Universidad
Carlos III de Madrid
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Escuela Politécnica Superior

Asignatura ______

Nombre del Alumno ______

Fecha ______ Curso ______ Grupo ______

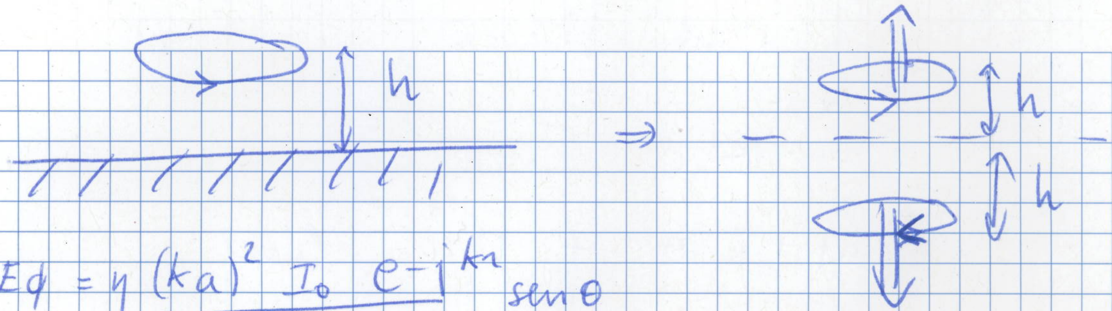
$\bar{r}_1 = h\hat{z}$

$\bar{r}_2 = -h\hat{z}$

$e^{+jk\hat{r}\cdot\bar{r}_1} - e^{+jk\hat{r}\cdot\bar{r}_2}$

$e^{+jkh\cos\theta} - e^{-jkh\cos\theta}$

$2j\,\mathrm{sen}\,(kh\cos\theta)$



a) $E_\phi = \eta \dfrac{(ka)^2 I_0\, e^{-jkr}}{4r}\,\mathrm{sen}\,\theta$

$FA = 2j\,\mathrm{sen}\,(kh\cos\theta)$ $\qquad \bar{E}_{lazo} = E_0\,\mathrm{sen}\,\theta\,\dfrac{e^{-jkr}}{r}\,\hat{\phi}$

$\bar{E}_{rad} = E_0\,\mathrm{sen}\,\theta \cdot 2j\,\mathrm{sen}\,(kh\cos\theta)\,\dfrac{e^{-jkr}}{r}\,\hat{\phi}$

$r(\theta,\phi) = \mathrm{sen}^2\theta \cdot \mathrm{sen}^2(kh\cos\theta)$ $\qquad$ par $\underline{z>0}$

b) $h=\lambda \qquad kh = \dfrac{2\pi}{\lambda}\cdot\lambda = 2\pi$

$\mathrm{sen}\,\theta\,[2j\,\mathrm{sen}\,(2\pi\cos\theta)] = 0 \qquad \mathrm{sen}\,(2\pi\cos\theta) = 0$

$2\pi\cos\theta = n\pi$

$n = 0, 1, 2$

$\theta = 0°\,, \quad \cos\theta_n = \dfrac{n}{2} \qquad n = 0, 1, 2$

$\theta_0 = \cos^{-1}(0) = 90°$

$\theta_1 = \cos^{-1}\left(\frac{1}{2}\right) = 60°$

$\theta_2 = \cos^{-1}(1) = 0°$

$\Uparrow E_0$

c) $E_\theta = E_0\,\mathrm{sen}\,\theta\,\dfrac{e^{-jkr}}{r}\,\hat{\theta}$

$\Uparrow E_0\, e^{+j\pi/2}$

$FA = 2\cos\,(kh\cos\theta)$

$e^{+j\pi/2}$

$E_{total} = E_0\,\mathrm{sen}\,\theta\,[2j\cos\,(kh\cos\theta)\,\hat{\theta} + 2j\,\mathrm{sen}\,(kh\cos\theta)\,\hat{\phi}]$

$\theta = 90° \quad \phi = 0 \qquad$ pol. lineal $\qquad \cancel{2\pi\,0} \quad E_0\,2j\hat{\theta} \qquad \cancel{0}$

Papel ecológico.