

Slinky and Magnetic Field Lab

AP Physics C: Mr. Perkins

Denny Cao

Due: March 15, 2023

1 Introduction

In this lab, we will explore factors that affect the magnetic field inside a solenoid and study how the field varies in different parts of the solenoid. By inserting a Magnetic Field Sensor between the coils of the Slinky, we can measure the magnetic field inside the coil, as well as the value of μ_0 .

2 Preliminary Questions

1. Hold the switch closed. The current should be 2.0 A. Place the Magnetic Field Sensor between the turns of the Slinky near its center. Rotate the sensor and determine which direction gives the largest magnetic field reading. What direction is the white dot on the sensor pointing?
2. What happens if you rotate the white dot to point the opposite way? What happens if you rotate the white dot so it points perpendicular to the axis of the solenoid?
3. Stick the Magnetic Field Sensor through different locations along the Slinky to explore how the field varies along the length. Always orient the sensor to read the maximum magnetic field at that point along the Slinky. How does the magnetic field inside the solenoid seem to vary along its length?

3 Data

3.1 Part 1: Magnetic Field and Current Relationship in Solenoid

Current in solenoid I (A)	Magnetic field B (T)
0.5	
1.0	
1.5	
2.0	

3.2 Part 2: Magnetic Field and Spacing of Turns Relationship in Solenoid