

Exercise 5.2.3 Attenuation of Light

Starting [from](#)

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

Decreasing
amplitude

Plane wave

- Give maximal values for κ (damping constant, attenuation index, extinction coefficient) if a penetration depth of **1m, 100 m 10⁴ 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](#)

Illustration