

broaden redshift range, select for luminous compact emission line galaxies (Luminosity of H beta, look into environment & merger together . . .

NOTE OIII ew is a metallicity dependent measure, so could lead to biased selection

Wed, July 5th

Questions for Nikhil Padamanabhan

- (are these all LRGs for Boss + previous??)
- how select randoms for LRGs (to account for sky distribution
- why a bit limited from RA/Dec of full footprint?
- any suggestions for helping to create Peas randoms....

DR12 paper on cluster BAO final results, plot of sky coverage, check

strange piece missing could be target selection . . . .

target selection bug .....

(D1D2/D1R2)-1 (randoms

instead of landy-szalay

Next instead of jackknife use (bootstrap??), by taking length of peas, generating random numbers same length, then running it 10x, this will give errors

So 1. Avoid errors, 2. fix jackknife issues

reading Zehavi et al. 2002 (Galaxy Clustering in early SDSS rel)

no 2 fibers can be placed within 55"

error estimates found by using Jackknife error estimate (see Lupton 1993)

divide sample into 10 regions of the sky approximately equal area, described in appendix

Zehavi et al. 2004 (On departures from a power law in the galaxy correlation function)\

also uses  $p_{\max}=40 \text{ mpc}^{-1}$  large enough to include signals of interest

The integration over line-of-sight separations makes  $w_p(r_p)$  independent of redshift-space distortions resembles angular correlation function  $w(\theta)$ , but because it makes use of known redshifts of each object a more sensitive measure of real-space correlation function  $\zeta(r)$

color space-

Do a color cut -# of objects??

change number of jackknives to explore errors,

-> follow Nikhil's paper by splitting sky up into squares of RA/DEC

different blocks this way, if length 0, redo - don't include it

Cross correlation - Trying different  $p_{\max}$ , and seeing how  $w_p$  (at a particular  $r_p$  (e.g., 2 Mpc), collecting a convergence

Friday, June 30th 2017

Working on Jackknife code w/ Merry

right now, splitting sphere up into bins of RA slices (size  $m$ ) and DEC slices (size  $m$  in radians w/  $\arcsin(\text{dec})$  sizes)

Note - it splits for all 4 (2 data, 2 randoms) in one go now. Then it takes only bins with more than 1 data

note - it splits for all 4 (2 data, 2 randoms) in one go now. Then it takes only bins with more than 1 data source to run the jackknife.

Regions may not be even - in the future could I use HEALPix to do this?

(note only  $2^n$  bins will split evenly) <http://faraday.uwyo.edu/~admyers/ASTR5160/handouts/51609.pdf>

Questions (working through Thurs June 29th)

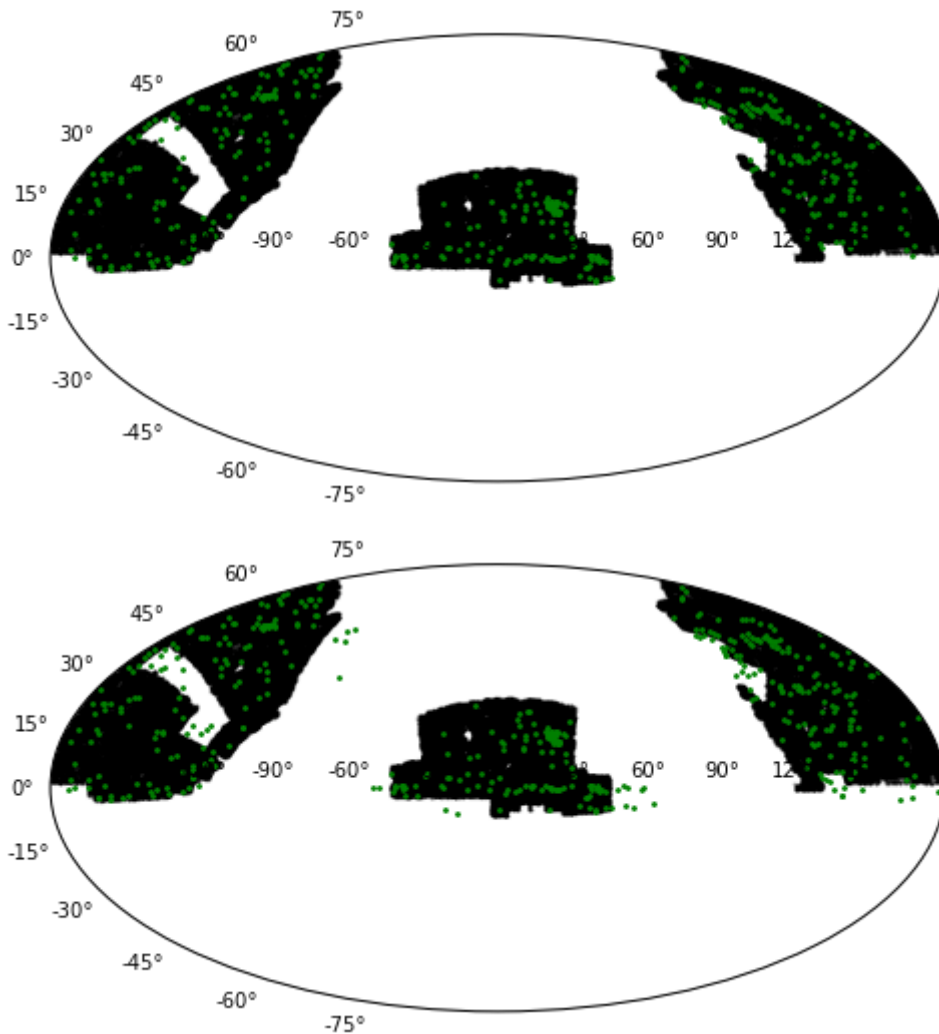
1. randoms make 100x peas number - done
2. Probe same volume of sky, but RA/Dec of peas dips outside LRG range - done, badly, look into masks for LRGs

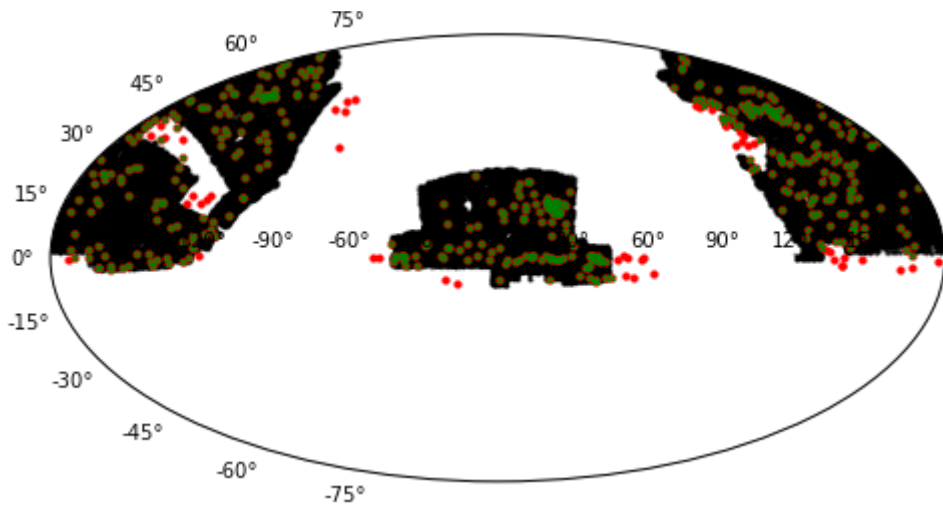
try pulling off Peas off image of SDSS LRG footprint

Jackknife, how split up sky? don't want 360 degs, now trying dec bins, and all RA as a stripe

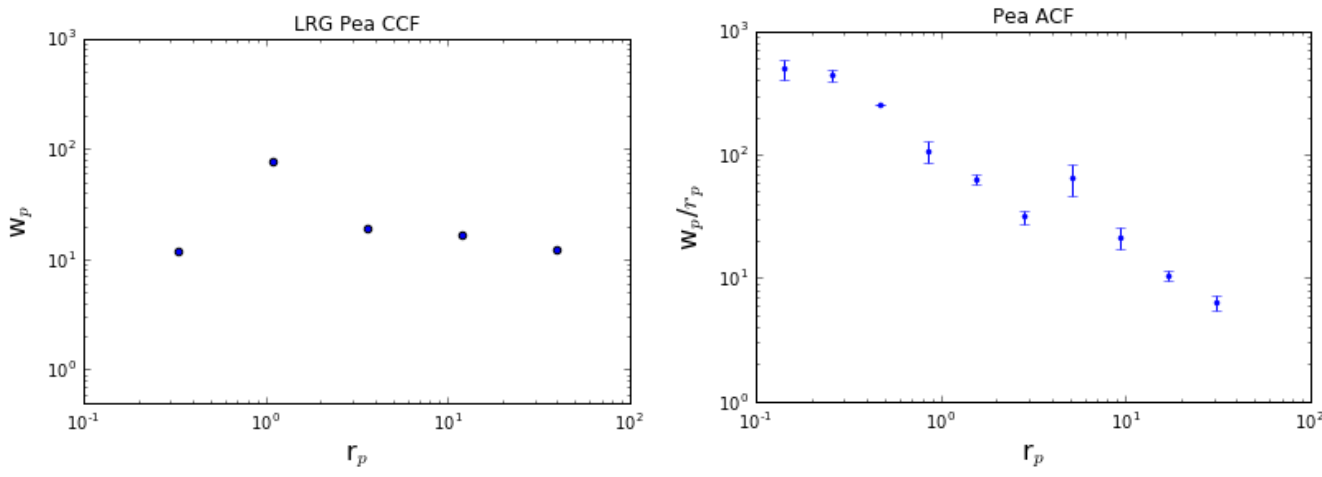
**2 - Pulling peas off SDSS LRG footprint** *Note quick & dirty method is removing peas not within projected 21 Mpc of a LRG (this is 1.4 degrees)*

*recovers small scale point in cross correlation without changing too much else (but the numbers do vary a bit...)*





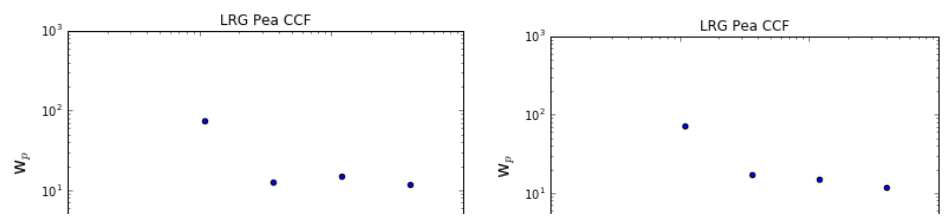
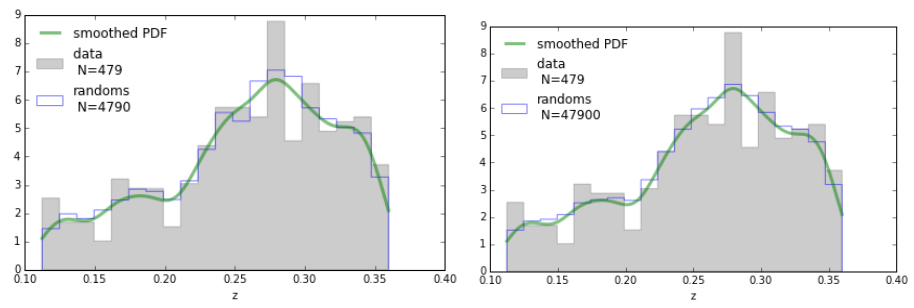
(Note red are removed)



```
wp_x - array([ 11.92595307, 77.53436715, 19.22110828, 16.82323691, 12.41548656])
wp_p -> array([ 70.    , 112.    , 120.    , 91.99298851,
97.00822885, 88.56083675, 336.53920382, 197.76710987, 180.25799518, 195.71429682])
```

1 - **randoms make 100x peas number** [Makes little difference in CCF, but definitely in auto, keep 100x - doesn't add much to running time)

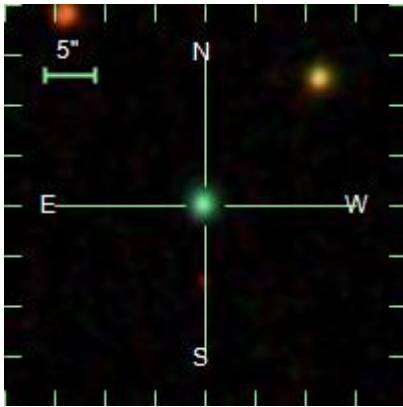
1st - Results with 10x peas number (cross correlation with LRGs & Autocorrelation of peas)



~~~~~

| u     | g     | r     | i     | z     |
|-------|-------|-------|-------|-------|
| 19.57 | 19.23 | 18.45 | 18.90 | 19.22 |

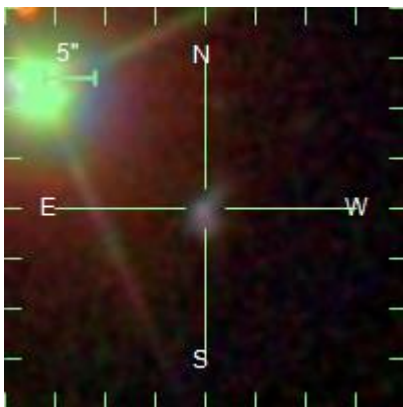
<http://skyserver.sdss.org/dr12/en/tools/explore/summary.aspx?ra=191.09738&dec=2.2612311>



587735695911747673 204.91963 55.461137

<http://skyserver.sdss.org/dr12/en/tools/explore/summary.aspx?ra=204.91963&dec=55.461137>

Plot flag, near bright star . . . but spectrum looks mostly OK



587738371672178952 125.69859 22.695578

<http://skyserver.sdss.org/dr12/en/tools/explore/summary.aspx?ra=125.69859&dec=22.695578>





Looks great!

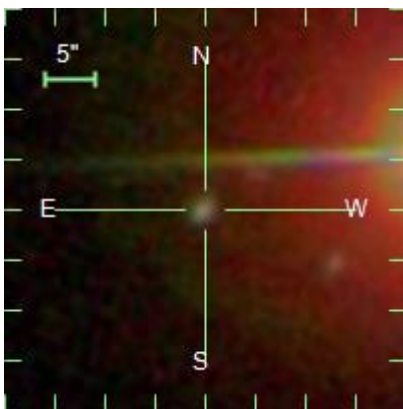
DR12 ID -

1237664092897083648

587741391573287017 145.94676 26.345161

Near bright star spike -

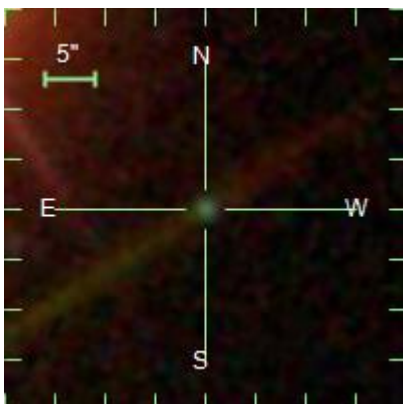
<http://skyserver.sdss.org/dr12/en/tools/explore/summary.aspx?ra=145.94676&dec=26.345161>



587744874785145599 121.32517 9.4259781

<http://skyserver.sdss.org/dr12/en/tools/explore/summary.aspx?ra=121.32517&dec=9.4259781>

Has phot flag, but really looks good, as does spectrum



Plot old color vs. New Color

Tuesday, June 20th

From Nikhil: I'm traveling this week but will be back next week and happy to chat then

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Just to get you started, I would just use the LSS catalogs we built for the BOSS analyses --- you can get them here :

<https://data.sdss.org/sas/dr12/booss/lss/>

These are documented here :

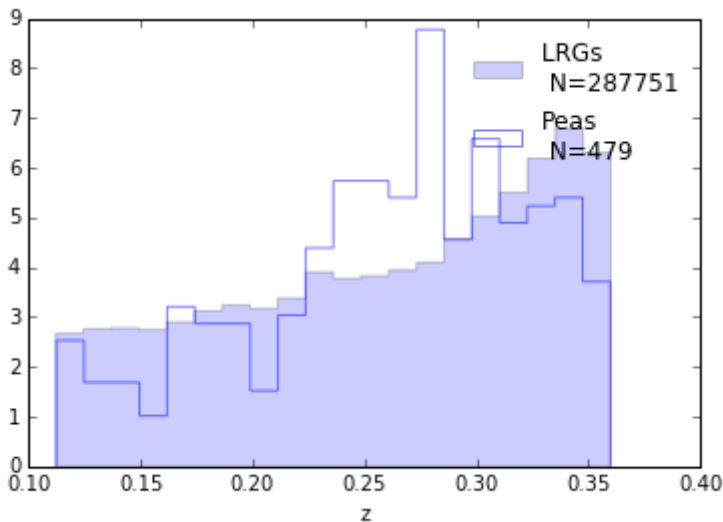
[https://data.sdss.org/datamodel/files/BOSS\\_LSS\\_REDUX/](https://data.sdss.org/datamodel/files/BOSS_LSS_REDUX/)

- note randoms created using masks
- This file contains the Large Scale Structure random points, (roughly 50 times the number of points in the respective galaxy\_DR12vX\_SAMPLE\_NS file).

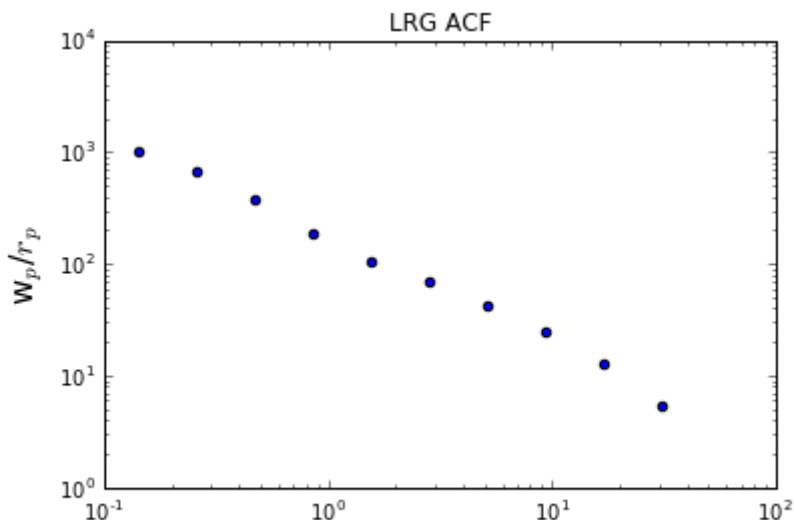
## Reading them into python notebook peas clustering

- working on adding randoms & LRGs into arrays

Took random catalog of LRGs, which has 50x LRGs, and made slightly smaller by cut in 1/2  
Now with peas & LRGs, can start playing with correlations in Peas\_clustering.ipynb

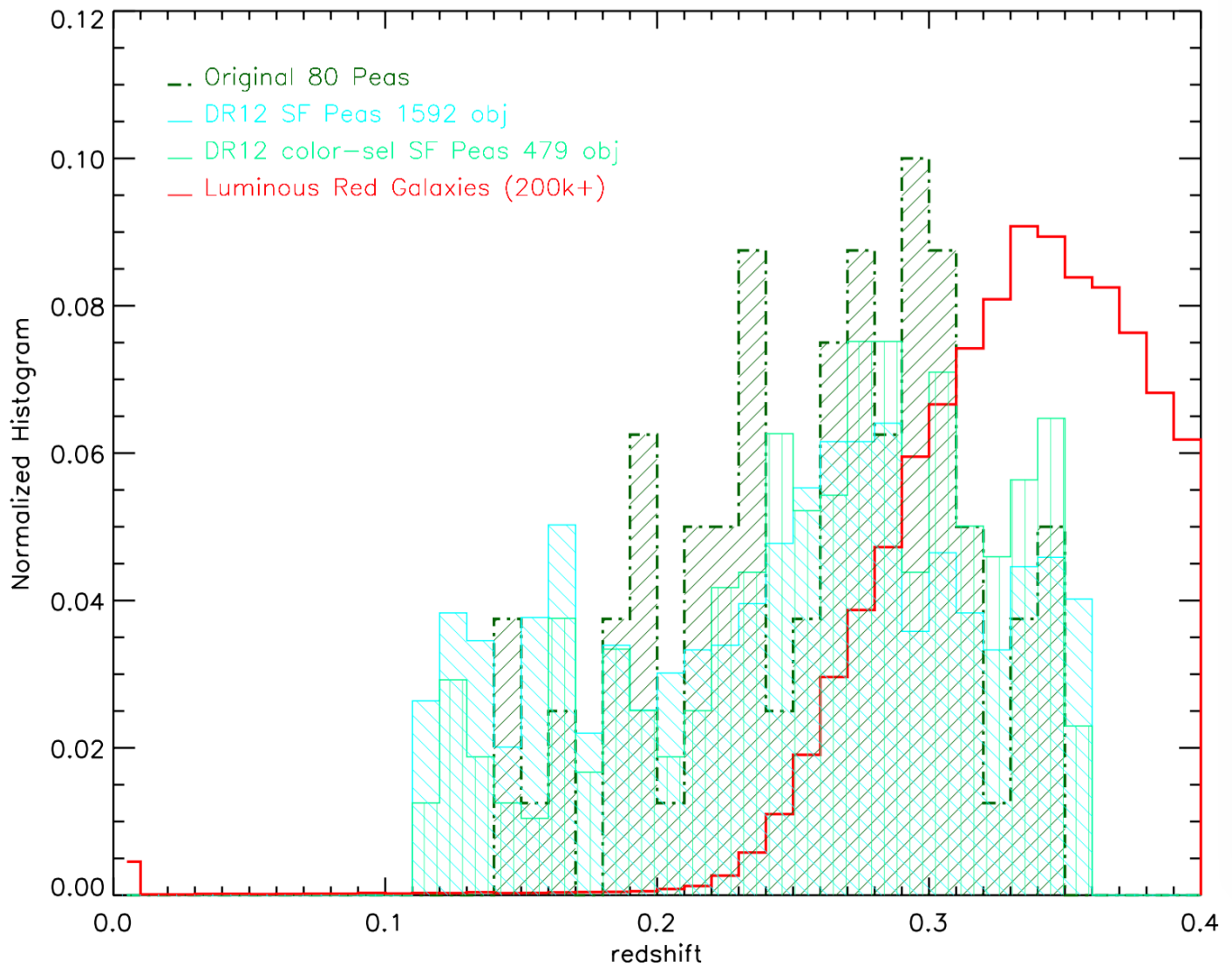


run an auto correlation of each separately:



$r_p$

Monday,



June 19th

Working on mkrand cat to generate matched catalog

Then with Merry on her randoms.py

(note LRGs have 861 objects b/w 0.1& 0.2, but 168k out to 0.36)

Running AutoCorrelation w/ 479 (color-selected DR12, but no phot flag limit)

479 vs. 341 (phot flag =1)

Looking at flag=0, 48 objects ("sfnot") -> 9 are true peas

Notes: Find the LRGs (for a cross correlation)

- <http://www.sdss.org/dr13/spectro/targets/>
- [http://www.sdss3.org/dr8/algorithms/target\\_selection.php#lrg](http://www.sdss3.org/dr8/algorithms/target_selection.php#lrg)