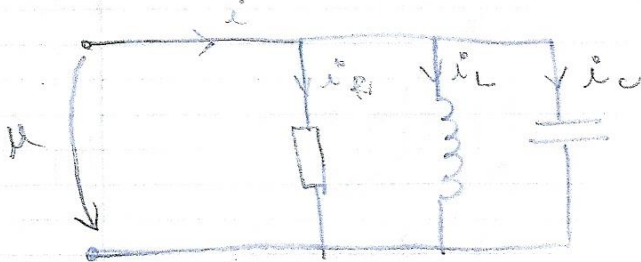


7.7.1 Rezonanță

Un circuit rezonant este un circuit care în lipsa unor forțe externe prezintă oscilații slab amortizate cu pulsația $\omega_0 = \frac{1}{\sqrt{LC}}$

7.7.2 Rezonanța unui circuit RLC paralel



$$\underline{I}_R = \frac{U}{R}$$

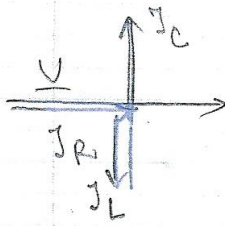
$$\underline{I}_L = \frac{U}{jX_L} = -j \frac{U}{X_L}$$

$$\underline{I}_C = \frac{U}{-jX_C} = j \frac{U}{X_C}$$

$$\underline{I} = \underline{I}_R + \underline{I}_L + \underline{I}_C$$

$$\underline{I} = U \left(\frac{1}{R} + j \left(\frac{1}{X_C} - \frac{1}{X_L} \right) \right)$$

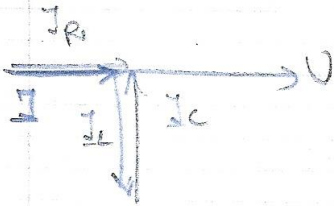
Rezonanță $X_L = X_C \Rightarrow \underline{I}_L + \underline{I}_C = 0$



$\varphi > 0$ regim inductiv

$$I_C < I_L$$

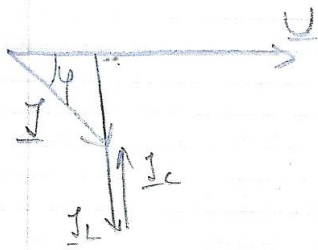
$$X_L < X_C$$



$\varphi < 0$ regim capacitiv

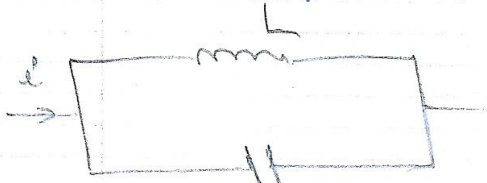
$$I_C > I_L$$

$$X_L > X_C$$



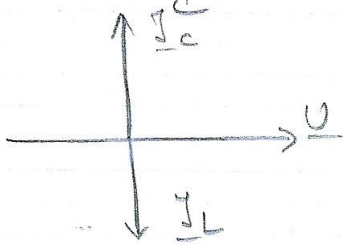
$$Z_C = \omega_0 L = \frac{1}{\omega_0 C} = \sqrt{\frac{L}{C}}$$

$$Q = \frac{I_{L0}}{I_R} = \frac{U}{Z_C} \cdot \frac{R}{U} = \frac{R}{\sqrt{L/C}} \text{ factorul de calitate}$$



$$I_L = \frac{U}{jX_L} = j \frac{U}{X_L}$$

$$I_C = \frac{U}{jX_C} = -j \frac{U}{X_C}$$



$$|I_L| = |I_C|$$

$$I_L + I_C = 0$$

$$Z_C = \frac{jX_L (-jX_C)}{j(X_L - X_C)} = \infty \quad X_L = X_C \text{ rezonanță}$$