

Resonance

Frequency at which voltage across inductor and capacitor cancel

R is independent of ω

X_L increases with ω

$$X_L = \omega L$$

X_C increases with $1/\omega$

$$X_C = \frac{1}{\omega C}$$

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

is minimum at resonance

$$\text{Resonance: } X_L = X_C \quad \omega_0 = \frac{1}{\sqrt{LC}}$$

