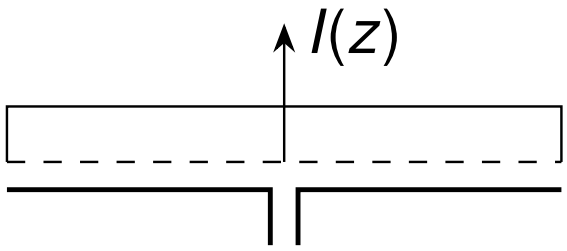
## Ideal dipole




$$I(z) = I_0$$

$$L \ll \Delta r$$

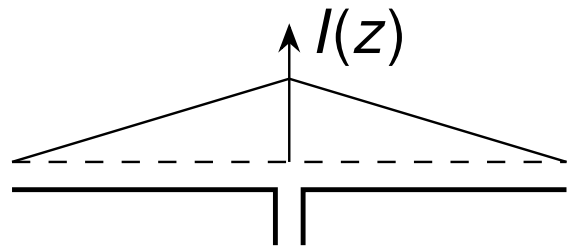
$$F(\theta) = \sin\theta \frac{\sin[\beta L \cos(\theta)/2]}{\beta L \cos(\theta)/2}$$

$$D = 1.5$$

$$R_r = \frac{2\pi}{3}\eta\left(\frac{L}{\lambda}\right)^2$$

$$R_0 = \frac{R_S}{2\pi a}L$$

## Short dipole




$$I(z) = I_0\left(1 - \frac{2}{L}|z|\right)$$

$$L \ll \lambda$$

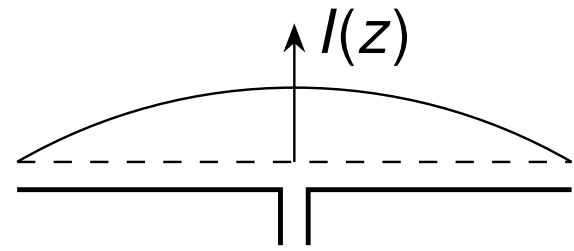
$$F(\theta) = \sin\theta \frac{\sin[\beta L \cos(\theta)/2]}{\beta L \cos(\theta)/2}$$

$$D = 1.5$$

$$R_r = \frac{\pi}{6}\eta\left(\frac{L}{\lambda}\right)^2$$

$$R_0 = \frac{R_S}{2\pi a}\frac{L}{3}$$

## Half-wave dipole




$$I(z) = I_0 \cos\left(\frac{\pi z}{L}\right)$$

$$L = \lambda/2$$

$$F(\theta) = \frac{\cos[\pi\cos(\theta)/2]}{\sin\theta}$$

$$D = 1.64$$

$$R_r \approx 70\,\text{Ohm}$$

$$R_0 = \frac{R_S}{2\pi a}\frac{\lambda}{4}$$