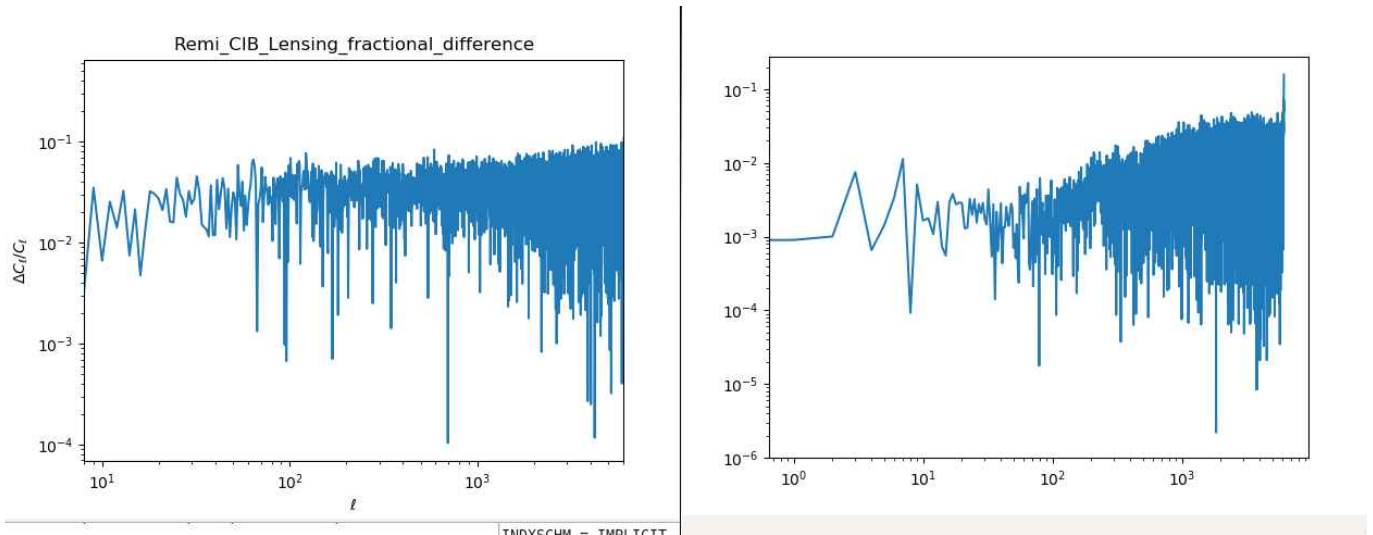


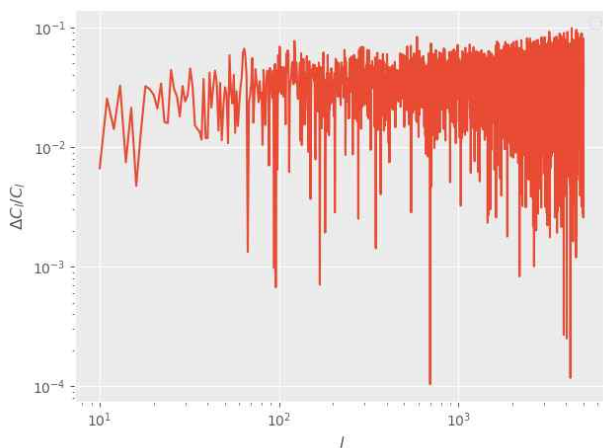
Corrections Needed for Remi's Plot

I tried the lensing again with the same maps Remi used for the plot below in red. (https://mocks.cita.utoronto.ca/index.php/File:Cib_totalfield_powerspectrum_reldiff.png)



The plot on the left is what I plotted using Remi's total maps from `cal_sky_new`. Note that this is the map Remi posted in 'mocks.' (It is absolute value.)

The plot on the right is what plotted after I did the lensing myself. It is more similar to Remi's plot than before (since I was able to use shells from $z = 0$ to $z=4.6$ for the kappa rather than only from $z = 0$ to $z=3.2$), but the fractional difference is still noticeably smaller.



Remi's plot in mocks

Below is Remi's added map (which I used to reproduce Remi's plot), displaying the values in the pixels. Note that the first value of the array is around **0.4286** (let's call this **a**).

```
In [35]: b
Out[35]:
array([0.42864904, 0.43556386, 0.410927 , ..., 0.41154575, 0.40081134,
       0.40952823])
```

Below is my added map, also displaying the pixel values. The first value is around **0.4624** (let's call this **b**)

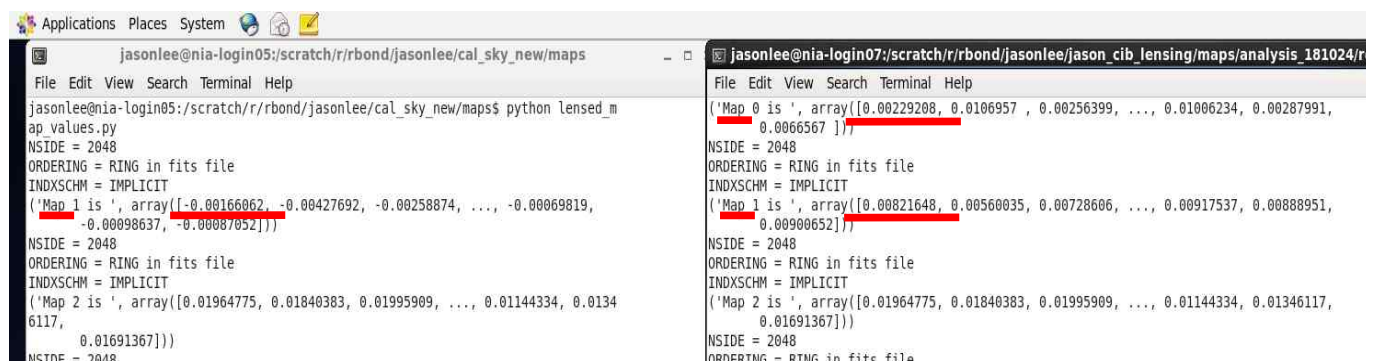
```
In [3]: hp.read_map('./lensed/added_map.fits')
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
Out[3]:
array([0.46245155, 0.47650072, 0.44545537, ..., 0.45818096, 0.44446969,
       0.45304564])
```

I needed to see if I was doing the lensing correctly, so I compared the pixel values for each of the shells. The shells start from $z=0.0$ and ends at $z=4.6$ so there is a total of 23 maps. The maps were labeled from Map 0 being $z=0.0$ to $z=0.2$ ~ Map 22 being $z = 4.4$ to $z= 4.6$.

The left side is a printout of Remi's shell pixel values, while the right side is mine.

The overall results are given in the subsequent pages.

Starting from shell $z=0.0$ to $z=0.2$ (Map 0),



1) Remi doesn't have a Map 0, it seems that he didn't add up the first shell after the lensing (since $z= 0.0$ to 0.2 cannot be lensed). Let's take the first value from my Map 0 as before: 0.00229

2) Map 1 ($z=0.2$ to $z=0.4$) show different values; Remi's is negative, while mine is positive. Taking the first values of both and taking the difference, $0.00824 - (-0.00166) = 0.0099$

Map 2 to Map 11 are exactly the same.

However, Remi has does not have a Map 12. So shell $z=2.4$ to $z=2.6$ is missing.

```
INDXSCHM = IMPLICIT
('Map 11 is ', array([0.04275562, 0.04328993, 0.04066905, ..., 0.02632799, 0.026
73193,
0.02466616]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 13 is ', array([0.02630469, 0.02245313, 0.02080149, ..., 0.01934251, 0.019
01553,
0.02219833]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 14 is ', array([0.01228446, 0.01226805, 0.01401314, ..., 0.01636673, 0.015
05587,
0.01503501]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 15 is ', array([0.01293109, 0.01088057, 0.010732, ..., 0.01312142, 0.010

('Map 10 is ', array([0.03209304, 0.033080310, 0.03771320, ..., 0.034339034, 0.03201103,
0.04247288]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 11 is ', array([0.04275562, 0.04328993, 0.04066905, ..., 0.02632799, 0.02673193,
0.02466616]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 12 is ', array([0.02163332, 0.02036387, 0.02208959, ..., 0.02669931, 0.03090256,
0.02698365]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 13 is ', array([0.02630469, 0.02245313, 0.02080149, ..., 0.01934251, 0.01901553,
0.02219833]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
```

The first value of my Map 12 is 0.02163.

The rest are all the same.

Now, adding the three values up,

$$(\text{Map 0})+(\text{difference of Map 1})+(\text{Map 12}) = 0,00229+0.0099+0.02163 = 0.03382.$$

From the previous page, the first value of Remi's total map, $\mathbf{a} = 0.4286$ and mine $\mathbf{b} = 0.4624$.

$\mathbf{b}-\mathbf{a} = 0.0338$ which is basically the same as the difference resulting from the three shells.

If I am correct, the fractional difference of the C_l spectrum from the simulations is smaller than what was posted in 'mocks' website.

The total added maps before lensing are a bit different as well, but the difference is much smaller and does not affect the fractional difference as much. (The first shell was missing as well, which seems to reason for the discrepancy.)

The next two pages show the comparison of all 23 maps values.

```
Applications Places System
jasonlee@nia-login05:/scratch/r/rbond/jasonlee/cal_sky_new/maps
File Edit View Search Terminal Help
jasonlee@nia-login05:/scratch/r/rbond/jasonlee/cal_sky_new/maps$ python lensed_m
ap_values.py
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 1 is ', array([-0.00166062, -0.00427692, -0.00258874, ..., -0.00069819,
-0.00098637, -0.00087052]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 2 is ', array([0.01964775, 0.01840383, 0.01995909, ..., 0.01144334, 0.0134
6117,
0.01691367]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 3 is ', array([0.02006391, 0.02089854, 0.02015961, ..., 0.03136671, 0.0268
2793,
0.02565552]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 4 is ', array([0.02487447, 0.02966837, 0.02674556, ..., 0.04306629, 0.0328
3849,
0.03870745]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 5 is ', array([0.03582478, 0.03685976, 0.0281662, ..., 0.02569212, 0.0233
9114,
0.02198461]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 6 is ', array([0.04002062, 0.05147995, 0.03817049, ..., 0.028201, 0.0281
7041,
0.02713103]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 7 is ', array([0.0496918, 0.0391411, 0.03910563, ..., 0.04895438, 0.0550
3287,
0.03960584]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 8 is ', array([0.0390154, 0.03712532, 0.0343812, ..., 0.04053572, 0.0418
4713,
0.05036654]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 9 is ', array([0.04786197, 0.05502933, 0.0567808, ..., 0.04655778, 0.0494
9244,
0.04909407]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 10 is ', array([0.03280964, 0.03560518, 0.03771526, ..., 0.03499854, 0.032
81189,
0.04247288]))
NSIDE = 2048
ORDERING = RING in fits file
jasonlee@nia-login07:/scratch/r/rbond/jasonlee/jason_cib_lensing/maps/analysis_181024/r
File Edit View Search Terminal Help
('Map 0 is ', array([0.00229208, 0.0106957, 0.00256399, ..., 0.01006234, 0.00287991,
0.0066567 ]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 1 is ', array([0.00821648, 0.00560035, 0.00728606, ..., 0.00917537, 0.00888951,
0.00900652]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 2 is ', array([0.01964775, 0.01840383, 0.01995909, ..., 0.01144334, 0.01346117,
0.01691367]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 3 is ', array([0.02006391, 0.02089854, 0.02015961, ..., 0.03136671, 0.02682793,
0.02565552]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 4 is ', array([0.02487447, 0.02966837, 0.02674556, ..., 0.04306629, 0.03283849,
0.03870745]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 5 is ', array([0.03582478, 0.03685976, 0.0281662, ..., 0.02569212, 0.02339114,
0.02198461]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 6 is ', array([0.04002062, 0.05147995, 0.03817049, ..., 0.028201, 0.02817041,
0.02713103]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 7 is ', array([0.0496918, 0.0391411, 0.03910563, ..., 0.04895438, 0.05503287,
0.03960584]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 8 is ', array([0.0390154, 0.03712532, 0.0343812, ..., 0.04053572, 0.04184713,
0.05036654]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 9 is ', array([0.04786197, 0.05502933, 0.0567808, ..., 0.04655778, 0.04949424,
0.04909407]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 10 is ', array([0.03280964, 0.03560518, 0.03771526, ..., 0.03499854, 0.03281189,
0.04247288]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 11 is ', array([0.04275562, 0.04328993, 0.04066905, ..., 0.02632799, 0.02673193,
0.02466616]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 12 is ', array([0.02163332, 0.02036387, 0.02208959, ..., 0.02669931, 0.03090256,
0.02698365]))
NSIDE = 2048
```

```
Applications Places System
jasonlee@nia-login05:/scratch/r/rbond/jasonlee/cal_sky_new/maps
File Edit View Search Terminal Help
INDXSCHM = IMPLICIT
('Map 11 is ', array([0.04275562, 0.04328993, 0.04066905, ..., 0.02632799, 0.02673193, 0.02466616]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 13 is ', array([0.02630469, 0.02245313, 0.02080149, ..., 0.01934251, 0.01901553, 0.02219833]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 14 is ', array([0.01228446, 0.01226805, 0.01401314, ..., 0.01636673, 0.01505587, 0.01503501]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 15 is ', array([0.01293109, 0.01088057, 0.010732, ..., 0.01312142, 0.01094226, 0.01003623]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 16 is ', array([0.00778164, 0.00812353, 0.00862978, ..., 0.00806933, 0.008081464, 0.00866406]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 17 is ', array([0.00572008, 0.00666204, 0.00543016, ..., 0.00688469, 0.0058847, 0.00616822]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 18 is ', array([0.00263341, 0.00256527, 0.00299376, ..., 0.0031418, 0.00332072, 0.00304228]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 19 is ', array([0.00216576, 0.00204144, 0.00190574, ..., 0.00252596, 0.00254259, 0.0024473 ]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 20 is ', array([0.00176155, 0.00175794, 0.00194296, ..., 0.00170027, 0.00181281, 0.00186918]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 21 is ', array([-1.16483378e-07, 2.26854610e-07, 1.03092496e-07, ..., -6.05710056e-07, -1.83574713e-07, 1.13804549e-06]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 22 is ', array([-7.96883228e-07, 2.19616467e-07, 3.82959115e-07, ..., 1.22618658e-07, 5.75222316e-07, -6.78514539e-07]))
jasonlee@nia-login05:/scratch/r/rbond/jasonlee/cal_sky_new/maps$

jasonlee@nia-login07:/scratch/r/rbond/jasonlee/jason_cib_lensing/maps/analysis_181024/remi_final
File Edit View Search Terminal Help
('Map 10 is ', array([0.03280964, 0.03560518, 0.03771526, ..., 0.03499854, 0.03281189, 0.04247280]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 11 is ', array([0.04275562, 0.04328993, 0.04066905, ..., 0.02632799, 0.02673193, 0.02466616]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 12 is ', array([0.02163332, 0.02036387, 0.02208959, ..., 0.02669931, 0.03090256, 0.02698365]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 13 is ', array([0.02630469, 0.02245313, 0.02080149, ..., 0.01934251, 0.01901553, 0.02219833]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 14 is ', array([0.01228446, 0.01226805, 0.01401314, ..., 0.01636673, 0.01505587, 0.01503501]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 15 is ', array([0.01293109, 0.01088057, 0.010732, ..., 0.01312142, 0.01094226, 0.01003623]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 16 is ', array([0.00778164, 0.00812353, 0.00862978, ..., 0.00806933, 0.008081464, 0.00866406]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 17 is ', array([0.00572008, 0.00666204, 0.00543016, ..., 0.00688469, 0.0058847, 0.00616822]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 18 is ', array([0.00263341, 0.00256527, 0.00299376, ..., 0.0031418, 0.00332072, 0.00304228]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 19 is ', array([0.00216576, 0.00204144, 0.00190574, ..., 0.00252596, 0.00254259, 0.0024473 ]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 20 is ', array([0.00176155, 0.00175794, 0.00194296, ..., 0.00170027, 0.00181281, 0.00186918]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 21 is ', array([-1.16483363e-07, 2.26854610e-07, 1.03092496e-07, ..., -6.05710056e-07, -1.83574699e-07, 1.13804549e-06]))
NSIDE = 2048
ORDERING = RING in fits file
INDXSCHM = IMPLICIT
('Map 22 is ', array([-7.96883228e-07, 2.19616467e-07, 3.82959115e-07, ..., 1.22618658e-07, 5.75222316e-07, -6.78514539e-07]))
jasonlee@nia-login07:/scratch/r/rbond/jasonlee/jason_cib_lensing/maps/analysis_181024/remi_final
```