

Problema n°1 0. Electromagnéticas

1)

$$E_{MAX} = 220 \text{ V/m}$$

$$B_m = ?$$

$$\frac{E_m}{B_m} = c \rightarrow B_m = \frac{E_m}{c} = \frac{220 \text{ V/m}}{3 \times 10^8 \text{ m/s}} = 7,33 \times 10^{-7} \text{ T}$$

Problema n°2

2) Onda electromag. de $f = 6,4 \times 10^{14} \text{ Hz}$

$$E_m = 320 \text{ N/C}$$

Escribir $E(x,t) = E_m \cos(kx - \omega t)$

$$B(x,t) = B_m \cos(kx - \omega t)$$

$$\frac{E_m}{B_m} = c \rightarrow B_m = \frac{E_m}{c} = \frac{320}{3 \times 10^8} = 1,07 \times 10^{-6} \text{ T}$$

$$\lambda = \frac{v}{f} = \frac{c}{f} \rightarrow k = \frac{2\pi}{\lambda} = \frac{2\pi}{c/f} = \frac{2\pi f}{c} = \frac{2\pi \cdot 6,4 \times 10^{14}}{3 \times 10^8}$$

$$k = 1,34 \times 10^7 \text{ (m}^{-1}\text{)}$$

$$\omega = 2\pi f = 2\pi \cdot 6,4 \times 10^{14} = 4,02 \times 10^{15} \text{ (rad/s)}$$

$$E(x,t) = 320 \text{ (N/C)} \cos(1,34 \times 10^7 x - 4,02 \times 10^{15} t)$$

$$B(x,t) = 1,07 \times 10^{-6} \text{ (T)} \cos(1,34 \times 10^7 x - 4,02 \times 10^{15} t)$$