

## Astro 321: Problem Set 7

Due Mar 4

### CAMB, CMB Power Spectra, Baryon Effects

Goto `camb.info`, download and compile the CAMB Einstein-Boltzmann code. Run the  $\Omega_m = 0.27$ ,  $h = 0.7$ ,  $n = 0.966$ ,  $A_S = (4.657 \times 10^{-5})^2$ ,  $\Omega_b h^2 = 0.022$ ,  $\tau = 0.085$  standard cosmology.

- Plot the temperature and  $E$  polarization power spectra against multipole moment  $\ell$ .
- Extract the transfer function (recall we normalize so that  $T(k=0) = 1$ ) and replace the CDM-only analytic form used in the previous problem sets with the numerical, baryon included results. Plot the two against each other and discuss the origin of the differences.
- Use the numerical transfer function to calculate  $\sigma_8$  and compare it with the value CAMB reports.