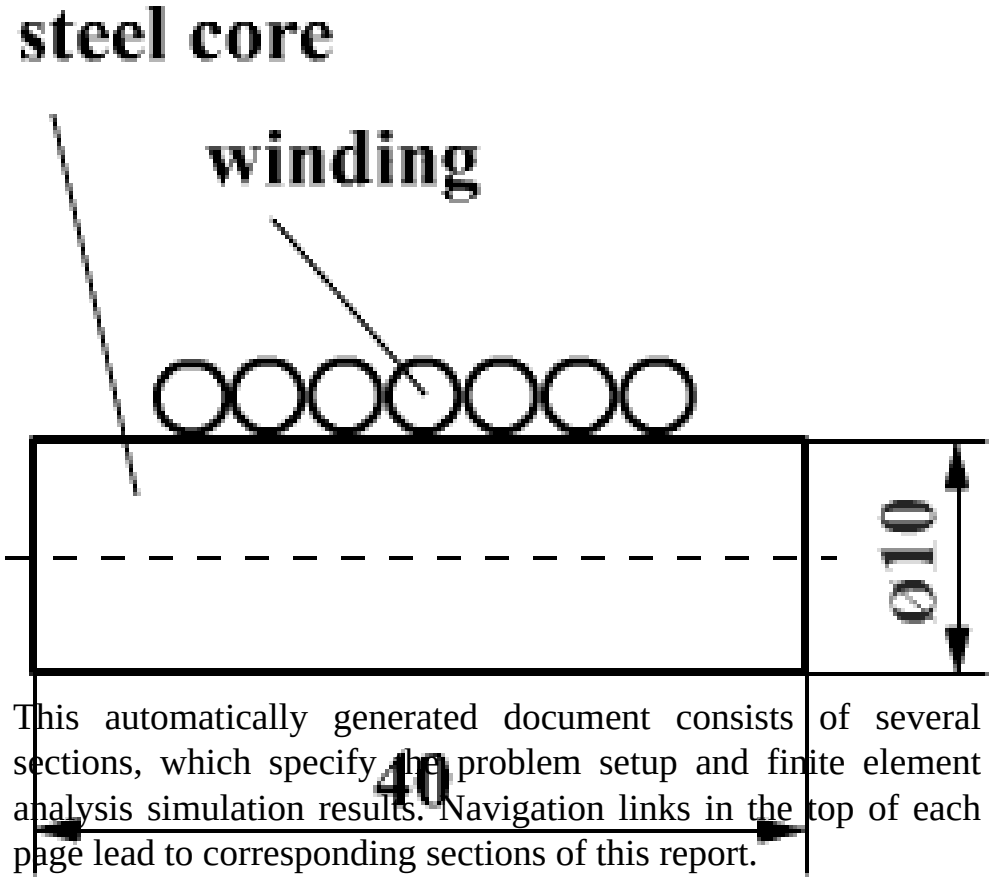
QuickField simulation report

Coil switching current

Calculation of the switching current for the coil. This is an example problem analysis performed with QuickField software



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/coil.htm

Problem info

Problem type: Transient Magnetics (integration time: 2.0000000949949E-03 s.)
Geometry model class: Axisymmetric
Problem database file names:

- Problem: *coil.pbm*
- Geometry: *Coil.mod*
- Material Data: *Coil.dms*
- Material Data 2 (library): *none*
- Electric circuit: *none*

Results taken from other problems:

- *none*

Geometry model

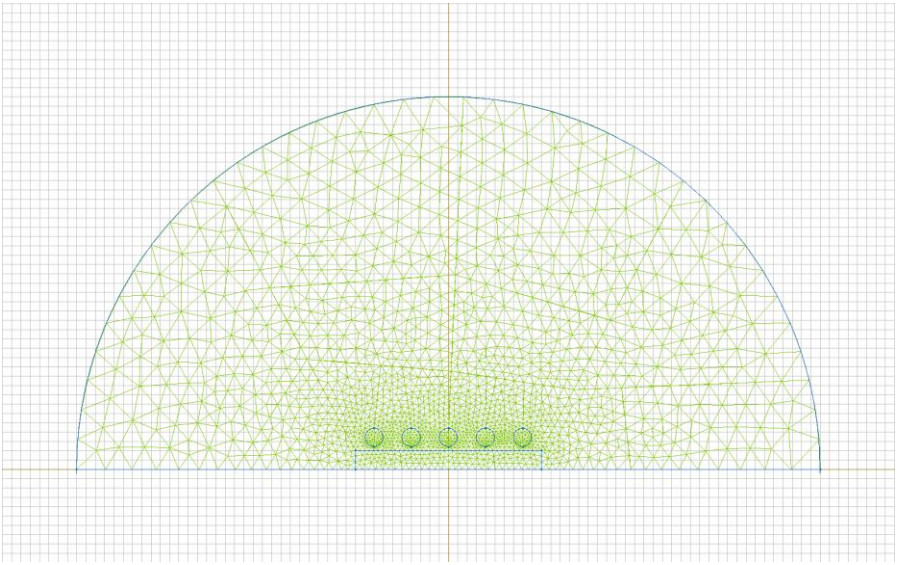


Table 1. Geometry model statistics

	With Label	Total
Blocks	3	7
Edges	2	17
Vertices	0	16

Number of nodes: 1744.

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)

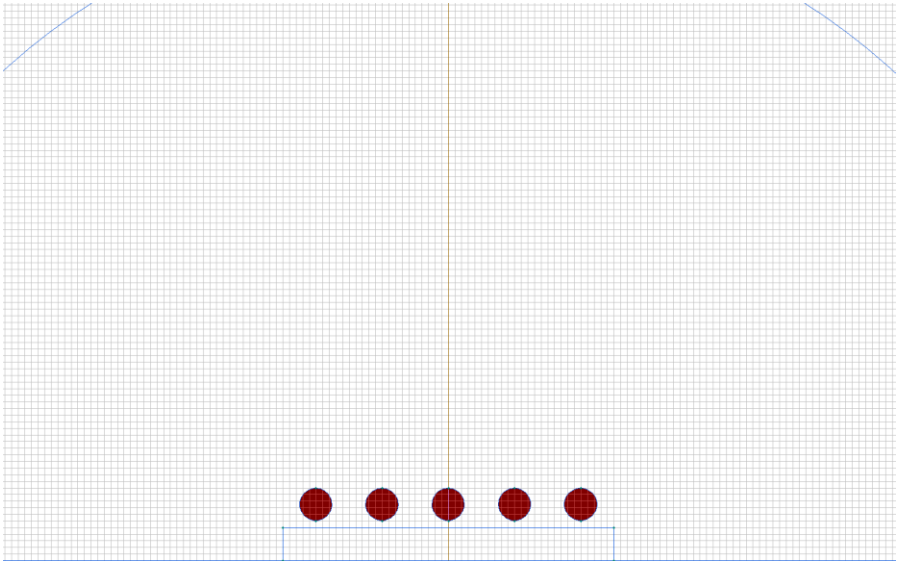
Blocks:	Edges:	Vertices:
• winding • air • core •	• far away • rotation axis •	

Detailed information about each label is listed below.

Labelled objects: block "winding"

There are (5) objects with this label

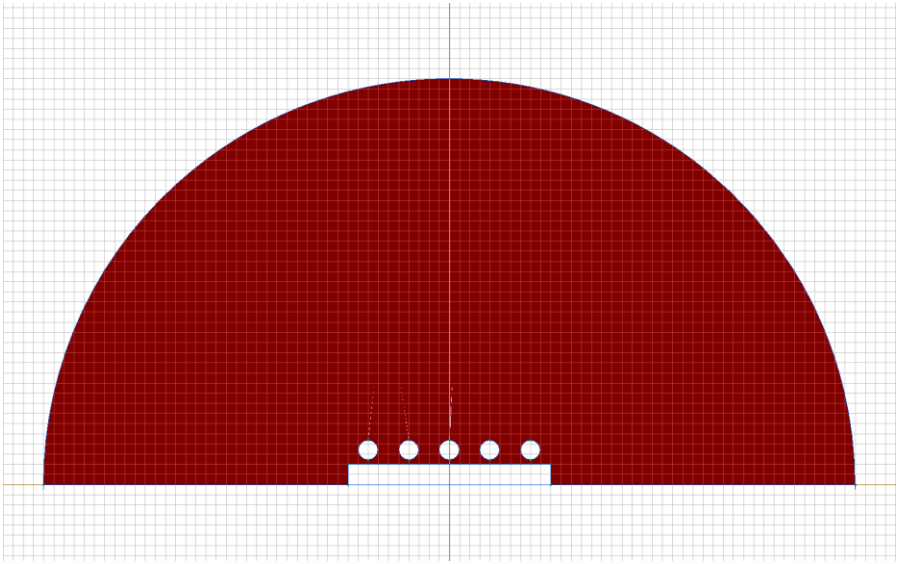
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma(T)=56000000 [S/m]
Voltage: U=0.1 [V]
Conductor's connection: in series



Labelled objects: block "air"

There are (1) objects with this label

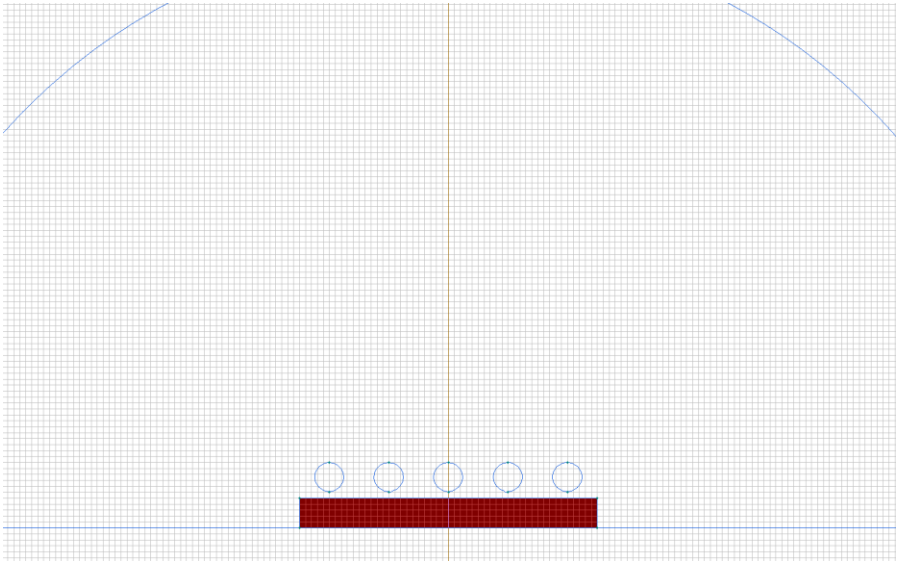
Relative magnetic permeability: mu_x=1, mu_y=1
Current density: j=0 [A/m2]
Conductor's connection: in parallel



Labelled objects: block "core"

There are (1) objects with this label

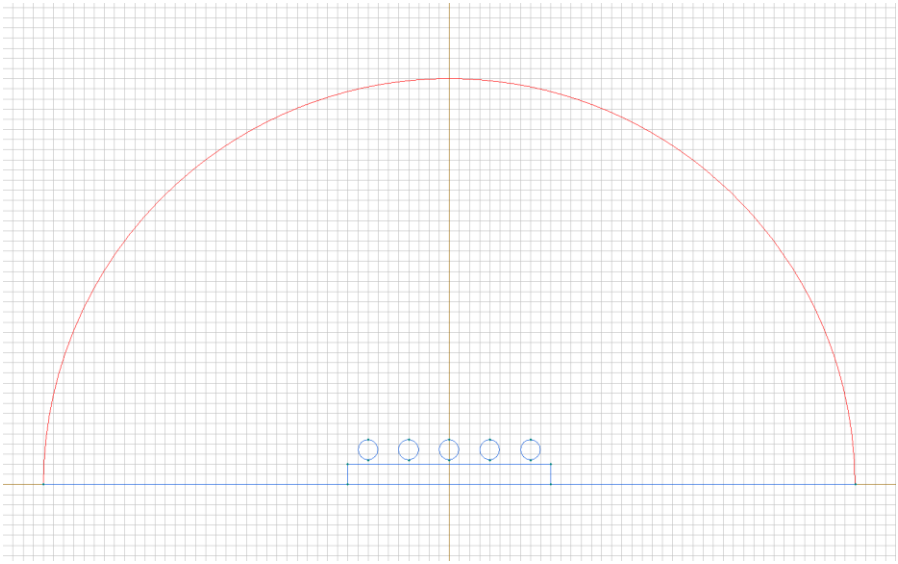
Relative magnetic permeability: mu_x=500, mu_y=500
Electric conductivity: sigma(T)=10000000 [S/m]
Voltage: U=0 [V]
Conductor's connection: in parallel



Labelled objects: edge "far away"

There are (1) objects with this label

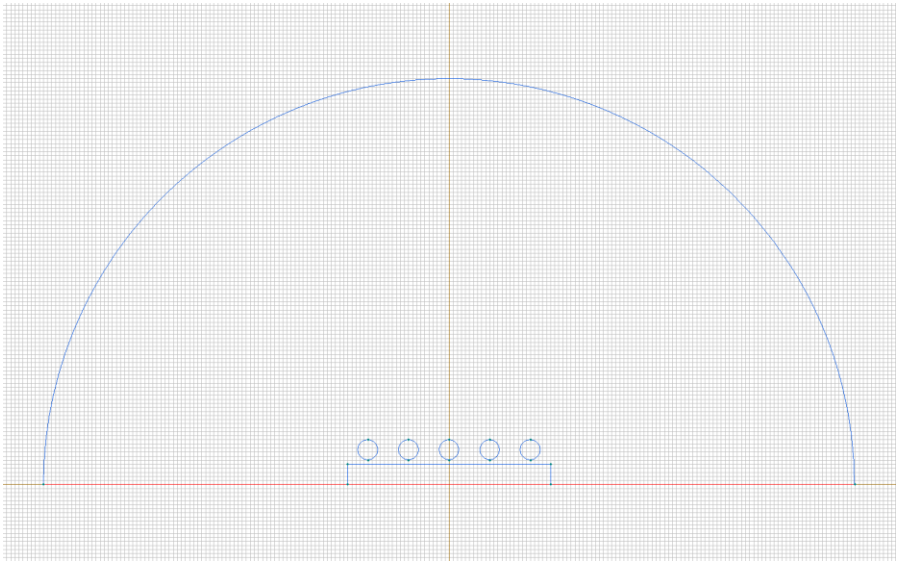
Magnetic potential: A=0 [Wb/m]



Labelled objects: edge "rotation axis"

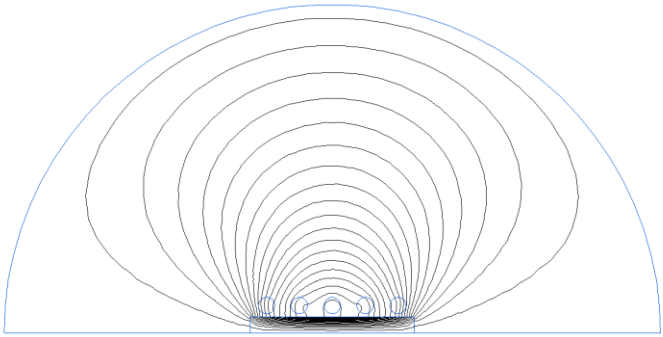
There are (3) objects with this label

Magnetic potential: A=0 [Wb/m]



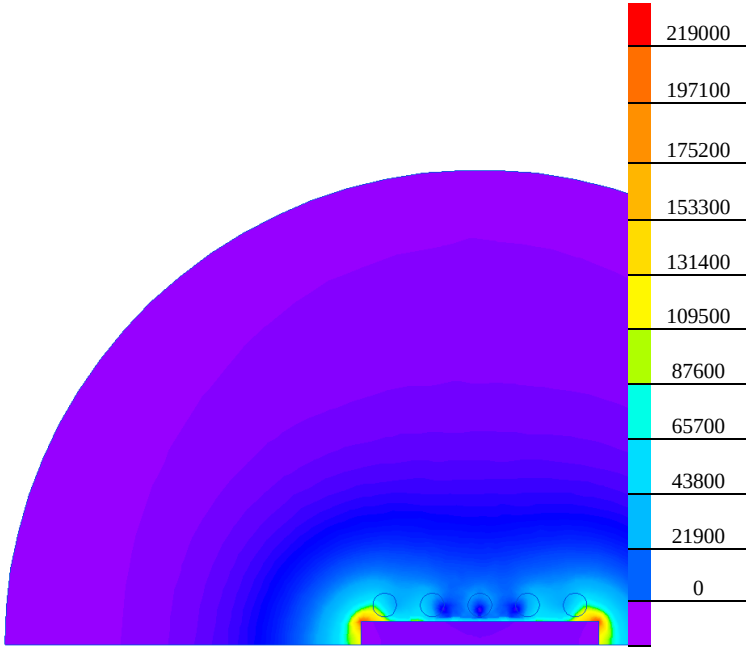
Results

Field lines



Results

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



Nonlinear dependencies

No non-linear dependencies are used in this problem data