Exp. Number	Experiment/Subject		Date
	LAB 4: MAG/IND		
Name Trevor N.	**Lab Partner** Lauren Lee	Phillip	**Course & Section No.** PHYS 122: 119B Station 31

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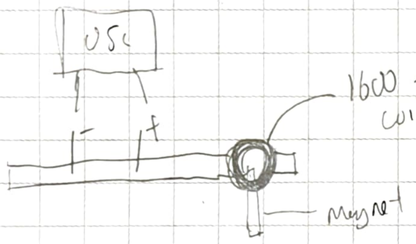
Abstract: The goal of this lab is to confirm Faraday's law of induction between coils & magnetic fields.



1) Turn on voltage detector
2) Pass magnet through coil and observe the voltage

1) Place the coil 40 cm away
2) Move back & forth ±2cm
3) place it/pierce to the magnet, move around
4) record the "noise" in the detector

Noise: −0.011 V at 40cm
Noise: −0.021 V at on magnet
40-to-center: 0.396 V
center to −40: −0.405 V

$\int s$: 40-cen: 0.06177 Vs
cen-40: −0.08926 Vs

		Max/Min	Int			Max/Min	Int
Slower:	40-cen	0.167 V	0.09059 Vs	Faster	40-cen	0.587 V	0.04096 Vs
	cen-40	−0.239 V	−0.06924 Vs		cen-40	−1.274 V	−0.1269 Vs

Coil over & V_0:

	onto	above
Int:	0.08035 Vs	−0.08291 Vs

1) Place coil 40 cm away & move it onto the magnet, then move it back
2) Record the peak & low
3) Integrate the first moment & second moment
4) Repeat @ 3 diff speeds.

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90°
Slow: 0.01035 Vs, -0.02728 Vs
East: 0.01000 Vs, -0.02931 Vs

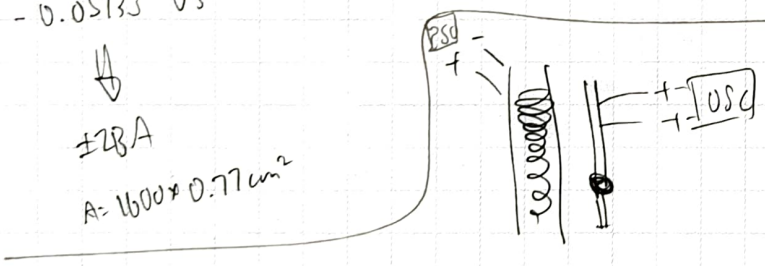
180°
0.03465 Vs
-0.05295 Vs
0.03663 Vs
-0.05133 Vs

⇓

±28A

A = 1600 × 0.77 cm²

1) Place coil with axis vertical over the magnet
2) Turn left 90° slowly
3) Turn right 90° slowly
4) Turn left 90° quickly
5) Turn right 90° quickly
6) Integrate the EMF for each movement
7) Now flip 180° & vary speeds
8) Integrate each movement again.



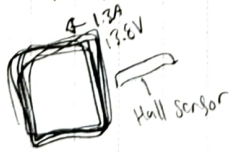
1) Connect 1600 turn coil
2) move coil to middle of coil
3) Collect voltage in coil over time
4) Record amplitude of sine wave
5) Swap to 160 & 16 turn coils & repeat

Amp

1600	224.05 mV
160	14.97 mV
16	1.73 mV

Measurement of earth's field

≈0.65 G

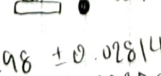


≈±0.2

Wire:

1.5	-14.25 ± 0.02237 G
3	-10.45 ± 0.02221 G
5	-8.479 ± 0.02694 G
8	-6.866 ± 0.02477 G
12	-5.800 ± 0.03249 G
off	-4.167 ± 0.1845 G

1) Record Magnetic field at various distances for "infinite" wire at 1.3A.



	Coil	Mag
1	-13.98 ± 0.02814 G	-30.07 ± 0.02397 G
3	-6.427 ± 0.02352 G	-10.20 ± 0.02331 G
5	-5.013 ± 0.1230 G	-6.492 ± 0.01407 G
7	-4.570 ± 0.1714 G	-5.205 ± 0.08188 G
9	-4.458 ± 0.1460 G	-4.814 ± 0.1187 G
11	-4.309 ± 0.1839 G	-4.583 ± 0.1053 G
13	-4.313 ± 0.1563 G	-4.465 ± 0.1772 G
off	-4.287 ± 0.1735 G	-4.267 ± 0.1677 G

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