

# Mosaic: a code for power spectrum analysis in multiple patches

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## 1 Intro

Mosaic is a set of tools for computing angular power spectra in healpix and CAR pixellisation using the Master algorithm (arxiv:0105302). It makes heavy use of healpix function (<https://healpix.sourceforge.io/>) and enlib function (see Sigurd Naess github: <https://github.com/amaurea>), and has benefited from Eiichiro Komatsu tools (<https://www.mpa.mpa-garching.mpg.de/~komatsu/>), SPHT are performed using libsharp (arXiv:1303.4945) so we are especially thankful to Martin Reinecke and Dag Sverre Seljebotn. The code also allows to make comparison with NaMaster (see David Alonso github: <https://github.com/damonge/>). While the bugs are all on me, special thanks for Sigurd Naess for help with the code.

## 2 Installation

The code is mostly written in python apart from the mode coupling calculation written in fortran 90. You need to compile it using f2py. Just use the make file in the mosaic folder. Then copy in your .bashrc the following lines:

```
export PATH=${PATH}:PATH_TO_MOSAIC/mosaic/bin
export PATH=${PATH}:PATH_TO_MOSAIC/mosaic/tests
export PYTHONPATH=${PYTHONPATH}:PATH_TO_MOSAIC/mosaic/python
```

## 3 Code structure

The code is structured around four executables (located in the *bin* directory):

1. *iso\_generate\_sims.py*
2. *iso\_generate\_window\_functions.py*
3. *iso\_generate\_mcms.py*
4. *iso\_generate\_all\_spectra.py*
5. *iso\_generate\_mc\_results.py*
6. *iso\_generate\_plots.py*

They should be run in order. Two other executables: *iso\_generate\_plots.py* and *iso\_generate\_mc\_results.py* allow for visualisation and combination of the results.

### 3.1 Generation of simulations

Gaussian simulations are generated from a camb lensed power spectrum.