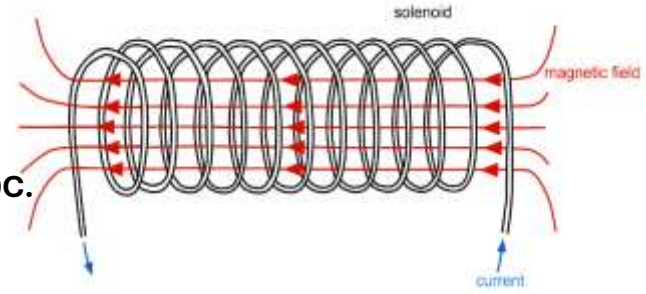

Manual to Lab 7: PHY2049C.

Florida State University

Electromagnetic Induction

About labs in this class

The labs in this class will have general instructions, and many things need to be figured out by the students. I will be answering any specific questions the students may have without completely giving away the key to the puzzle. **Answer the questions and record your measurements in your lab notebook, and then submit the notebook at the end of the activity.**

About this lab

In this lab, you are provided with all the tools necessary to light a lightbulb wirelessly. You have two solenoids, one, connected to a power supply, will produce a magnetic flux change in the other one (see figure 1). You are provided with two power supplies: the Universal Interface, and an old school power supply that can produce greater DC Voltage. DO NOT USE THE OLDSCHOOL POWER SUPPLY TO PRODUCE AC VOLTAGE.

Activity 1. Light the lightbulb via electromagnetic induction. Hint: use the switch to create a sudden change in the current.

Question 1. What is the current through the lightbulb? Do a theoretical estimation (you will have to estimate the magnetic field flux change through the smaller solenoid) and then measure it with the tools provided.

Question 2. What is the circuit diagram of this circuit you have created?

Activity 2. Using the Universal Interface and an AC power supply, produce a constant signal in the secondary solenoid. Draw a diagram of the situation.

Question 3: Estimate the current through the second solenoid and then measure it. Record the value. Show the work for your theoretical estimate.

Figure 1: The big solenoid is the primary solenoid, the small one the secondary solenoid.