Wiensches Verschiebungsgesetz

$$\rho(\nu)\,\mathrm{d}\nu = \frac{8\pi h\nu^3}{c^3}\frac{\mathrm{d}\nu}{e^{\frac{h\nu}{k_B T}}-1}$$

a) $\nu = \frac{c}{\lambda}; \quad \mathrm{d}\nu = -\frac{c}{\lambda^2}\,\mathrm{d}\lambda$

$$\rho(\nu)\,\mathrm{d}\nu = \frac{8\pi h\nu^3}{c^3}\frac{\mathrm{d}\nu}{e^{\frac{h\nu}{k_B T}}-1}$$

$$\rho(\lambda)\,\mathrm{d}\lambda = \underline{\underline{\frac{8\pi ch}{\lambda^5}\frac{\mathrm{d}\lambda}{e^{\frac{hc}{\lambda k_B T}}-1}}}$$

b)

Photoeffekt

$$W = 2.9\text{ eV}$$

a) $E > \underline{\underline{W = 2.9\text{ eV}}}$

b) $E = hf; \quad \lambda = \frac{c}{f}$

$\lambda = \frac{ch}{E} = \underline{\underline{4.28 \times 10^{-7}\text{ m}}}$

c) $\lambda = 400\text{ nm}; \quad I = 1\text{ mA}$

d)

e)

f)

Zerfließen eines Gauß-Pakets

$$\psi(x,t) = \frac{\sqrt{a}}{(2\pi)^{3/4}} \int_{-\infty}^{\infty} \exp\left(-\frac{a^2}{4}(k-k_0)^2 \right) \exp\left(i\,(kx - \omega(k)t) \right) \mathrm{d}k$$

a)

b)

c)