

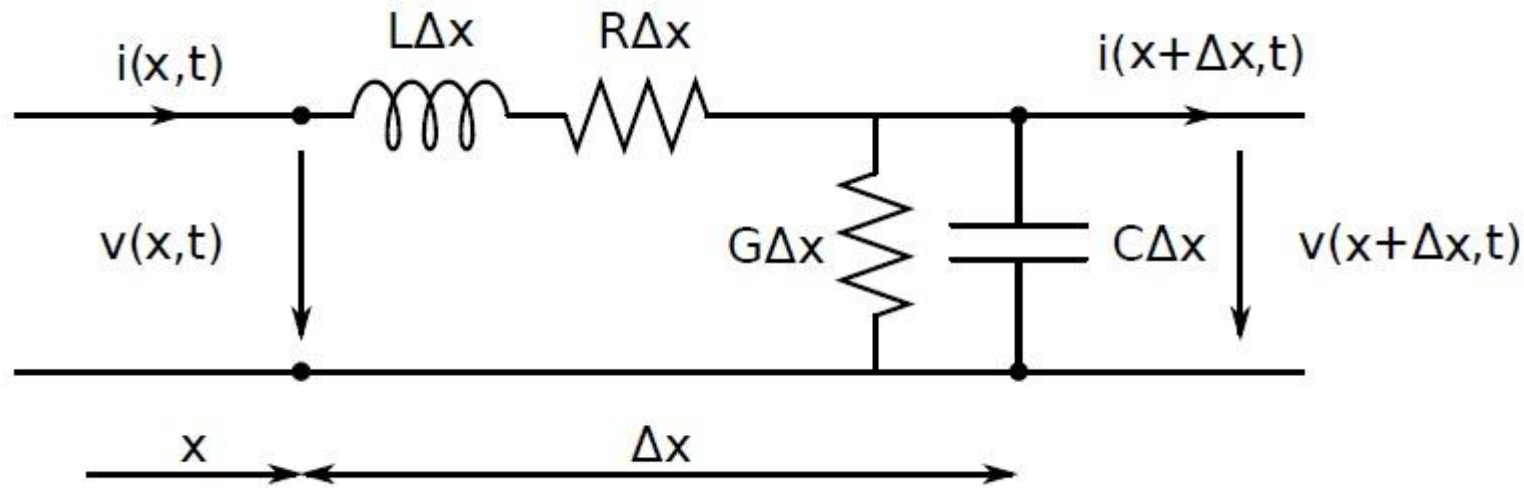
Sistemas Eléctricos de Potencia

Primavera 2012, Auxiliar 2

Parámetros

- ▶ Capacitancia $C = \frac{2\pi\epsilon_0}{\ln\left(\frac{DMG}{r_c}\right)} \left[\frac{F}{m}\right]$
- ▶ Inductancia $L = 2 \cdot 10^{-7} \ln\left(\frac{DMG}{r_c}\right) \left[\frac{H}{m}\right]$

Modelo de línea de transmisión



$$\frac{\partial V(x,t)}{\partial x} + R'I(x,t) + L'\frac{\partial I(x,t)}{\partial t} = 0$$

$$\frac{\partial I(x,t)}{\partial x} + G'V(x,t) + C'\frac{\partial V(x,t)}{\partial t} = 0$$



$$\frac{\partial \dot{V}}{\partial x} + \underbrace{(R' + j\omega L')}_{\dot{Z}'} \dot{I} = 0$$

$$\frac{\partial \dot{I}}{\partial x} + \underbrace{(G' + j\omega C')}_{\dot{Y}'} \dot{V} = 0$$

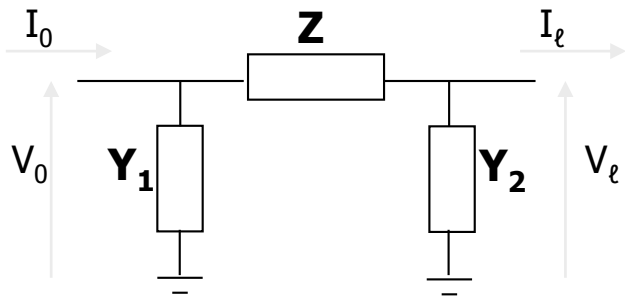
Parámetros ABCD

$$\begin{bmatrix} \dot{V}(0) \\ \dot{I}(0) \end{bmatrix} = \begin{bmatrix} \cosh \gamma \ell & \dot{Z}_c \sinh \gamma \ell \\ \dot{Y}_c \sinh \gamma \ell & \cosh \gamma \ell \end{bmatrix} \begin{bmatrix} \dot{V}(\ell) \\ \dot{I}(\ell) \end{bmatrix}$$

$$\gamma = \sqrt{(R' + j\omega L')(G' + j\omega C')}$$

$$\gamma = \alpha + j\beta$$

Modelo pi

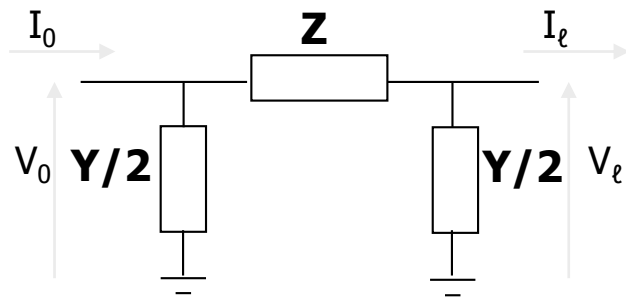


$$A = 1 + Y_2 Z$$

$$B = Z$$

$$C = Y_1 + Y_2 + Z Y_1 Y_2$$

$$D = 1 + Y_1 Z$$



$$A = 1 + ZY/2$$

$$B = Z$$

$$C = Y(1 + ZY/4)$$

$$D = A$$

Aproximación línea corta

$$\dot{Z} = \dot{Z}_c \sinh \gamma \ell \approx \sqrt{\frac{Z'}{Y'}} \cdot \sqrt{Z'Y'} \ell = Z' \ell = (R' + j\omega L') \ell$$

$$\frac{\dot{Y}}{2} = \frac{1}{\dot{Z}_c} \tanh \frac{\gamma \ell}{2} \approx \sqrt{\frac{Y'}{Z'}} \cdot \frac{\sqrt{Z'Y'}}{2} = \frac{Y'}{2} = \frac{(G' + j\omega C')}{2} \ell$$

Carta operación

$$\left(P_r + \frac{V_r^2 A}{B} \cos(\beta - \alpha)\right)^2 + \left(Q_r + \frac{V_r^2 A}{B} \sin(\beta - \alpha)\right)^2 = \left(\frac{V_r V_t}{B}\right)^2$$