modo TE_{11} in guida circolare

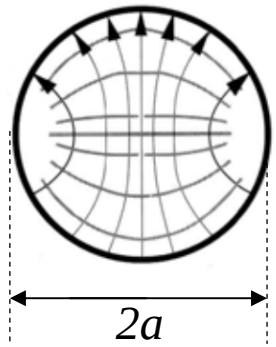
modo $TE_{11}^{(e)}$ $\qquad \kappa''_{11} = x'_{11}/a \approx 1.841/a \qquad \lambda''_{11} = 2\pi a / x'_{11} \approx 3.412\,a$

$$\Phi''^{(e)}_{11} = F''_{11}\, J_1(\kappa''_{11} r)\, \cos\varphi$$

$$\vec{e}\,''^{(e)}_{11} = F''_{11} \left(\vec{u}_r \frac{J_1(\kappa''_{11} r)}{\kappa''_{11} r} \sin\varphi + \vec{u}_\varphi\, J'_1(\kappa''_{11} r)\, \cos\varphi \right)$$

$$\vec{h}\,''^{(e)}_{11} = F''_{11} \left(-\vec{u}_r\, J'_m(\kappa''_{11} r)\, \cos\varphi + \vec{u}_\varphi \frac{J_1(\kappa''_{11} r)}{\kappa''_{11} r} \sin\varphi \right)$$

$$F''_{11} = \frac{\sqrt{2}\,\kappa''_{11}}{J_1(x'_{11})\sqrt{\pi\,(x'^{\,2}_{11} - 1)}} \approx \frac{1.633}{a}$$



le espressioni del potenziale e dei vettori modali relativi al modo dispari si deducono dalle precedenti cambiando $\cos\varphi \to \sin\varphi$ e $\sin\varphi \to -\cos\varphi$.

campi modali

$$\vec{E}''_{11} = \vec{e}\,''^{(e)}_{11}\, V''^{(e)}_{11}(z) + \vec{e}\,''^{(o)}_{11}\, V''^{(o)}_{11}(z)$$

$$\vec{H}''_{11} = \vec{h}\,''^{(e)}_{11}\, I''^{(e)}_{11}(z) + \vec{h}\,''^{(o)}_{11}\, I''^{(o)}_{11}(z) - j\,\vec{u}_z \frac{\lambda}{\lambda''_{11}} \left(\Phi''^{(e)}_{11} \frac{V''^{(e)}_{11}(z)}{\eta} + \Phi''^{(o)}_{11} \frac{V''^{(o)}_{11}(z)}{\eta} \right)$$

$$\lambda > \lambda_{11}''$$

$$\alpha = \frac{2\pi}{\lambda_{11}''}\sqrt{1-\left(\frac{\lambda_{11}''}{\lambda}\right)^2}$$

$$Z = \frac{j\,\eta}{\sqrt{\left(\frac{\lambda_{11}''}{\lambda}\right)^2 - 1}}$$

$$\lambda < \lambda_{11}''$$

$$\beta = \frac{2\pi}{\lambda}\sqrt{1-\left(\frac{\lambda}{\lambda_{11}''}\right)^2}$$

$$Z = \frac{\eta}{\sqrt{1-\left(\frac{\lambda_{11}''}{\lambda}\right)^2}}$$