$\lambda := 1.5$ um $\qquad \lambda = 1.5$

$k_0 := \frac{(2 \cdot \pi)}{\lambda} \qquad k_0 = 4.189$

$\varepsilon := 12$

$n := \left(\frac{\varepsilon}{\varepsilon_0}\right) \qquad n = \left(1.355 \cdot 10^{12}\right) \frac{kg \cdot m^3}{s^4 \cdot A^2}$

$k := n \cdot k_0 \qquad k = \left(5.677 \cdot 10^{12}\right) \frac{kg \cdot m^3}{s^4 \cdot A^2}$

$n_1 := 1.45 \qquad n_1 = 1.45$

$n_2 := 1 \qquad n_2 = 1$

$a := 0.95$ um $\qquad a = 0.95$

$$\gamma := \frac{1.655}{a} \cdot e^{\left(\left(\frac{{n_1}^2 + {n_2}^2}{8 \cdot {n_2}^2}\right) - \left(\frac{{n_1}^2 + {n_2}^2}{{n_2}^2 \cdot \left({n_1}^2 - {n_2}^2\right)}\right)\left(\frac{\lambda^2}{(2 \cdot \pi \cdot a)^2}\right)\right)} \qquad \gamma = 2.149$$

$$\beta := \frac{2 \cdot \pi \cdot n_2}{\lambda} + \frac{\gamma^2 \cdot \lambda}{4 \cdot \pi \cdot n_2} \qquad \beta = 4.74$$

$$d := 2 \cdot a \qquad d = 1.9$$

$$U := d \cdot \frac{\left({k_0}^2 \cdot {n_1}^2 - \beta^2\right)^{\frac{1}{2}}}{2} \qquad U = 3.608$$

$$W := d \cdot \left(\frac{\beta^2 - {k_0}^2 \cdot {n_2}^2}{2}\right)^{\frac{1}{2}} \qquad W = 2.981$$

$$V := k_0 \cdot d \cdot \frac{\left({n_1}^2 - {n_2}^2\right)^{\frac{1}{2}}}{2} \qquad V = 4.178$$

$$b_1 := \frac{1}{2 \cdot U} \cdot \left(\frac{\mathrm{J0}(U)}{\mathrm{J1}(U)} - \frac{\mathrm{Jn}(2, U)}{\mathrm{J1}(U)}\right) \qquad b_1 = -1.255$$

$$b_2 := \frac{1}{2 \cdot U} \cdot \left(\frac{\mathrm{K0}(W)}{\mathrm{K1}(W)} - \frac{\mathrm{Kn}(2, W)}{\mathrm{K1}(W)}\right) \qquad b_2 = -0.093$$

$$F_2 := \frac{V}{U \cdot W} \cdot \frac{1}{b_1 + b_2} \qquad F_2 = -0.288$$

$$\Delta := \frac{\left(1 - \frac{{n_2}^2}{{n_1}^2}\right)}{2} \qquad \Delta = 0.262$$

$$F_1 := \left(\frac{U \cdot W}{V}\right)^2 \cdot \left(b_1 + (1 - 2 \cdot \Delta) \cdot b_2\right) \qquad F_1 = -8.61$$

$$a_1 := \frac{F_2 - 1}{2} \qquad a_1 = -0.644$$

$$a_2 := \frac{F_2+1}{2} \qquad a_2 = 0.356$$

$$a_3 := \frac{F_1-1}{2} \qquad a_3 = -4.805$$

$$a_4 := \frac{F_1+1}{2} \qquad a_4 = -3.805$$

$$a_5 := \frac{F_1-1+2\cdot\Delta}{2} \qquad a_5 = -4.543$$

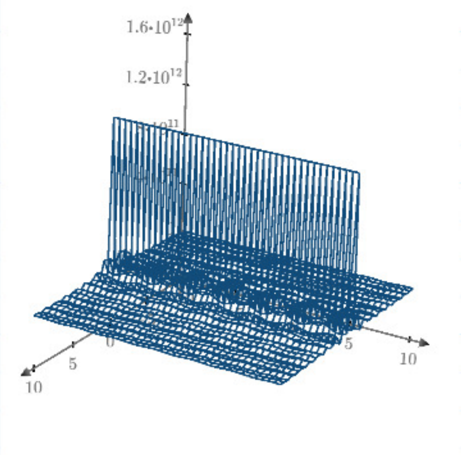
$$a_6 := \frac{F_1+1-2\cdot\Delta}{2} \qquad a_6 = -4.067$$

Aquí definimos un r mayor que cero y menor que el radio a

$$S_{z1}(r,\phi) := \frac{1}{2}\cdot\left(\frac{\varepsilon_0}{\mu_0}\right)^{\frac{1}{2}}\cdot\frac{k\cdot {n_1}^2}{\beta\cdot(\mathrm{J1}(U))^2}\cdot\left(a_1\cdot a_3\cdot\left(\mathrm{J0}\left(\frac{U\cdot r}{a}\right)\right)^2 + a_2\cdot a_4\cdot\left(\mathrm{Jn}\left(2,\frac{U\cdot r}{a}\right)\right)^2 + \frac{1-F_1\cdot F_2}{2}\cdot\mathrm{J0}\left(\frac{U\cdot r}{a}\right)\cdot\mathrm{Jn}\left(2,\frac{U\cdot r}{a}\right)\cdot\cos(2\cdot\phi)\right)$$

Aquí definimos un r mayor que a y menor que el infinito

$$S_{z2}(r,\phi) := \frac{1}{2}\cdot\left(\frac{\varepsilon_0}{\mu_0}\right)^{\frac{1}{2}}\cdot\frac{k\cdot {n_1}^2}{\beta\cdot(\mathrm{K1}(W))^2}\cdot\frac{U^2}{W^2}\cdot\left(a_1\cdot a_5\cdot\left(\mathrm{K0}\left(\frac{W\cdot r}{a}\right)\right)^2 + a_2\cdot a_6\cdot\left(\mathrm{Kn}\left(2,\frac{W\cdot r}{a}\right)\right)^2 - \frac{1-2\cdot\Delta-F_1\cdot F_2}{2}\cdot\mathrm{K0}\left(\frac{W\cdot r}{a}\right)\cdot\mathrm{Kn}\left(2,\frac{W\cdot r}{a}\right)\cdot\cos(2\cdot\phi)\right)$$



$$S_{z1}\ \left(\frac{m}{s}\right)$$