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BATCH: B10

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Physics - 2 (ISBII PH211)

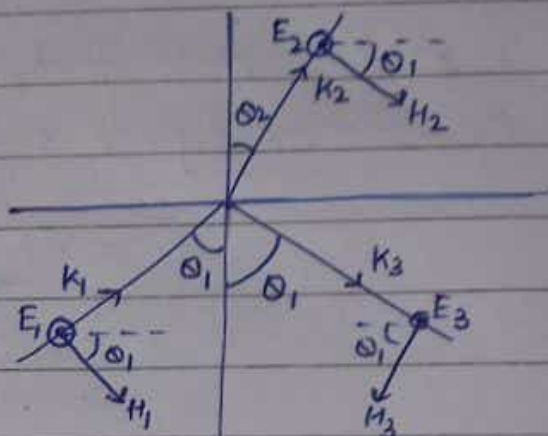
Assignment - 3

The reflection & refraction of a plane wave with the Electric vector lying perpendicular to the plane of incidence. (s-polarized)

$$E_{10} + E_{30} = E_{20}$$

$$H_{10} \cos \theta_1 - H_{30} \cos \theta_1 = H_{20} \cos \theta_2$$

$$\frac{k_1}{\omega \mu_1} (E_{10} - E_{30}) \cos \theta_1 = \frac{k_2}{\omega \mu_2} E_{20} \cos \theta_2$$



$$r_{\perp} = \frac{n_1 \cos \theta_1 - n_2 \cos \theta_2}{n_1 \cos \theta_1 + n_2 \cos \theta_2} = -\frac{\sin(\theta_1 - \theta_2)}{\sin(\theta_1 + \theta_2)}$$

$$t_{\perp} = \frac{2n_1 \cos \theta_1}{n_1 \cos \theta_1 + n_2 \cos \theta_2} = \frac{2 \cos \theta_1 \sin \theta_2}{\sin(\theta_1 + \theta_2)}$$

$$R = (r_{\perp})^2 = \left(\frac{n_1 \cos \theta_1 - n_2 \cos \theta_2}{n_1 \cos \theta_1 + n_2 \cos \theta_2} \right)^2 = \left(\frac{\sin(\theta_1 - \theta_2)}{\sin(\theta_1 + \theta_2)} \right)^2$$

$$T = \frac{4n_1 n_2 \cos \theta_1 \cos \theta_2}{(n_1 \cos \theta_1 + n_2 \cos \theta_2)^2}$$