Problem info

Problem type: AC Magnetics , frequency: 60 Hz,
Geometry model class: Plane-Parallel
Problem database file names:

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

Results taken from other problems:

- *none*

Geometry model

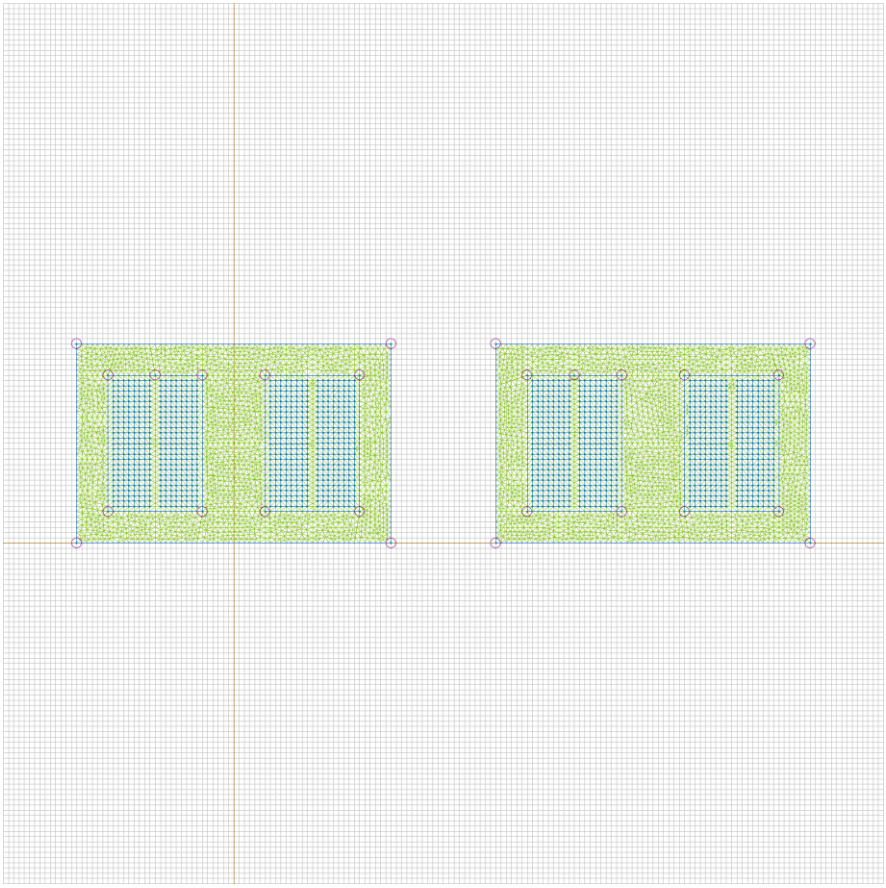


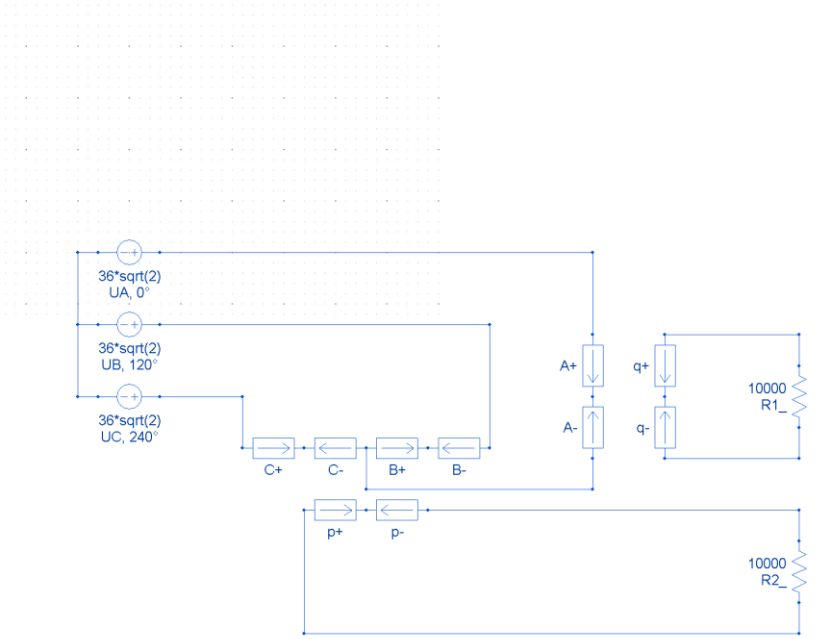
Table 1. Geometry model statistics

	With Label	Total
Blocks	12	1350
Edges	1	2962
Vertices	0	1626

Number of nodes: 5535.

Electric circuit

Coupled electric circuit



Circuit elements:

QuickField block 'C+'
QuickField block 'C-'
QuickField block 'p+'
QuickField block 'p-'
QuickField block 'A+'
QuickField block 'A-'

Voltage source UA, 0°=36*sqrt(2) [V] 0 [deg]
Voltage source UB, 120°=36*sqrt(2) [V] 120 [deg]
Voltage source UC, 240°=36*sqrt(2) [V] 240 [deg]
QuickField block 'q+'
QuickField block 'q-'
Resistor R2_=10000 [Ohm]
Resistor R1_=10000 [Ohm]
QuickField block 'B+'
QuickField block 'B-'

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)

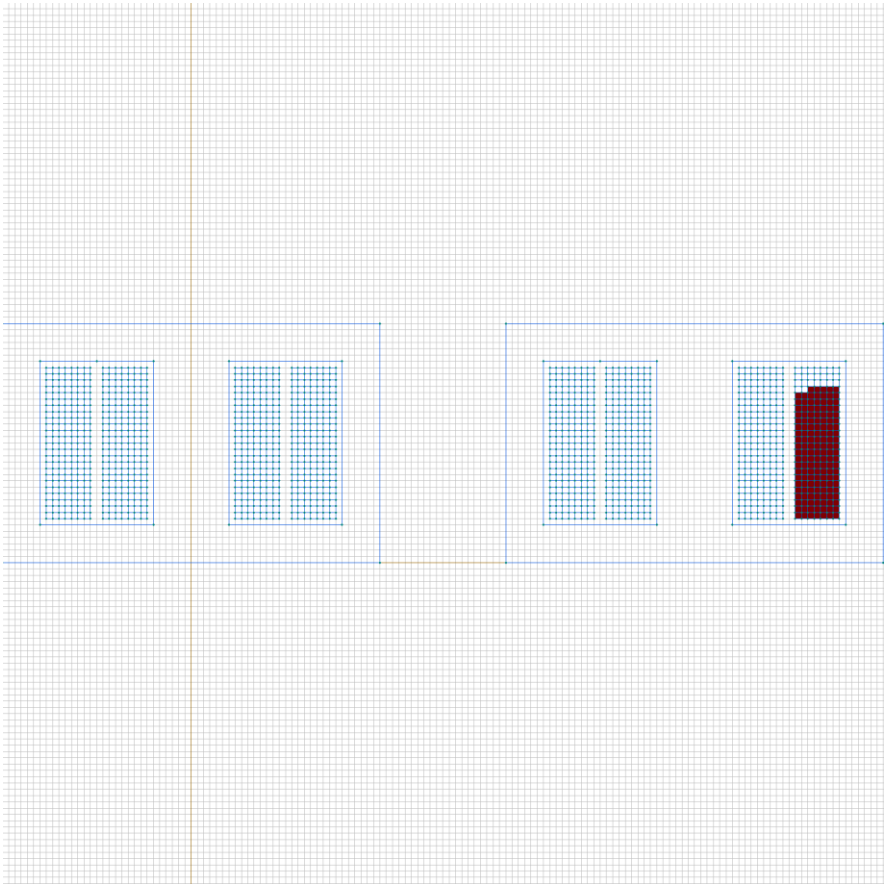
Blocks:	Edges:	Vertices:
• A+ • q- • C+ • B+ • q+ • p- • insulation • A- • p+ • C- • B- • core •	• boundary •	

Detailed information about each label is listed below.

Labelled objects: block "A+"

There are (145) objects with this label

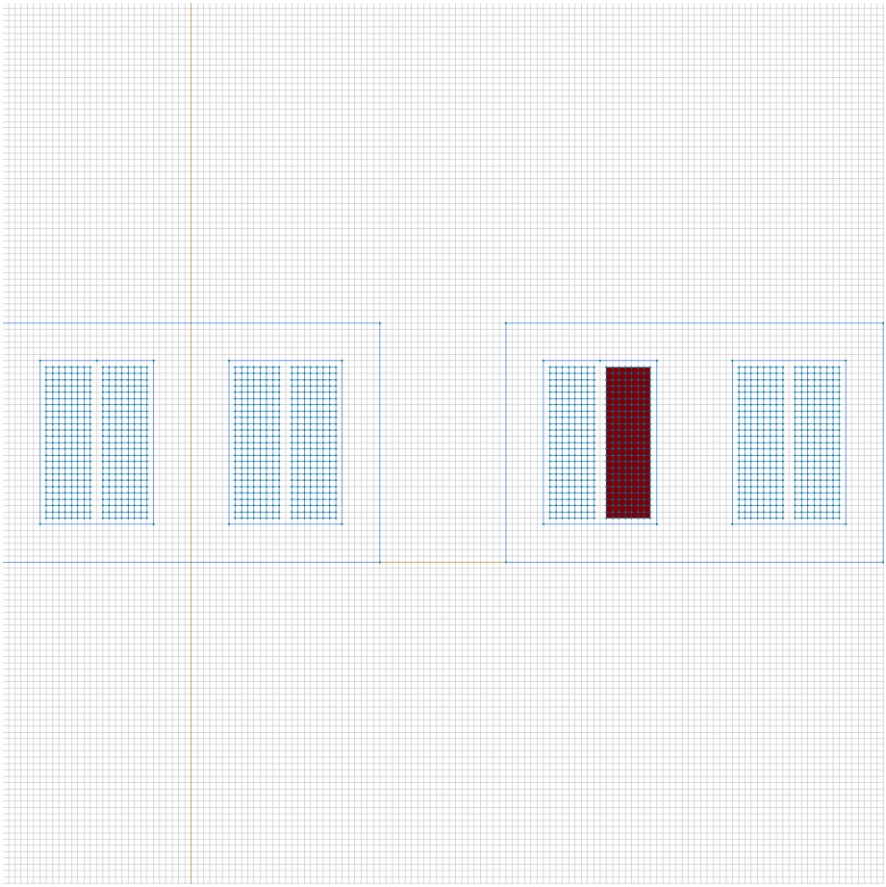
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "q-"

There are (168) objects with this label

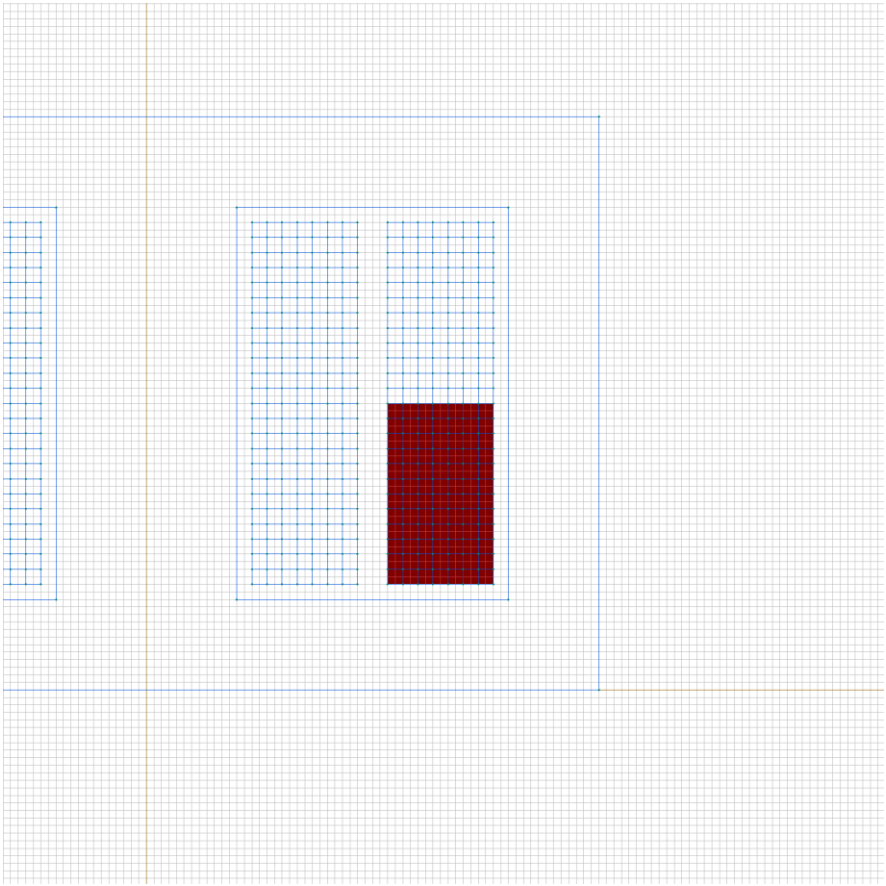
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "C+"

There are (84) objects with this label

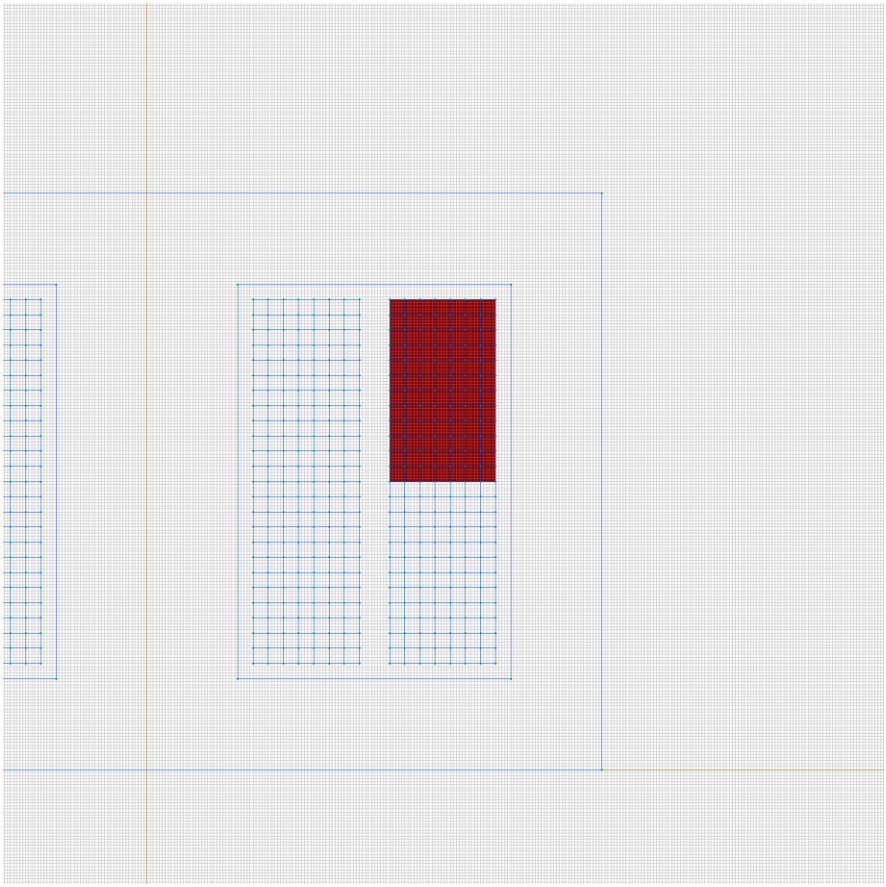
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "B+"

There are (84) objects with this label

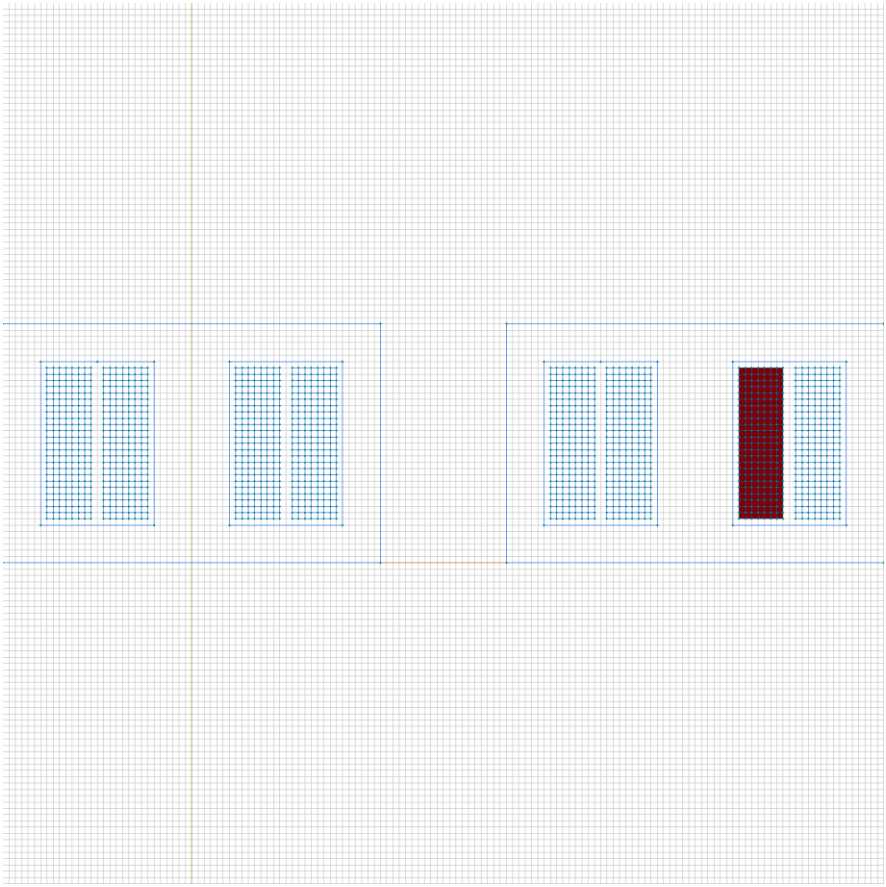
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "q+"

There are (168) objects with this label

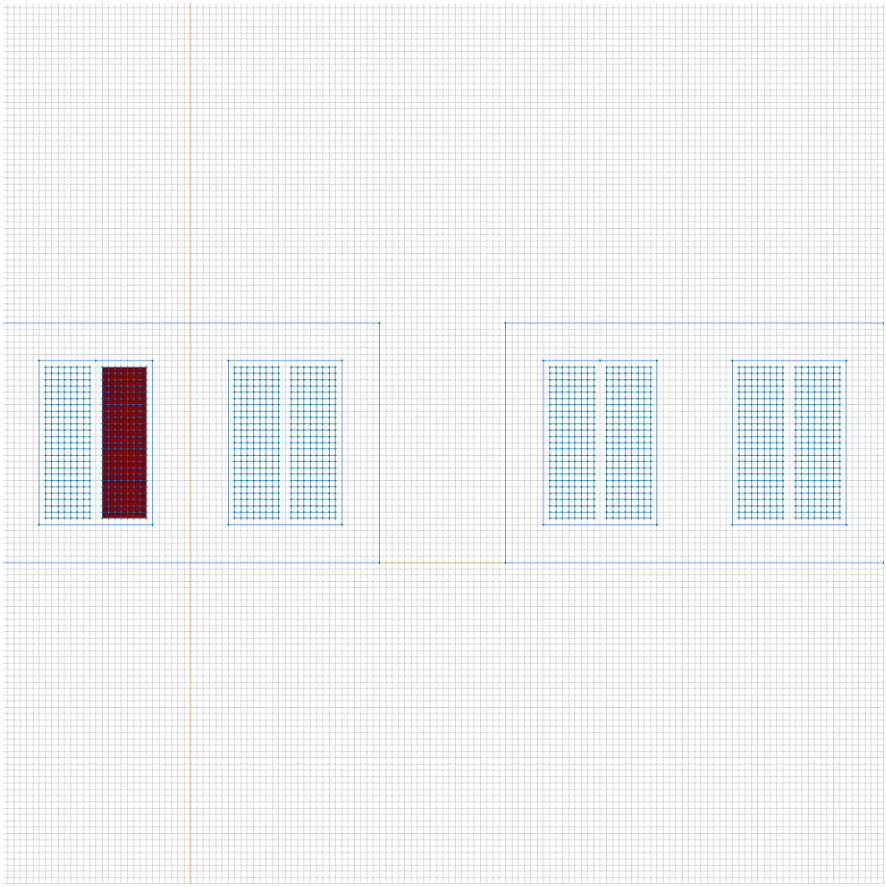
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "p-"

There are (168) objects with this label

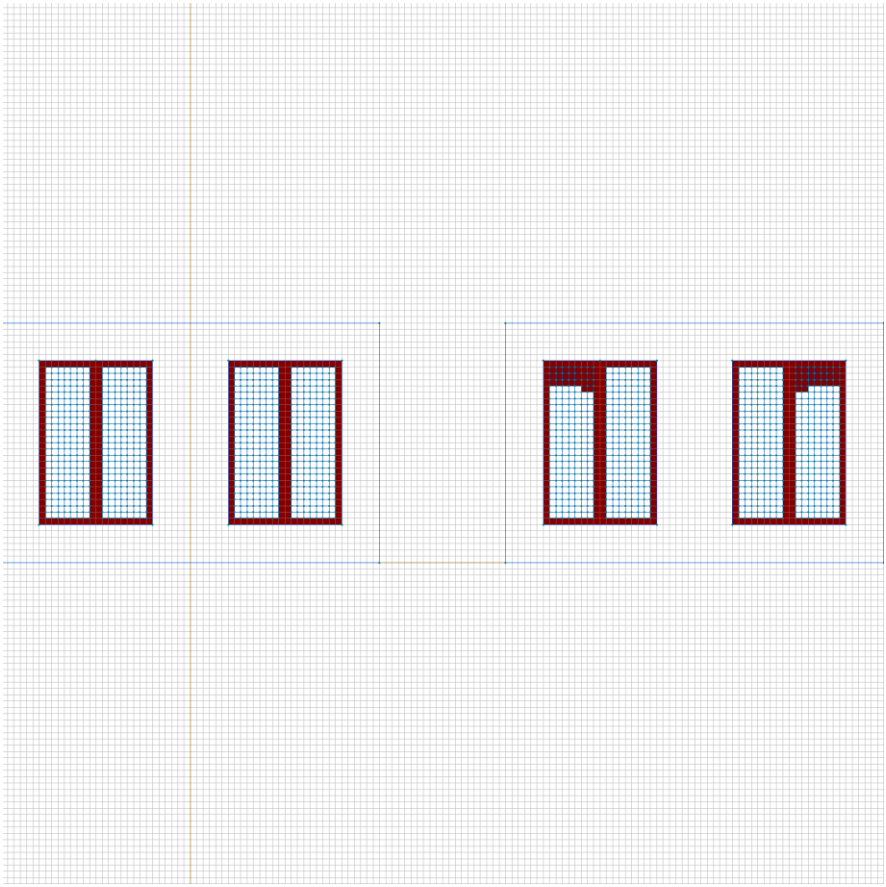
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "insulation"

There are (50) objects with this label

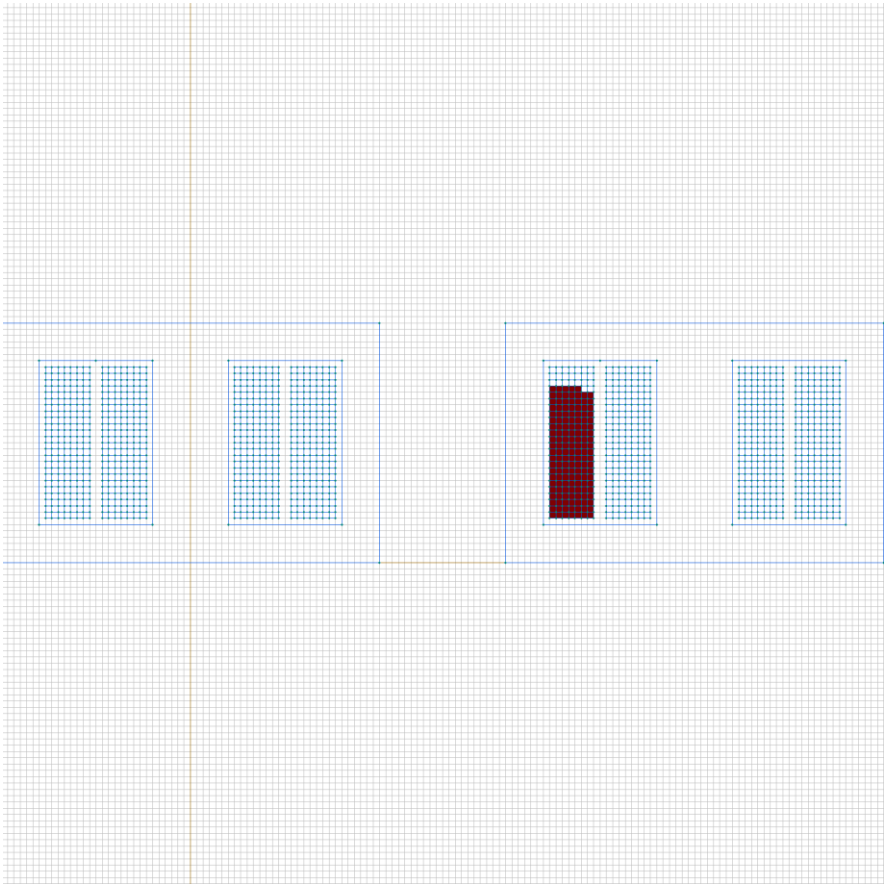
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel



Labelled objects: block "A-"

There are (145) objects with this label

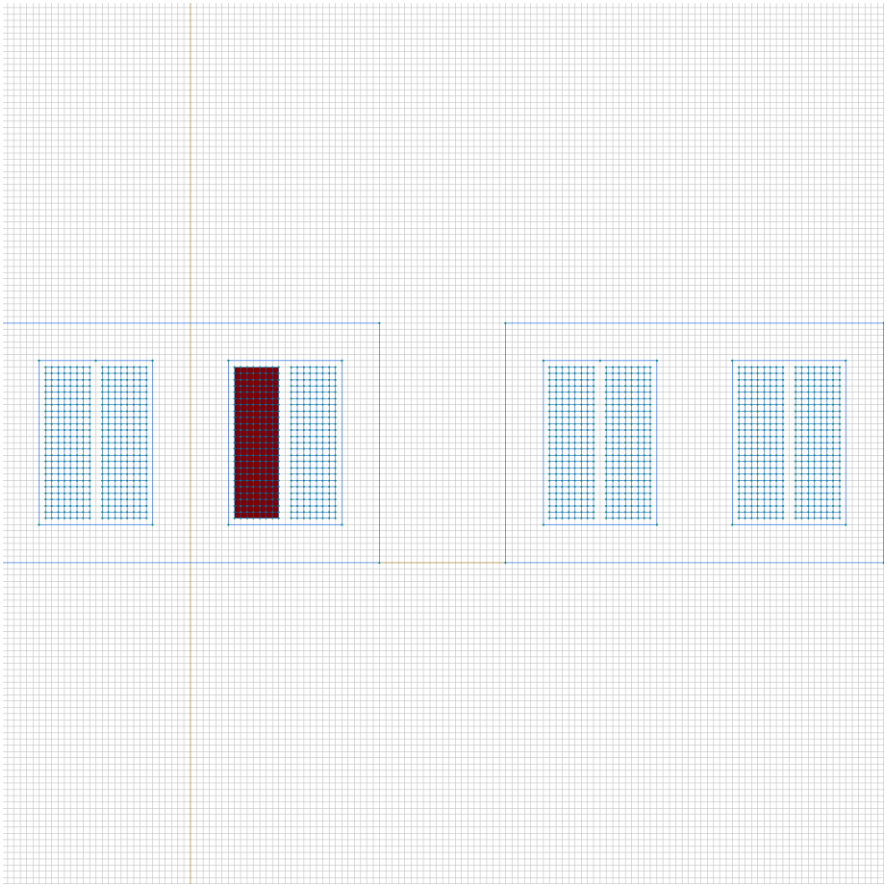
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "p+"

There are (168) objects with this label

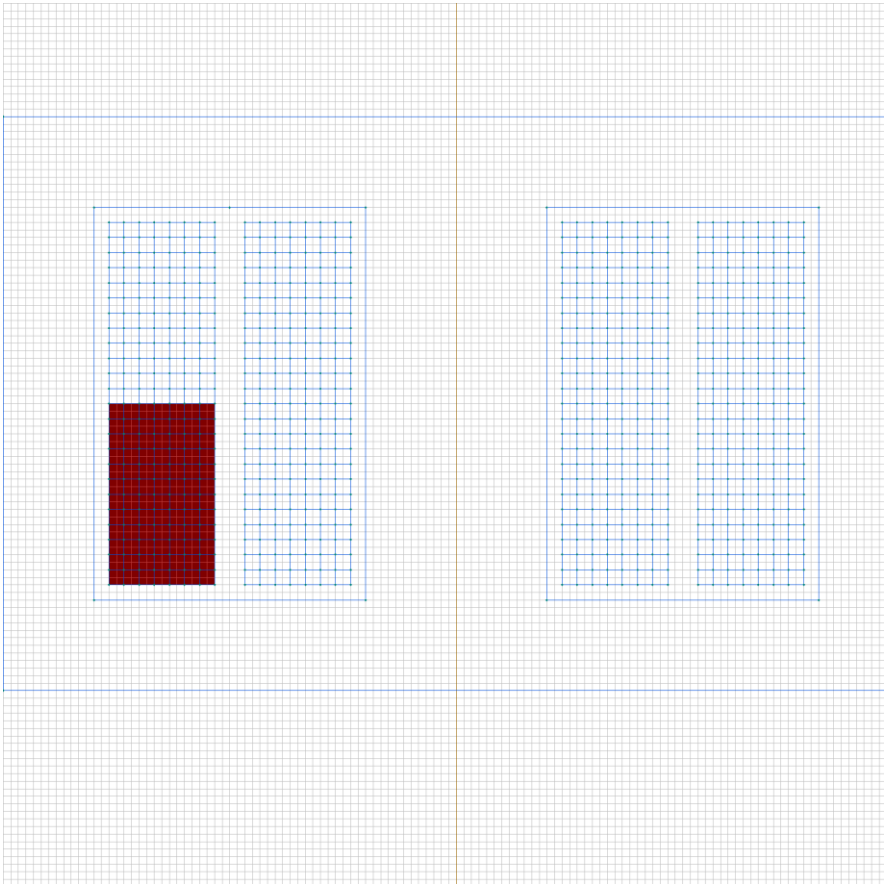
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "C-"

There are (84) objects with this label

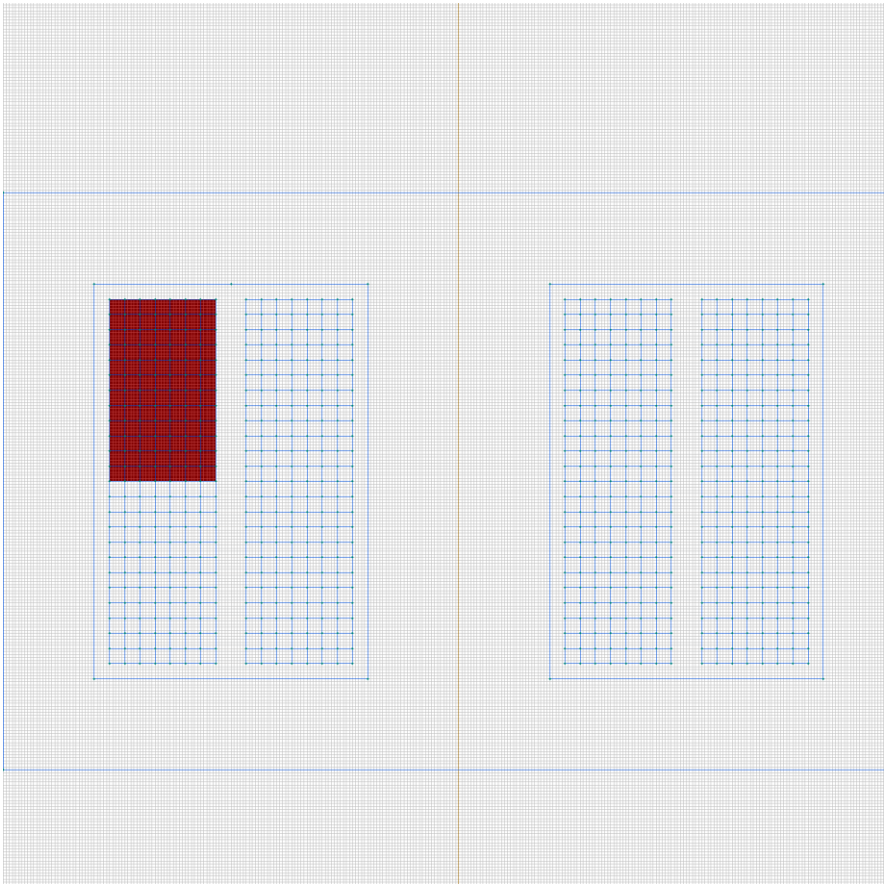
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "B-"

There are (84) objects with this label

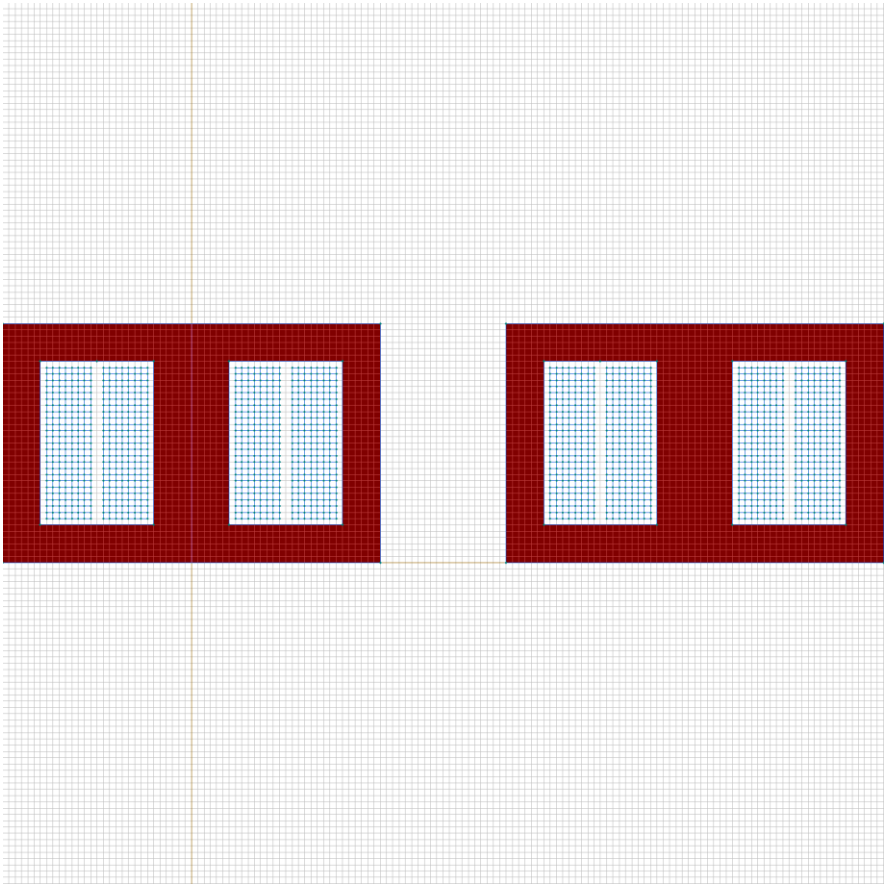
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "core"

There are (2) objects with this label

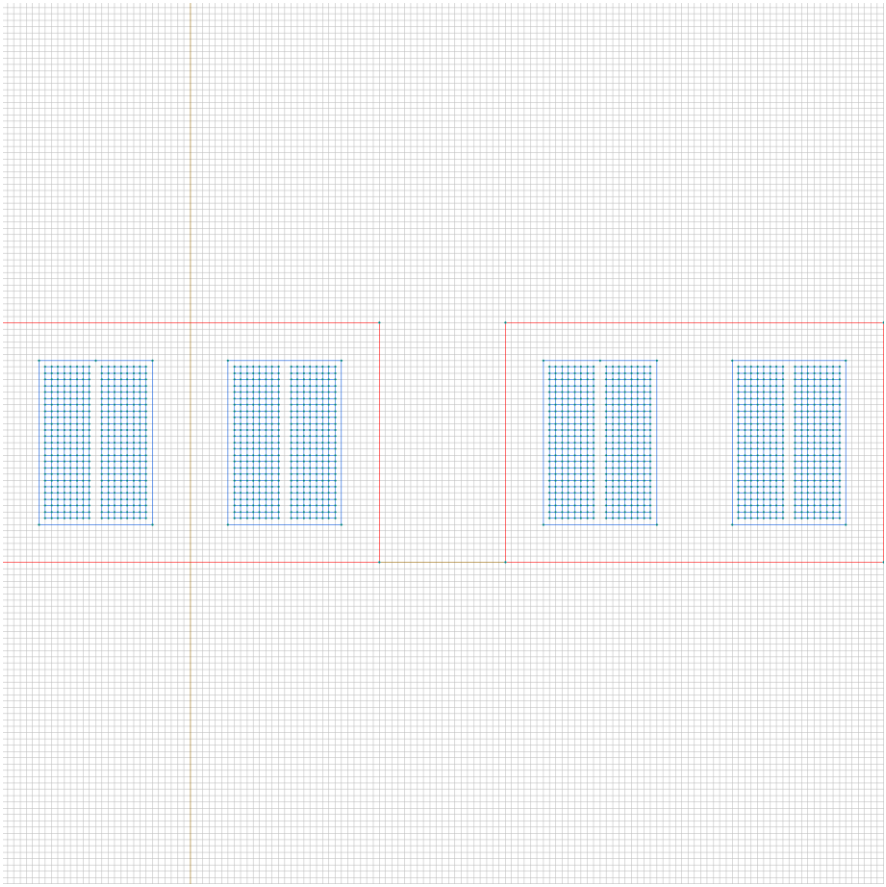
Relative magnetic permeability: mu_x=1000, mu_y=1000
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel



Labelled objects: edge "boundary"

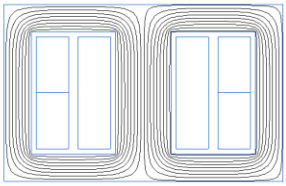
There are (8) objects with this label

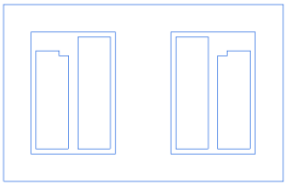
Magnetic potential: A=0 [Wb/m], phase 0 [deg]



Results

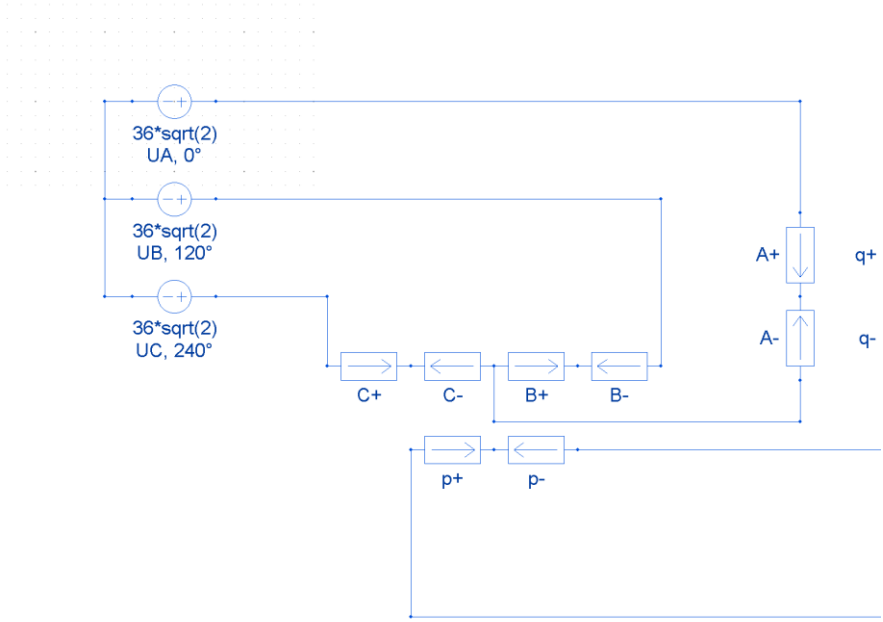
Field lines





Results

Electric circuit currents



Circuit elements:

C+. I=3.468 [A], phase=111.97 [deg]

C-. I=1.6113 [A], phase=-23.681 [deg]

p+. I=0.4991 [A], phase=64.72 [deg]

p-. I=0.05603 [A], phase=-81.14 [deg]

A+. I=3.371 [A], phase=-124.44 [deg]

A-. I=1.4236 [A], phase=90.87 [deg]

UA, 0°. I=3.371 [A], phase=-124.44 [deg]

UB, 120°. I=2.993 [A], phase=-1.9092 [deg]

UC, 240°. I=3.468 [A], phase=111.97 [deg]

q+. I=0.19066 [A], phase=-82.85 [deg]

q-. I=0.15485 [A], phase=-81.73 [deg]

R2_. I=0.008793 [A], phase=-89.82 [deg]

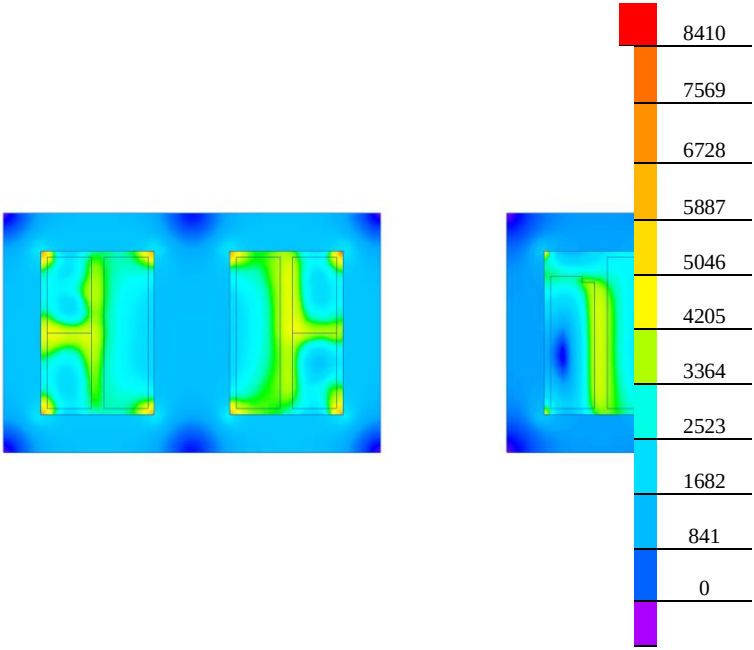
R1_. I=0.008815 [A], phase=-179.69 [deg]

B+. I=1.622 [A], phase=-153.18 [deg]

B-. I=2.993 [A], phase=-1.9092 [deg]

Results

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



Nonlinear dependencies

No non-linear dependencies are used in this problem data