

Magnetic field of paired coils in a Helmholtz arrangement with a teslameter

Product details



Magnetic field of paired coils in a Helmholtz arrangement with a teslar

Item no.: P2430301



Experiment Type: Teacher Experiment, Laboratory Experiment

Description

Scope of Supply

Downloads and Documents

Principle

The spatial distribution of the field strength between a pair of coils in the Helmholtz arrangement is measured. The spacing at which a uniform magnetic field is produced is investigated and the superposition of the two individual fields to form the combined field of the pair of coils is demonstrated.

Benefits

- Particularly homogeneous magnetic field and high flux density due to large Helmholtz coil diameter
- Helmholtz coils suitable for multiple other elementary experiments

Tasks

1. To measure the magnetic flux density along the z-axis of the flat coils when the distance between them $\alpha = R$ (R = radius of the coils) and when it is larger and smaller than this.
2. To measure the spatial distribution of the magnetic flux density when the distance between coils $\alpha = R$, using the rotational symmetry of the set-up: a) measurement of the axial component B_z ; b) measurement of radial component B_r .
3. To measure the radial components B'_r and B''_r of the two individual coils in the plane midway between them and to demonstrate the overlapping of the two fields at $B_r = 0$.

What you can learn about

- Maxwell's equations
- Wire loop
- Flat coils
- Biot-Savart's law
- Hall effect"