

Instructions

CAMB is a software package for simulating the cosmic microwave background anisotropy pattern, written by Antony Lewis and Antony Challinor. It is recommended that you download the latest version from the website camb.info, where you will find instructions and links to additional software packages for physics add-ons and data analysis. These notes will tell you how to get started.

1. Once you have downloaded the code and unpacked it, you should first edit the Makefile for the fortran compiler specific to your computer. Then execute

```
> make
```

to generate the executable `camb`. To run the program, you need to tell it what cosmological parameters to use, which is done as

```
> camb params.ini
```

When it finishes running you will find files named

```
XXX_scalCls.dat, XXX_matterpower.dat
```

where “XXX” is some text string used to identify the set of parameters. If you graph column 1 vs column 2 of these files, then you will find the C_ℓ spectrum and the matter power spectrum, as shown in the figures below.

2. To choose a set of cosmological parameters, simply edit the file

```
params.ini
```

The nomenclature should be easy to figure out. The output filename prefix (“XXX”) is set in line 4. Density parameters $\Omega_b h^2$, $\Omega_c h^2$ are set in lines 34, 35. The Hubble constant is set in line 38. The dark energy equation of state, w , is set in line 40.

3. Have fun!

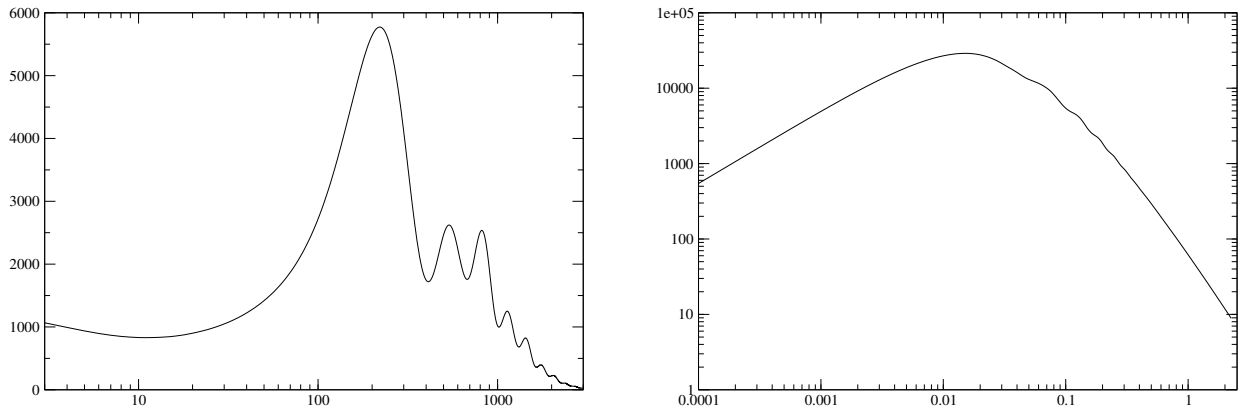


Figure 1: Left: The CMB anisotropy spectrum $\ell(\ell + 1)C_\ell/2\pi$ vs ℓ is plotted for a cosmological model using the WMAP 7-year Best Fit parameters. Right: The matter power spectrum $P_\delta(k)$ vs k is plotted for the same cosmological model.