

PGF5292: Physical Cosmology I

Problem Set 8

(Due May 06, 2015)

1) CMB Power Spectrum. Use CAMB to generate the CMB C_l 's. Make plots of C_l versus l , changing the cosmological parameters one at a time, and explain the effects you see on the spectrum. Vary the following parameters:

Ω_m : matter density

T_γ : photon temperature (or similarly its density Ω_γ)

Ω_b : baryon density

Ω_{DE} : dark energy density

Ω_k : curvature density

w : dark energy equation of state

h : Hubble constant

N_{eff} : effective number of massless neutrino species

A_s : spectral amplitude of primordial scalar perturbations

n_s : spectral index of primordial scalar perturbations

τ : optical depth