

Series RLC Circuit Applet

Open the Series RLC Circuit applet.

1. Check the *phasor diagram* checkbox.
2. Check all the voltage checkboxes: V_R , V_L , V_C , V , I . Note: if you click the checkboxes twice the graphs will be in color.
3. Animate the applet by clicking on the double arrow below the t axis.
4. Play with the applet.

Suggested Applet Exercise

Set the applet to show you all four voltages and the current I . Set $L = 500$ mH, $C = 100 \mu\text{F}$, $R = 250$ ohms.

Compute the resonant frequency of the system.

Move ω to the resonant frequency, watch the phasors and the sinusoidal plots as you do this.

With ω set at ω_0 watch the amplitudes of the three output voltages and the output current as R increases. Explain everything you see in terms of the complex Ohm's laws and the Exponential Response formula solution for \tilde{i} .

In the phasor diagram, can you see that the voltages across R and L are 90° out of phase? What about R and C ? Are the voltages across C and L 180° out of phase? Why does the the angle between the input voltage and the output voltages vary as you vary ω ?

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