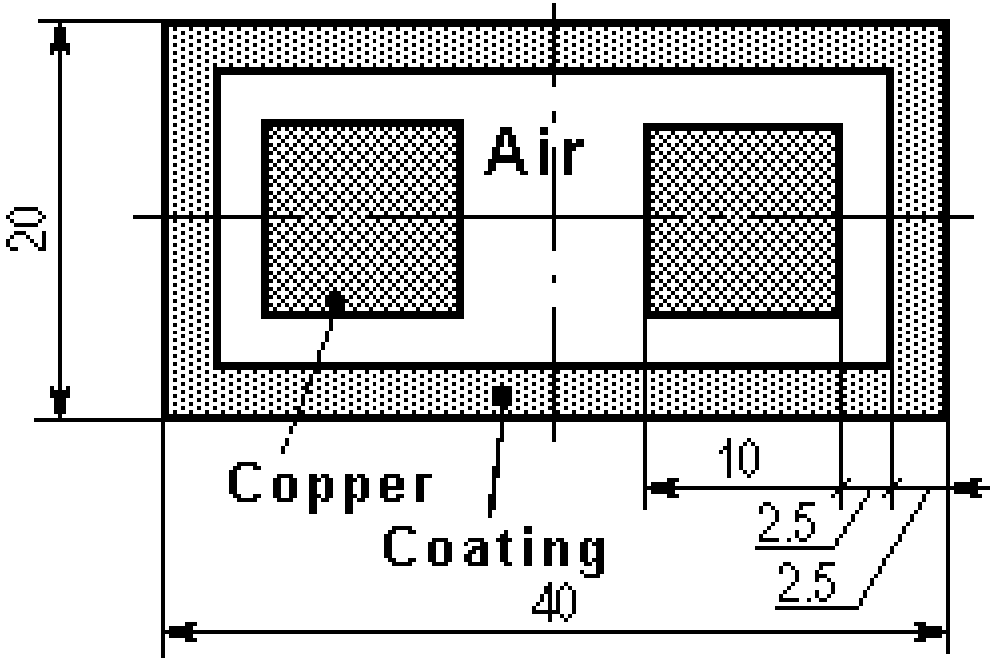
# QuickField simulation report

## Symmetric double line of conductors

Calculation of the power losses in the conductors of the transmission line




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/circuit1.htm

# Problem info

Problem type: AC Magnetics , frequency: 100 Hz,
Geometry model class: Plane-Parallel
Problem database file names:

- Problem: *Circuit1.pbm*
- Geometry: *Circuit1.mod*
- Material Data: *Circuit1.dhe*
- Material Data 2 (library): *none*
- Electric circuit: *Circuit1.qcr*

Results taken from other problems:

- *none*

# Geometry model

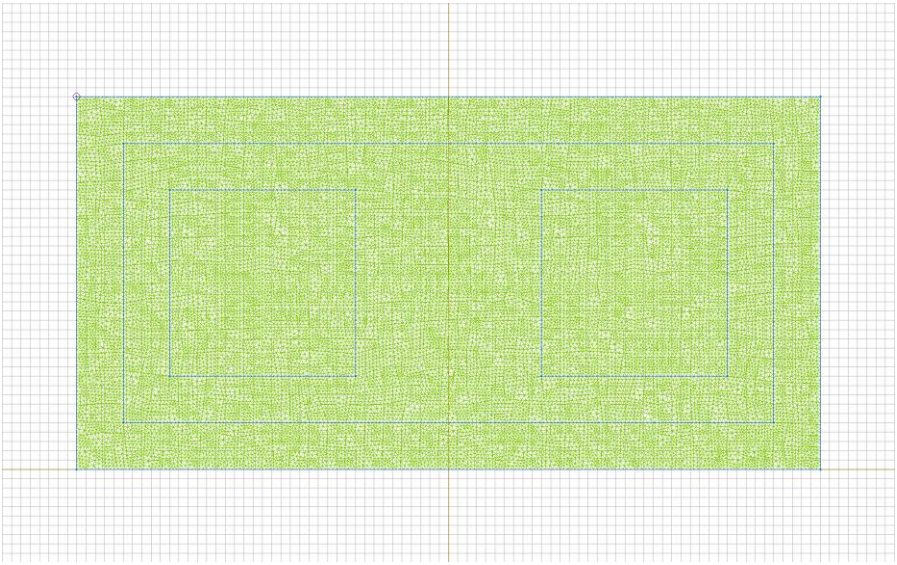


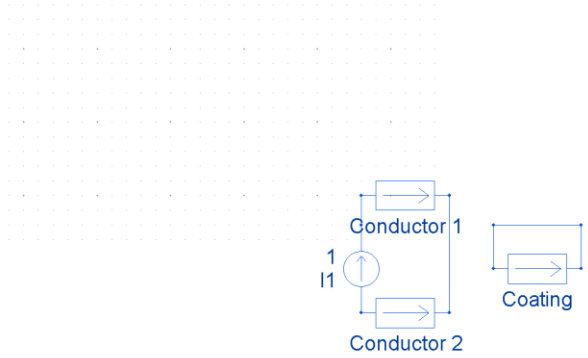
Table 1. Geometry model statistics

| | With Label | Total |
|---|---|---|
| Blocks | 4 | 4 |
| Edges | 1 | 16 |
| Vertices | 0 | 16 |

Number of nodes: 24091.

# Electric circuit

Coupled electric circuit




**Circuit elements:**

QuickField block 'Conductor 2'
Current source I1=1 [A] 0 [deg]
QuickField block 'Coating'
QuickField block 'Conductor 1'

# 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)

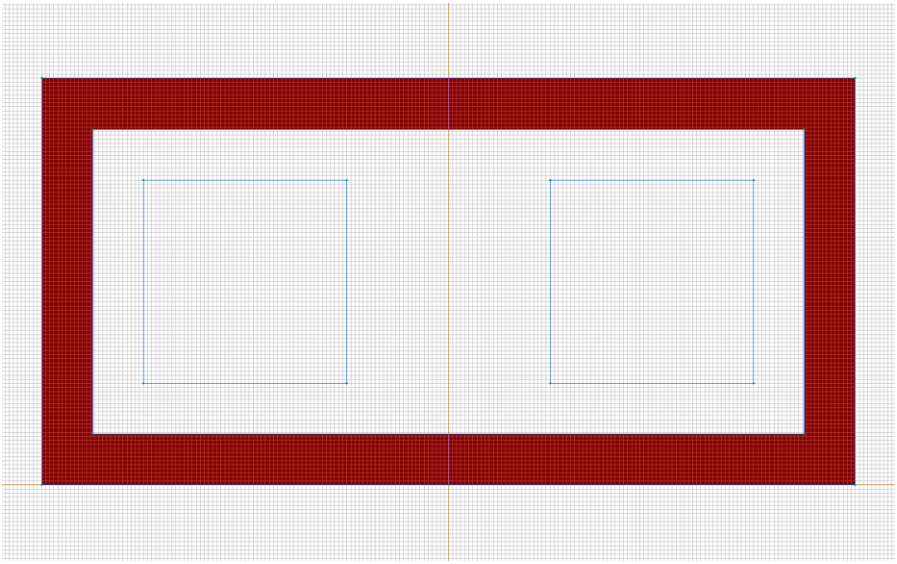
| Blocks: | Edges: | Vertices: |
|---|---|---|
| • Coating<br>• Conductor 2<br>• Conductor 1<br>• Air<br>• | • Outer Surface<br>• | |

Detailed information about each label is listed below.

# Labelled objects: block "Coating"

There are (1) objects with this label

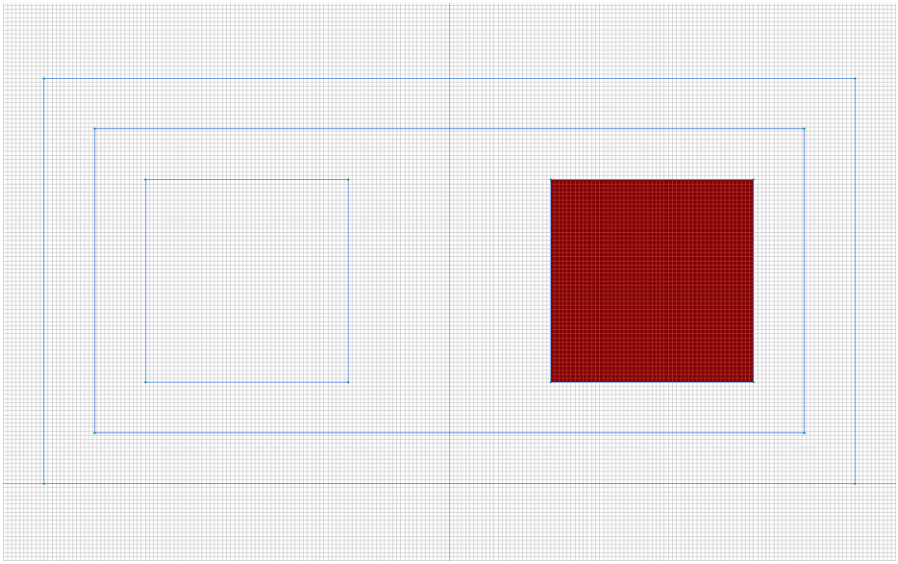
Relative magnetic permeability: mu_x=100, mu_y=100
Electric conductivity: sigma=10000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



# Labelled objects: block "Conductor 2"

There are (1) objects with this label

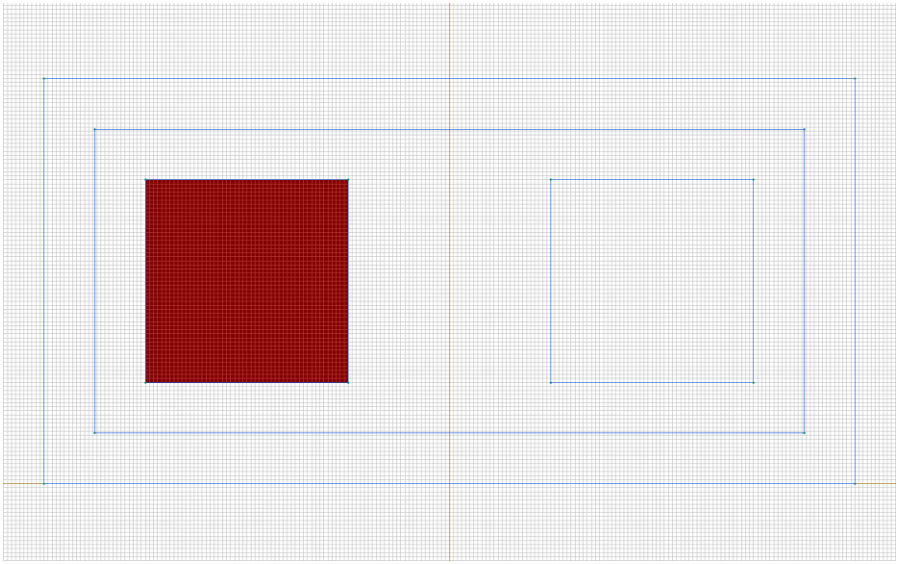
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Total current: I=1 [A], phase 0 [deg]
Conductor's connection: in parallel



# Labelled objects: block "Conductor 1"

There are (1) objects with this label

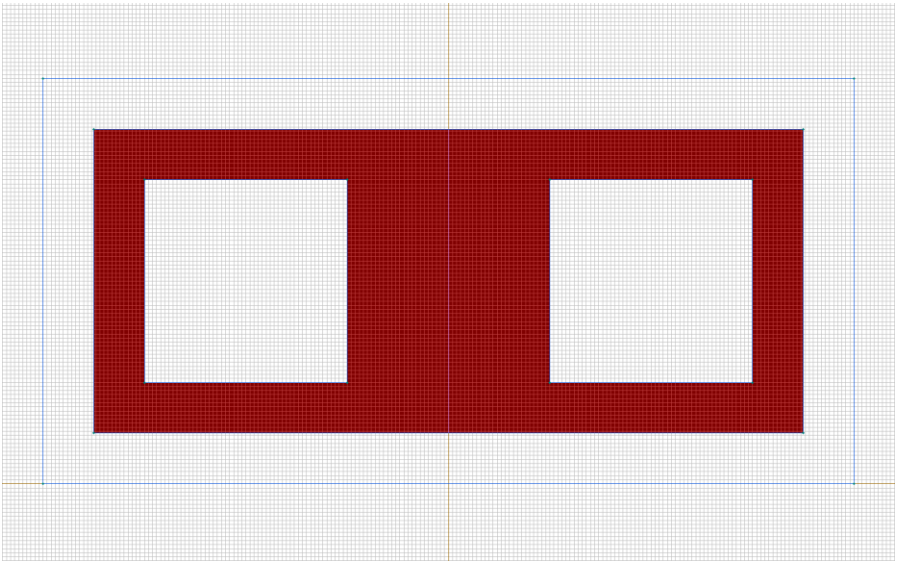
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Total current: I=-1 [A], phase 0 [deg]
Conductor's connection: in parallel



# Labelled objects: block "Air"

There are (1) objects with this label

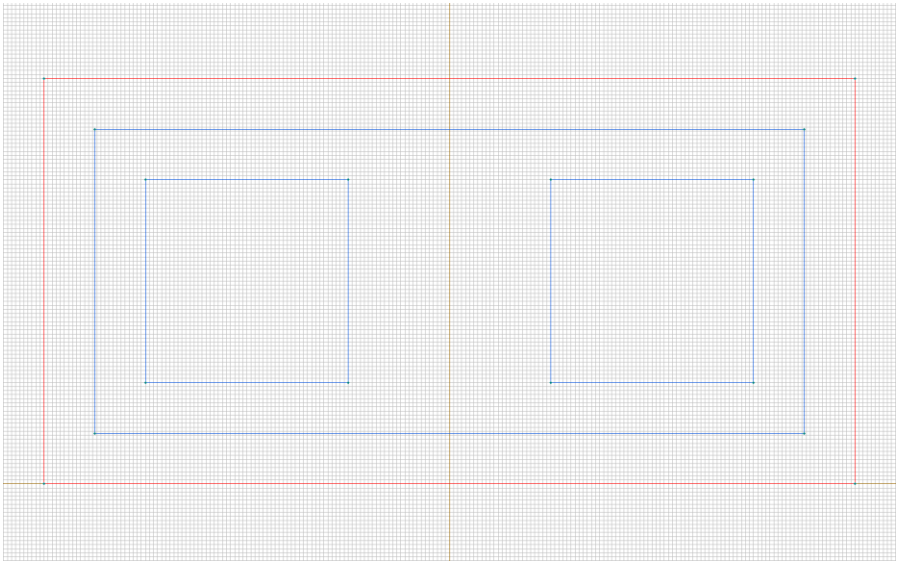
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel



# Labelled objects: edge "Outer Surface"

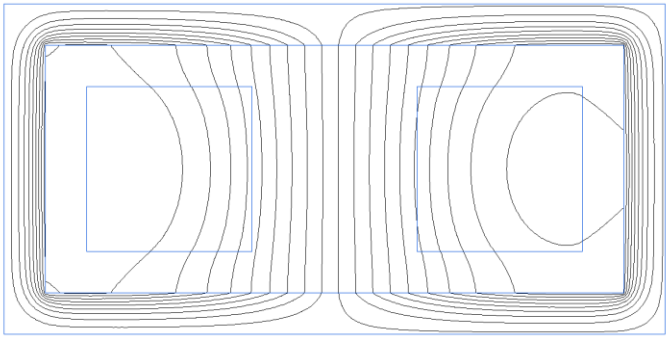
There are (4) objects with this label

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



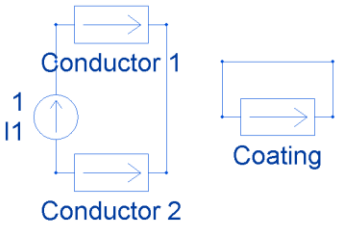
# Results

Field lines



# Results

Electric circuit currents




**Circuit elements:**

Conductor 2. I=1 [A], phase=180 [deg]

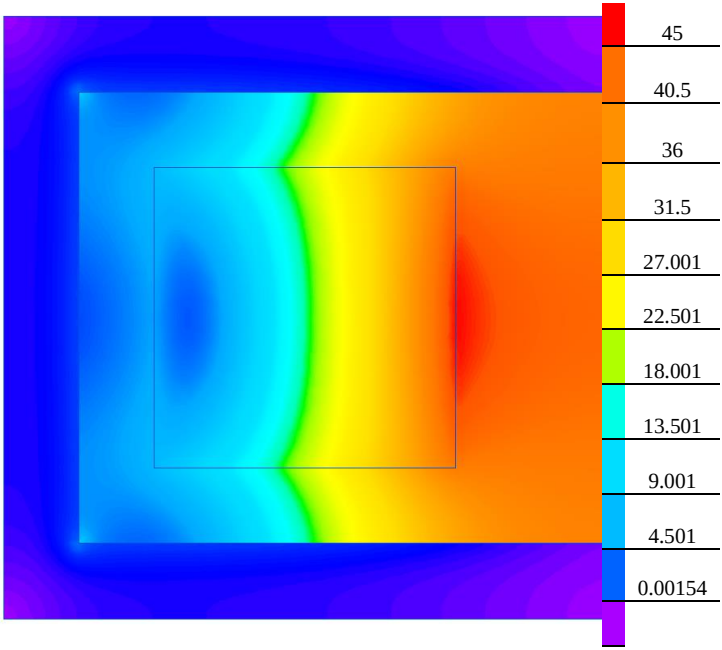
I1. I=1 [A], phase=0 [deg]

Coating. I=0.000009113 [A], phase=-70.74 [deg]

Conductor 1. I=1 [A], phase=0.00009259 [deg]

# Results

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



# Nonlinear dependencies

No non-linear dependencies are used in this problem data