

4.3.01-00 Earth's magnetic field



What you can learn about ...

- Magnetic inclination and declination
- Isoclinic lines
- Isogenic lines
- Inclinator
- Magnetic flow density
- Helmholtz coils

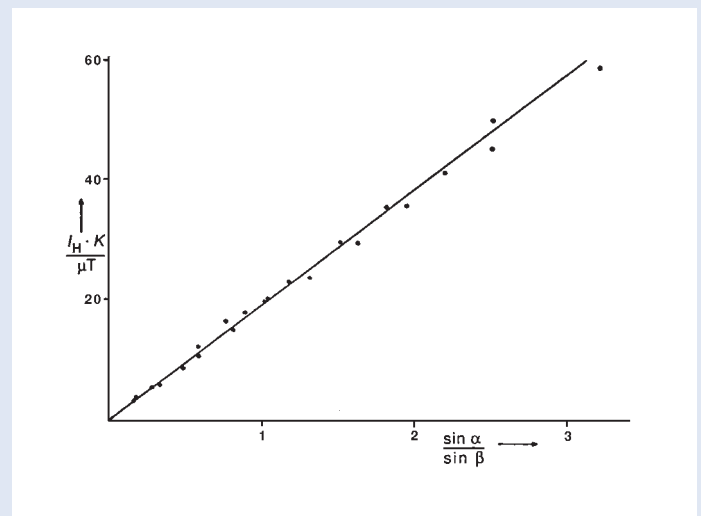
Principle:

A constant magnetic field, its magnitude and direction known, is superimposed on the unknown earth-magnetic field. The earth-magnetic field can then be calculated from the magnitude and direction of the resulting flux density.

What you need:

Helmholtz coils, one pair	06960.00	1
Power supply, universal	13500.93	1
Rheostats, 100 Ω , 1.8 A	06114.02	1
Teslameter, digital	13610.93	1
Hall probe, axial	13610.01	1
Digital multimeter 2010	07128.00	1
Magnetometer	06355.00	1
Barrel base -PASS-	02006.55	1
Right angle clamp -PASS-	02040.55	1
Support rod -PASS-, square, $l = 250$ mm	02025.55	1
Stand tube	02060.00	1
Connecting cable, 4 mm plug, 32 A, red, $l = 100$ cm	07363.01	1
Connecting cable, 4 mm plug, 32 A, blue, $l = 100$ cm	07363.04	4

Complete Equipment Set, Manual on CD-ROM included
Earth's magnetic field P2430100



Linear function to determine the horizontal component ${}^h B_E$ of the magnetic flux density of the earth-magnetic field.

Tasks:

1. The magnetic flux of a pair of Helmholtz coils is to be determined and plotted graphically as a function of the coil current. The Helmholtz system calibration factor is calculated from the slope of the line.
2. The horizontal component of the earth-magnetic field is determined through superimposition of the Helmholtz field.
3. The angle of inclination must be determined in order to calculate the vertical component of the earth-magnetic field.