

Homework V
due October 6th 2006

- 1) A 40W incandescent light bulb radiates from a tungsten filament a 3300K. We assume it radiates like a black body and the electric power is entirely converted into radiation.
- 1) From the information given, estimate the size of the radiating tungsten filament.
 - 2) What is the wave-length λ_m at the maximum of the radiation spectral distribution? What is the corresponding frequency ν_m ?
 - 3) With ν_m as an approximation of the average frequency, estimate how many photons are emitted by the light bulb per second.
 - 4) You are looking at the light bulb from a distance of 5m, how many photons enter you eye per second? (the diameter of your pupil is about 5mm)
 - 5) The light bulb is now mounted in a lamp that redirect all the light along one direction. Estimate the force exerted by the light on the lamp?
- 2) Measurements of the stopping potential at different wavelength are given in the table. Plot these data in such a way you can extract
- a) the work function
 - b) the threshold frequency and
 - c) the ratio h/e

λ (nm)	200	300	400	500	600
V_0 (V)	4.2	2.06	1.05	0.41	0.03