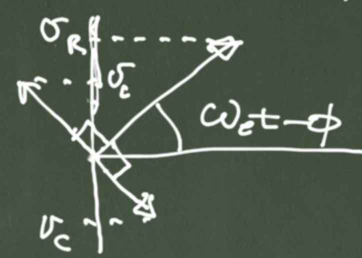
$\mathcal{E} = \mathcal{E}_m \sin \omega_e t \qquad I = I_0 \sin(\omega_e t - \phi)$

$= V_R + V_C + V_L$



$$\mathcal{E}_m^2 = V_R^2 + (V_L - V_C)^2 = (I_0 R)^2 + (I_0 X_L - I_0 X_C)^2 = I_0^2\left(R^2 + (X_L - X_C)^2\right)$$

$$I_0 = \frac{\mathcal{E}_m}{\sqrt{R^2 + (X_L - X_C)^2}}$$

$$I_0 = \frac{\mathcal{E}_m}{\sqrt{R^2 + (X_L - X_C)^2}} = \frac{\mathcal{E}_m}{Z}$$ → impedanse

$$Z = \sqrt{R^2 + (X_L - X_C)^2}$$

$$\mathcal{E}_m \cos\phi = V_R$$

$$\mathcal{E}_m \sin\phi = V_L - V_C$$

$$\operatorname{tg}\phi = \frac{V_L - V_C}{V_R} = \frac{X_L - X_C}{R}$$

$$\phi = \operatorname{arctg}\frac{X_L - X_C}{R}$$

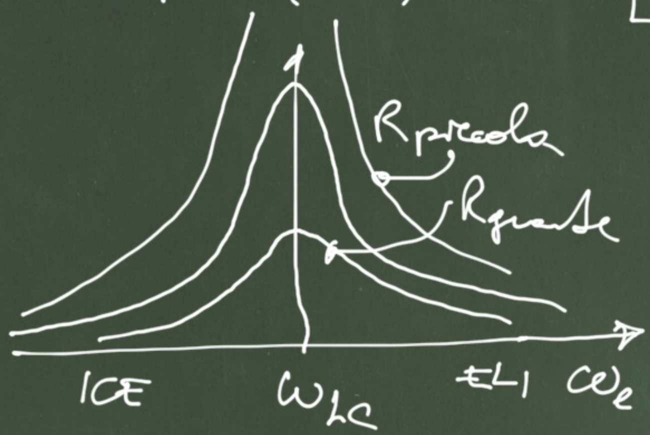
$X_L > X_C \rightarrow \phi > 0$

$X_L = X_C \rightarrow \phi = 0$

$X_L < X_C \rightarrow \phi < 0$

$$I_0 = \frac{\mathcal{E}_m}{\sqrt{R^2+(X_L-X_C)^2}} = \frac{\mathcal{E}_m}{Z}$$

$$\boxed{\phi = 0 \Leftrightarrow X_L = X_C \qquad \frac{\mathcal{E}}{R} = I_0}$$



$$X_L = \omega_e L = X_C = \frac{1}{\omega_e C}$$

$$\omega_e^2 = \frac{1}{LC}$$

$$\omega_e = \frac{1}{\sqrt{LC}}$$

$$\boxed{\omega_e = \omega_{LC}}$$

$$I^2 R = R I_0^2 \sin^2(\omega t - \phi)$$

$$\mathcal{E}_m = Z I_0$$

$$V_R = R I_0$$

$$\mathcal{E}_m \cos\phi = V_R \qquad \frac{\mathcal{E}_m}{V_R} = \frac{Z}{R}$$

$$\cos\phi = \frac{R}{Z} \le 1$$

(= se in risonanza)

$\cos\phi = 1$ in rison. $\Rightarrow \phi = 0$

$$P_{ave} = I_0^2 \frac{R}{2} = \left(\frac{I_0}{\sqrt{2}}\right)^2 R = I_{rms}^2 R$$

$$P_{ave} = I_0^2 \frac{R}{2} = \left(\frac{I_0}{\sqrt{2}}\right)^2 R = I_{rms,\phi}^2 R$$

$$\mathcal{E}_{rms} = \frac{\mathcal{E}_m}{\sqrt{2}} \qquad I_{rms,\phi} = \frac{\mathcal{E}_{rms}}{Z}$$

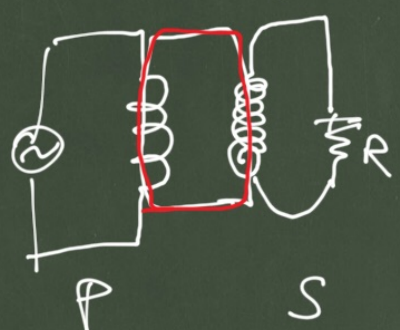
$$P_{ave} = \frac{\mathcal{E}_{rms}}{Z} I_{rms,\phi} R = \mathcal{E}_{rms} I_{rms,\phi} \frac{R}{Z}$$

$$\boxed{P_{ave} = \mathcal{E}_{rms} I_{rms,\phi} \cos\phi}$$

P = ind. primo

$I_p \to B \to \chi B$

$L = M$



var. flusso in S

$$\mathcal{E}_{ind} = \frac{d\phi}{dt}$$

$$V_s = N_s \mathcal{E}_{ind}$$

$$V_p = N_p \mathcal{E}_{ind}$$

$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

$$I_s V_s = I_p V_p$$

$$= I_s V_p \frac{N_s}{N_p}$$

$$I_s = I_p \frac{N_p}{N_s}$$

$$\frac{I_s}{I_p} = \frac{N_p}{N_s}$$

inductive charging