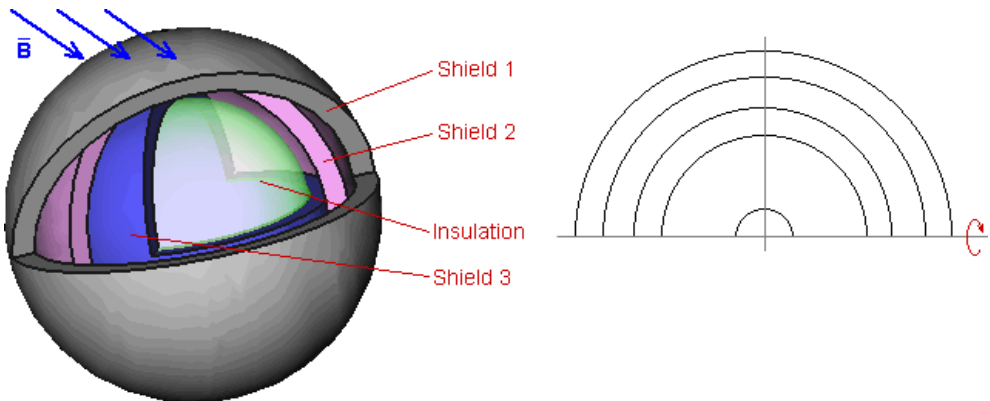


# QuickField simulation report

## Coupl6: Electromagnetic Screen

Calculation of the shielding coefficient as a function of temperature



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/coupl6\\_electromagnetic\\_screen.htm](https://quickfield.com/advanced/coupl6_electromagnetic_screen.htm)

# Problem info

Problem type: AC Magnetics , frequency: 4000 Hz,

Geometry model class: Axisymmetric

Problem database file names:

- Problem: *Coupl6HE.pbm*
- Geometry: *Coupl6.mod*
- Material Data: *Coupl6he.dhe*
- Material Data 2 (library): *none*
- Electric circuit: *none*

Results taken from other problems:

- *Temperature Field: Coupl6ht.pbm*

# Geometry model

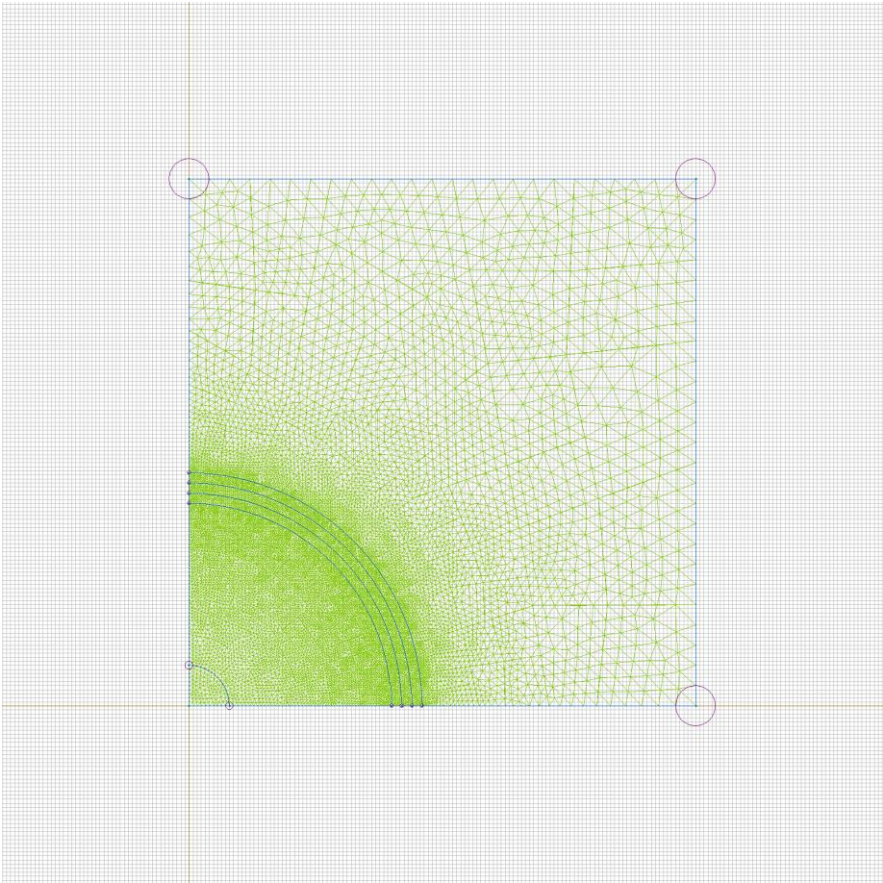


Table 1. Geometry model statistics

	With Label	Total
Blocks	6	6
Edges	5	19
Vertices	0	14

Number of nodes: 12247.

# 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:

- [shield 1](#)
- [insulation](#)
- [shield 3](#)
- [device](#)
- [vacuum](#)
- [shield 2](#)
- 

Edges:

- [side](#)
- [symmetry v](#)
- [right](#)
- [inside](#)
- [outside](#)
- 

Vertices:

Detailed information about each label is listed below.

## Labelled objects: block "shield 1"

There are (1) objects with this label

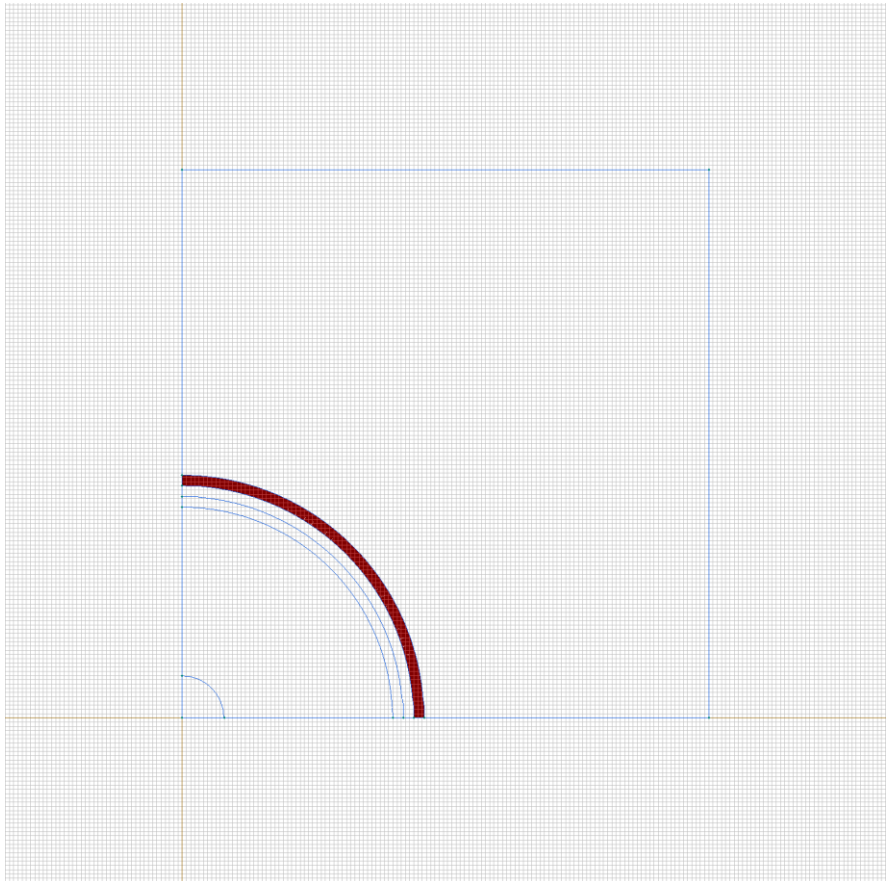
Relative magnetic permeability:  $\mu_x=1$ ,  $\mu_y=1$

Electric conductivity:  $\sigma(T)=\text{nonlinear}$  (see Table 2 in the "Nonlinear dependencies" section)

Reference temperature:  $T=-273.15$  [K]

Voltage:  $U=0$  [V], phase 0 [deg]

Conductor's connection: in parallel



## Labelled objects: block "insulation"

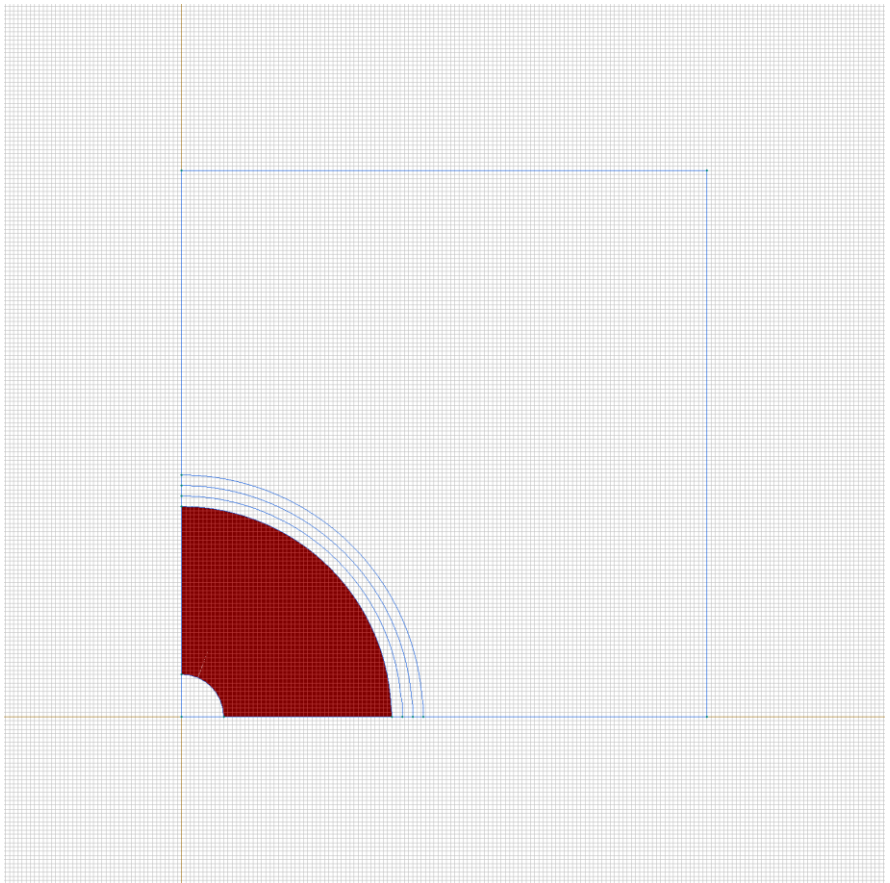
There are (1) objects with this label

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

Electric conductivity:  $\sigma=0$  [S/m]

Current density:  $j=0$  [A/m<sup>2</sup>], phase 0 [deg]

Conductor's connection: in parallel



## Labelled objects: block "shield 3"

There are (1) objects with this label

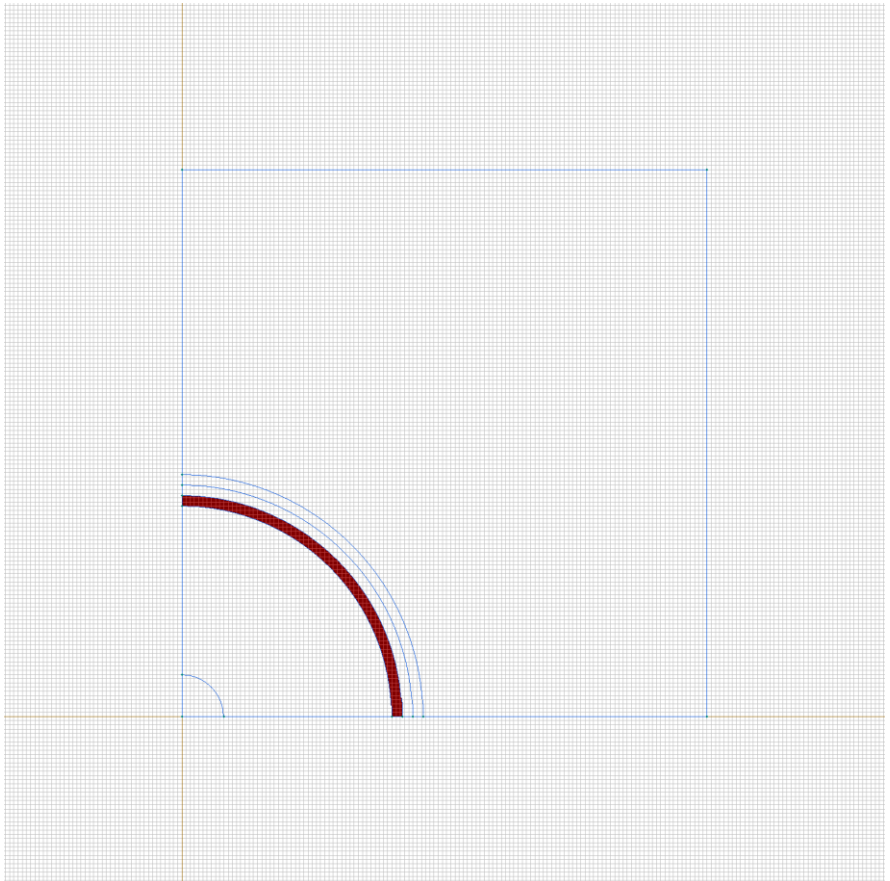
Relative magnetic permeability:  $\mu_x=1$ ,  $\mu_y=1$

Electric conductivity:  $\sigma(T)=\text{nonlinear}$  (see Table 3 in the "Nonlinear dependencies" section)

Reference temperature:  $T=-273.15$  [K]

Voltage:  $U=0$  [V], phase 0 [deg]

Conductor's connection: in parallel





## Labelled objects: block "device"

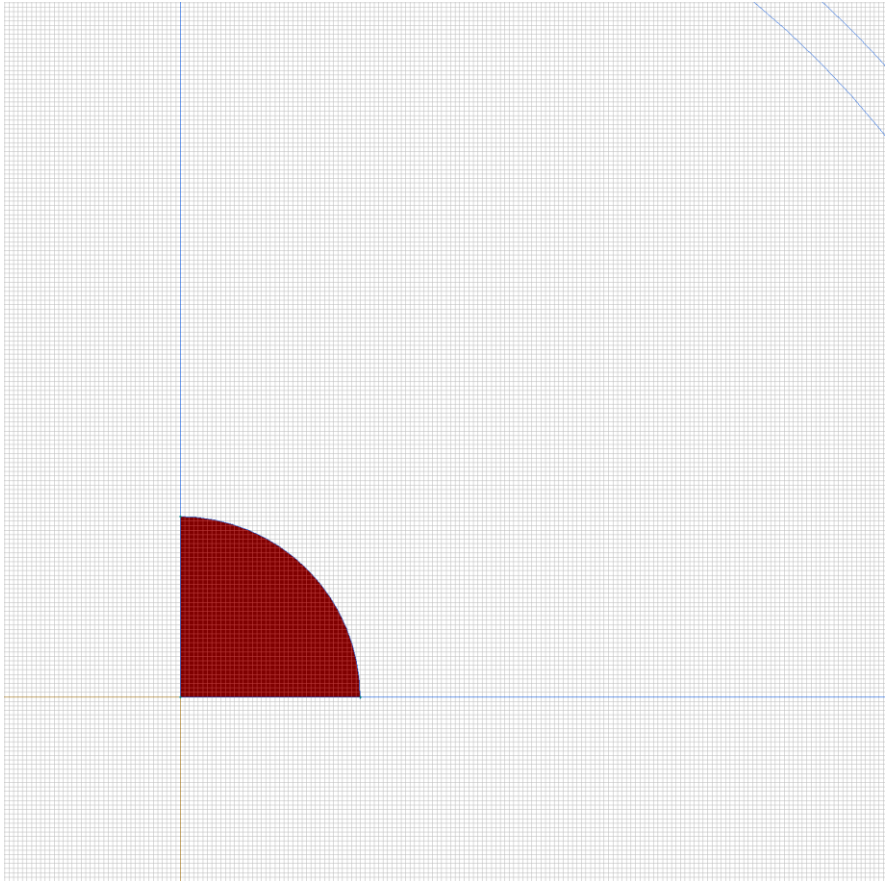
There are (1) objects with this label

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

Electric conductivity:  $\sigma=0$  [S/m]

Current density:  $j=0$  [A/m<sup>2</sup>], phase 0 [deg]

Conductor's connection: in parallel



Labelled objects: block "vacuum"

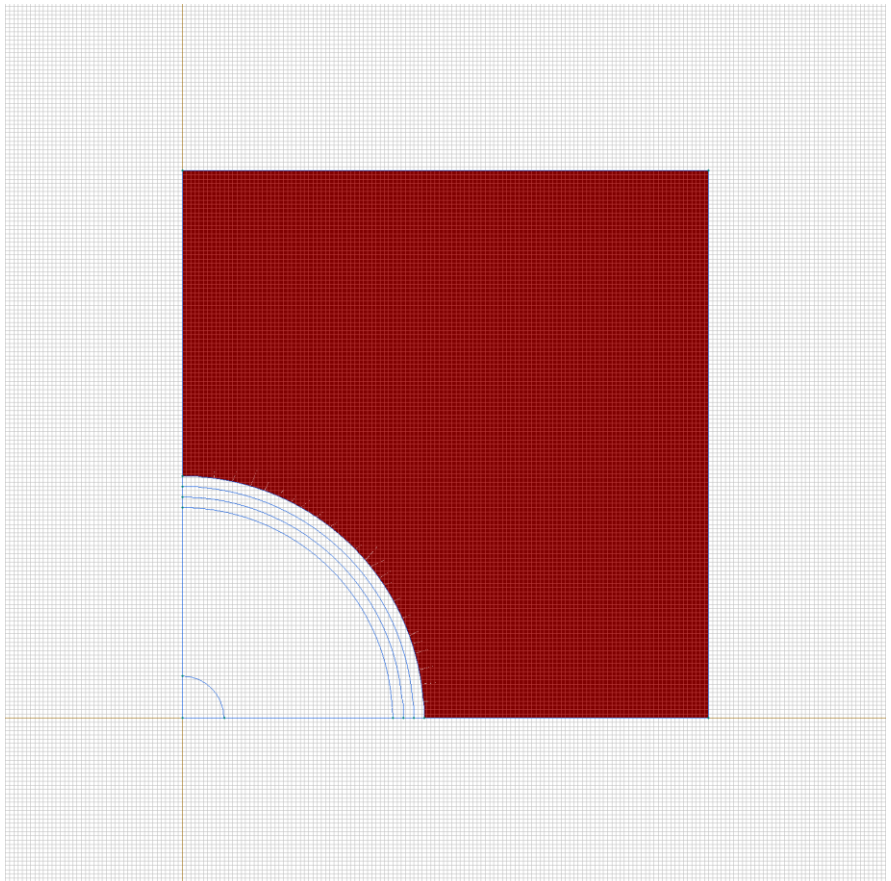
There are (1) objects with this label

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

Electric conductivity:  $\sigma=0$  [S/m]

Current density:  $j=0$  [A/m<sup>2</sup>], phase 0 [deg]

Conductor's connection: in parallel



Labelled objects: block "shield 2"

There are (1) objects with this label

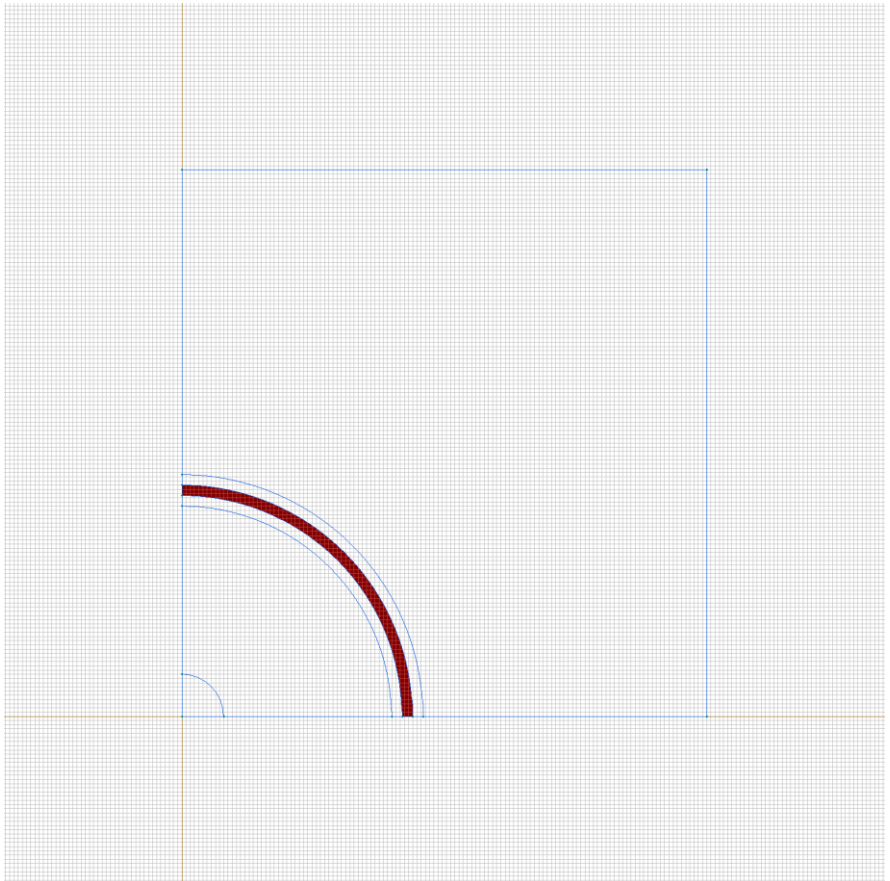
Relative magnetic permeability:  $\mu_x=1$ ,  $\mu_y=1$

Electric conductivity:  $\sigma(T)=\text{nonlinear}$  (see Table 4 in the "Nonlinear dependencies" section)

Reference temperature:  $T=-273.15$  [K]

Voltage:  $U=0$  [V], phase 0 [deg]

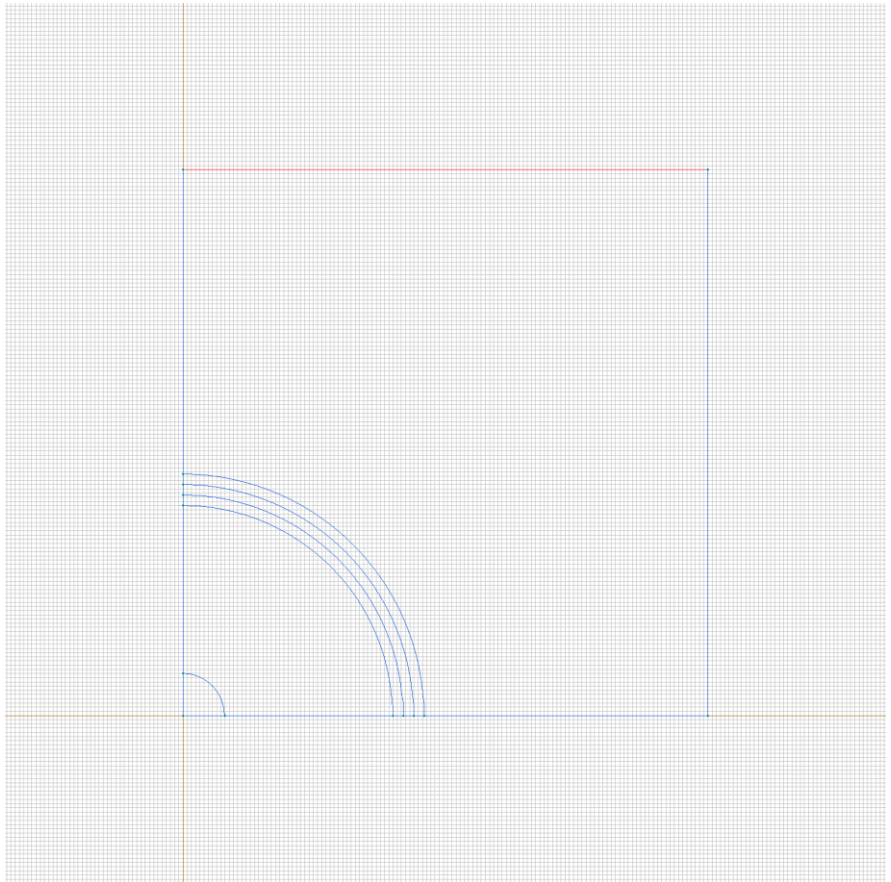
Conductor's connection: in parallel



Labelled objects: edge "side"

There are (1) objects with this label

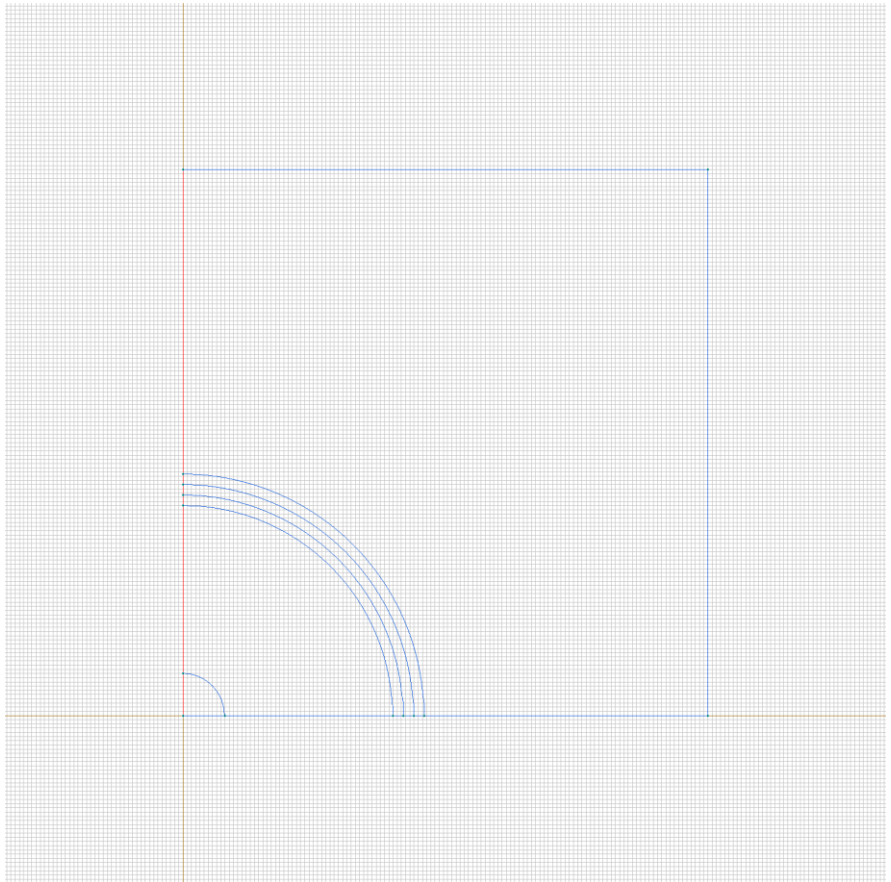
Magnetic potential:  $A=0.001$  [Wb/m], phase 0 [deg]



Labelled objects: edge "symmetry v"

There are (6) objects with this label

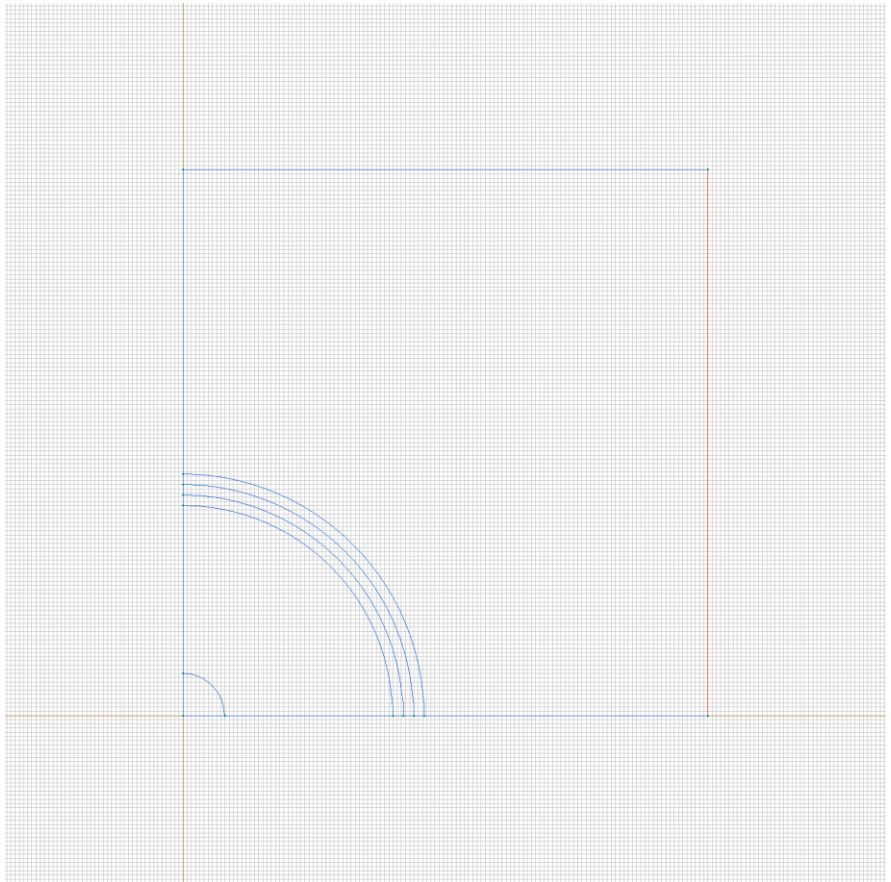
Tangential field:  $H_t=0$  [A/m], phase 0 [deg]



Labelled objects: edge "right"

There are (1) objects with this label

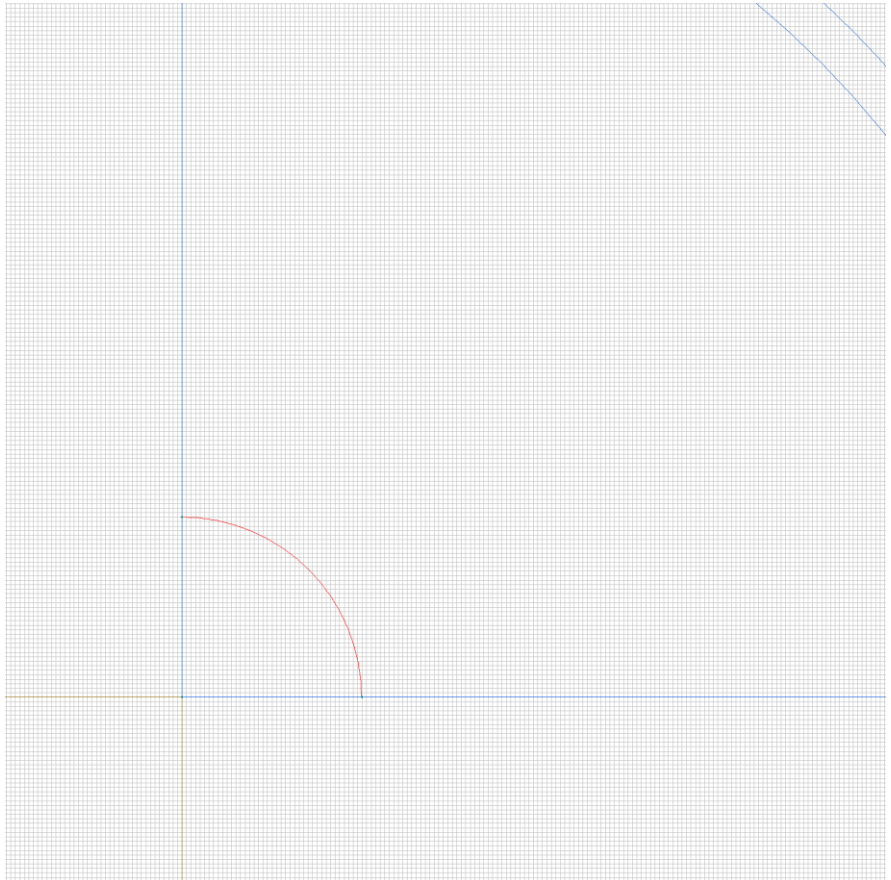
Tangential field:  $H_t=0$  [A/m], phase 0 [deg]



## Labelled objects: edge "inside"

There are (1) objects with this label

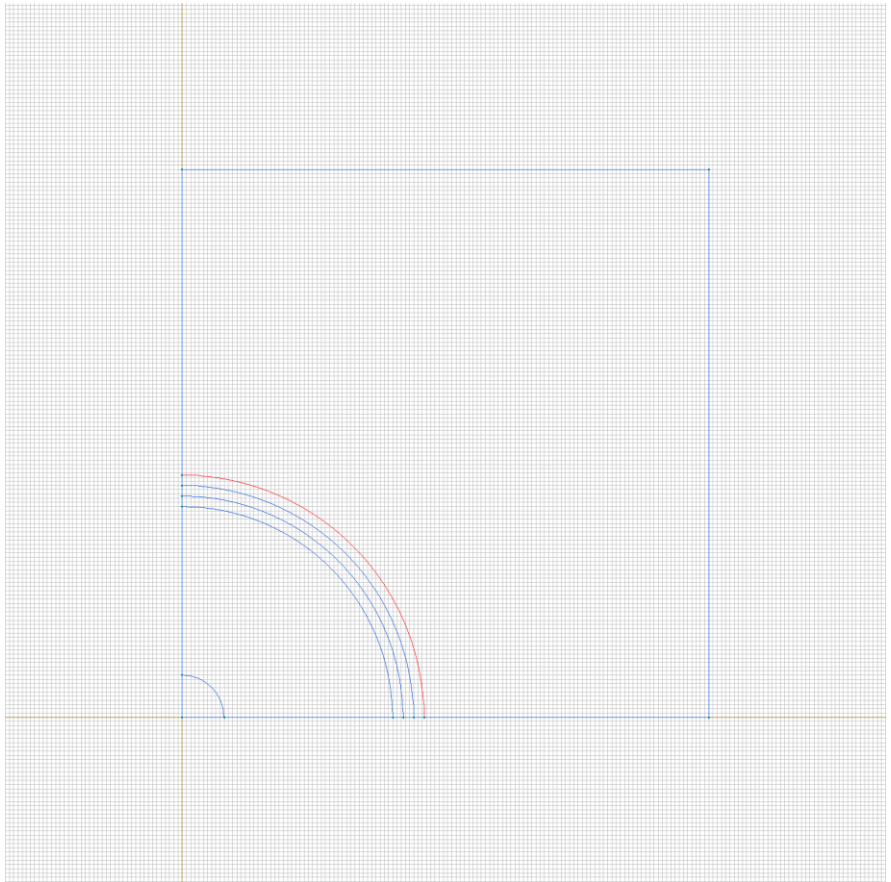
No material data (boundary conditions) are specified



## Labelled objects: edge "outside"

There are (1) objects with this label

No material data (boundary conditions) are specified

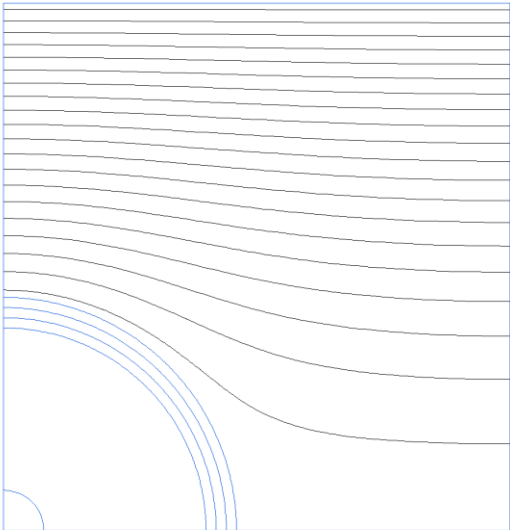






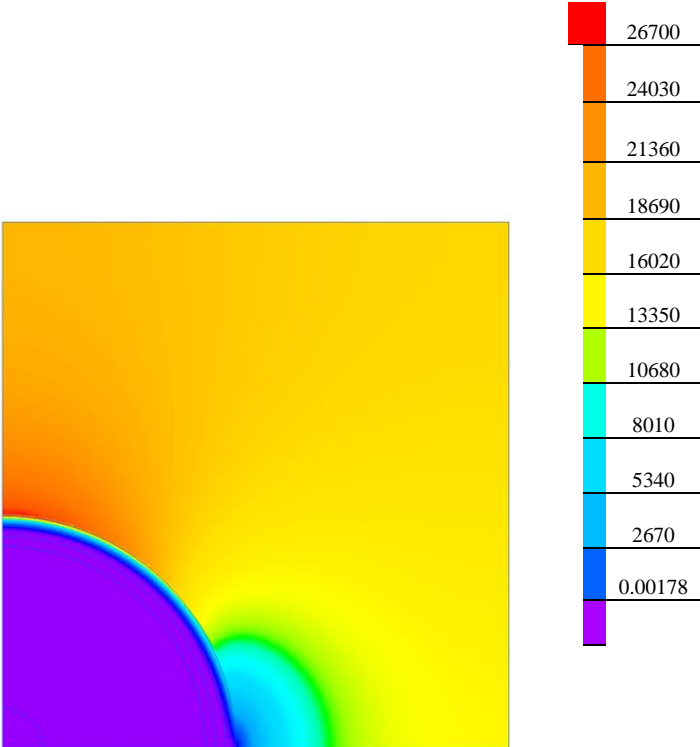
# Results

Field lines



# Results

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



# Nonlinear dependencies

**Table 2. Electric conductivity**

T [K]	sigma [S/m]
273	18182000
353	13609000
483	9661000
673	6784000

**Table 3. Electric conductivity**

T [K]	sigma [S/m]
273	57140000
353	43030000
483	30705000
673	21645000

**Table 4. Electric conductivity**

T [K]	sigma [S/m]
273	35710000
353	26732000
483	18977000
673	13326000