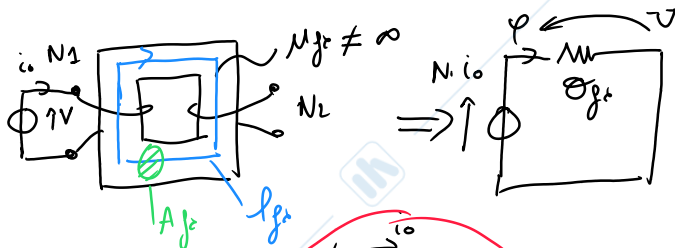


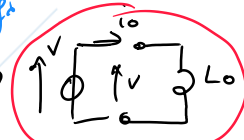
# MODELLI DEL TRASFORMATORE



$$\Theta_{j\phi} = \frac{1}{\mu \mu_0} \cdot \frac{l_{gr}}{A_{gr}} \quad \mathcal{N} = \frac{d\psi}{dt} = N_1 \frac{d\phi}{dt}$$

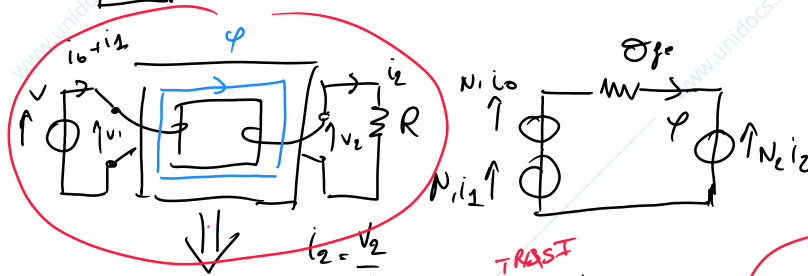
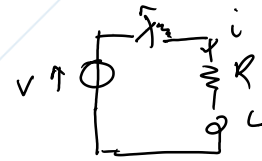
$$V = \Theta_{j\phi} \dot{\phi} \quad N_1 i_0 = \Theta_{j\phi} \phi$$

$$L_0 = \frac{N_1^2}{\Theta_{j\phi}}$$



Regime sin.  $\Rightarrow \vec{v}_0 = \vec{I}_0 j\omega L_0 \quad \vec{V}_0 = j\omega L_0 \vec{I}_0$

$$\mathcal{N} = \mathcal{N}_2 V \cos(\omega t) \Rightarrow \vec{V} = V e^{j\omega t}$$

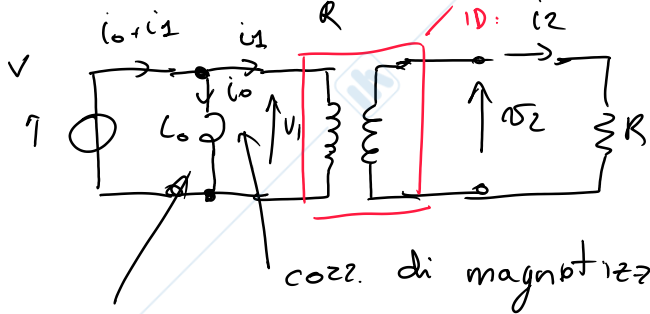


$$\mathcal{N}_2 = \frac{d\psi_2}{dt} = N_2 \frac{d\phi}{dt}$$

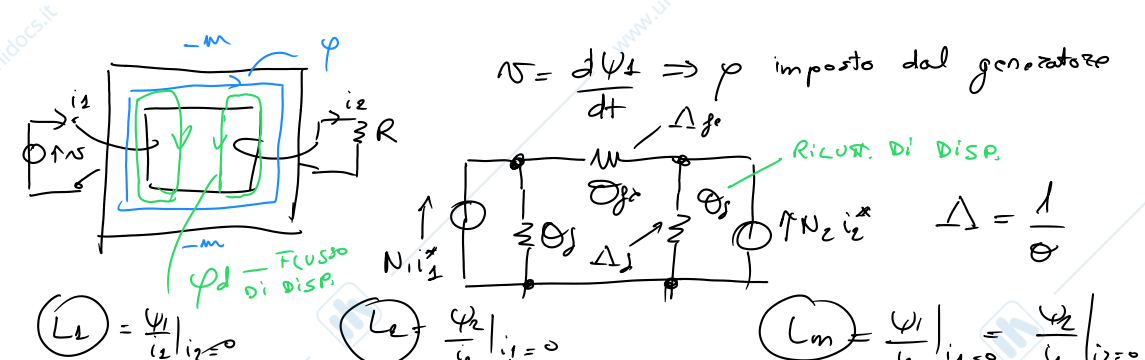
RAPP. TRASF

$$\frac{\mathcal{N}_1}{\mathcal{N}_2} = \frac{N_1}{N_2} = \frac{i_2}{i_1}$$

$$\mathcal{N}_1 i_1 = \mathcal{N}_2 i_2$$



cozz. di magnetizz  
indutt. di magnetizz.

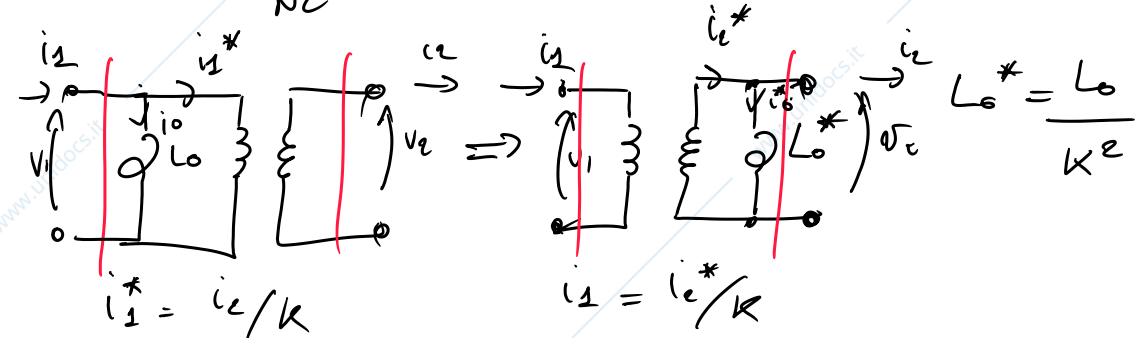
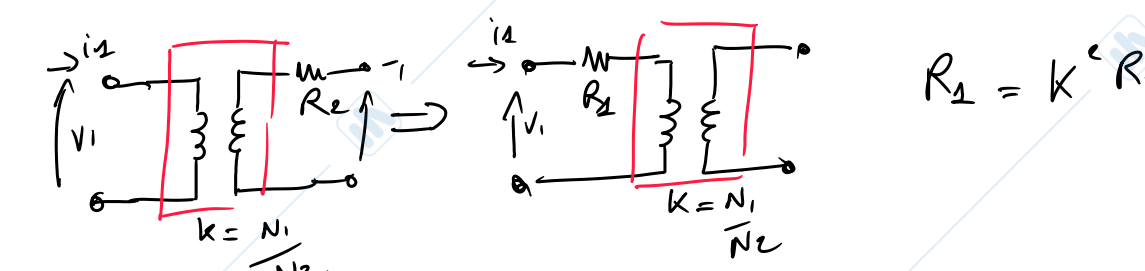


$L_1 = \frac{\psi_1}{i_1} | i_2 = 0$      
  $L_2 = \frac{\psi_2}{i_2} | i_1 = 0$      
  $L_m = \frac{\psi_1}{i_2} | i_1 = 0 = \frac{\psi_2}{i_1} | i_2 = 0$

$L_1 = N_1^2 (\Delta_s + \Delta_{fe})$      
  $L_2 = N_2^2 (\Delta_s + \Delta_{fe})$      
  $L_m = N_2 N_1 \Delta_{fe}$

$\psi_2 = N_1 i_1 \Delta_{fe}$      
  $\psi_e = N_2 \psi_e$

$\begin{cases} v_1 = L_1 \frac{di_1}{dt} + L_m \frac{di_2}{dt} \\ v_2 = L_2 \frac{di_2}{dt} + L_m \frac{di_1}{dt} \end{cases} \leftarrow \text{LEGGI DI FARADAY} \right. \left. \begin{cases} v_1 = \frac{d\psi_{TOT}}{dt} \\ \dots \end{cases} \right.$



$$L_1 = N_1^2 (\Delta f_0 + \Delta S)$$

$$L_e = N_e^2 (\Delta f_0 + \Delta S)$$

$$L_m = N_1 N_e \Delta f_0$$

$$v_1 = L_1 \frac{di_1}{dt} + L_m \frac{di_2}{dt} \quad p = \frac{d}{dt}$$

$$v_2 = L_e \frac{di_2}{dt} + L_m \frac{di_1}{dt}$$

$$\begin{cases} v_1 = N_1^2 (\Delta f_0 + \Delta S) p i_1 + N_1 N_e \Delta f_0 p i_2 + N_1^2 \Delta f_0 p i_1 \\ v_2 = N_e^2 (\Delta f_0 + \Delta S) p i_2 + N_1 N_e \Delta f_0 p i_1 + N_e^2 \Delta f_0 p i_2 \end{cases}$$

$$\begin{cases} v_1 = N_1^2 \Delta S p i_1 + N_1 N_e \Delta f_0 p i_2 + N_1^2 \Delta f_0 p i_1 = \\ = N_1^2 \Delta S p i_1 + N_1^2 \Delta f_0 p \left( i_1 + \frac{N_e}{N_1} i_2 \right) = \\ v_1 = N_1^2 \Delta S p i_1 + N_1^2 \Delta f_0 p \left( i_1 + \frac{N_e}{N_1} i_2 \right) \end{cases}$$

$$\begin{aligned} v_2 &= N_e^2 \Delta S p i_2 + N_1 N_e \Delta f_0 p i_1 + N_e^2 \Delta f_0 p i_2 = \\ &= N_e^2 \Delta S p i_2 + N_e^2 \Delta f_0 p \left( \frac{N_1}{N_e} i_1 + i_2 \right) + \\ &\quad + N_1^2 \Delta f_0 p \left( \frac{N_e}{N_1} i_1 + \frac{N_e}{N_e} i_2 \right) \end{aligned}$$

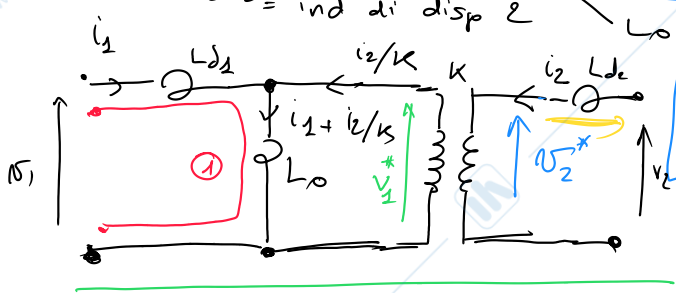
$N_1 N_e \Delta f_0 p i_1$   
 $N_e^2 \Delta f_0 p i_2$

$$v_2 = N_e^2 \Delta S p i_2 + \frac{N_e N_1^2 \Delta f_0 p}{N_1} \left( i_1 + \frac{N_e}{N_1} i_2 \right)$$

$$\begin{cases} v_1 = N_1^2 \Delta S p i_1 + N_1^2 \Delta f_0 p \left( i_1 + \frac{N_e}{N_1} i_2 \right) \quad (1) \quad p = j\omega \\ v_2 = N_e^2 \Delta S p i_2 + \frac{N_e N_1^2 \Delta f_0 p}{N_1} \left( i_1 + \frac{N_e}{N_1} i_2 \right) \quad (2) \quad K = \frac{N_1}{N_e} \end{cases}$$

$L_d = \text{ind. di disp. 1}$        $L_0 = 1/K$

$L_{de} = \text{ind. di disp. 2}$        $L_0$

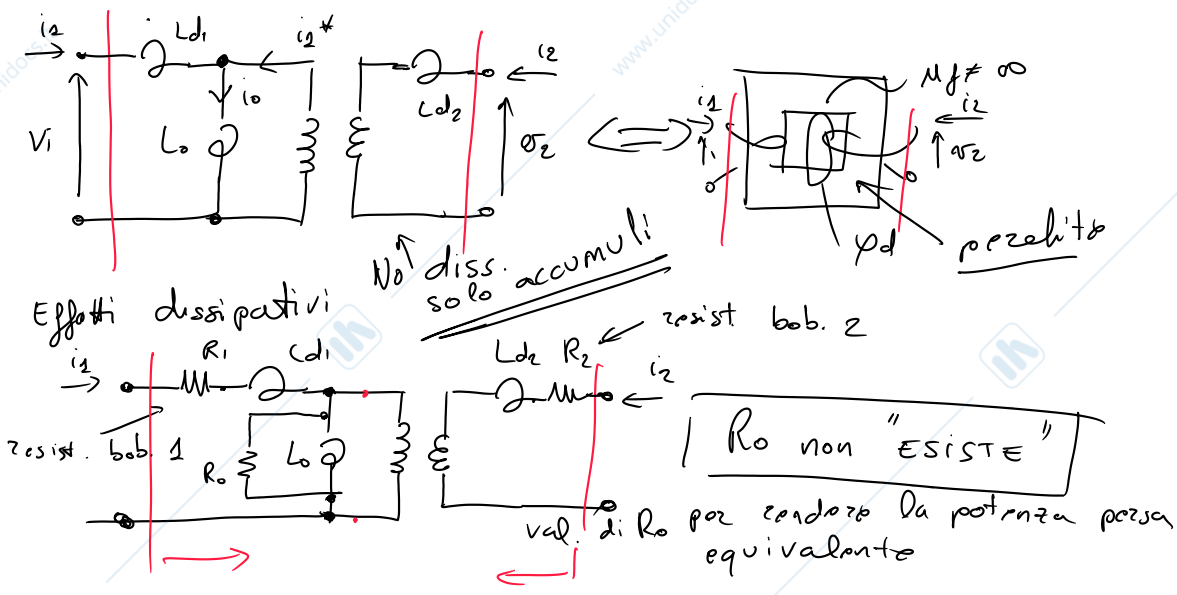


$$v_2^* = L_0 p (i_1 + i_2/k)$$

$$v_2^* = \frac{v_1^*}{k} = \frac{1}{k} L_0 p (i_1 + i_2/k)$$

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