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Physics 208-CC3

Lab 4- Electric Potential and Electric Fields

Procedure

The materials needed for this experiment was the plotting board with special paper, a voltmeter, and a direct current outlet. The point of the exam was to develop a potential difference in order to measure the electric field.

Experiment for Equipment

Materials

- Plotting Board
- Electric Voltmeter
- D.C. Power Cord
- Ruler

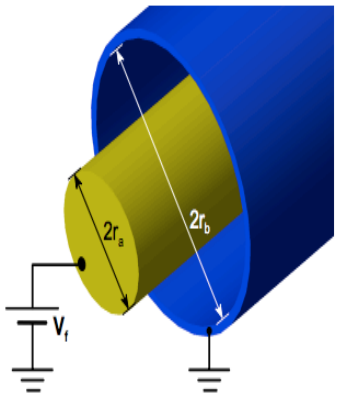


Figure 1: Coaxial arrangement of two conductors.

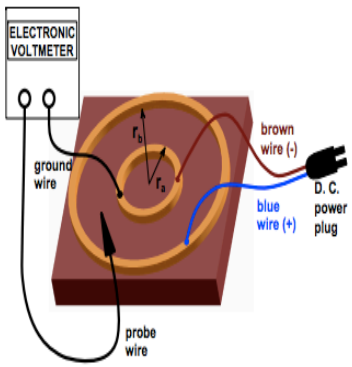
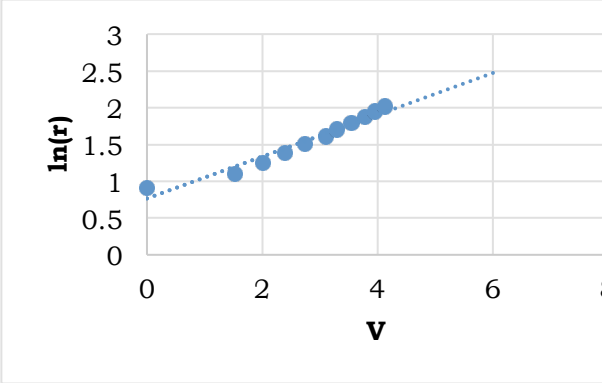


Figure 2: Wiring diagram.

Organized Data/Calculation

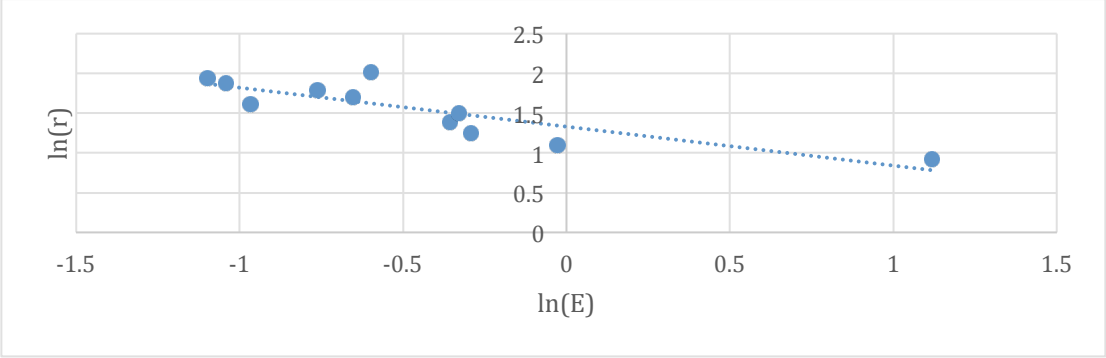
r(cm)	V1	V2	V3	V(avg)
2.5	0	0	0	0
3	1.76	1.76	1.07	1.53
3.5	2.16	2.13	1.76	2.1067
4	2.54	2.4	2.23	2.39
4.5	2.86	2.79	2.57	2.74
5	3.18	3.08	3.04	3.1
5.5	3.38	3.23	3.26	3.29
6	3.66	3.48	3.51	3.55
6.5	3.88	3.7	3.77	3.7833
7	4.07	3.85	3.96	3.96
7.5	4.24	3.94	4.2	4.1267



- Measure of the voltage of the electric field
- Increasing distances (Center of the ring)

$$E = \frac{V_{i+1} - V_i}{r_{i+1} - r_i}$$

ln(r)	E	ln(E)
0.916290732	3.06	1.11841492
1.098612289	0.973333333	-0.0270287
1.252762968	0.746666667	-0.2921364
1.386294361	0.7	-0.3566749
1.504077397	0.72	-0.3285041
1.609437912	0.38	-0.967584
1.704748092	0.52	-0.6539265
1.791759469	0.466666667	-0.7621401
1.871802177	0.353333333	-1.0403434
1.945910149	0.333333333	-1.0986123
2.014903021	0.550222222	-0.597433



Analysis/Discussion

In this experiment, we used the equations provided to plot and compare the relationship between the values. Also Gauss's Law was used to understand the concepts of electric fields and potentials. This law was great at explaining visually as well.