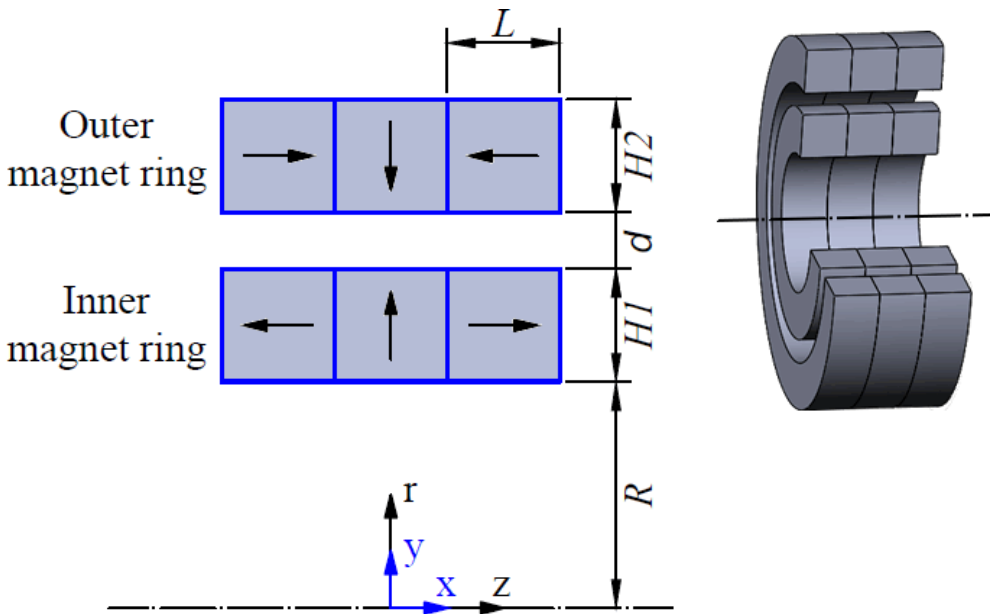# QuickField simulation report

Magnetic axial bearing

Passive magnetic bearing provides radial and axial positioning of a shaft. Calculation of the magnetic force acting between bearing rings as a function of rings mutual displacement

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/magnetic_axial_bearing.htm

Problem info

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

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

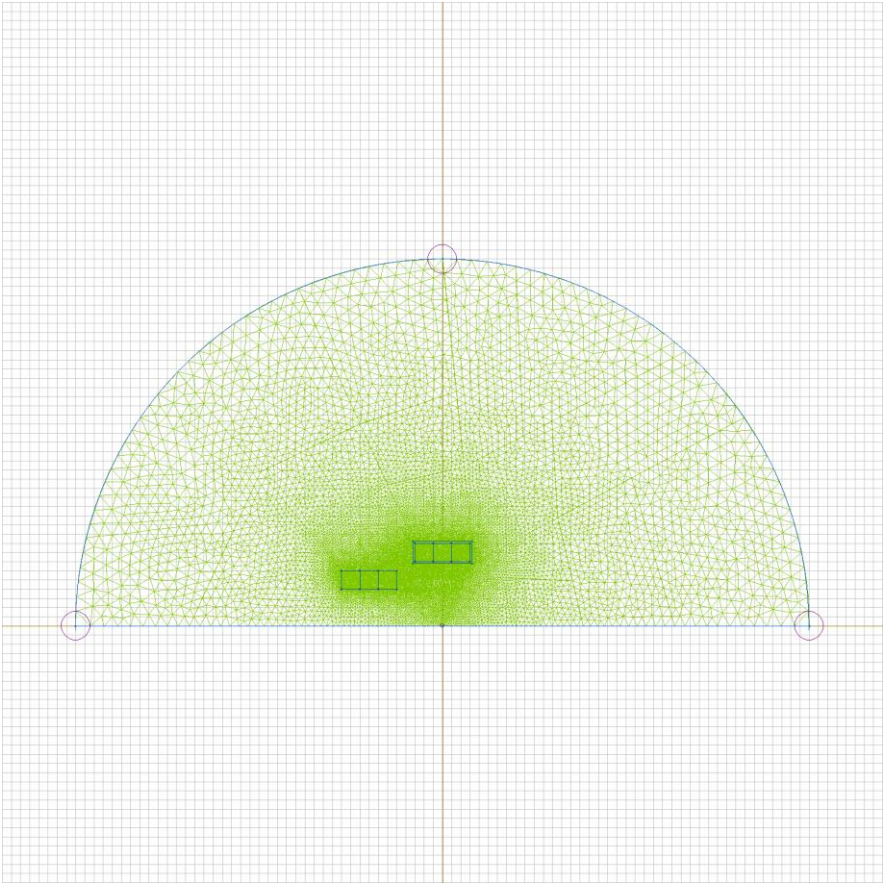Results taken from other problems:

- *none*

Geometry model

Table 1. Geometry model statistics

	With Label	Total
Blocks	7	8
Edges	2	28
Vertices	0	24

Number of nodes: 15035.

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:
- ring_1_left - ring_1_center - air - ring_1_right - ring_2_right - ring_2_left - ring_2_center	- Extern_boundary - contour	

Detailed information about each label is listed below.
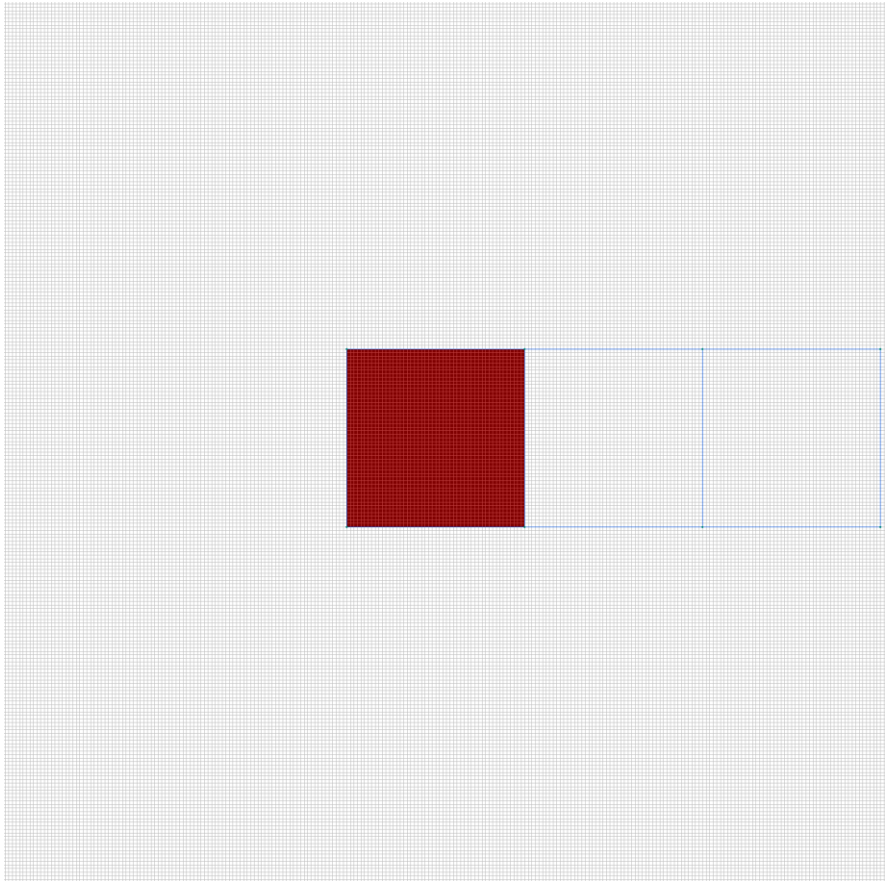
Labelled objects: block "ring_1_left"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1.05, mu_y=1.05
Coercive force: Hc=955000 [A], direction: 180 [deg]
Current density: j=0 [A/m2]
Conductor's connection: in parallel
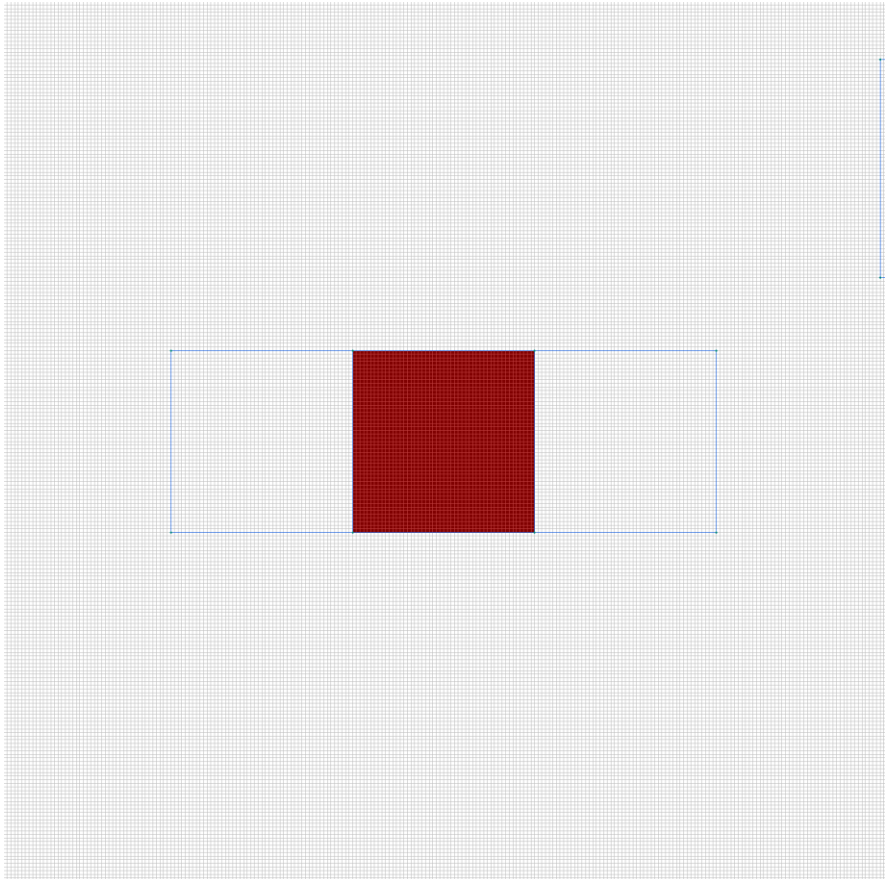
Labelled objects: block "ring_1_center"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1.05, mu_y=1.05
Coercive force: Hc=955000 [A], direction: 90 [deg]
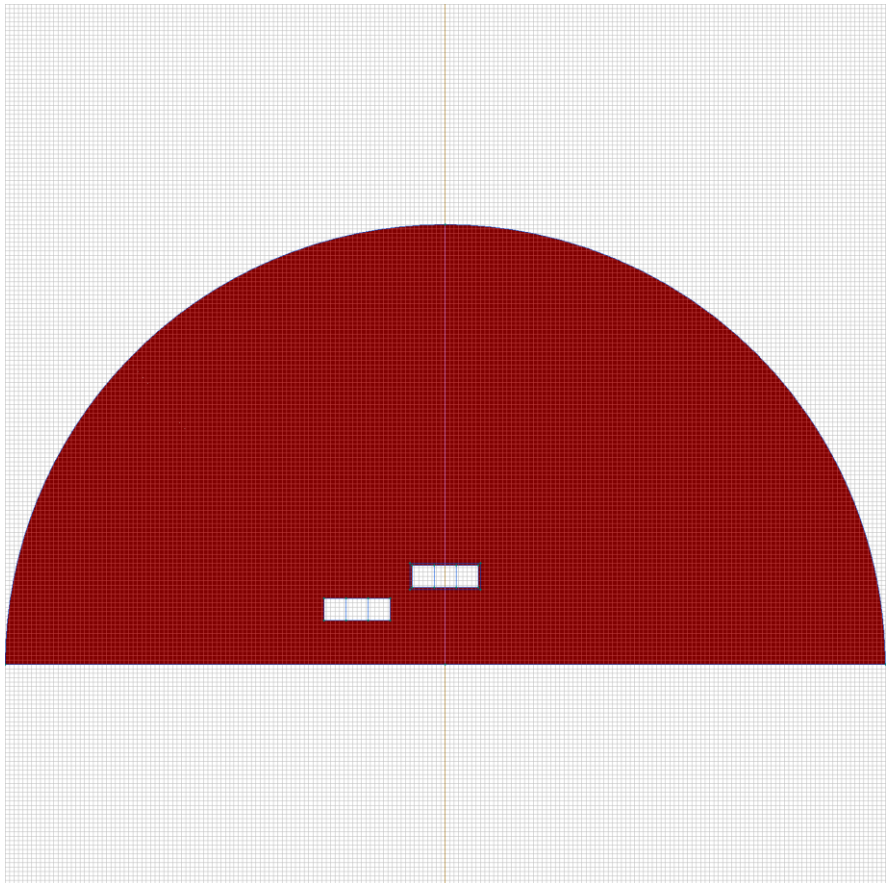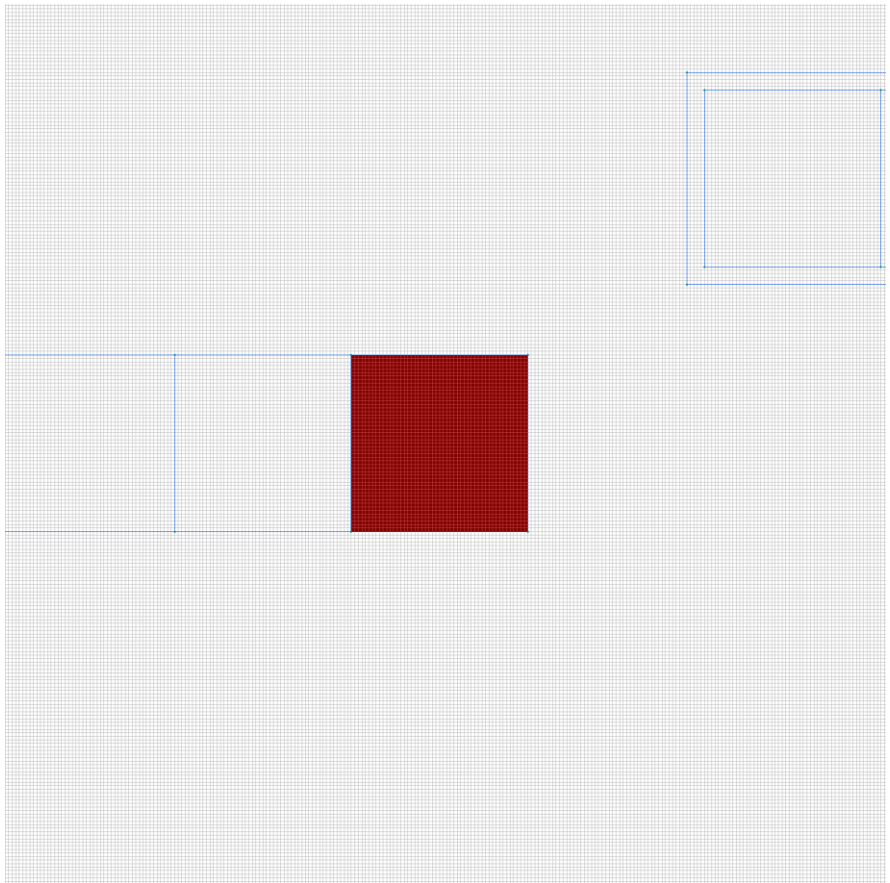Current density: j=0 [A/m2]
Conductor's connection: in parallel

Labelled objects: block "air"
There are (2) 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 "ring_1_right"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1.05, mu_y=1.05
Coercive force: Hc=955000 [A], direction: 0 [deg]
Current density: j=0 [A/m2]
Conductor's connection: in parallel
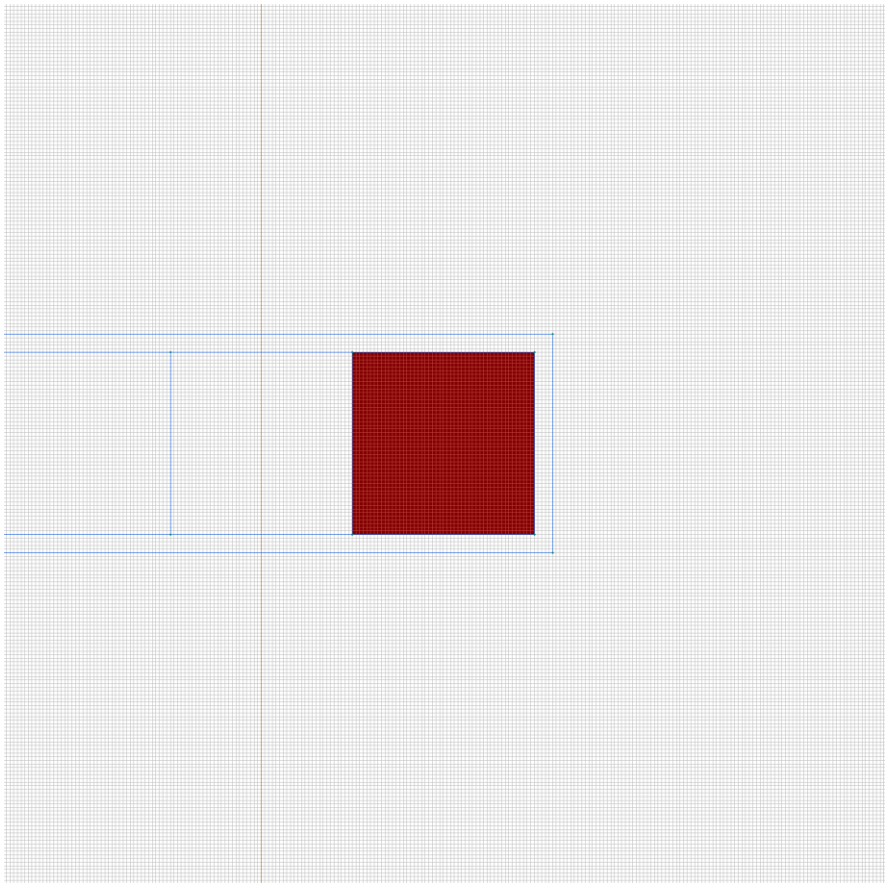
Labelled objects: block "ring_2_right"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1.05, mu_y=1.05
Coercive force: Hc=955000 [A], direction: 180 [deg]
Current density: j=0 [A/m2]
Conductor's connection: in parallel
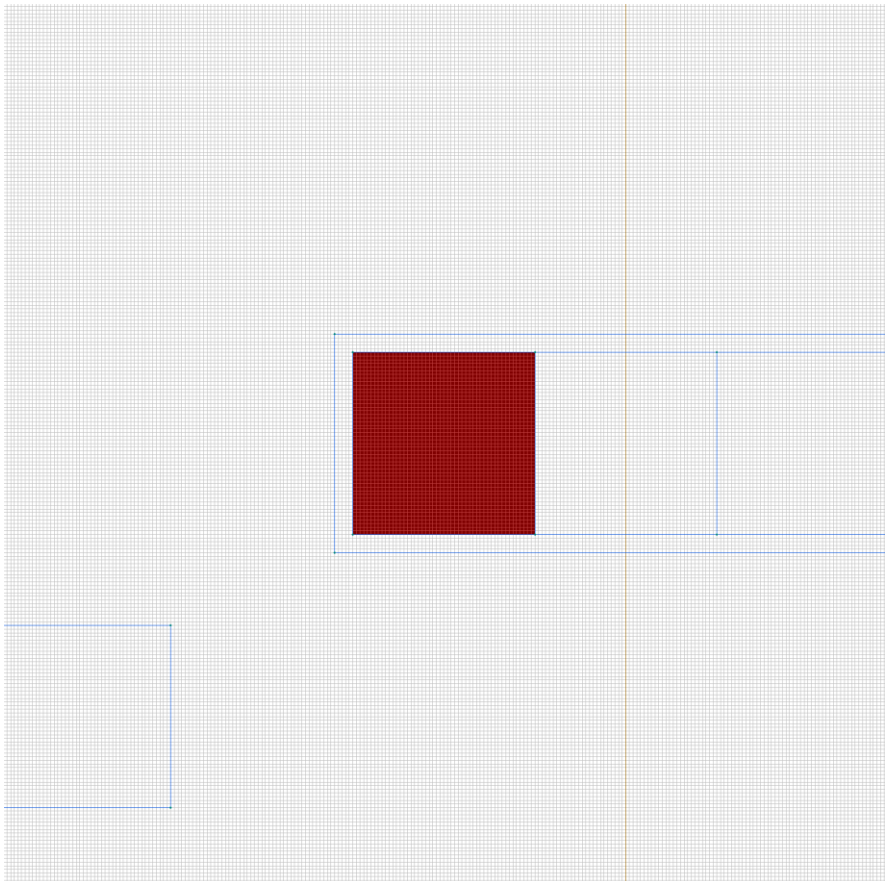
Labelled objects: block "ring_2_left"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1.05, mu_y=1.05
Coercive force: Hc=955000 [A], direction: 0 [deg]
Current density: j=0 [A/m2]
Conductor's connection: in parallel

Labelled objects: block "ring_2_center"
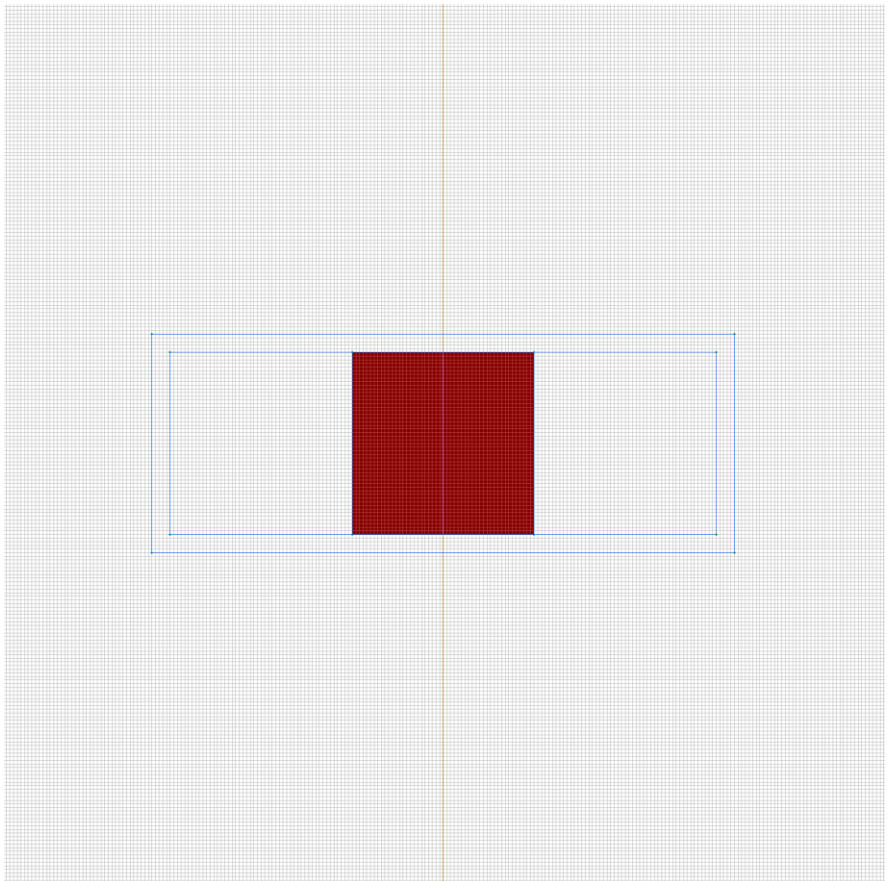There are (1) objects with this label

Relative magnetic permeability: mu_x=1.05, mu_y=1.05
Coercive force: Hc=955000 [A], direction: -90 [deg]
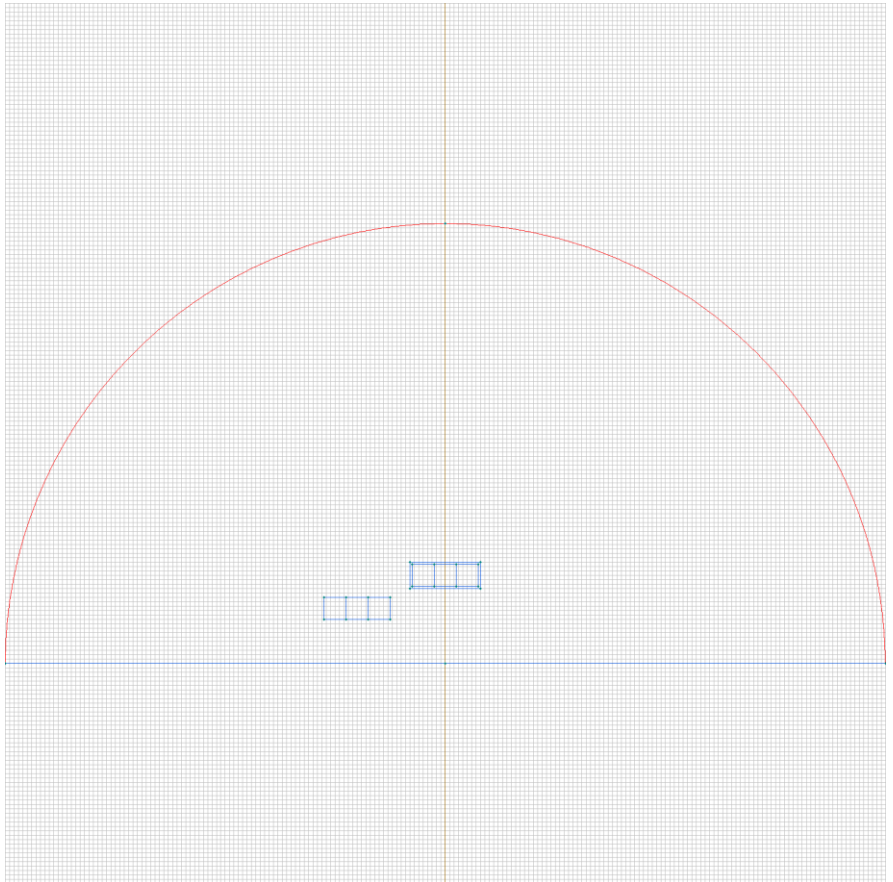Current density: j=0 [A/m2]
Conductor's connection: in parallel

Labelled objects: edge "Extern_boundary"
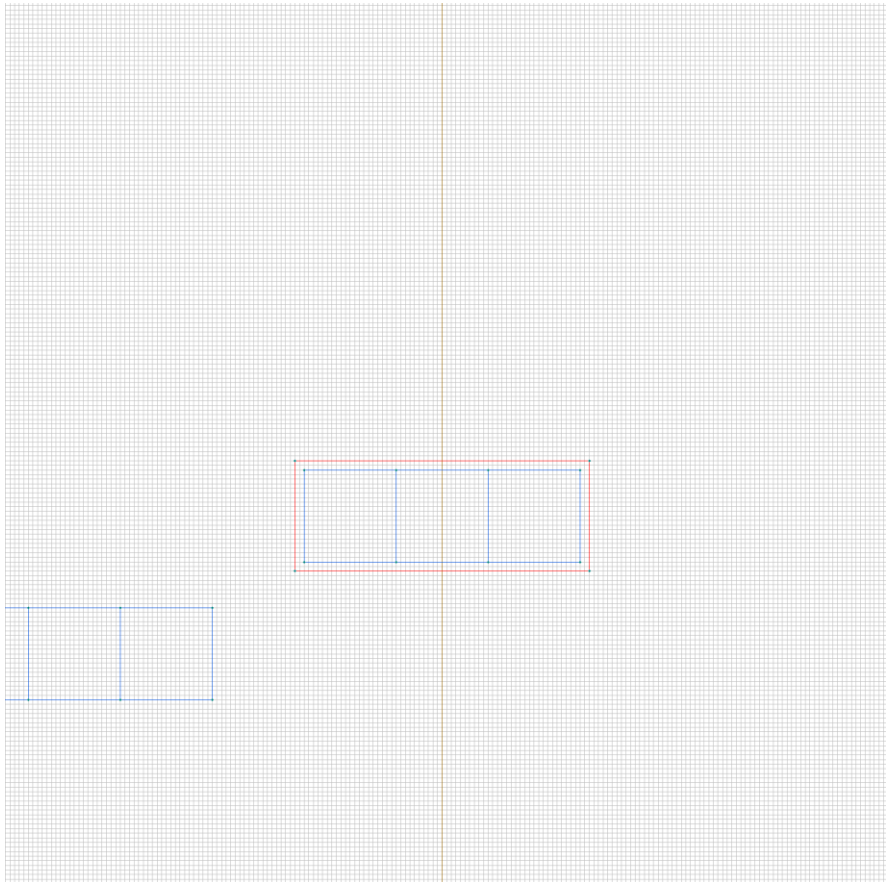There are (2) objects with this label

Magnetic potential: A=0 [Wb/m]
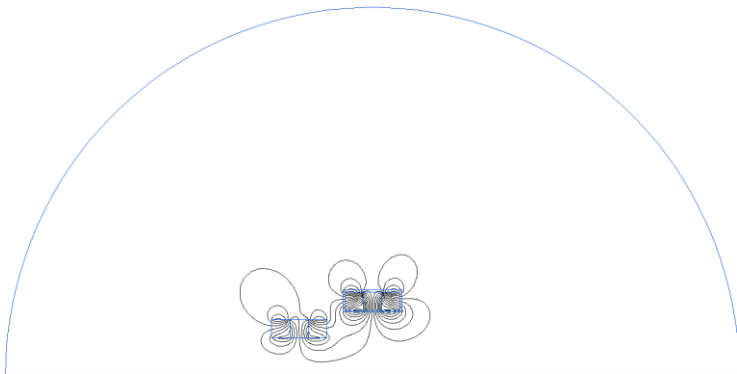
Labelled objects: edge "contour"
There are (4) objects with this label

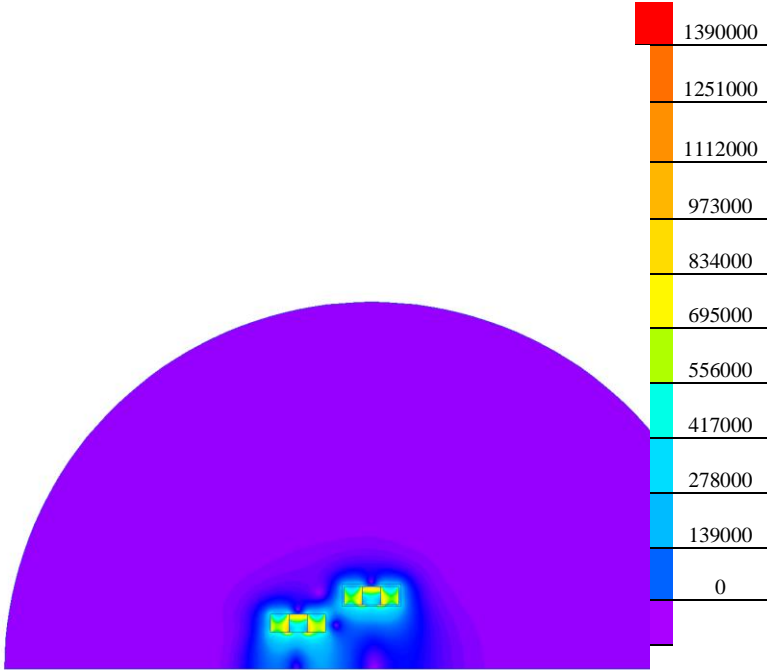No material data (boundary conditions) are specified

Results

Field lines

Results

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

	1390000
	1251000
	1112000
	973000
	834000
	695000
	556000
	417000
	278000
	139000
	0

Nonlinear dependencies

No non-linear dependencies are used in this problem data