décembre 2018

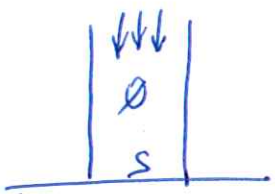
1) 11)

$$I = \frac{d\Phi}{d\Omega} \rightarrow d\Phi = I\, d\Omega$$

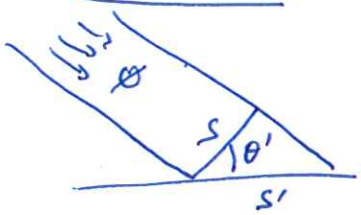
$$E = \frac{d\Phi}{dS'} \rightarrow E = \frac{I\, d\Omega}{dS'} = \frac{I\, dS' \cos\theta'}{dS'\, R^2} = \boxed{\frac{I \cos\theta'}{R^2}}$$

12) en incidence normale : $\boxed{E = \frac{I}{R^2}}$ (Bouguer)

13)



$E = \frac{\Phi}{S}$



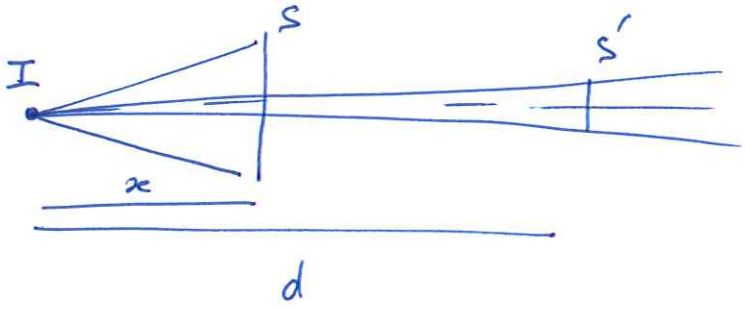
$S = S' \cos\theta'$

$\rightarrow E = \frac{\Phi}{S'} = \frac{\Phi \cos\theta'}{S}$

$\boxed{E' = E \cos\theta'}$ ou $E' = \frac{I \cos\theta'}{R^2} = E \cos\theta'$

2) Voir corrections décembre 2012

3)



31) Flux reçu par S' : $\Phi = I\,\Omega = I\,\frac{S'}{d^2}$ sans filtre

avec filtre : $\Phi_1 = \tau\Phi = \tau I \frac{S'}{d^2}$

$$\boxed{E_1 = \frac{\Phi_1}{S'} = \tau \frac{I}{d^2}}$$

32) Flux incident sur le filtre : $\Phi' = I\,\frac{S}{x^2}$

$\Phi'' = \tau_d \Phi' = \tau_d I \frac{S}{x^2}$

$M = \frac{\Phi''}{S} = \frac{\tau_d I}{x^2}$

$$L = \frac{M}{\pi} = \frac{\tau_d I}{\pi x^2}$$

$$E_2 = \frac{L S}{(d-x)^2} = \frac{\tau_d I S}{\pi x^2 (d-x)^2}$$

3 3) $$E_t = E_1 + E_2 = \frac{I}{d^2}\left[\tau + \frac{\tau_d S}{\pi}\,\frac{d^2}{x^2(d-x)^2}\right]$$

$d \gg d-x$: $E_t = \frac{I}{d^2}\left(\tau + \frac{\tau_d}{\pi}\frac{1}{(d-x)^2}\right)$; $x \ll d$: $E_t = \frac{I}{d^2}\left(\tau + \frac{\tau_d S}{\pi x^2}\right)$

4) 41) $$\alpha = 1{,}22\,\frac{\lambda}{D} = 7{,}72 \text{ mrd}$$

$$I_\lambda = \frac{\Phi}{2\pi(1-\cos\alpha)} = \frac{2.10^{-3}}{2\pi\left(1-\cos\left(7.72.10^{-3}\right)\right)} = 10{,}67 \text{ W sr}^{-1}$$

42) $$k = \frac{2L}{\lambda} = 1{,}67\ 10^6 \text{ modes.}$$

$$\Delta\nu = \frac{c}{2L} = 283 \text{ MHz}$$

$\frac{1500}{283} = 5$ modes longitudinaux de chaque côté → 10 modes.