Ondas

Ecuación de las ondas

$$\frac{\partial^2 \varepsilon}{\partial x^2} - \frac{1}{c^2}\frac{\partial^2 \varepsilon}{\partial t^2} = 0$$

$$\nabla^2 \vec{\varepsilon} - \frac{1}{c^2}\frac{\partial^2 \vec{\varepsilon}}{\partial t^2} = 0$$

$$\nabla^2 \varepsilon_x - \frac{1}{c^2}\frac{\partial^2 \varepsilon_x}{\partial t^2} = 0$$

$$\nabla^2 \varepsilon_y - \frac{1}{c^2}\frac{\partial^2 \varepsilon_y}{\partial t^2} = 0$$

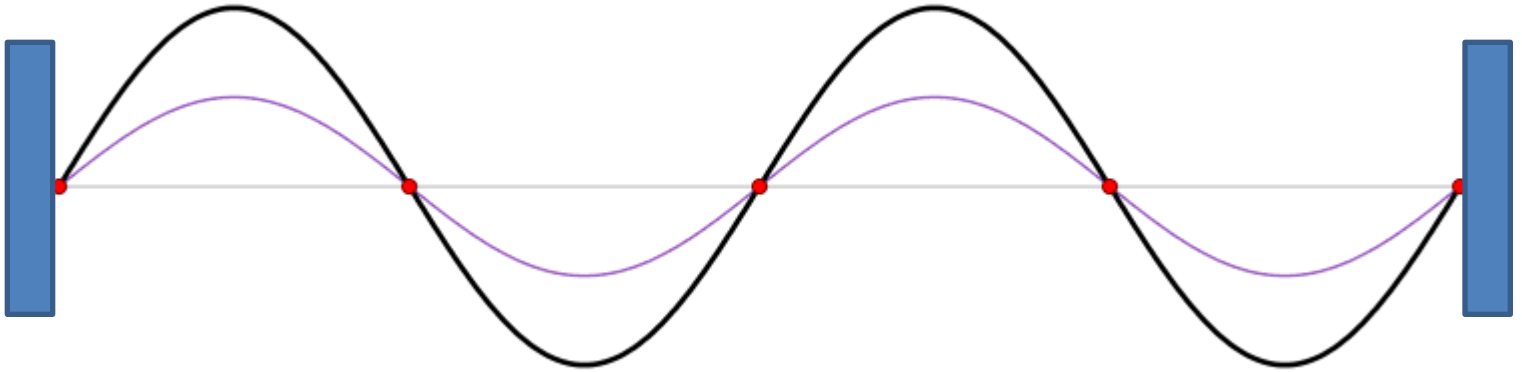
$$\nabla^2 \varepsilon_z - \frac{1}{c^2}\frac{\partial^2 \varepsilon_z}{\partial t^2} = 0$$

Ondas

Ondas estacionarias

$$\varepsilon_1 = \varepsilon_o \operatorname{sen}(kx - wt)$$

$$\varepsilon_2 = \varepsilon_o \operatorname{sen}(kx + wt)$$

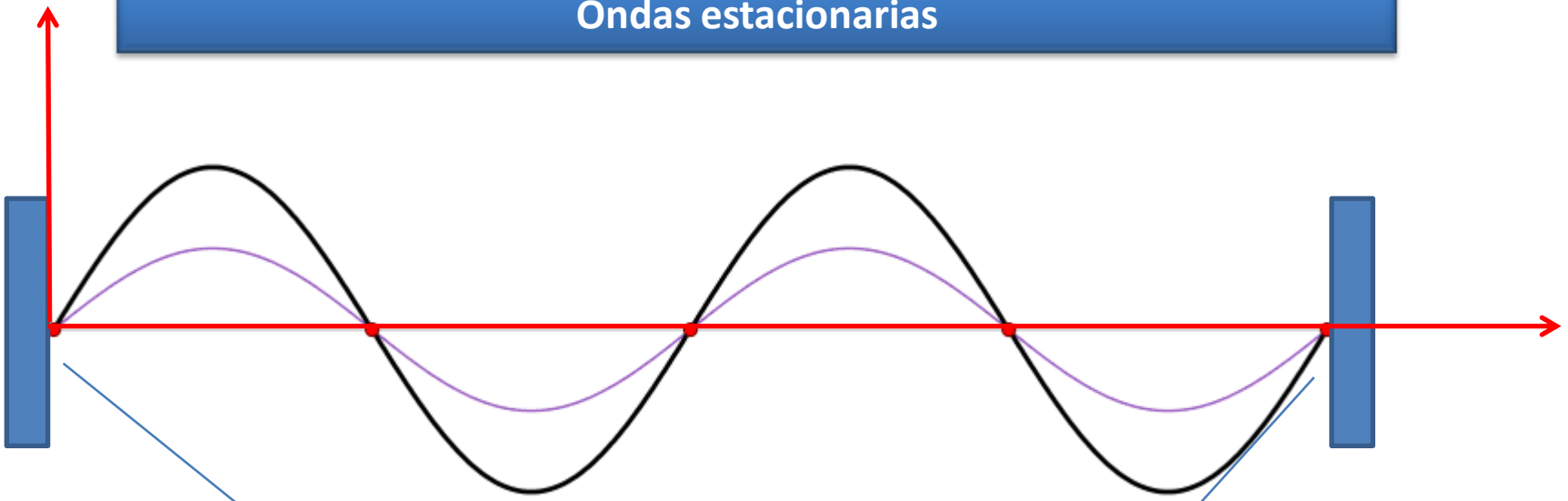


$$\varepsilon = 2\varepsilon_o \operatorname{sen}(kx)\cos(wt)$$

$$\varepsilon(x,t) = \varepsilon_o^*(x)\cos(wt) \qquad \text{Donde} \qquad \varepsilon_o^*(x) = 2\varepsilon_o \operatorname{sen}(kx)$$

Ondas

Ondas estacionarias



x=0

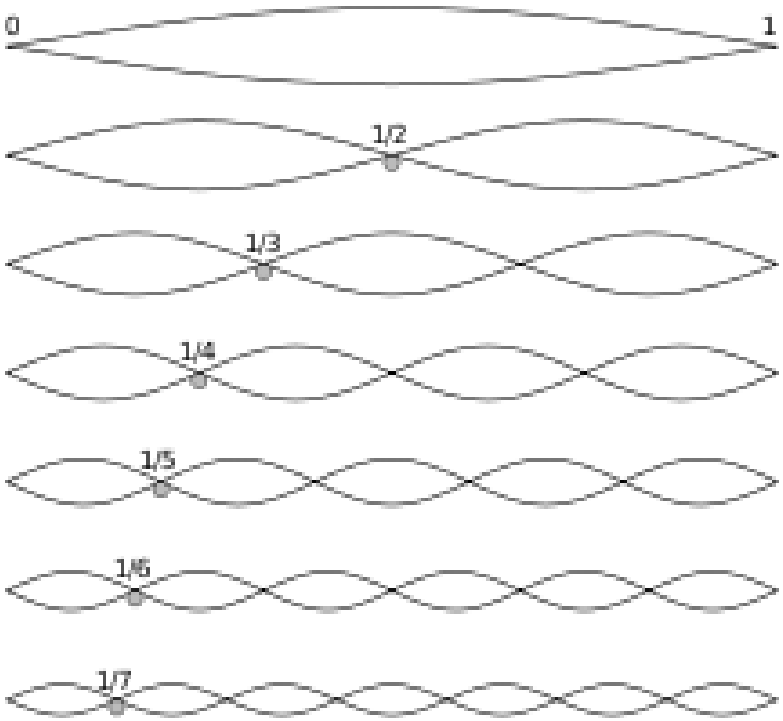
x=L

$$\varepsilon_o^*(x) = 2\varepsilon_o \operatorname{sen}(kx) = 0$$

$$kL = n\pi \quad \Rightarrow \quad k_n = n\frac{\pi}{L}$$

Ondas

Ondas estacionarias



$$\omega = kc \quad \Rightarrow \quad \omega_n = k_n c \quad \Rightarrow \quad \omega_n = n\frac{\pi c}{L}$$

Ondas

Ondas estacionarias