

DOE REPORT

Julia Young

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LBT Clusters

Purpose:

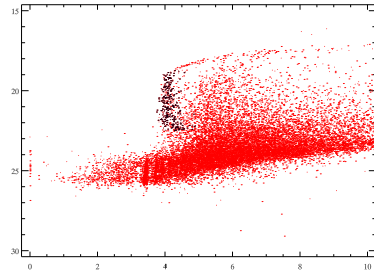
The primary goal of this study is to provide a weaklensing cluster mass measurement for six massive galaxy clusters with data taken from the LBT. We will process the six clusters through two completely different weak lensing pipelines and compare our results for these clusters with previously measured ones. By looking at these massive clusters it will be possible to study cosmological implications of the mass-concentration relations derived from these clusters. In addition for these clusters we will comment on the effect that different choices such as color selection, choice of point spread function, and varying star selection have on the final mass reconstruction.

Clusters:

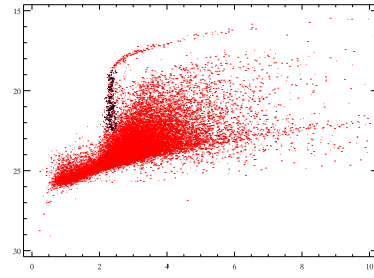
These clusters were taken by the LBT in 2007-2008.

Table 1: Table of the various clusters

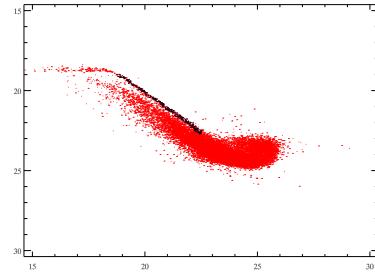
Cluster	g	r	i	u	DATE	CENTER RA : DEC	Redshift
Abell 611	12	3	0	4	2007-03-17	120.2445 : 336.0469	0.288
MS 1385	12	3	0	6	2007-04-15	209.962 : 62.518	0.33
Abell 1835	3	9	12	0	2008-03-12	210.259 : 2.880	0.253
	0	0	0	8	2007-04-22		
	4	1	0	0	2007-04-15		
MaxBCG 198.7718+51.8174	3	9	12	0	2008-05-04	198.7718 : 51.8174	0.286
MaxBCG 203.1601+50.5599	3	9	12	0	2008-03-12	203.1601 : 50.5599	0.284
MaxBCG 189.2468+63.1866	3	10	13	0	2008-03-11	189.2468 : 63.1866	0.294



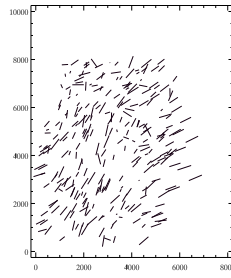
(a) FWHM vs mag



(b) Flux radius vs mag

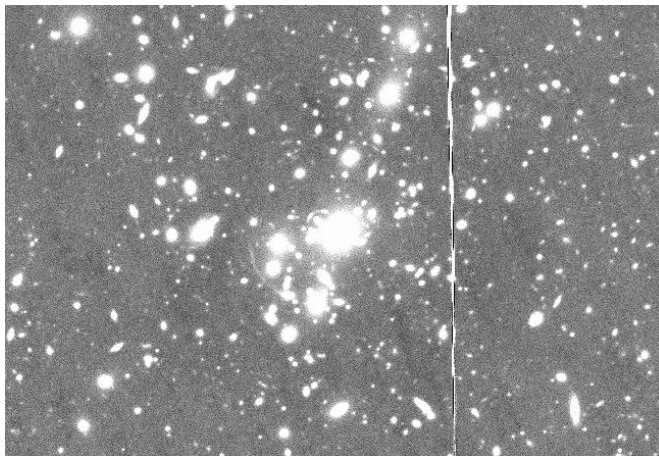


(c) mag vs mumax



(d) ellipticity

Figure 1: This is the star selection for MAX3 in the i image.



(a) Image of cluster center

Figure 2: This is an image of the cluster center of MAX3 in the i image.

Cluster STEP

Purpose:

The primary goal of this study is to provide an estimate for the ability of various weaklensing pipelines to reconstruct a cluster mass, as well as to provide realistic cluster simulations for development and testing of other weak lensing pipelines. We will present the results of three weaklensing pipelines, KSB, lensfit and Shapelets tested on clusters simulated using tools created for the Dark Energy Survey. The simulated clusters in this study contain a number of aspects which have not been jointly studied in any previous simulation. There are clusters generated with mass profiles based on ray-tracing N-body simulations and analytic profiles, point spread functions that are spatially varying and non-varying with several seeing conditions, and realistic galaxy color information.

Clusters:

The shear catalogs were produced using a ray tracing code written by Matthew Becker and run on the density field of the light cone used to produce the mock galaxies. All of the (mock) galaxy catalogs were made by Michael Busha and Risa Wechsler.

Table 2: Table of the various clusters

Halo ID	M200	NGALS	R200	Redshift
6	5.6861e+14	114	1.267651	0.1860765
28	3.7924e+14	56	1.109561	0.1809255
2	7.5275e+14	99	1.350407	0.2701271
5	5.3202e+14	114	1.202866	0.2701663
38	3.7213e+14	91	1.045223	0.3273885
180	2.0878e+14	61	0.8489274	0.3678215
139	2.5416e+14	103	0.8694841	0.4751449
11	2.6616e+14	87	0.8832777	0.4742235
24	4.1163e+14	57	1.015055	0.4902111
29	3.9336e+14	70	0.9569623	0.600747

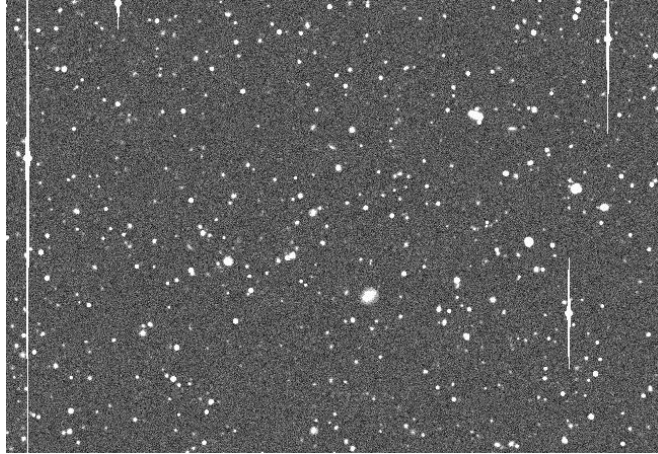


Figure 3: This is an image of the simulated cluster.

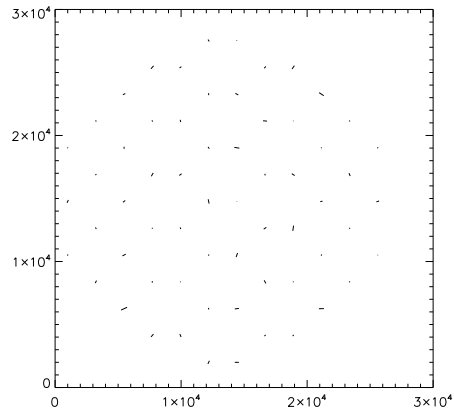


Figure 4: This is an image of the simulated constant circular gaussian PSF

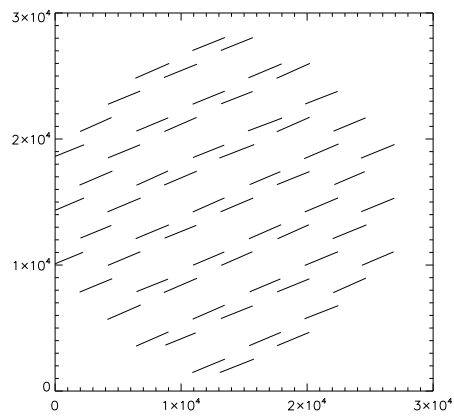


Figure 5: This is an image of the simulated constant elliptical gaussian PSF

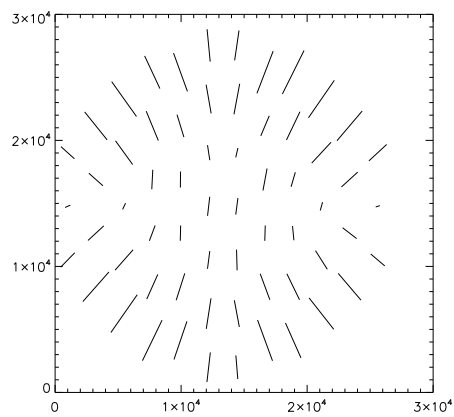


Figure 6: This is an image of the simulated spatially varying DECam PSF

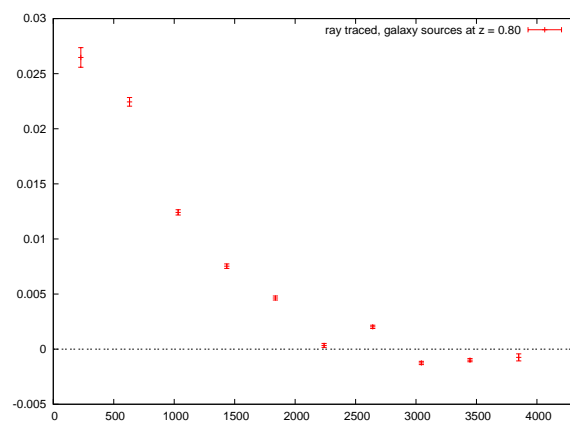


Figure 7: This shows the ray traced shear profile of the simulated cluster

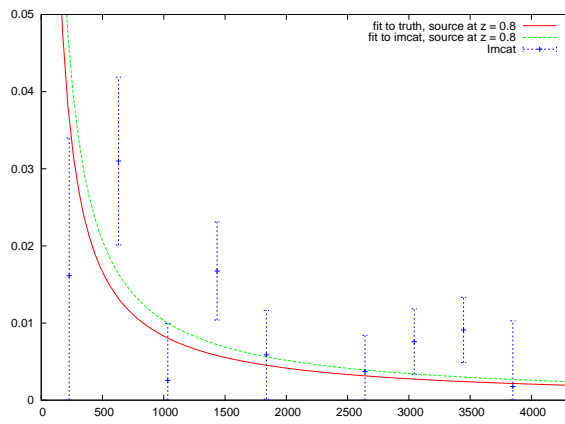


Figure 8: This shows the shear profile of the simulated cluster plotted versus the reconstructed imcat shear