**MAGNETIC FORCE 1**

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PHY 134

SECTION 07

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DATA TAKEN: 10/15/2014

LAB DUE: 10/20/2014 at 10:00AM

LAB HANDED: 10/20/2014

**Aim:**

To determine the vertical component of earth’s magnetic field by measuring the deflection of a current carrying method stretched between two supports

**Procedure:**

**1)** First position the microscope at the center of the wire and focus the wire in the center of the microscope

**2)** Measure the diameter of the wire and then compare it to the known value of 0.255mm

**3)** Now slowly turn up the current and watch the wire deflect. Measure the current I and repeat for several values of I

**Data Analysis:**

Using the data collected, we find the Vertical component of the earth’s magnetic field to be 0.00465 ± 0.001081T

**Q1) What is the resistance of the shunt**

The resistance of the shunt is about 10mΩ

**Q2)**  **Why should the microscope be placed at the middle of the wire?**

The microscope should be placed at the center because we can see the maximum deflection at the center and its easier to get readings.

**Q3)**  **Do the vibrations ever damp out?**

The vibrations decrease to some extent but never disappear completely.

**Q4)**  **When the wire moves “up”, say, in the microscope image, is the actual wire moving in the same direction?**

When the wire moves up in the image, the actual wire is moving down.

**Q5)**  **Is the image erect or inverted?**

The image is inverted

**Q6)**  **How many values at each I should be taken?**

We should take at least 4 values for each I to get a reasonable mean and standard deviation

**Q7)**  **Why do we need to know all these directions**

We need to know all these directions so we can accurately apply the right hand thumb rule and find the direction of the force.

**Q8) Does the calculated value of Bvert agree with the accepted value?**

Yes, our calculated value is 4.65µT and the accepted value is 4.643µT which falls well within the range of uncertainty

**Conclusion:**

Using various experiments we successfully calculated the value of an the vertical component of the Earth’s magnetic field in the Lab.



