

Stacked Weak Lensing with Redmapper Clusters in Early DES Data

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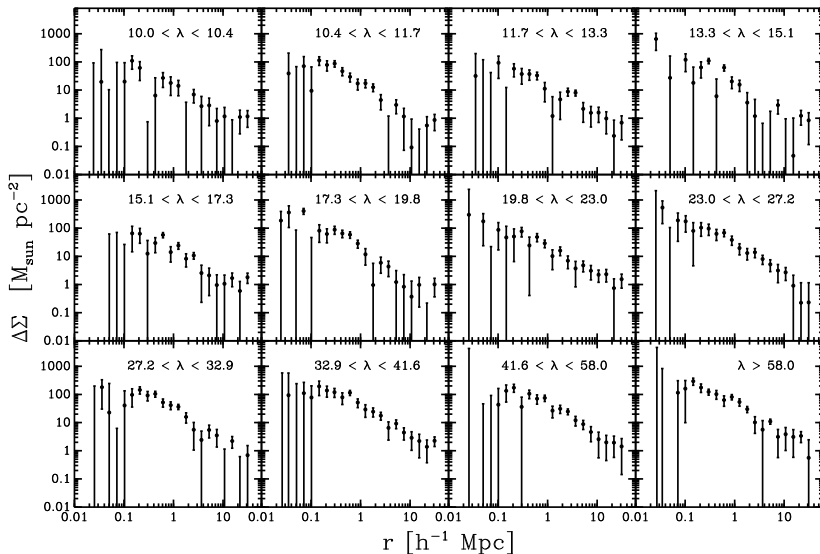
May 22, 2014

- Overview
- Motivation to stack clusters
- SVA signal and consistency checks:
- https://cdcv.sfn.gov/redmine/projects/des-clusters/wiki/WL_with_RedMapper_in_Early_DES_Data
- JBOP (Just a Bunch of Plots)
- TODO

- Measure the properties of dark matter halos
- Dark matter – baryon connection
- Cosmology:
 - Find clusters
 - Abundance Function
 - **Mass calibration**
 - Cluster clustering
- Cluster mass calibration is a key part of cluster cosmology

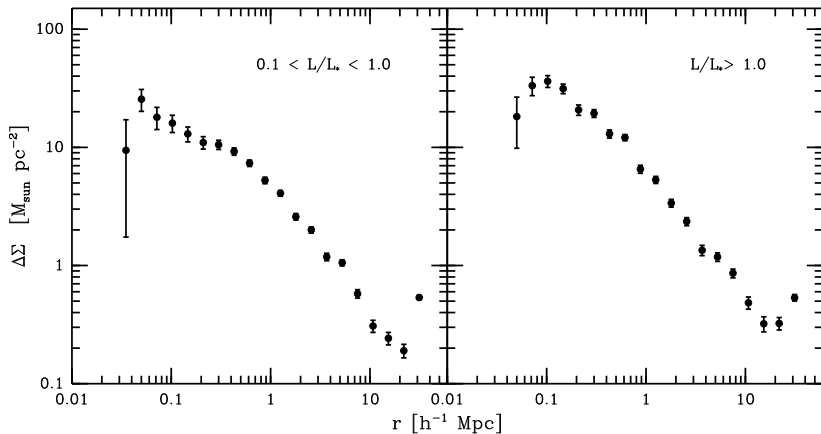
- Simplify interpretation: all projections and neighboring structure are part of the well-understood 2-halo term
- “Universal Profile” from theory/sims is really a description of the mean profile, which stacking measures.
- Corrections are possible:
 - “boost factors”: sources clustered with the lenses give zero shear; this can be corrected using the cross-correlation function. (e.g. Sheldon 2009)
 - Some additive errors show up in random point tests, and can be subtracted. (e.g. Sheldon 2009)
 - mis-centering can be understood statistically and corrected in the ensemble average (Rozo in prep.) or modeled (Johnston 2007)
 - non-sphericity averages out and remaining orientation bias can be modeled (Dietrich 2014)

Stacked Signal for RedMapper Clusters

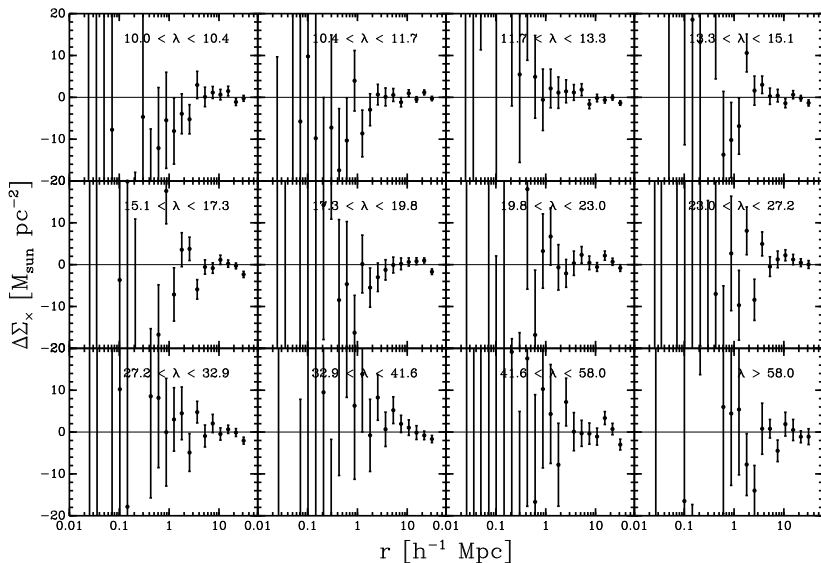


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Comparison: RedMapper LRGs



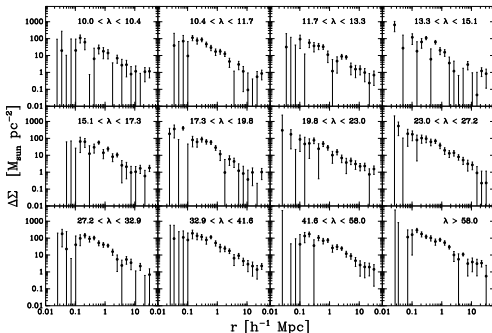
Stacked Signal for RedMapper Clusters: B mode



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Stacked Signal for RedMapper Clusters

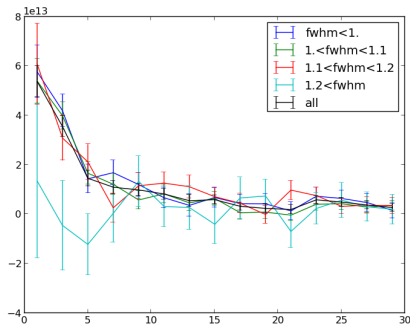
- Im3Shape catalog v4 with suggested cuts
- No boost corrections yet applied
- Mis-centering not accounted for.
- Potential photometry problems in crowded fields.
- Random point test will elucidate large-scale features.



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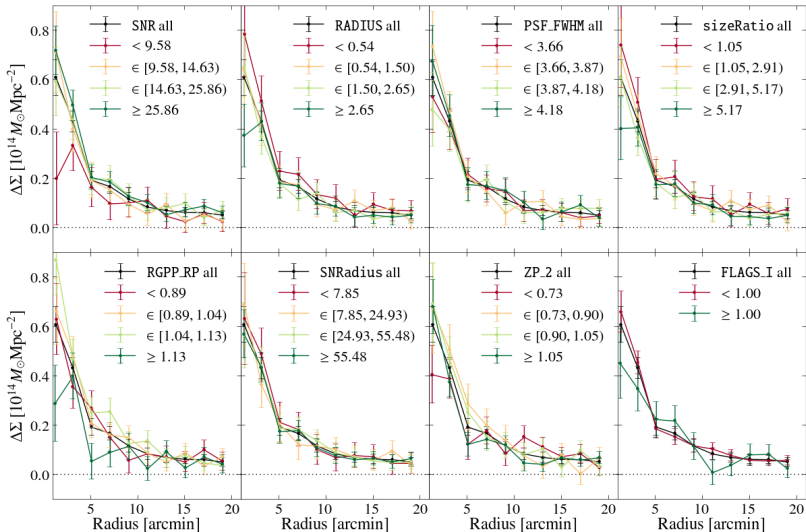
Dominik's Shape Consistency Tests

- Larger galaxies have larger detected shear.
- Partly related to definition of size
- Check if fixed in v5



Dominik Gangkofner

Peter's Consistency Tests



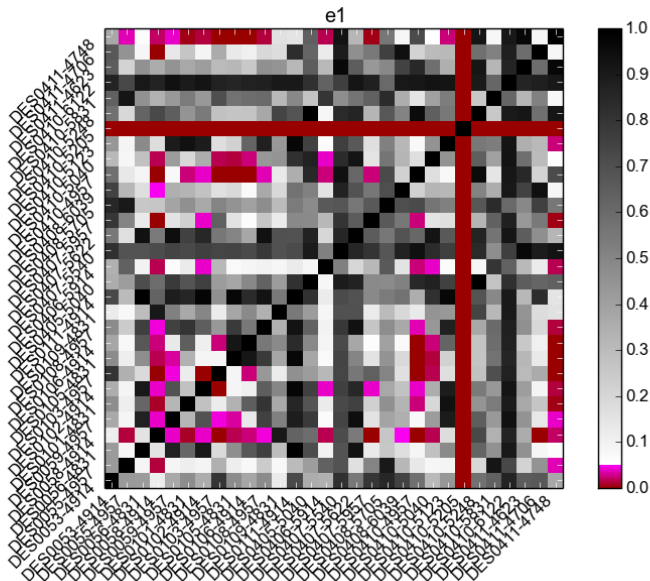
Peter Melchior

- There is a clear dependence on SNR. No noise bias correction applied.
- Galaxies with smaller RADIUS (deconvolved half-light radius) are more strongly lensed, in particular at larger separation from the cluster centers.
- Blending (FLAGS=1) does matter a lot towards cluster centers. This was also seen in the pointed SV clusters. This FLAG==0 cut needs to be applied for any lens sample that is associated with a higher concentration of galaxies.
- flag==0 cut does introduce a density-dependent bias: see this paper

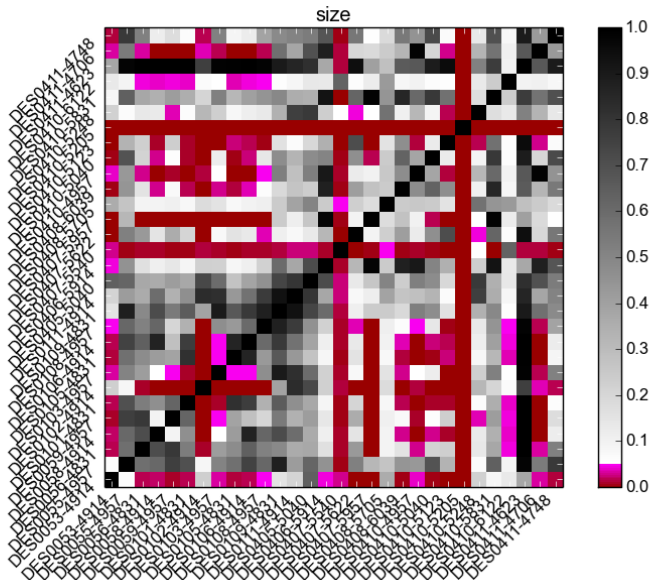
Jörg's Coadd Tile Consistency Tests

- Check that the shear catalog properties of different DES tiles are consistent.
- Computing the KS test for several galaxy properties.

Jörg's Coadd Tile Consistency Tests



Jörg's Coadd Tile Consistency Tests



- Run on new RedMapper catalogs.
- Run with new im3shape v5 (collating), ngmix (running)
- Repeat above tests.
- Add random points tests: Randoms are special for RedMapper