~~862~~

Pb

Tve vågor

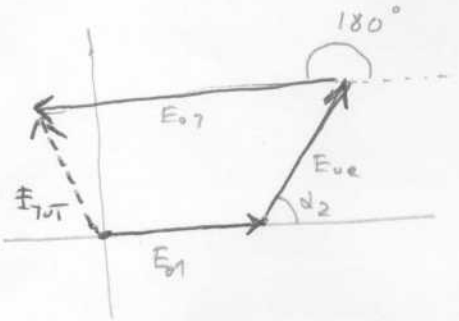
$$E_i(x,t) = E_{0i} \cdot \sin(kx - \omega t + \alpha_i)$$

$$E_{01} = E_{02} = \frac{1}{2} E_{03}$$

$$\alpha_1 = 0 \;,\; \alpha_2 = 60^\circ \;,\; \alpha_3 - \alpha_2 = 120^\circ \Rightarrow \alpha_3 = 180^\circ$$

$$I_1 = 1 \text{ W/cm}^2 \;,\; I_{TOT} = ?$$

Fasdiagram:



$$E_{tot-0}^2 = \left(\sum_{i=1}^{N} E_{0i} \cdot \cos\alpha_i\right)^2 + \left(\sum_{i=1}^{N} E_{0i} \cdot \sin\alpha_i\right)^2 =$$

$$= \left(E_{01} \cdot \cos 0^\circ + E_{01} \cdot \cos 60^\circ + 2E_{01} \cdot \cos 180^\circ\right)^2 + \left(E_{01} \cdot \sin 0 + E_{01} \cdot \sin 60^\circ + 2E_{01} \cdot \sin 180^\circ\right)^2 =$$

$$= E_{01}^2 \cdot \left(\left(1 + \frac{1}{2} - 2\right)^2 + \left(0 + \frac{\sqrt{3}}{2} + 0\right)^2\right) =$$

$$= E_{01}^2 \cdot \left(\frac{1}{4} + \frac{3}{4}\right) = E_{01}^2$$

$$I \sim E_0^2 \Rightarrow I_{TOT} = I_1 = 1 \text{ W/cm}^2$$