

ELEC 302-81  
Lab 1  
Power in AC Circuits

January 19, 2013

Date Performed:	January 14, 2013
Partners:	Rawley Dent Charles Pittman
Instructor:	Dr. Weatherford

# 1 Introduction

Praesent congue faucibus turpis et cursus. Phasellus vitae nisi felis, elementum malesuada ante. Aliquam bibendum quam ac libero sollicitudin vel congue eros feugiat. Aenean ultricies malesuada felis ut vestibulum. Praesent non tellus risus. Nulla feugiat mauris sed nisl hendrerit ultricies vitae non Donec non mollis turpis. Etiam tempus ligula et tellus tempus a mollis massa faucibus. Proin ac interdum risus. Duis nec lacus elit. Donec venenatis tristique diam, in sollicitudin dui laoreet nec.

1. State the theoretical principles or concepts that this experiment is trying to prove.
2. May also be to gain experience in using the lab equipment.

# 2 Circuit Tested

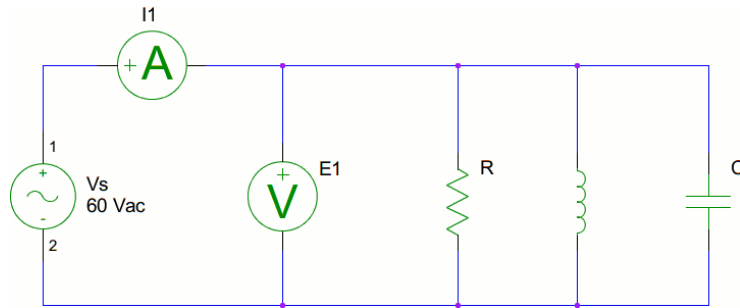


Figure 1: Parallel RLC Circuit Configuration

R	L	C
$\Omega$	H	$\mu F$
1200	0.8	—
1200	0.8	2.2
1200	0.8	4.4
1200	0.8	8.8
1200	1.6	—
1200	1.6	2.2
1200	1.6	4.4
1200	1.6	8.8

Table 1: RLC Values for circuit in Figure 1

### 3 Procedure

Sed luctus lacinia sollicitudin. Praesent arcu sapien, accumsan et convallis quis, fringilla vel ligula. Morbi id purus massa. Aliquam ut leo tellus, vel auctor urna. Nulla molestie tellus et velit aliquet convallis.

Suspendisse fermentum tincidunt lorem in pellentesque. Vestibulum tincidunt nibh eget lectus posuere ut luctus libero pretium. Integer sit amet purus ac nibh dictum elementum. Quisque sagittis leo eu felis mollis vitae interdum metus mattis. Maecenas et sem libero.

Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Morbi imperdiet, odio id scelerisque euismod, lectus libero eleifend justo, sit amet porttitor diam est eget orci. Praesent congue facilisis sem nec condimentum. Suspendisse mi enim, pharetra imperdiet congue nec, tincidunt a tellus.

Maecenas lacus risus, elementum a pulvinar vel, ullamcorper a diam. Maecenas malesuada, turpis sit amet euismod posuere, lectus elit bibendum magna, a molestie erat neque ut magna. Integer magna neque, ultricies vitae eleifend ac, mollis eget erat. Aenean risus enim, venenatis quis dapibus vel, ullamcorper id ante. Proin eget mattis magna. Integer rhoncus facilisis leo eget semper. Aenean sodales sagittis eleifend. Nulla hendrerit nunc vel felis rutrum tristique. Quisque posuere ullamcorper arcu. Etiam consequat accumsan elit at semper. Proin vulputate iaculis interdum. Praesent ac enim in enim commodo malesuada. Quisque non augue at nunc vulputate scelerisque id quis nisi. Vestibulum id augue eget neque semper aliquet.

Aliquam laoreet elit quis arcu dignissim vitae ornare enim consequat. Donec sodales dignissim commodo. Vivamus porttitor laoreet tincidunt. Curabitur aliquam luctus sapien quis tincidunt. Quisque in diam velit, nec luctus nulla. Mauris vel est nec metus luctus suscipit. Vestibulum mattis laoreet ipsum eu ullamcorper. Maecenas sit amet tempus nisl. Quisque ut dui at erat dictum imperdiet.

Ut aliquet, mi quis tincidunt posuere, eros purus egestas diam, ac hendrerit quam lectus in orci. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Proin vulputate porta mauris, ac congue tortor porta euismod. Donec sit amet massa diam. Etiam sed mi eros, porta congue libero. Lor

1. Enough description that someone familiar with basic electrical measurements could reproduce the experiment.
2. Sequential
3. Paragraph form is usually preferred.
4. Write in past tense.
5. Do not just copy the instruction lists in the lab assignments.
6. Learn to be brief

## 4 Calc

R $\Omega$	L H	C $\mu\text{F}$	I <sub>1</sub> A	E <sub>1</sub> V	P W	$\theta$ $^\circ$	S VA	Q VAR	p.f.
1200	0.8	—	0.210	60	4.56	68.77	12.58	11.73	0.36
1200	0.8	2.2	0.164	60	4.56	62.48	9.86	8.75	0.46
1200	0.8	4.4	0.122	60	4.56	51.65	7.34	5.76	0.62
1200	0.8	8.8	0.076	60	4.56	-2.67	4.56	-0.21	1.00
1200	1.6	—	0.114	60	3.39	60.27	6.84	5.94	0.50
1200	1.6	2.2	0.075	60	3.39	41.06	4.50	2.96	0.75
1200	1.6	4.4	0.057	60	3.39	-0.50	3.39	-0.03	1.00
1200	1.6	8.8	0.115	60	3.39	-60.51	6.89	-6.00	0.49

Table 2: Calculated Data

$$\mathbf{P} = \mathbf{VI} \cos \theta$$

$$\mathbf{Q} = \mathbf{VI} \sin \theta$$

$$\mathbf{S} = \mathbf{VI}^*$$

$$\mathbf{V} = \mathbf{IZ}$$

$$\text{p.f.} = \cos \theta$$

## 5 Results

R $\Omega$	L H	C $\mu\text{F}$	I <sub>1</sub> A	E <sub>1</sub> V	P W	$\theta$ $^\circ$	S VA	Q VAR	p.f.
1200	0.8	—	0.206	60.9	4.53	68.0	12.55	11.21	0.37
1200	0.8	2.2	0.158	60.9	4.56	60.9	9.62	8.19	0.49
1200	0.8	4.4	0.117	60.9	4.59	49.0	7.13	5.28	0.66
1200	0.8	8.8	0.081	61.0	4.65	-4.4	4.94	-0.36	1.00
1200	1.6	—	0.116	61.0	3.94	55.4	7.08	0.37	1.00
1200	1.6	2.2	0.079	61.0	3.96	32.8	4.82	2.55	0.84
1200	1.6	4.4	0.067	61.0	3.99	-6.6	4.09	-0.46	1.00
1200	1.6	8.8	0.124	61.2	4.05	-57.4	7.60	-6.33	0.54

Table 3: Experimental Data

## 6 Comparison with Theoretical

Praesent iaculis metus ornare tellus semper interdum. Nunc cursus sapien quis tortor condimentum fermentum. Fusce tristique, eros sit amet euismod elementum, tellus diam porttitor erat, et gravida nisi sapien et orci. Donec nec quam tempus mi gravida ornare in eu lorem. In sit amet massa vitae ligula malesuada consectetur. Vivamus faucibus tristique lacus, non scelerisque eros rhoncus ut. Mauris eget interdum nisi. Nullam ac est odio, in mollis dui. Suspendisse potenti.

Donec posuere vestibulum viverra. In vestibulum sem nisl. Donec eros tortor, ultrices a ullamcorper vitae, dapibus ac libero. Vivamus quis nisi elit, non venenatis urna. Donec porta dolor in ligula vehicula in vulputate ligula commodo. Donec viverra convallis felis, eget vulputate nunc lacinia eget.

1. Measured values versus what would be predicted by a theoretical analysis of the circuit performance.
2. For example, compare the measured resistance of two resistors connected in series with  $R_1 + R_2$ .
3. Express comparison as a %error.

$$\% \text{deviation} = \frac{\text{measured} - \text{theoretical}}{\text{theoretical}} \times 100\%$$

## 7 Conclusions

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Duis dui turpis, convallis ac hendrerit in, facilisis sed lectus. Nulla facilisi. Aenean id nulla ante, sit amet venenatis eros.

Fusce orci nibh, pharetra id bibendum sit amet, porta id metus. Sed faucibus ultricies ullamcorper. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos. Suspendisse bibendum vestibulum metus pellentesque gravida. Proin justo ligula, ultrices at faucibus at, blandit ut libero. Fusce cursus commodo nisl, sit amet pretium velit dignissim quis. Cras ut posuere felis.

Proin suscipit porta sodales. Sed non massa sit amet dui condimentum convallis. Vestibulum vitae tincidunt dui. Mauris tincidunt, neque vel congue ornare, sem sapien eleifend urna, sit amet dictum neque orci id felis. Cras diam nunc, viverra interdum aliquam sit amet, blandit quis libero. Nunc eget odio scelerisque eros placerat auctor. Aliquam mattis tellus sed lacus sodales id molestie risus cursus.

1. What theoretical principle or concept did this experiment prove?
2. Within experimental error, this laboratory exercise has demonstrated that the equivalent resistance of two resistors connected in series is equal to the sum of the individual values.