

LEEI-37A Helmholtz Coil Magnetic Field Apparatus



This apparatus adopts an integrated Hall sensor as the detector to detect Helmholtz coil magnetic field. Hall sensors are compact, sensitive, accurate, and flexible to deploy. The output voltage is measured with a DC voltmeter with higher measurement accuracy.

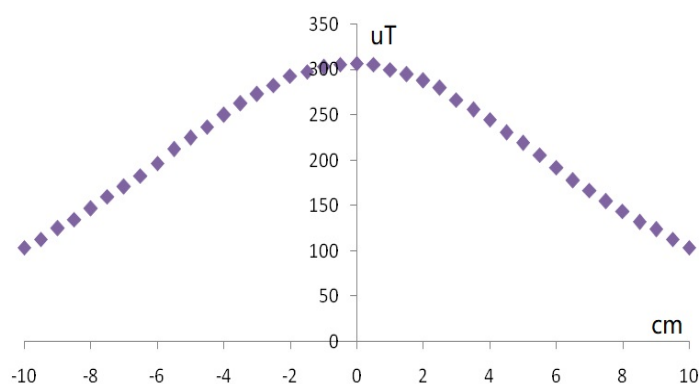
LEEI-37A apparatus can measure the magnetic field distribution not only on the central axis of a single coil or Helmholtz coil, but also in the plane of radius. That is, the two-dimensional magnetic field measurement is realized, and because the magnetic field in the coil radius direction is the same in all directions, it is also equivalent to a three-dimensional measurement. Using this apparatus, the following experiments can be performed:

- Compact, accurate, and flexible
- Adjustable coil spacing
- Easy to use
- Stable and reliable

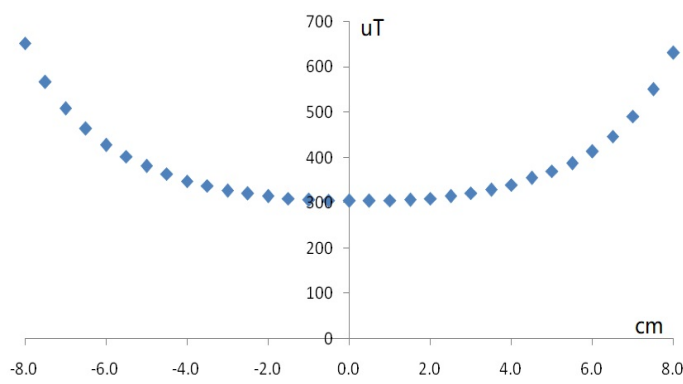
1. Measure the magnetic field distribution along the central axis of a single coil and compare with theoretical value;
2. Measure the magnetic field distribution along the radius direction of a single current-carrying coil;
3. Measure the magnetic field distribution along the central axis of the Helmholtz coil;
4. Measure the magnetic field distribution in a plane perpendicular to the central axis of the Helmholtz coil;
5. Measure the magnetic field distribution along the axis of each single coil (separately measure coil A and coil B) and plus their results together at corresponding points, and compare with the magnetic field of the Helmholtz coil to verify the magnetic field superposition principle;
6. Measure the magnetic field distribution on the axis for cases of different spacing of the two coils to further prove the principle of magnetic field superposition

Specifications

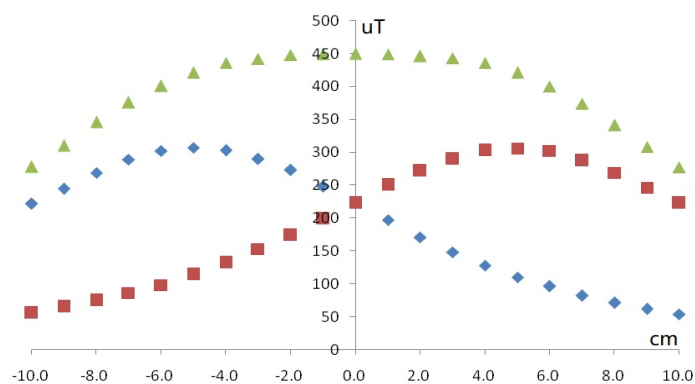
Description	Specifications
Milli-Teslameter	range: 0 - 1.999 mT, resolution: 0.001 mT
DC current supply	0 - 200 mA, stability: 1%
Helmholtz coil	500 turns, outer diameter: 21 cm, inner diameter: 19 cm
Ruler	vertical range 0 - 160 mm, resolution 0.02 mm, coil center at 80 mm
Rail	length 500 mm, resolution 1 mm
Measurement error	< 3%



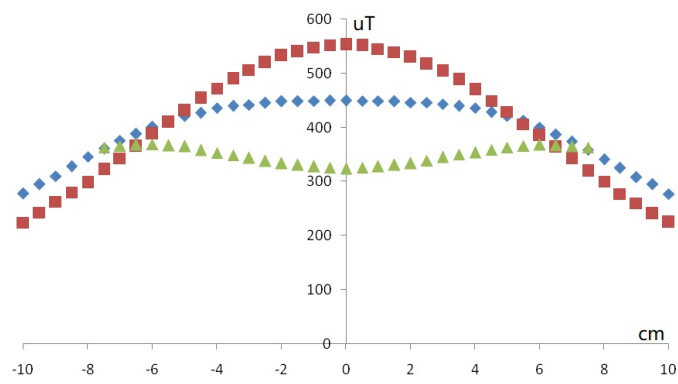
Magnetic field along central axis of a single coil



Magnetic field along radius of a single coil



Magnetic field along central axis: Blue for coil A,
Red for coil B, Green for A+B



Magnetic field along central axis of different coil
spacing: Red, Blue and Green for R/2, R and 3R/2