint clustering--weak-lensing analysis

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A combined measure of the galaxy bias

significance of the BAO peak detection <=> galaxy bias

- An **Halo Occupation Distribution** model is used to statistically characterize the position of galaxies within dark matter haloes; see Cooray & Sheth, 2002; Tinker et al. 2005; Coupon et al. 2012.

$$\langle b_g \rangle = \frac{\int n(M,z) b_h(M,z) N(M) dM}{\int n(M,z) N(M) dM}$$

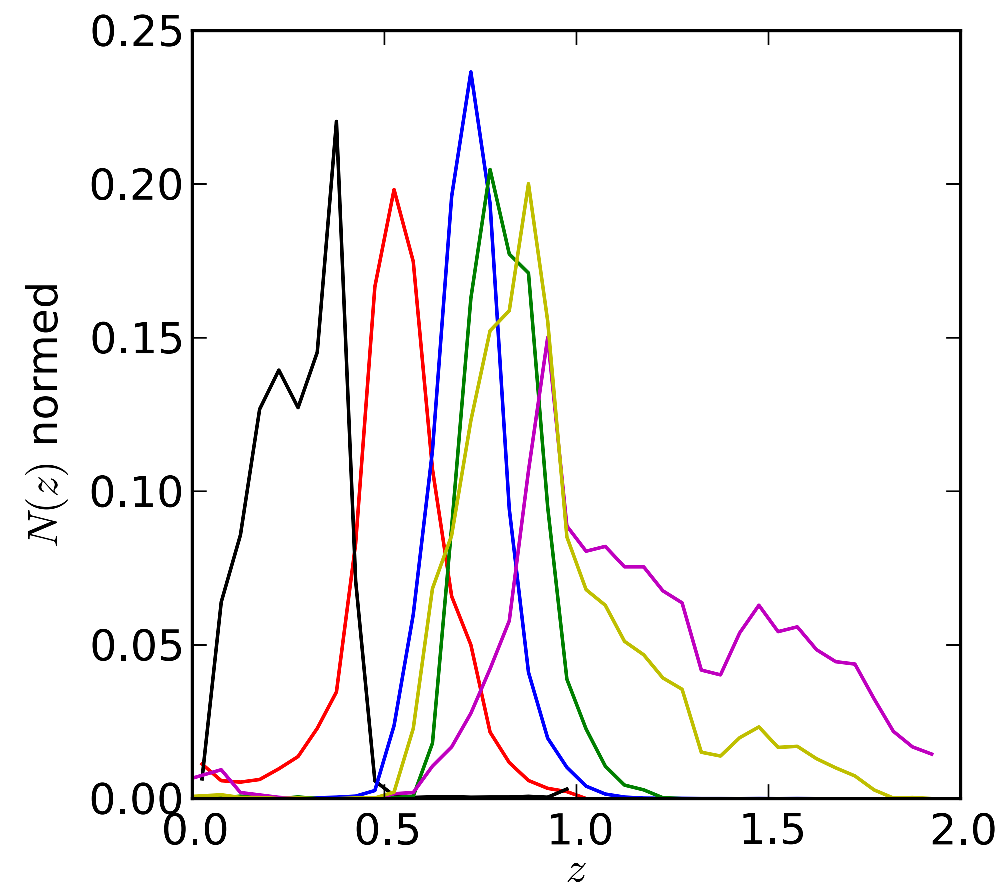
- **Weak lensing, aperture statistics**; intrinsic shapes are distorted by the foreground mass hence the autocorrelation of the observed ellipticities of the background galaxies contains the clustering information of the matter field between the background galaxies and us; see Schneider et al. 1998 and applied on RCS data in Hoekstra et al. 2002, GaBoDS data in Simon et al. 2007, and on COSMOS in Jullo et al. 2012.

$$b(\theta) = f_1(\theta, \Omega_m, \Omega_\Lambda) \times \sqrt{\frac{\langle \mathcal{N}^2(\theta) \rangle}{\langle M_{ap}^2(\theta) \rangle}}$$

Future BAO surveys

- BigBOSS
- Euclid
- PFS Sumire

- Target emission line galaxies to measure quickly a huge amount of redshifts



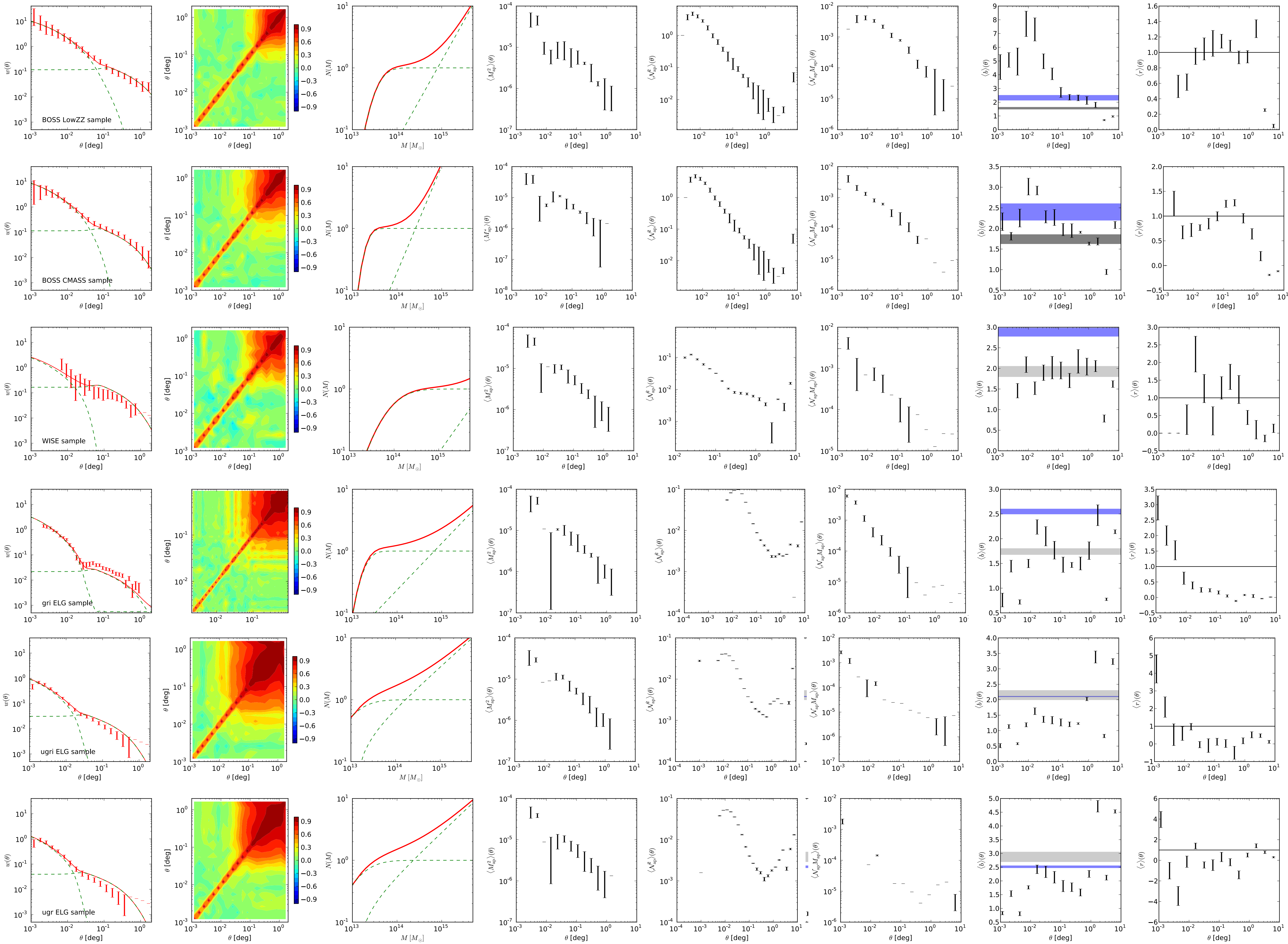
Results

sample	$\bar{z}$	$log(\frac{M_{min}}{M_\odot})$	$log(\frac{M_1}{M_\odot})$	$log(\frac{M_0}{M_\odot})$	σ_{logM}	α	$\langle N_{gal/halo} \rangle$	$\langle b_{gal} \rangle$	$\langle b_{gal}(z=0) \rangle$	$\langle M_{halo} \rangle$	χ^2/dof	$\langle b_{\rm lensing} \rangle$	$\langle r_{\rm lensing} \rangle$
SDSS LRG	0.3	$13.614^{+0.078}_{-0.098}$	$14.92^{+0.65}_{-0.15}$	$10.824^{+1.88}_{-1.95}$	$0.37^{+0.18}_{-0.26}$	$1.336^{+0.32}_{-0.37}$	$1.298^{+0.19}_{-0.11}$	$2.356^{+0.15}_{-0.19}$	$2.015^{+0.10}_{-0.16}$	$13.95^{+0.06}_{-0.09}$	1.2118	1.57 ± 0.06	~ 1
BOSS CMASS	0.56	13.30 ± 0.02	14.41 ± 0.04	10.87 ± 1.6	0.19 ± 0.07	1.72 ± 0.2	$1.169^{+0.06}_{-0.02}$	2.43 ± 0.02	1.841 ± 0.002	$13.73^{+0.01}_{-0.02}$	0.6566	1.74 ± 0.11	~ 1
LRG WISE bright	0.67	$13.923^{+0.007}_{-0.02}$	16.015 ± 0.6	11.25 ± 1.5	$0.587^{+0.009}_{-0.03}$	$1.017^{+0.6}_{-0.02}$	$2.62^{+0.2}_{-0.1}$	2.88 ± 0.1	2.04 ± -0.1	13.84 ± 0.01	4.0679	1.92 ± 0.13	~ 1
ELG gri	0.78	13.26 ± 0.02	14.83 ± 0.15	10.85 ± 1.58	0.27 ± 0.05	0.75 ± 0.09	$1.323^{+0.08}_{-0.1}$	2.569 ± 0.03	1.618 ± 0.01	$13.56^{+0.01}_{-0.02}$	3.5225	1.72 ± 0.087	$\lesssim 1$
ELG ugri	0.96	$12.98^{+0.013}_{-0.013}$	$14.19^{+0.067}_{-0.075}$	$13.09^{+0.018}_{-0.012}$	$0.593^{+0.005}_{-0.014}$	$0.653^{+0.067}_{-0.033}$	$2.157^{+0.01}_{-0.04}$	$2.106^{+0.015}_{-0.004}$	$1.308^{+0.01}_{-0.0}$	$13.14^{+0.01}_{-0}$	6.958	2.18 ± 0.12	$\lesssim 1$
ELG ugr	1.23	$13.106^{+0.012}_{-0.013}$	$14.341^{+0.19}_{-0.16}$	$13.09^{+0.19}_{-1.03}$	$0.596^{+0.004}_{-0.018}$	$0.685^{+0.13}_{-0.13}$	$2.576^{+0.27}_{-0.02}$	$2.51^{+0.04}_{-0.03}$	$1.36^{+0.002}_{-0.02}$	$13.13^{+0.01}_{-0.02}$	6.1349	2.82 ± 0.16	-

Comparing the two galaxy bias estimation is interesting !

Supports future selections for BAO surveys

Opens questions about galaxy formation scenarii at z=1



Johan Comparat et al. september Carghese 2012