

$$X_1 = \beta \tau (C_1 - i_1)$$

$$X_2 = \beta \tau (C_2 - i_2)$$

$$\frac{X_2}{X_1} = \frac{C_2 - i_2}{C_1 - i_1}$$

$$\frac{X_2}{X_1} (C_1 - i_1) = C_2 - i_2$$

$$\frac{X_2}{X_1} \left[ \frac{C_1}{i_1} - 1 \right] = \frac{C_2}{i_1} - \frac{i_2}{i_1}$$

$$\frac{i_2}{i_1} = \frac{C_2}{i_1} - \frac{X_2}{X_1} \left[ \frac{C_1}{i_1} - 1 \right]$$

$$\frac{i_2}{i_1} = \frac{C_2}{i_1} - \frac{X_2}{X_1} \frac{C_1}{i_1} + \frac{X_2}{X_1}$$

$$\frac{i_2}{i_1} = \frac{C_1}{i_1} \left[ \frac{C_2}{C_1} - \frac{X_2}{X_1} \right] + \frac{X_2}{X_1}$$

for small  $X_1$ :

$$\left[ \frac{C_2}{C_1} - \frac{X_2}{X_1} \right] \ll 1$$

$$\frac{i_2}{i_1} = \frac{X_2}{X_1} - \frac{C_1}{i_1} \left[ \frac{X_2}{X_1} - \frac{C_2}{C_1} \right] \Rightarrow \frac{X_2}{X_1} - \frac{C_1}{i_1} \left[ \frac{X_2}{X_1} - \frac{C_2}{C_1} \right]$$

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$$\left[ \frac{C_2}{C_1} \right]$$



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$$\frac{ir}{u_1} = \frac{x_2}{x_1} - \frac{c_1}{c_1} \left[ \frac{x_2}{x_1} - \frac{c_2}{c_1} \right]$$

~~$$\frac{c_1}{i_2} = \frac{x_1}{x_2} - \frac{c_2}{i_2} \left[ \frac{x_1}{x_2} - \frac{c_1}{c_2} \right]$$~~

$$\frac{c_1}{i_2} = \frac{x_1}{x_2} + \frac{c_2 c_1}{i_2} - \frac{c_2}{i_2} \frac{x_1}{x_2}$$

$$= \frac{x_1}{x_2} + \frac{c_1}{i_2} - \frac{c_2}{i_2} \frac{x_1}{x_2} \frac{c_1}{c_1}$$

$$\frac{c_1}{i_2} = \frac{x_1}{x_2} + \frac{c_1}{i_2} \left[ 1 - \frac{c_2}{c_1} \frac{x_1}{x_2} \right]$$

for small  $\frac{x_1}{x_2}$   
and  $i_2 > c_1$  }

$$\frac{c_1}{i_2} < \frac{x_1}{x_2} + \frac{c_1}{i_2} \left[ 1 - \frac{c_2}{c_1} \frac{x_1}{x_2} \right]$$