

E-type proper wave modes:

$$F_{EP}(\beta_x) := \frac{\sqrt{k_1^2 - \beta_x^2}}{\sigma_1 + j \cdot \omega \epsilon_1} \cdot \tan\left(h \cdot \sqrt{k_1^2 - \beta_x^2}\right) - \frac{\operatorname{Re}\left(\sqrt{\beta_x^2 - k_2^2}\right)}{\left|\operatorname{Re}\left(\sqrt{\beta_x^2 - k_2^2}\right)\right|} \cdot \frac{\sqrt{\beta_x^2 - k_2^2}}{\sigma_2 + j \cdot \omega \epsilon_2}$$

$$\beta_x := \frac{k_1 + k_2}{2} \quad \beta_x := \operatorname{root}\left(F_{EP}(\beta_x), \beta_x\right) \quad \beta_x = 175.338 - 5.359j \cdot \frac{\operatorname{rad}}{\operatorname{m}}$$

$$F_{EP}(\beta_x) = -7.218 \cdot 10^{-7} + 3.616 \cdot 10^{-6}j \cdot \operatorname{kg} \cdot \operatorname{m}^2 \cdot \operatorname{sec}^{-1} \cdot \operatorname{coul}^{-2}$$

$$s_{z2} := -j \cdot \frac{\operatorname{Re}\left(\sqrt{\beta_x^2 - k_2^2}\right)}{\left|\operatorname{Re}\left(\sqrt{\beta_x^2 - k_2^2}\right)\right|} \cdot \sqrt{\beta_x^2 - k_2^2} \quad s_{z2} = -115.228 - 8.154j \cdot \frac{\operatorname{rad}}{\operatorname{m}}$$

$$N := 301 \quad \operatorname{Start}_x := 0 \cdot \frac{\operatorname{rad}}{\operatorname{m}} \quad \operatorname{End}_x := \operatorname{Re}(k_1) \quad \operatorname{Start}_y := -250 \cdot \frac{\operatorname{rad}}{\operatorname{m}} \quad \operatorname{End}_y := 250 \cdot \frac{\operatorname{rad}}{\operatorname{m}}$$

$$x := 0, 1 \dots N \quad y := 0, 1 \dots N \quad \Delta x := \frac{\operatorname{End}_x - \operatorname{Start}_x}{N} \quad \Delta y := \frac{\operatorname{End}_y - \operatorname{Start}_y}{N}$$

$$B_{EP_{x,y}} := \log\left[\left|F_{EP}\left(\left(\operatorname{Start}_x + x \cdot \Delta x\right) + \left[j \cdot \left(\operatorname{Start}_y + y \cdot \Delta y\right)\right]\right)\right| \cdot \frac{\operatorname{siemens} \cdot \operatorname{m}}{\operatorname{m} \cdot \operatorname{rad}}\right]$$

$\operatorname{Im}(\beta_x)$  [rad/m]

