Lab 7: The DIY Capacitor

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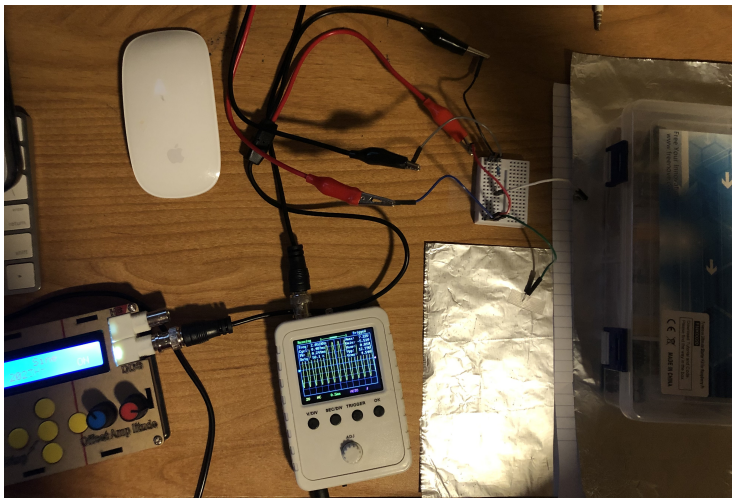
March 25, 2021

Part 1

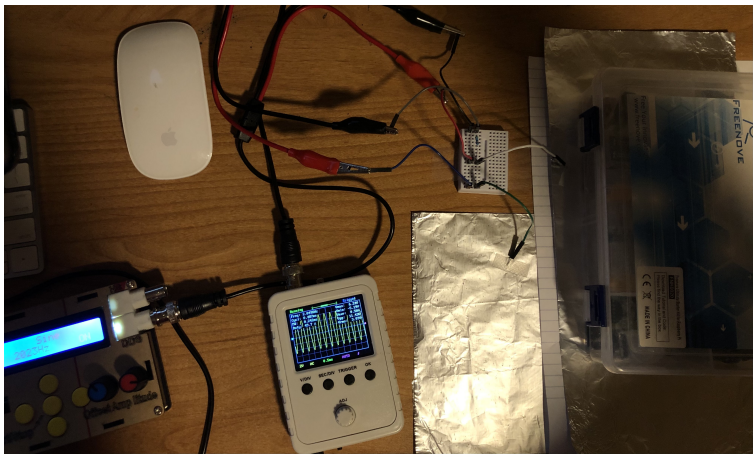
Table 1: Geometry of the Capacitor	
Width 1 w_1	6”
Width 2 w_2	6”
Area of overlap A	276”

Table 2: Impedance the DIY Capacitor									
n	R	V_{RC}	V_R	V/DIV for V_R	f_{gen}	f_{osc}	I_R	V_C	$X_{C,exp}$
1	470Ω	4.54V	3.97V	2V	2023Hz	2052Hz	0.0084	2.2024	260.74
2	470Ω	4.54V	3.89V	2V	2023Hz	2052Hz	0.0083	2.3408	282.83
3	470Ω	4.54V	3.65V	2V	2023Hz	2052Hz	0.0078	2.6998	346.65
4	470Ω	4.54V	3.48V	2V	2023Hz	2052Hz	0.0074	2.9157	393.78
1	470Ω	4.54V	4.05V	2V	2023Hz	2052Hz	0.0086	2.0516	238.09
2	470Ω	4.54V	3.89V	2V	2023Hz	2052Hz	0.0083	2.3408	282.83
3	470Ω	4.54V	3.73V	2V	2023Hz	2052Hz	0.0079	2.5882	326.13
4	470Ω	4.54V	3.40V	2V	2023Hz	2052Hz	0.0072	3.0086	415.89
1	470Ω	4.54V	3.89V	2V	2023Hz	2052Hz	0.0083	2.3408	282.83
2	470Ω	4.54V	3.65V	2V	2023Hz	2052Hz	0.0078	2.6998	346.65
3	470Ω	4.54V	3.56V	2V	2023Hz	2052Hz	0.0076	2.8174	371.97
4	470Ω	4.54V	3.40V	2V	2023Hz	2052Hz	0.0072	3.0086	415.89

V_{RC} Setup

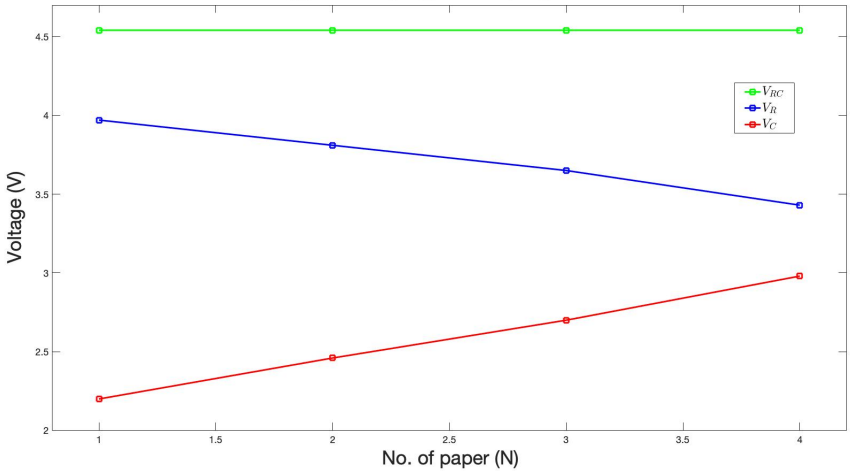


V_R Setup



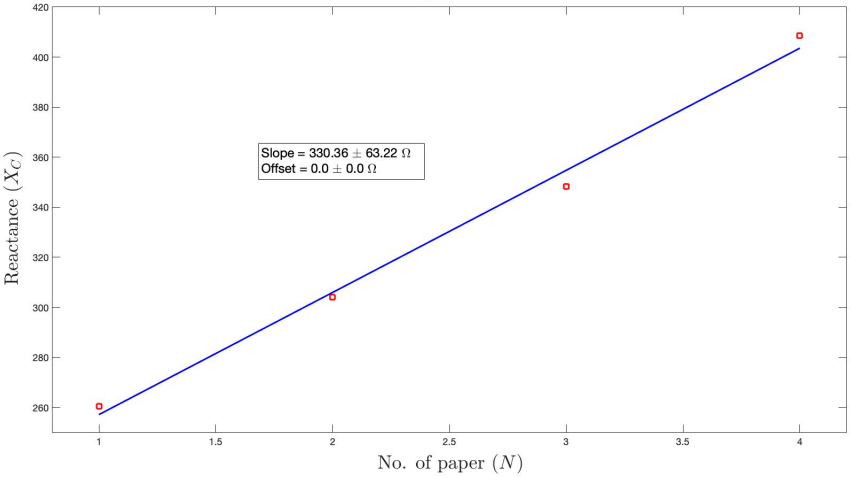
Graph 1:

V_{RC} *vs.* N, V_R *vs.* N, V_C *vs.* N



Graph 2:

X_C vs N



1. What slope do you find for graph 2 and how does it compare to your expectation?
    - Slope = 330.36 ± 63.22 Ω
    - Expectation = 0.0 ± 0.0 Ω
2. What do you think could cause the offset in the fit?
    - Mostly from the aluminum foil not being constant and always changing its form.