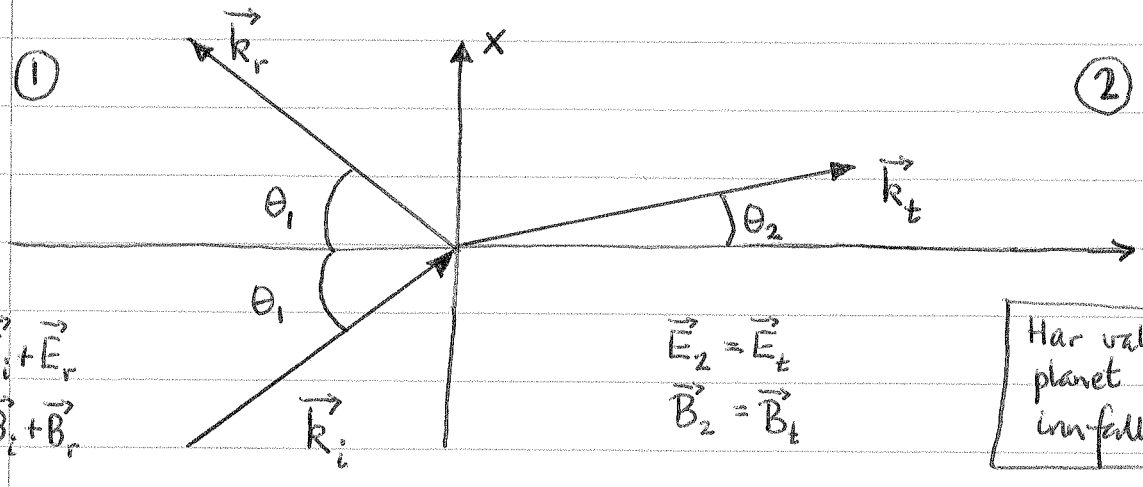
Ekstratimen 25.10.06

(100A)

Litt mer om refl. & transm. av e.m. bølger



$\vec{E}_1 = \vec{E}_i + \vec{E}_r$
$\vec{B}_1 = \vec{B}_i + \vec{B}_r$

$\vec{E}_2 = \vec{E}_t$
$\vec{B}_2 = \vec{B}_t$

Har valgt xz-planet som innfallsplan!

$$\vec{E}_i(\vec{r},t) = \vec{E}_{i0}\cos(\vec{k}_i\cdot\vec{r} - \omega t) \qquad \vec{B}_i = \frac{1}{\omega}\vec{k}_i \times \vec{E}_i$$

$$\vec{E}_r(\vec{r},t) = \vec{E}_{r0}\cos(\vec{k}_r\cdot\vec{r} - \omega t) \qquad \vec{B}_r = \frac{1}{\omega}\vec{k}_r \times \vec{E}_r$$

$$\vec{E}_t(\vec{r},t) = \vec{E}_{t0}\cos(\vec{k}_t\cdot\vec{r} - \omega t) \qquad \vec{B}_t = \frac{1}{\omega}\vec{k}_t \times \vec{E}_t$$

$$k_i v_1 = k_r v_1 = k_t v_2 = \omega, \quad v_1 = \frac{c}{n_1}, \quad v_2 = \frac{c}{n_2}$$

Fra Maxwells ligninger:

$$\left.\begin{aligned} \varepsilon_1 E_{1z} &= \varepsilon_2 E_{2z} \\ B_{1z} &= B_{2z} \\ E_{1x} &= E_{2x} \\ E_{1y} &= E_{2y} \\ \frac{1}{\mu_1} B_{1x} &= \frac{1}{\mu_2} B_{2x} \\ \frac{1}{\mu_1} B_{1y} &= \frac{1}{\mu_2} B_{2y} \end{aligned}\right\} \text{i grenseflaten } z=0$$

F.eks: $\varepsilon_1 E_{i0z}\cos(\vec{k}_i\cdot\vec{r} - \omega t) + \varepsilon_1 E_{r0z}\cos(\vec{k}_r\cdot\vec{r} - \omega t) = \varepsilon_2 E_{t0z}\cos(\vec{k}_t\cdot\vec{r} - \omega t)$

Ovng 9 $\Rightarrow \vec{k}_i\cdot\vec{r} = \vec{k}_r\cdot\vec{r} = \vec{k}_t\cdot\vec{r} \Rightarrow$ alle $\cos(\dots)$ kan forkortes

$$\Rightarrow \varepsilon_1 E_{i0z} + \varepsilon_1 E_{r0z} = \varepsilon_2 E_{t0z}$$

OSV.