

ECE 209L - INTRODUCTION TO FILTERS - LAB 14

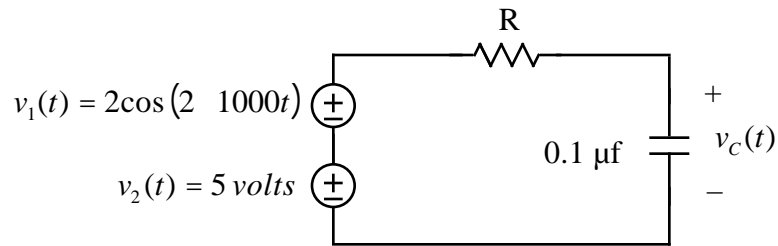
SUPERPOSITION OF STEADY STATE RESPONSES

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A.P. FELZER

OBJECTIVE

The objective of this lab is to demonstrate that superposition works for the following first order RC circuits



PARTNER 1: $R = 1\text{K}$

PARTNER 2: $R = 2\text{K}$

LAB

1. **Prelab** - Obtain and measure your resistor and capacitor values. Then compare your nominal and measured values. Put your results in a Table
2. Make use of what you see on the scope to sketch and write an equation for $v_C(t)$. Note that an easy way to generate $v_1(t) + v_2(t)$ is to use a sinusoid with a DC offset.
3. Make use of what you see on the scope to sketch and write an equation of $v_{C1}(t) =$ voltage across the capacitor due to just $v_1(t)$
Remember that to obtain $v_{C1}(t)$ you need to set $v_2(t)$ to zero - **replace** it with a short
4. Make use of what you see on the scope to sketch and write an equation of $v_{C2}(t) =$ voltage across the capacitor due to just $v_2(t)$
Remember that to obtain $v_{C2}(t)$ you need to set $v_1(t)$ to zero - **replace** it with a short
5. Make use of your results in Problems (3) and (4) to sketch $v_{C1}(t) + v_{C2}(t)$
6. Compare your results in Parts (2) and (5). Are they equal. Did superposition work.