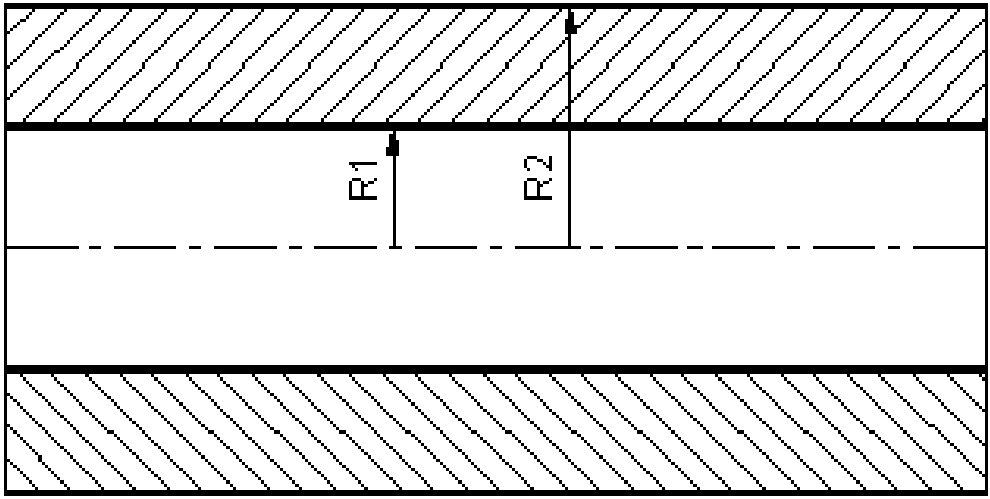
QuickField simulation report

Stress distribution in a long solenoid

Calculation of the magnetic flux density and stress distribution in a solenoid



This automatically generated document consists of several sections, which specify the problem setup and finite element analysis simulation results. Navigation links in the top of each page lead to corresponding sections of this report.

Problem description and QuickField simulation files:
https://quickfield.com/advanced/coupl1.htm

Problem info

Problem type: Magnetostatics
Geometry model class: Axisymmetric
Problem database file names:

- Problem: *Coupl1MS.pbm*
- Geometry: *Coupl1.mod*
- Material Data: *Coupl1ms.dms*
- Material Data 2 (library): *none*
- Electric circuit: *none*

Results taken from other problems:

- *none*

Geometry model

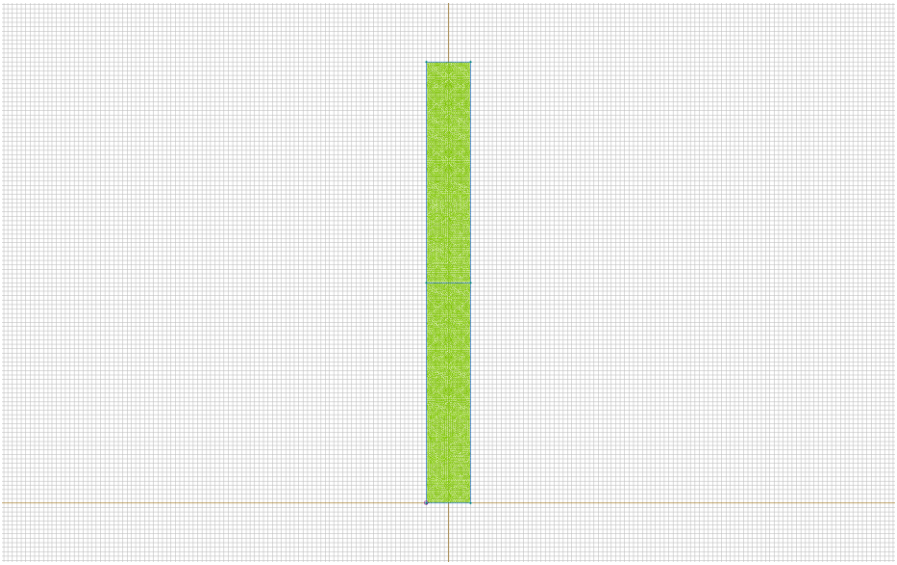


Table 1. Geometry model statistics

	With Label	Total
Blocks	2	2
Edges	2	7
Vertices	0	6

Number of nodes: 5833.

Labelled objects

There are following labelled objects in the geometry model (Material Data file could contain more labels, but only those labels that assigned to geometric objects are listed)

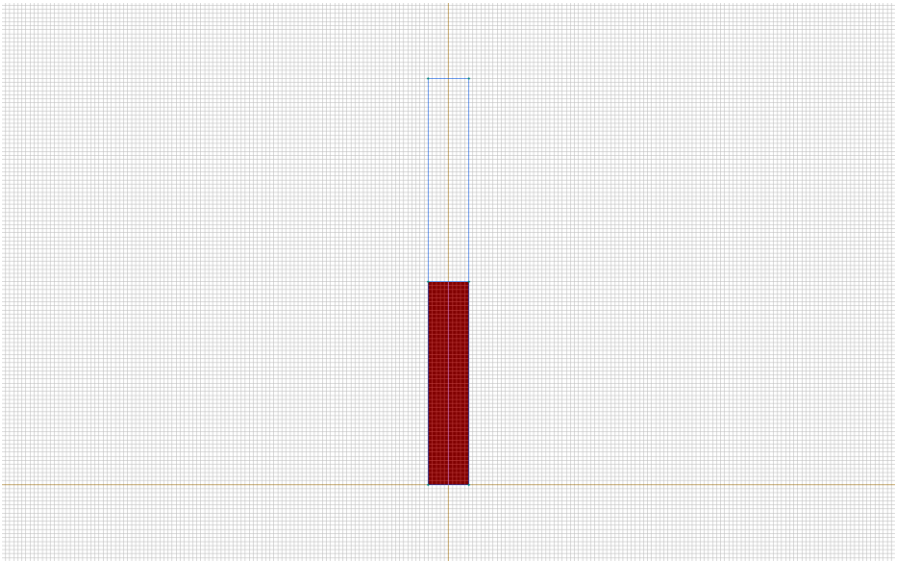
Blocks:	Edges:	Vertices:
• air • coil •	• no axial displ. • outer •	

Detailed information about each label is listed below.

Labelled objects: block "air"

There are (1) objects with this label

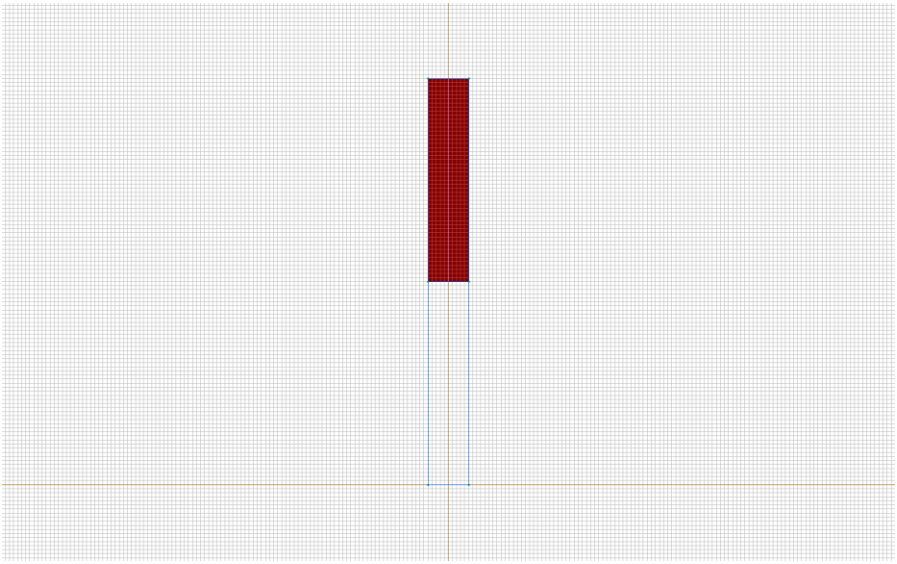
Relative magnetic permeability: mu_x=1, mu_y=1
Current density: j=0 [A/m2]
Conductor's connection: in parallel



Labelled objects: block "coil"

There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Current density: j=1000000 [A/m2]
Conductor's connection: in parallel



Labelled objects: edge "no axial displ."

There are (2) objects with this label

Tangential field: H_t=0 [A/m]

Labelled objects: edge "outer"

There are (1) objects with this label

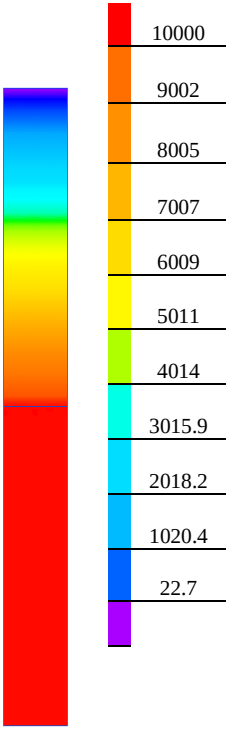
Zero normal flux: B_n=0

Results

Field lines

Results

Color map of Strength |H| [A/m]



Nonlinear dependencies

No non-linear dependencies are used in this problem data