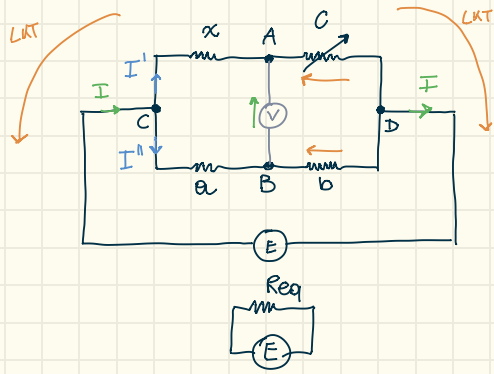


# PONTE DI WHEATSTONE



Scopo  $V = V_{AB} = 0V$

So che  $I = I' + I''$

$$\begin{cases} I' = \frac{E}{x+c} \\ I'' = \frac{E}{a+b} \end{cases}$$

Voglio che  $V_{AB} = 0$  ma  $V_{AB} = V_C - V_B = I' \cdot c - I'' \cdot b$

$$\rightarrow V_{AB} = \frac{E \cdot c}{x+c} - \frac{E \cdot b}{a+b} = 0 \rightarrow \frac{c}{x+c} = \frac{b}{a+b}$$

$$\rightarrow \frac{c(a+b)}{b} = x+c \rightarrow \frac{ca+cb-cb}{b} = x$$

$$\rightarrow x = \frac{c \cdot a}{b} \quad \text{QED}$$

Considerazioni

$\mu_G$  è nota come:  $\mu_G = \frac{dx}{x}$

Se lo strumento R è lineare

$$\frac{dx}{d\lambda} = \frac{\Delta x}{\Delta \lambda}$$

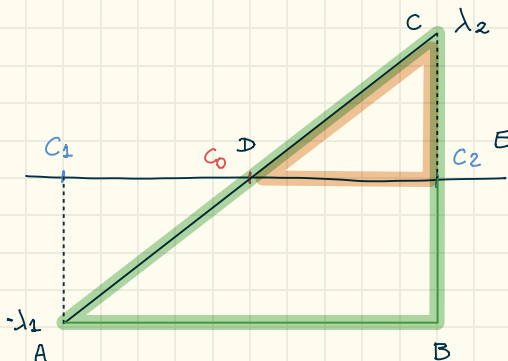
$\Rightarrow$  dalla ②  $dx = \frac{\Delta x}{\Delta \lambda} \cdot d\lambda$   $\rightarrow$  nella ①  $\mu_G = \frac{\Delta x}{x} \cdot \frac{d\lambda}{\Delta \lambda}$

Variazione  
Finita  
dello Strumento

Suppongo che le variazioni di  $x$  siano uguali a quelle di  $c \Rightarrow \frac{\Delta x}{x} = \frac{\Delta c}{c} \Rightarrow \mu_G = \frac{\Delta c}{c} \cdot \frac{d\lambda}{\Delta \lambda}$

Variazione Finita di  $R_c$   $\rightarrow$  MINIMA Variazione apprezzabile dallo Strumento

Interpolazione



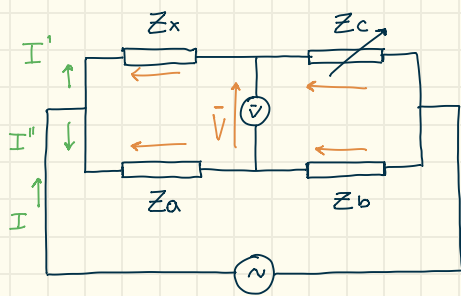
$$AB:DE = CB:CE \rightarrow \frac{AB}{DE} = \frac{CB}{CE}$$

$$\text{ma } \begin{cases} AB = C_2 - C_1 \\ DE = C_2 - C_0 \\ CB = \lambda_2 - (-\lambda_1) \\ CE = \lambda_2 \end{cases} \rightarrow$$

$$\frac{C_2 - C_1}{C_2 - C_0} = \frac{\lambda_1 + \lambda_2}{\lambda_2} \rightarrow C_2 - C_0 = \frac{C_2 - C_1}{\lambda_1 + \lambda_2} \lambda_2$$

$$\rightarrow C_0 = C_2 - \frac{\lambda_2 (C_2 - C_1)}{\lambda_1 + \lambda_2}$$

# PONTE DI WINSTON



Voglio  $\bar{V} = 0$  ma  $\bar{V} = \bar{V}_c - \bar{V}_b$

con  $\begin{cases} \bar{V}_c = Z_c \cdot I'' \\ \bar{V}_b = Z_b \cdot I' \end{cases}$

e  $\begin{cases} I' = \frac{E}{c+x} \\ I'' = \frac{E}{a+b} \end{cases} = 0 \quad \begin{cases} \bar{V}_c = \frac{c \cdot E}{c+x} \\ \bar{V}_b = \frac{b \cdot E}{a+b} \end{cases}$

$\bar{V} = \frac{cE}{c+x} - \frac{bE}{a+b} = 0 \rightarrow \frac{cE}{c+x} = \frac{bE}{a+b} \rightarrow \frac{c}{c+x} = \frac{b}{a+b}$

$\rightarrow c(a+b) = b(c+x)$  Voglio conoscere  $x$

$\frac{ca+cb}{b} - c = x \rightarrow \frac{ca+cb-cb}{b} = x \rightarrow x = \frac{ca}{b} = 0 \quad \boxed{\dot{Z}_x \cdot \dot{Z}_b = \dot{Z}_c \cdot \dot{Z}_a}$  Uguaglianza a Croce

Uguaglianza valida quando

$\begin{cases} \text{ReP}(\dot{Z}_x \cdot \dot{Z}_b) = \text{ReP}(\dot{Z}_a \cdot \dot{Z}_c) \\ \text{ImP}(\dot{Z}_x \cdot \dot{Z}_b) = \text{ImP}(\dot{Z}_a \cdot \dot{Z}_c) \end{cases}$