

Assignment 6

1. Explain why the sky is blue and the setting sun is red?
2. For s polarized light, plot, the reflection and transmission coefficients for incident angle between 0° and 90° .
3. Explain how Polaroid sunglasses work.
4. Calculate Brewster's angle for a light ray travelling in water incident on a glass surface.
5. Consider an elliptically polarized light wave having the following electric field.

$$\vec{E} = \hat{x} E_1 \cos(kz - \omega t) + \hat{y} E_2 \sin(kz - \omega t)$$

$$\text{where } E_1 = E_0 \cos \alpha \quad E_2 = E_0 \sin \alpha$$

A detector measures the intensity light transmitted through a linearly polarizer whose transmission axis is oriented at angle θ with respect to the x axis.

- a) Plot the detector signal versus θ .
- b) Does this signal make sense for the case of linearly polarized incident light?
- c) Does the signal make sense for the case of circularly polarized incident light?