

Problem info

Problem type: Magnetostatics

Geometry model class: Axisymmetric

Problem database file names:

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

Results taken from other problems:

- *none*

Geometry model

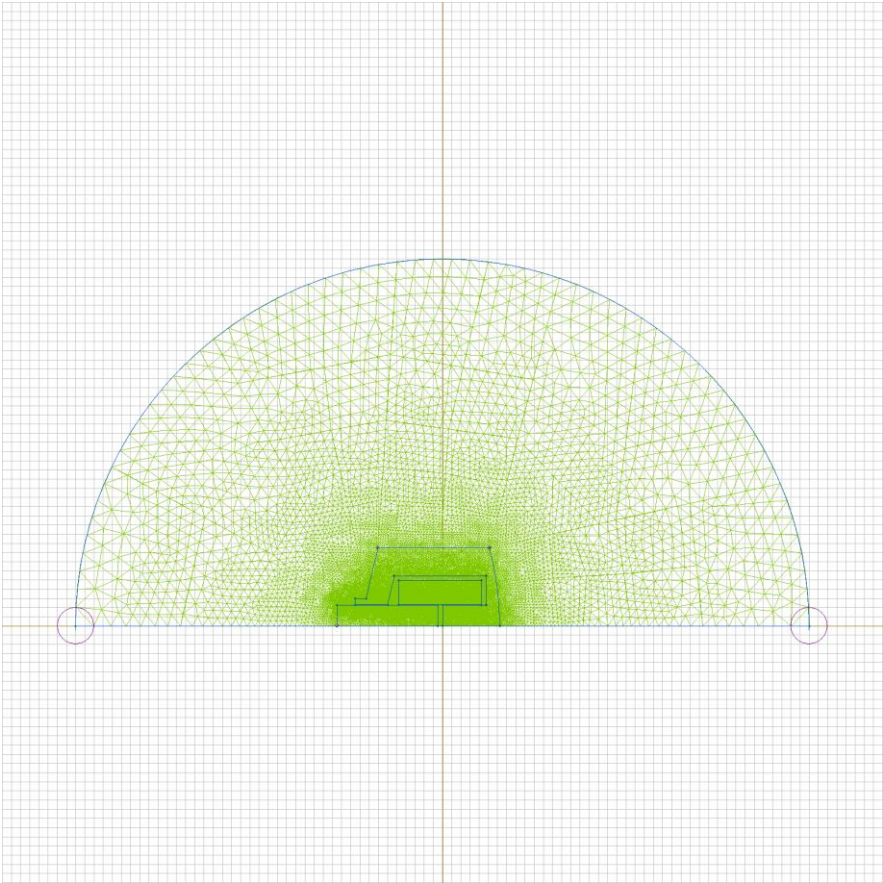


Table 1. Geometry model statistics

	With Label	Total
Blocks	4	7
Edges	1	32
Vertices	0	26

Number of nodes: 61982.

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:

- [coil](#)
- [air](#)
- [plunger](#)
- [core](#)
-

Edges:

- [zero potential](#)
-

Vertices:

Detailed information about each label is listed below.

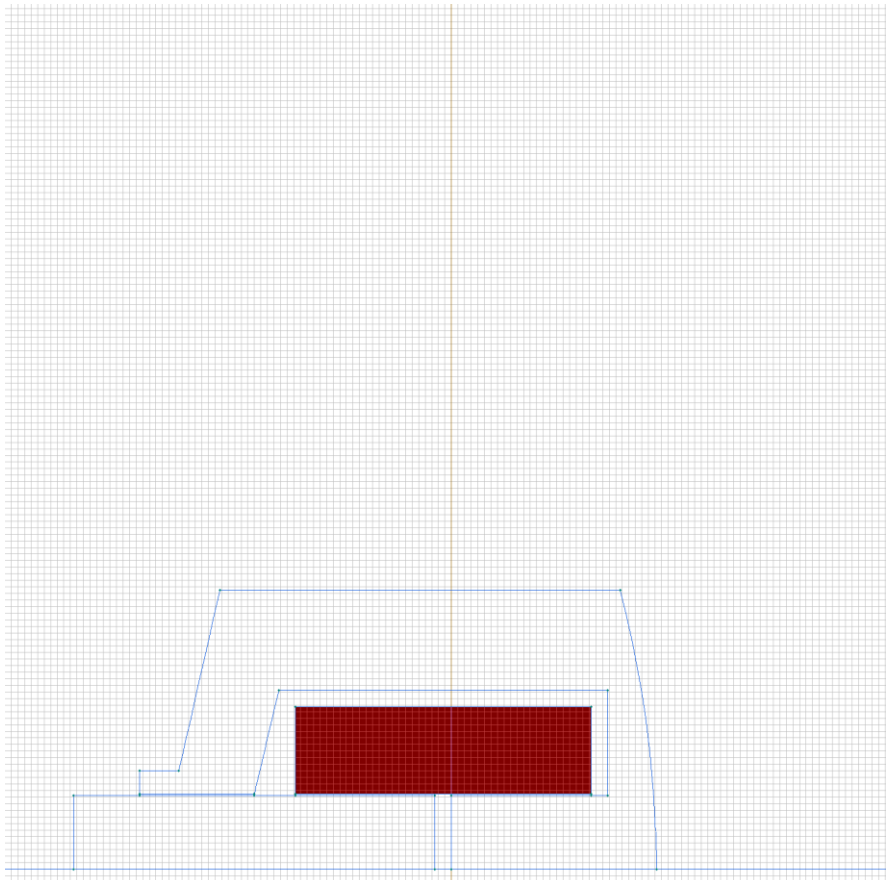
Labelled objects: block "coil"

There are (1) objects with this label

Relative magnetic permeability: $\mu_x=1$, $\mu_y=1$

Total current: $I=5*1000$ [A]

Conductor's connection: in series



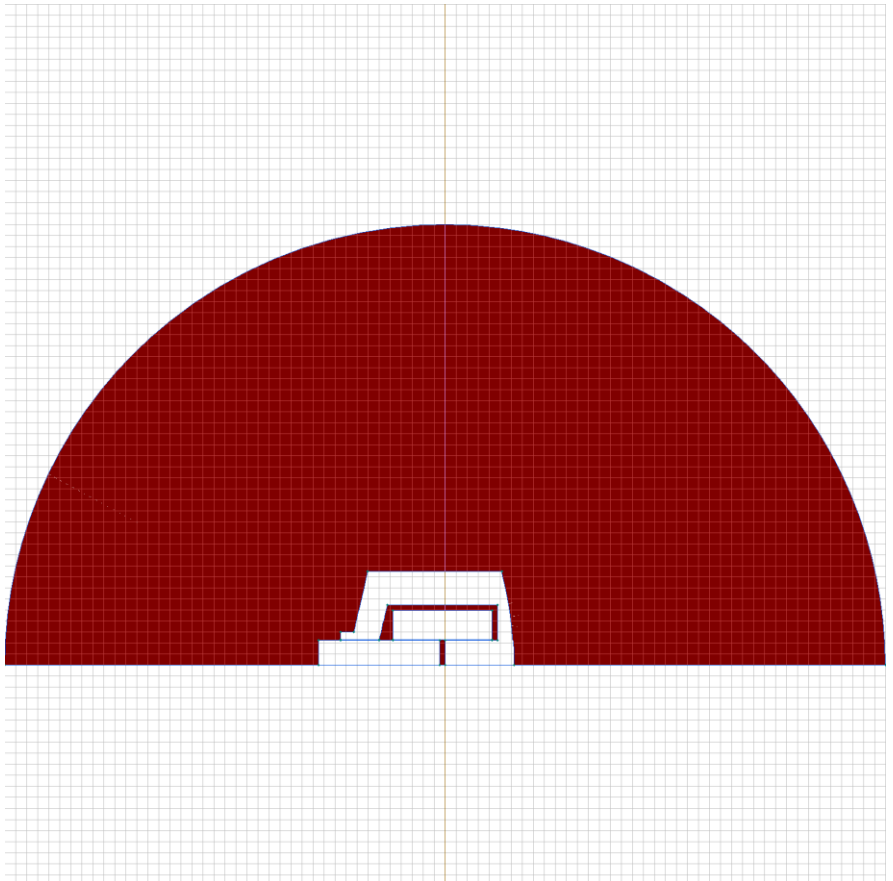
Labelled objects: block "air"

There are (4) objects with this label

Relative magnetic permeability: $\mu_x=1$, $\mu_y=1$

Current density: $j=0$ [A/m²]

Conductor's connection: in parallel



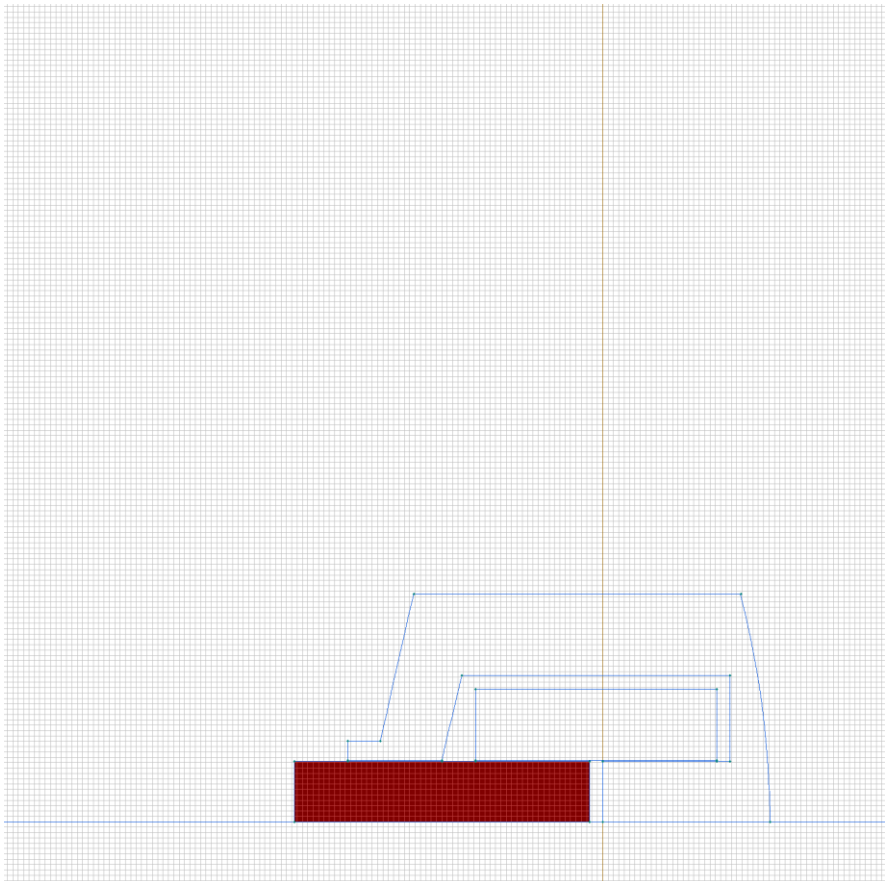
Labelled objects: block "plunger"

There are (1) objects with this label

Relative magnetic permeability: μ =nonlinear (see Table 2 in the "Nonlinear dependencies" section)

Current density: $j=0$ [A/m²]

Conductor's connection: in parallel



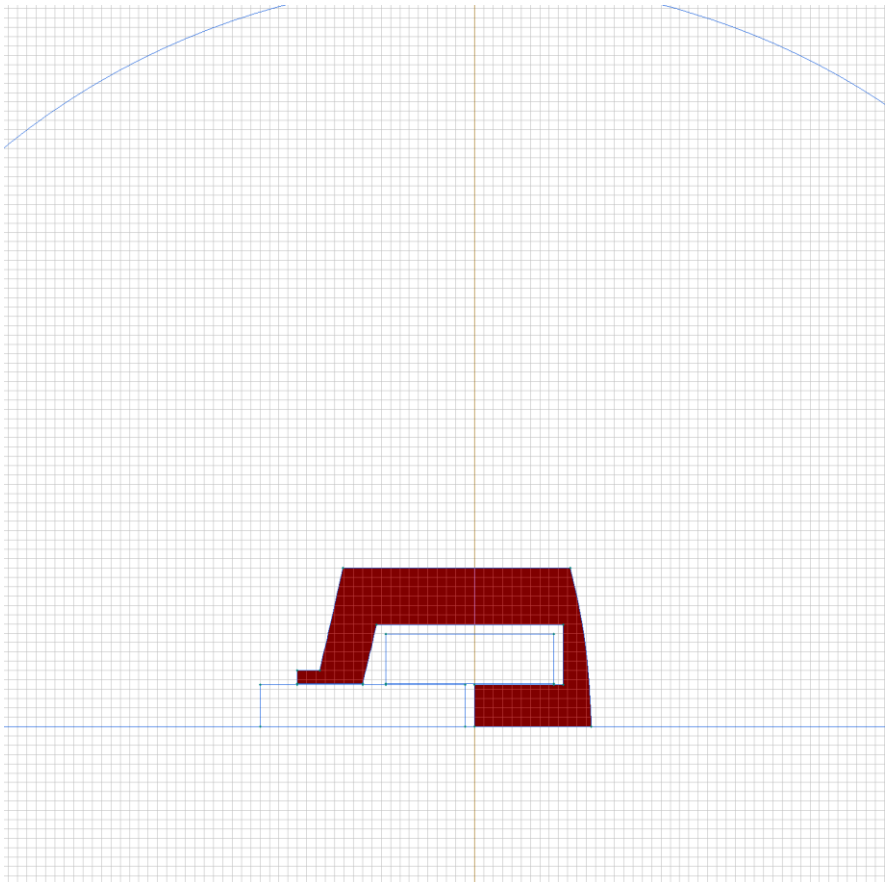
Labelled objects: block "core"

There are (1) objects with this label

Relative magnetic permeability: μ =nonlinear (see Table 3 in the "Nonlinear dependencies" section)

Current density: $j=0$ [A/m²]

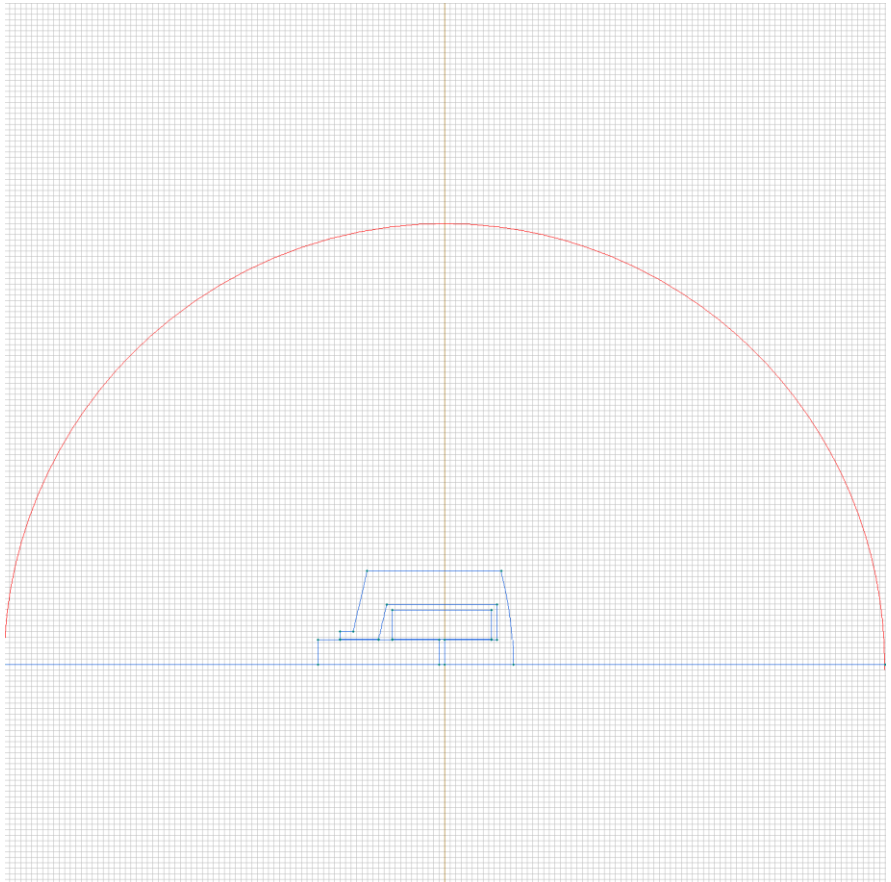
Conductor's connection: in parallel



Labelled objects: edge "zero potential"

There are (1) objects with this label

Magnetic potential: $A=0$ [Wb/m]



[Problem info](#)

[Geometry model](#)

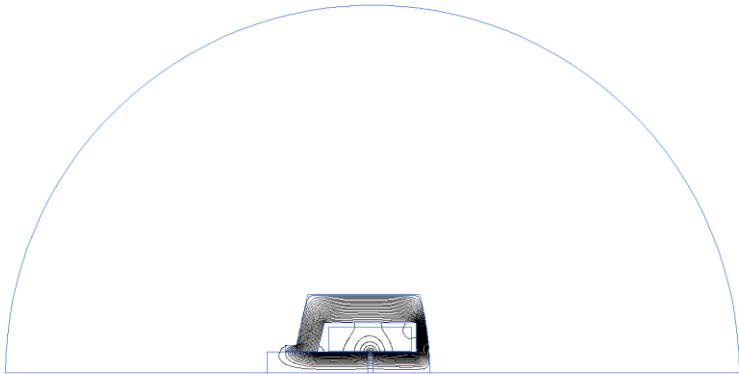
[Labelled Objects](#)

[Results](#)

[Nonlinear dependencies](#)

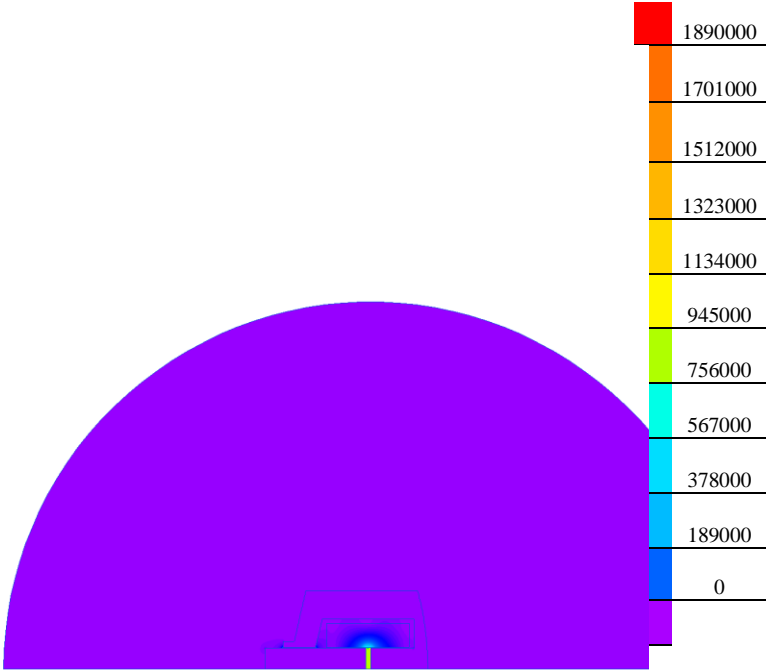
Results

Field lines



Results

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



Nonlinear dependencies

Table 2. BH-curve

B [T]	H [A/m]
0	0
0.9	200
1.2	400
1.3	600
1.36	800
1.4	1000
1.44	1200
1.48	1600
1.5	2000

Table 3. BH-curve

B [T]	H [A/m]
0	0
0.9	200
1.2	400
1.3	600
1.36	800
1.4	1000
1.44	1200
1.48	1600
1.5	2000

