

Earth's Magnetic Field Lab

Procedure

Briefly, but completely, describe the procedure for this lab – and include labeled sketches.

Data

$$L = \underline{\hspace{2cm}} \quad R = \underline{\hspace{2cm}} \quad x = \underline{\hspace{2cm}} \quad I = \underline{\hspace{2cm}}$$

Questions

- 1) Using your data and the formula for the magnetic field of a solenoid, calculate the magnetic field of the Earth. Show all of your work.
- 2) Using your data and the formula for the magnetic field of a Helmholtz coil, calculate the magnetic field of the Earth. Show all of your work.
- 3) Go to this website <http://www.ngdc.noaa.gov/geomag-web/#igrfwmm> and put in the school's zip code. Find the N component of the Earth's magnetic field. Use this value as the accepted value and find the percent error for both values you calculated.
- 4) Which formula proved more effective? Why?

Error Analysis

Thoroughly explain what the main sources of error are for this lab, and how you would correct them.

