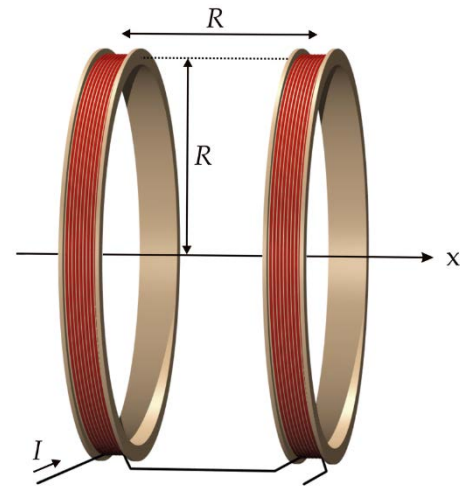


Bachelor Thesis

Magnetic Field Sensor calibration with 3D coil arrangement

Motivation

For measurements to be carried out properly, the measuring instruments must be suitably calibrated. For magnetic field sensors, this can be realized e.g. with a Helmholtz coil arrangement or distributed coils. With a three-dimensional arrangement, the magnetic fields can be generated independently, as well as superpositions. In addition to calibration, the coil assembly is also intended for use in the laboratory for the display of different magnetic fields.



Single-axis Helmholtz coil, © A. Hellwig (de.wikipedia.org)

Research questions

- How must the coil arrangement be dimensioned to generate a magnetic field that is as homogeneous as possible in a defined area in all three axes?
- How can it be ensured that the coils generate a traceable (calibrated) magnetic field?
- Can a static magnetic field (0 Hz) also be generated and calibrated with the model?

Procedure/Methodology/Task definition

- Working out the theory
- computational comparison: Helmholtz coil arrangement vs. distributed coils (MATLAB® script available)
- planning, dimensioning & drawing (CAD) of the preferred coil arrangement
- Programming of an operating software for calibration (MATLAB®, Python, or similar)
- Test calibration of measuring instruments

Organisational Issues

Start Immediately. Language: German or English

Contact Person/Supervisor

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