Exercise 5.2.3 Attenuation of Light

Starting from

$$E_x = \exp - \frac{\omega \cdot \kappa \cdot x}{c} \cdot \exp[\, i \cdot (k_x \cdot x - \omega \cdot t)]$$

Decreasing amplitude   **Plane wave**

- Give maximal values for κ (damping constant, attenuation index, extinction coefficient) if a penetration depth of **1m**, **100 m 10^4 m** is specified for the light intensity.
- Calculate what that would mean in terms of *only* ϵ'' or *only* ϵ''.
- Discuss the results with respect to the complex index of refractions of **Si** and the dielectric function of **GaAs** as given in this link for frequencies above and below the band gap (after you located the band gap by straight thinking).

Link to the solution