





Deliverable 5.3

Low-level visualization tools

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Work Package

WP5 - Beam deconvolution map making

Docid [xxx-xxx-xxx]









Revision History

Version	Authors	Date	Changes
1.0	Anna-Stiina Suur-Uski, Trygve Leithe Svalheim	25 October 2020	Initial Version





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Overview

Along with the BeyondPlanck data produced over the last few years, a companion code called c3pp was developed. This code would be used to visualize results and serve as a simple tool for handling the BeyondPlanck data structures. The tool as it exists today has built in functionality for making figures, sky-maps and converting and restructuring files to name a few. All figures in Svalheim et al. (2020) have been generated by this script, and most of the available data for the full BeyondPlanck release available at beyondplanck.science has been formatted using this.

The code is publicly available at https://github.com/cosmoglobe/c3pp



Figure 1: Example of a map image generated by c3pp.

Installation

Install tools by running

pip install git+https://github.com/trygvels/c3pp.git -U

or

pip install git+https://github.com/trygvels/c3pp.git --user





and make sure that

```
PATH=$PATH:~/.local/bin
```

is in your path.

Usage

The tool uses command line arguments and has many different tools built in (and more coming). In order to get an overview of the available tools and how to access them, simply type

c3pp --help

in your terminal. This will display a list of all available tools. For more information on each specific tool, simply type

```
c3pp [toolname] --help
```

and a description will be printed:

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```
[command prompt]$ c3pp
Usage: c3pp [OPTIONS] COMMAND [ARGS]...
Options:
  --help Show this message and exit.
Commands:
 alm2fits
                   Converts c3 alms in .h5 file to fits.
  crosspec
                   Calculates a powerspectrum from polspice.
 dlbin2dat
                   Outputs binned powerspectra averaged over a range of
                    output samples.
  fits-mean
                   Calculates the mean over sample range from fits-files.
  fits-stddev
                   Calculates the standard deviation over sample range
                    from fits-files.
 generate-sky
                   Generate sky maps from separate input maps.
 gnomplot
                   Gnomonic view plotting.
 h52fits
                   Outputs a .h5 map to fits on the form
                    000001 cmb amp n1024.fits
 make-diff-plots Produces difference maps between output directories.
                   Calculates the mean over sample range from .h5 file.
 mean
  output-sky-model Outputs spectrum plots.
```





	pixreg2trace	Outputs the values of the pixel regions for each sample
		to a dat file.
	plot	Plots map from .fits or h5 file.
	plotrelease	Plots all release files.
	printdata	Prints the data of a fits file
	printheader	Prints the header of a fits file.
	qu2ang	Calculates polarization angle map from QU signals.
	release	Creates a release file-set on the BeyondPlanck format.
	rmcolumn	Removes columns in fits file
	sigma-l2fits	Converts c3-h5 dataset to fits for c1 BR and GBR
estimator analysis.		
	specplot	Plots the file output by the Crosspec function.
	stddev	Calculates the stddev over sample range from .h5 file.
	traceplot	Traceplot of samples from .dat.

A short description about data and a couple of example cases goes here ...?

References

BeyondPlanck XIV. Polarized foreground emission between 30 and 70GHz, Svalheim, T. L. et al. 2020, A&A, submitted [2011.08503]



