

Lab Session 3
(12-16 Feb 2024)

Objectives:

On Simulink, design a circuit with ac source, series RLC branch and a series RLC load and perform the following activities:

- (1) Connect an AC source to a series RLC branch and a series RLC load.
- (2) Convert the series RLC branch as RL and RLC load as RL load.
- (3) Connect the current meter to measure and display the RMS value of current in the circuit.
- (4) Connect the voltage meter across the source and the load, measure and display the RMS value of phase voltage.
- (5) Connect the power meter to the source and the load and measure the real and reactive power. Connect the displays to read the powers.
- (6) Find the difference of the real power supplied to the load from the source.
- (7) Calculate the power factor of the load. [This is done by dividing the real power appearing across the load by the apparent power of the load]
- (8) Run the simulator and analyze the values displayed. In particular, the value of the power factor.
- (9) Now, to enhance the power factor (i.e., performance of the system), connect a load capacitor in parallel with the RL load.
- (10) Run the simulator and analyze the changes in the value displayed. Is the power factor increasing / decreasing ?
- (11) Repeat the experiments to make the power factor unity ($p.f. \sim 1$). Note down the values in each step.
- (12) What will happen when you further change the values? Note and report your observations.