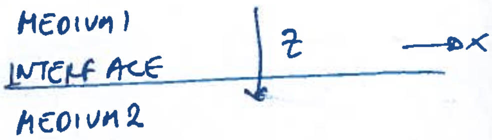
TESTING AMPLITUDES IN CODE OCT 2012

POYNTING VECTOR

$$\underline{S} = \frac{1}{2}\left(\underline{E} \times \underline{H}^*\right) = \begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ 0 & E_y & 0 \\ H_x^* & 0 & H_z^* \end{vmatrix}$$

$$\Downarrow$$

$$S_z = \frac{1}{2} \operatorname{Re}\left(-E_y H_x^*\right)$$



FOR DIELECTRICS, LOSSLESS MATERIAL

SI UNITS

$$i \underline{K} \times \underline{E} = i\omega\mu_r\mu_0 \underline{H} \Rightarrow$$

$$\underline{H} = \frac{1}{\omega\mu_r\mu_0} \begin{vmatrix} \underline{i} & \underline{j} & \underline{k} \\ K_x & 0 & K_z \\ 0 & E_x & 0 \end{vmatrix}$$

So:
$$H_x^* = \frac{1}{\omega\mu_r\mu_0}\left(-K_z E_y^*\right)$$

$\mu_r = 1$ IN THE CASE WE BENCHMARK

So:
$$S_z = \frac{1}{2\omega\mu_0} \operatorname{Re}\left(-|E_y|^2 K_z\right)$$

$$R = \frac{S_{z,r}}{S_{z,I}} = |r|^2 \frac{K_{z1}}{K_{z1}} = |r|^2$$

$$T = \frac{S_{z,t}}{S_{z,I}} = |t|^2 \frac{K_{z2}}{K_{z1}}$$

CONSERVATION OF ENERGY $\boxed{|r|^2 + |t|^2 \frac{K_{z2}}{K_{z1}} = 1}$