Problem info

Problem type: AC Magnetics , frequency: 50 Hz,
Geometry model class: Plane-Parallel
Problem database file names:

- Problem: *3phase_transformer.pbm*
- Geometry: *3phase_transformer_model.mod*
- Material Data: *3phase_transformer_data.dhe*
- Material Data 2 (library): *none*
- Electric circuit: *3phase_transformer_circuit.qcr*

Results taken from other problems:

- *none*

Geometry model

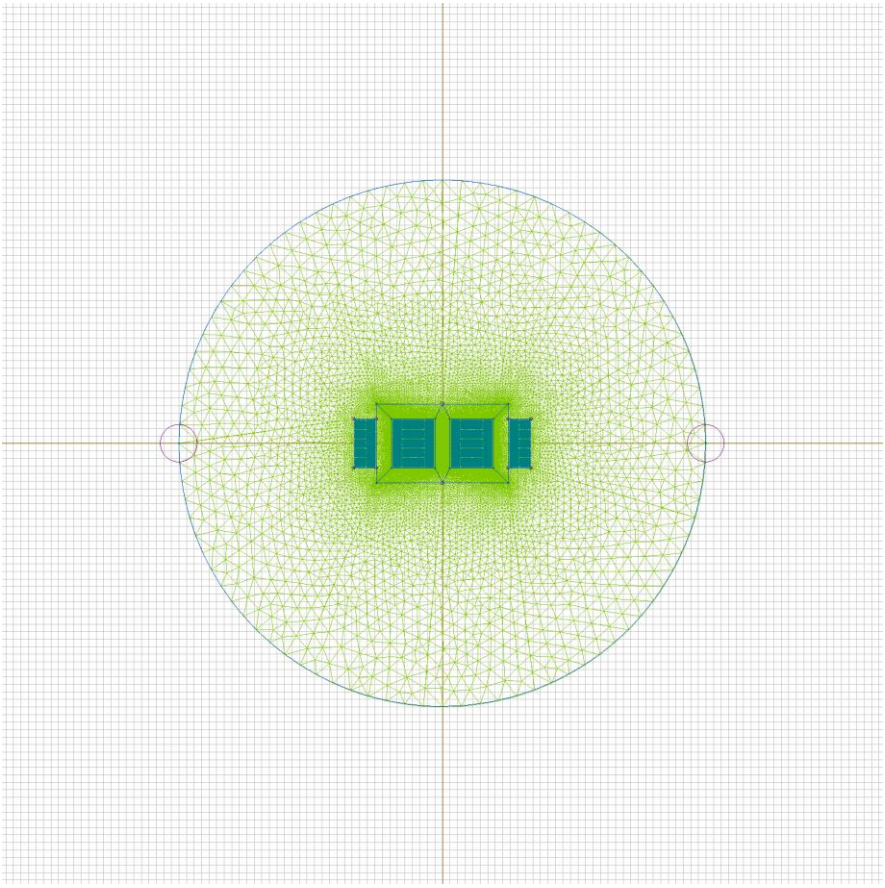


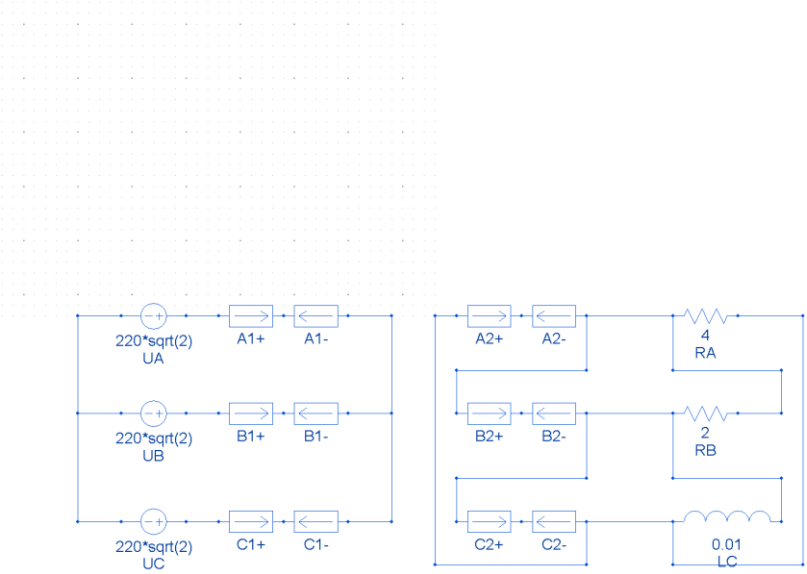
Table 1. Geometry model statistics

	With Label	Total
Blocks	15	3216
Edges	1	7108
Vertices	0	3930

Number of nodes: 30266.

Electric circuit

Coupled electric circuit



Circuit elements:

QuickField block 'B1-'
QuickField block 'B1+'
QuickField block 'A2-'
QuickField block 'A2+'
Resistor RA=4 [Ohm]
QuickField block 'A1-'

QuickField block 'A1+'
QuickField block 'C1-'
QuickField block 'C1+'
QuickField block 'B2-'
QuickField block 'B2+'
Resistor RB=2 [Ohm]
QuickField block 'C2-'
QuickField block 'C2+'
Inductor LC=0.01 [H]
Voltage source UB=220*sqrt(2) [V] 120 [deg]
Voltage source UA=220*sqrt(2) [V] 0 [deg]
Voltage source UC=220*sqrt(2) [V] 240 [deg]

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:

- A1-
- A2-
- core
- A2+
- A1+
- insulation
- B1-
- B2-
- B2+
- B1+
- C2+
- C1+
- C1-
- C2-
- air
-

Edges:

- boundary
-

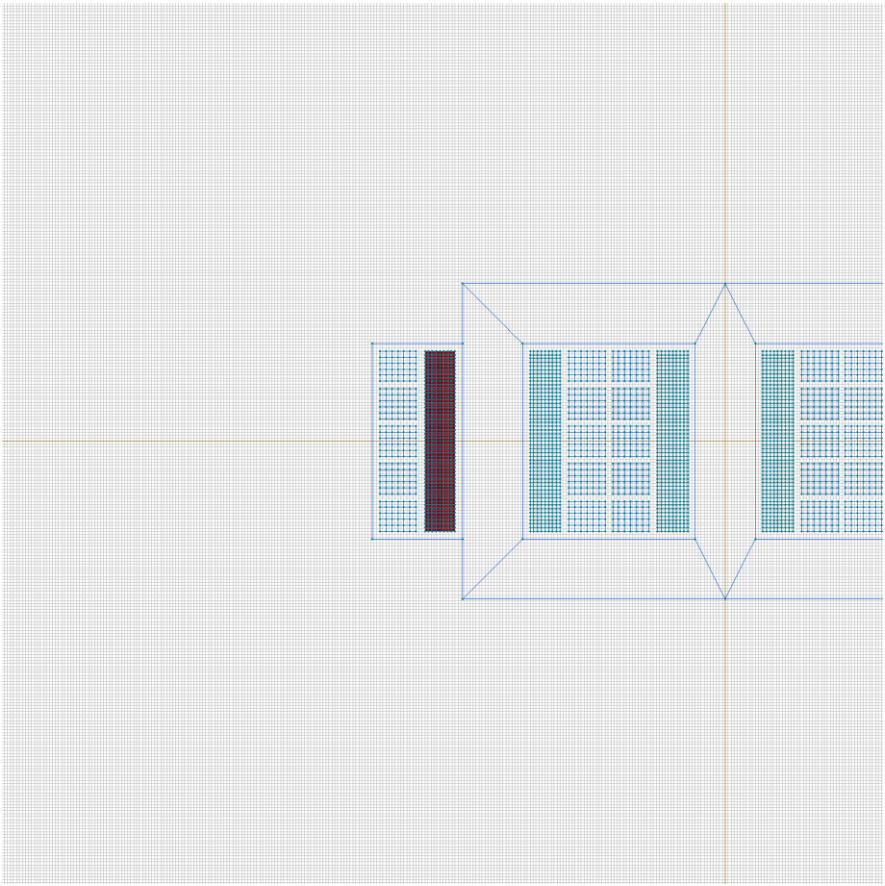
Vertices:

Detailed information about each label is listed below.

Labelled objects: block "A1-"

There are (384) objects with this label

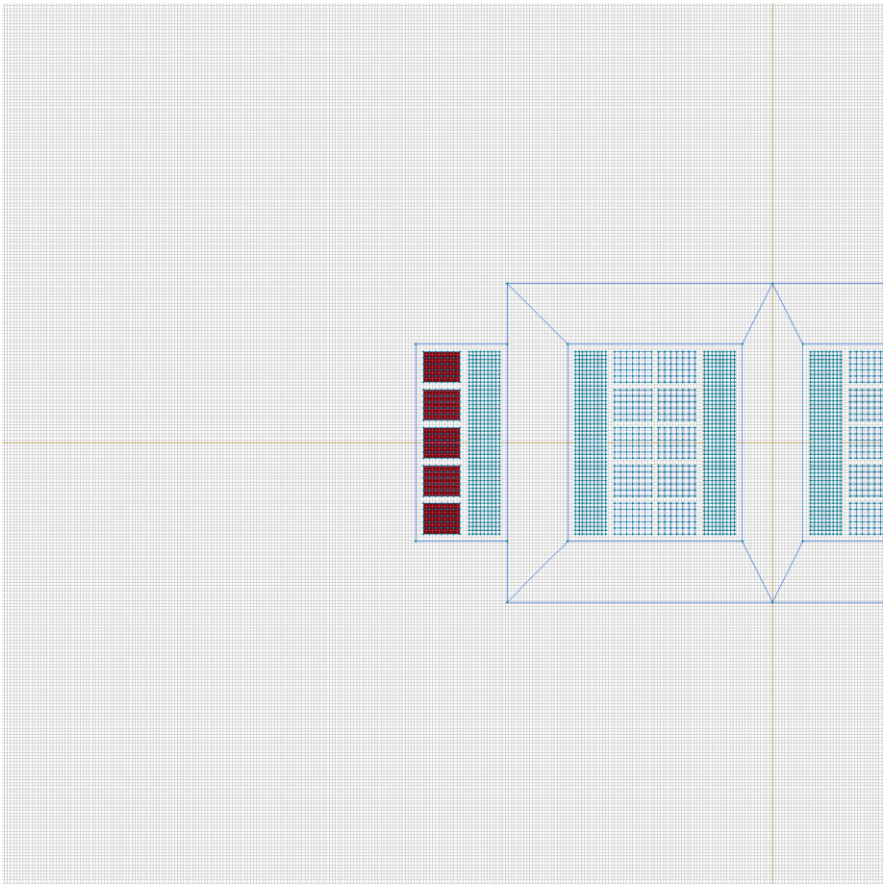
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "A2-"

There are (150) objects with this label

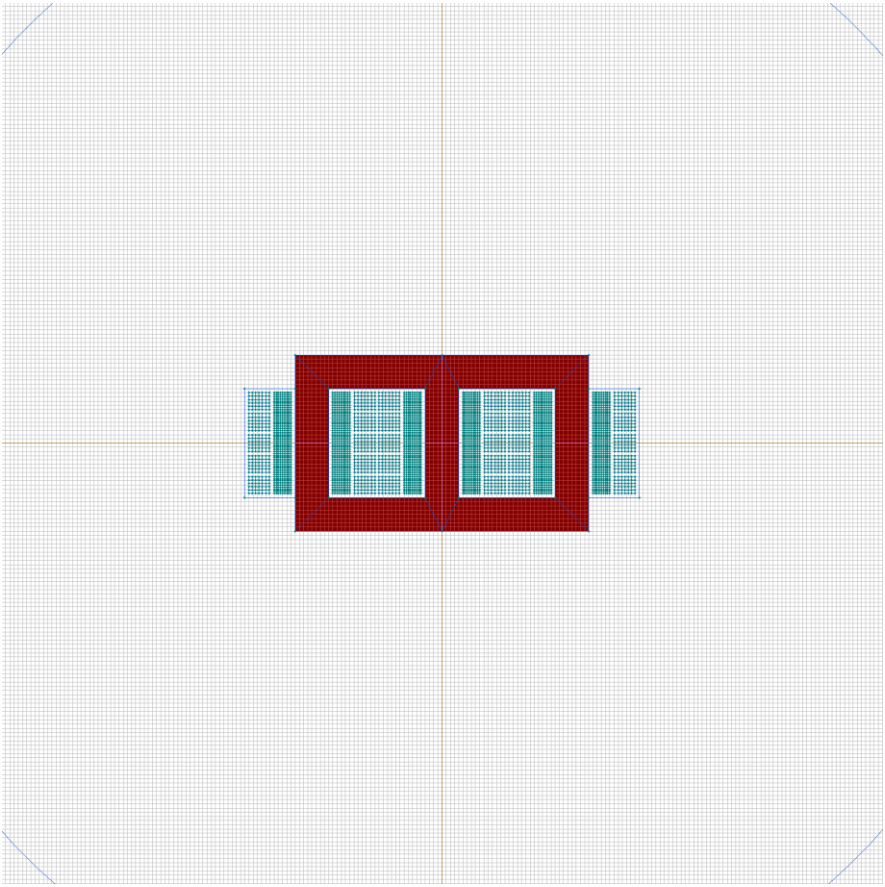
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "core"

There are (7) objects with this label

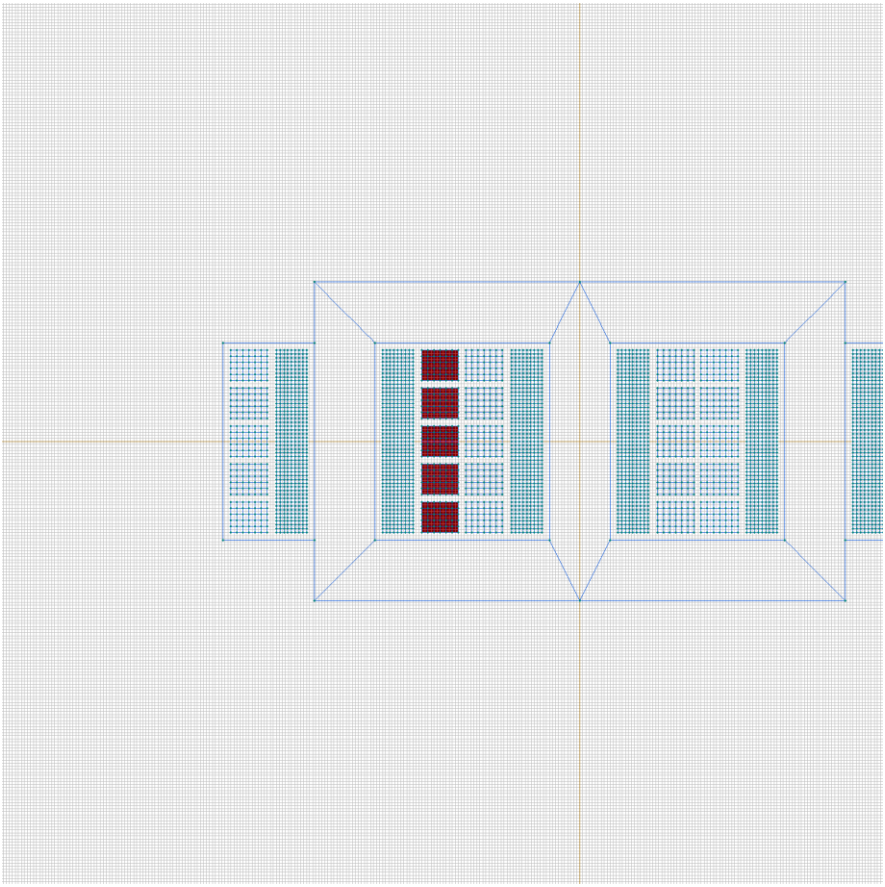
Relative magnetic permeability: mu_x=1000, mu_y=1000
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel



Labelled objects: block "A2+"

There are (150) objects with this label

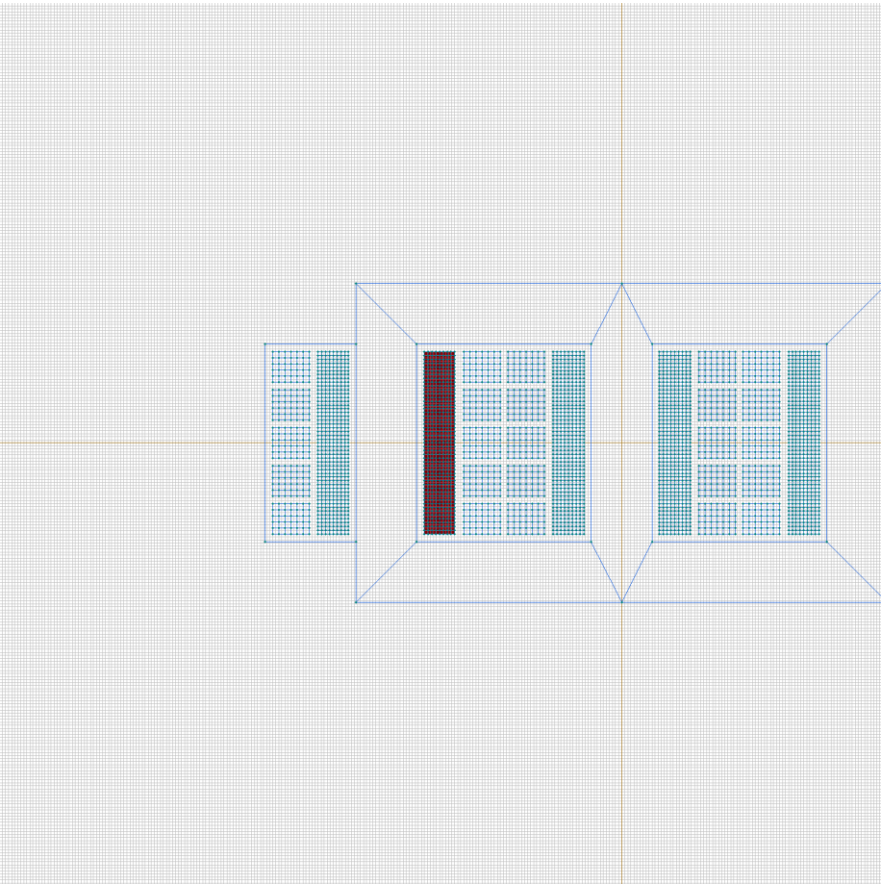
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "A1+"

There are (384) objects with this label

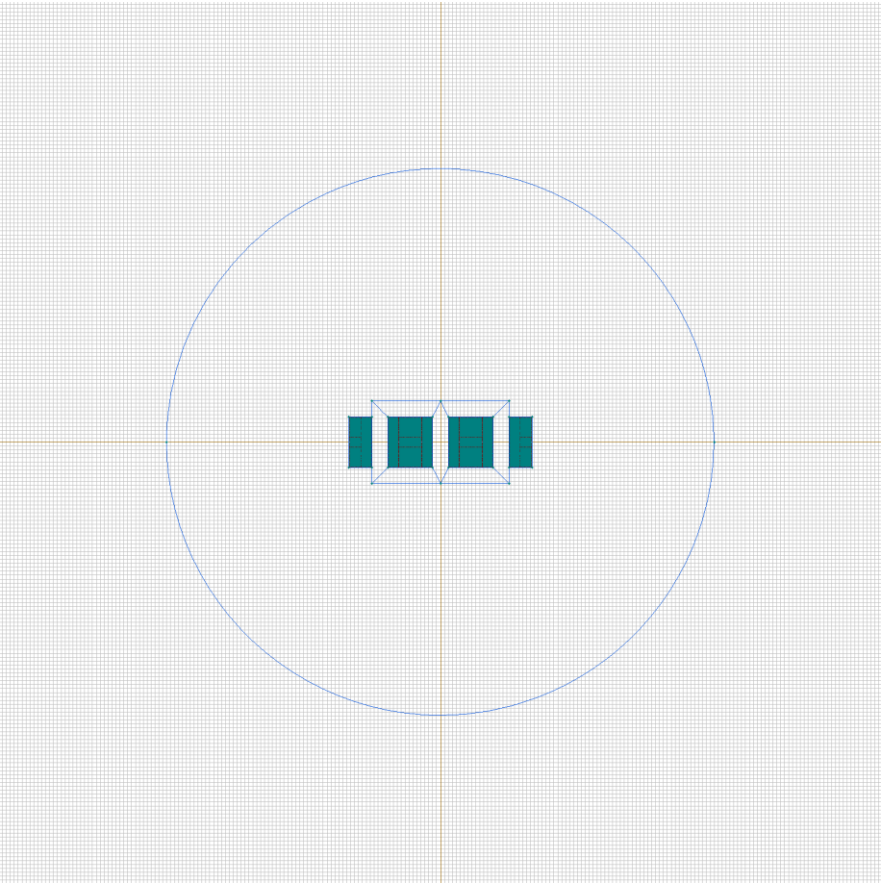
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "insulation"

There are (4) objects with this label

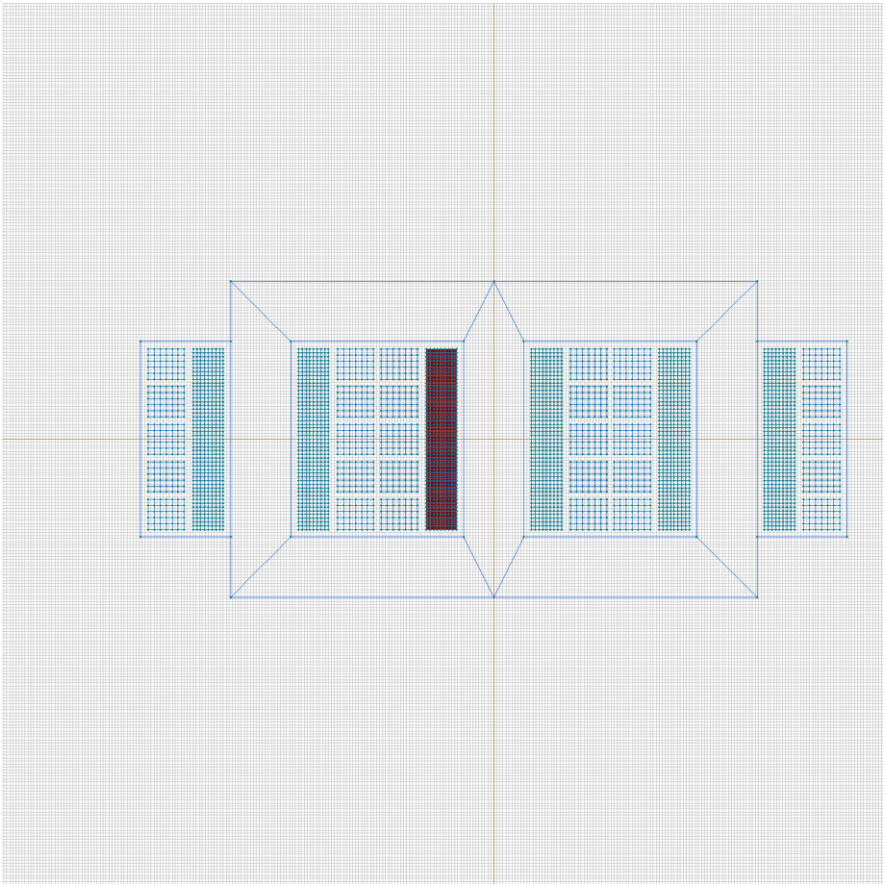
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel



Labelled objects: block "B1-"

There are (384) objects with this label

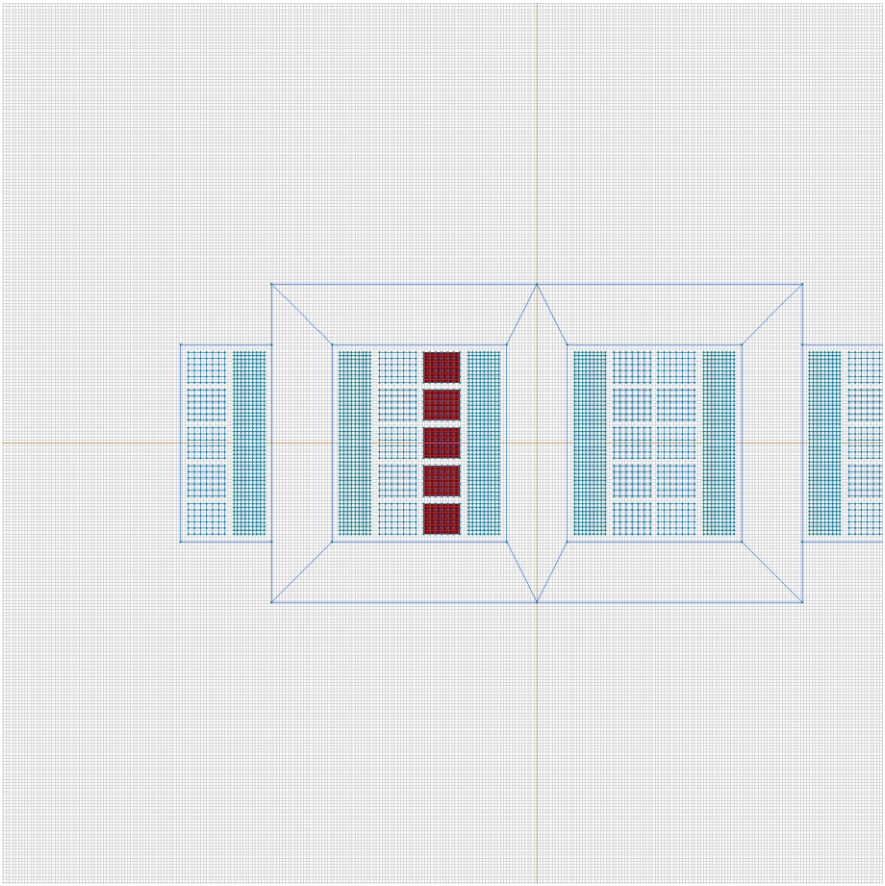
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "B2-"

There are (150) objects with this label

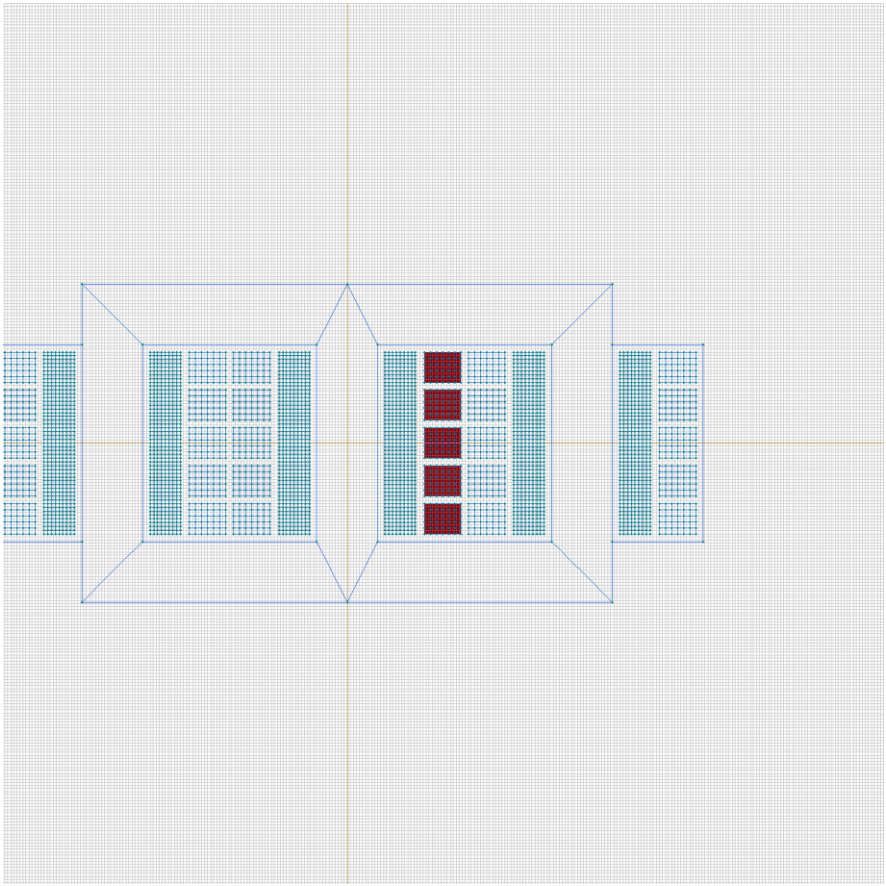
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "B2+"

There are (150) objects with this label

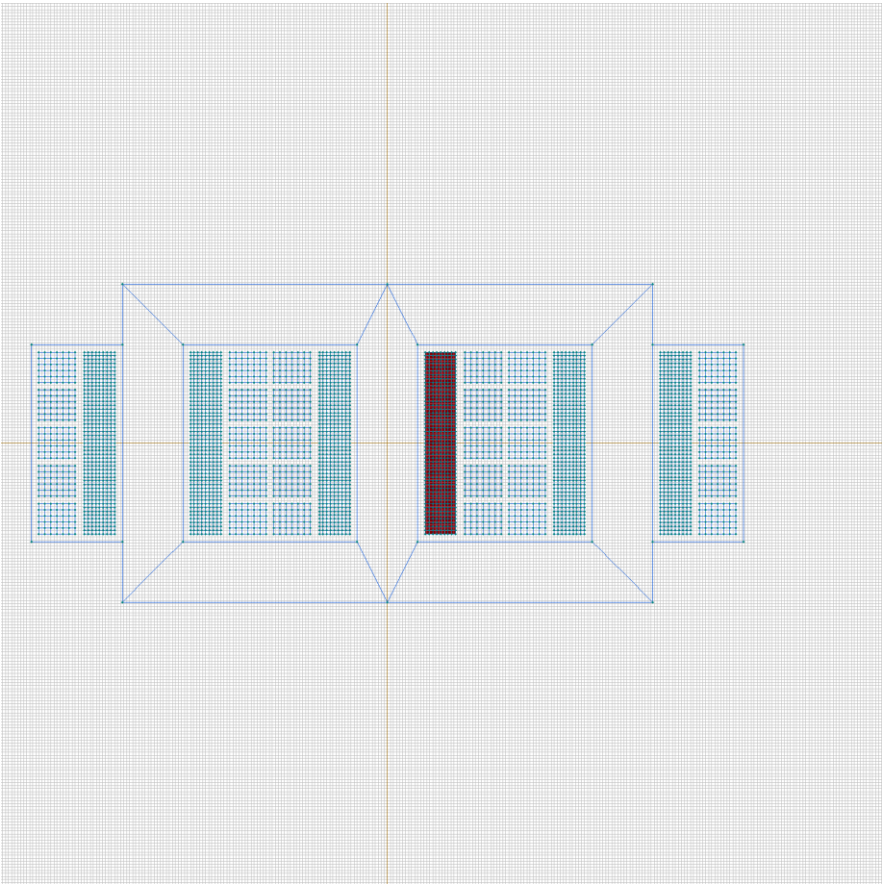
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "B1+"

There are (384) objects with this label

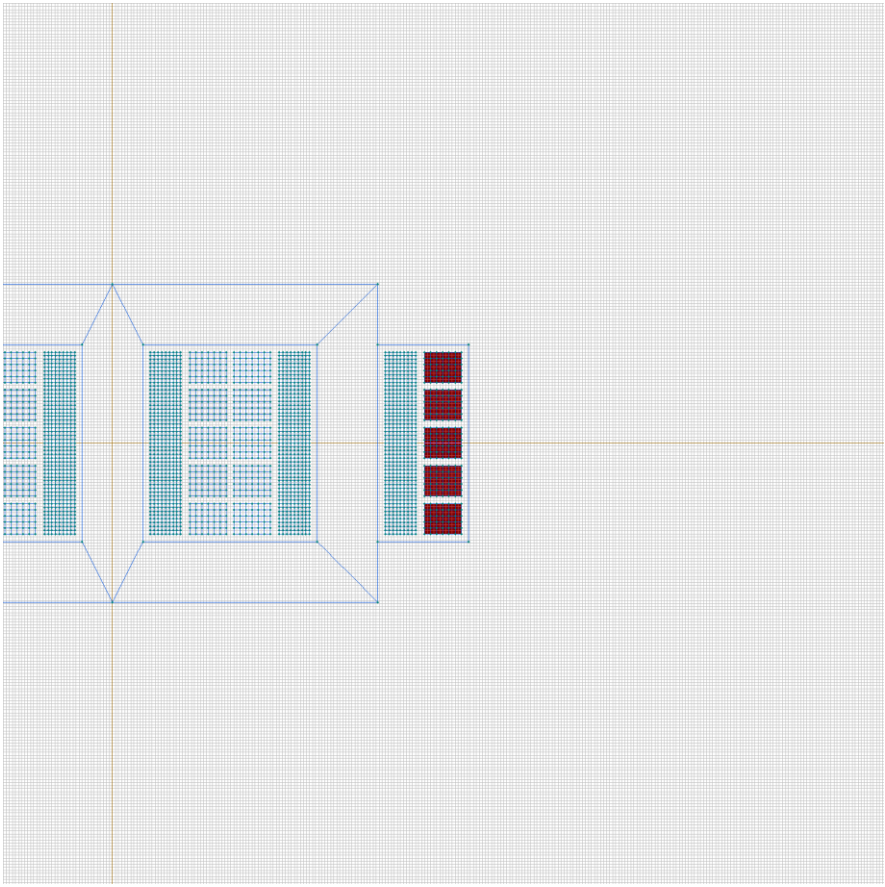
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "C2+"

There are (150) objects with this label

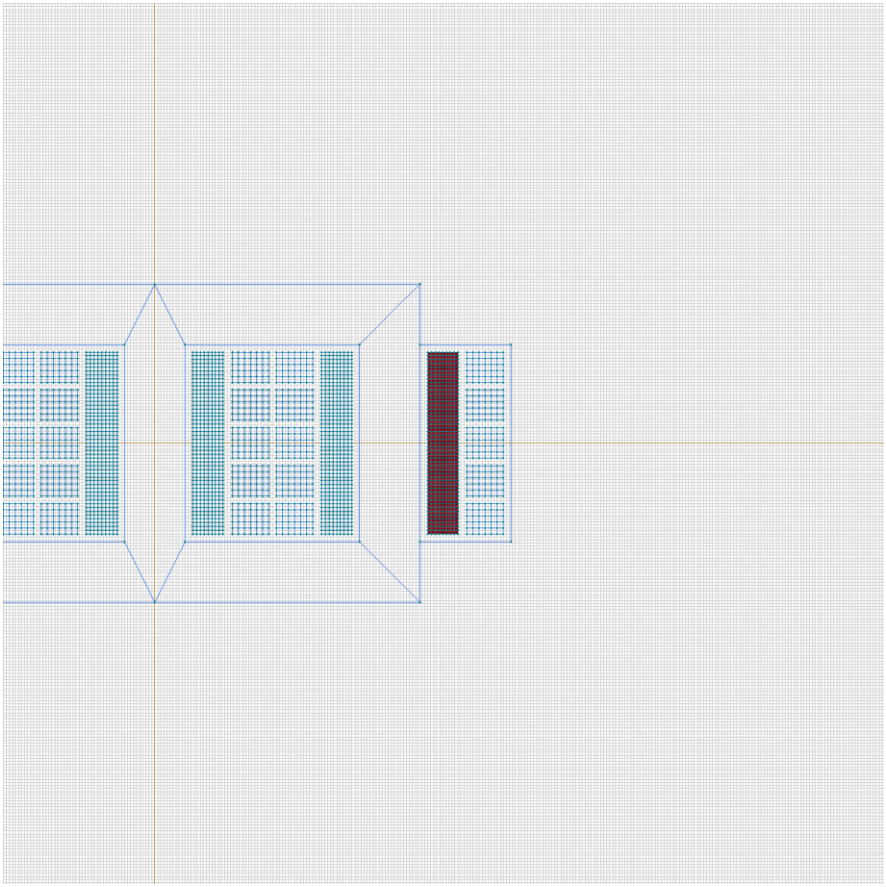
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "C1+"

There are (384) objects with this label

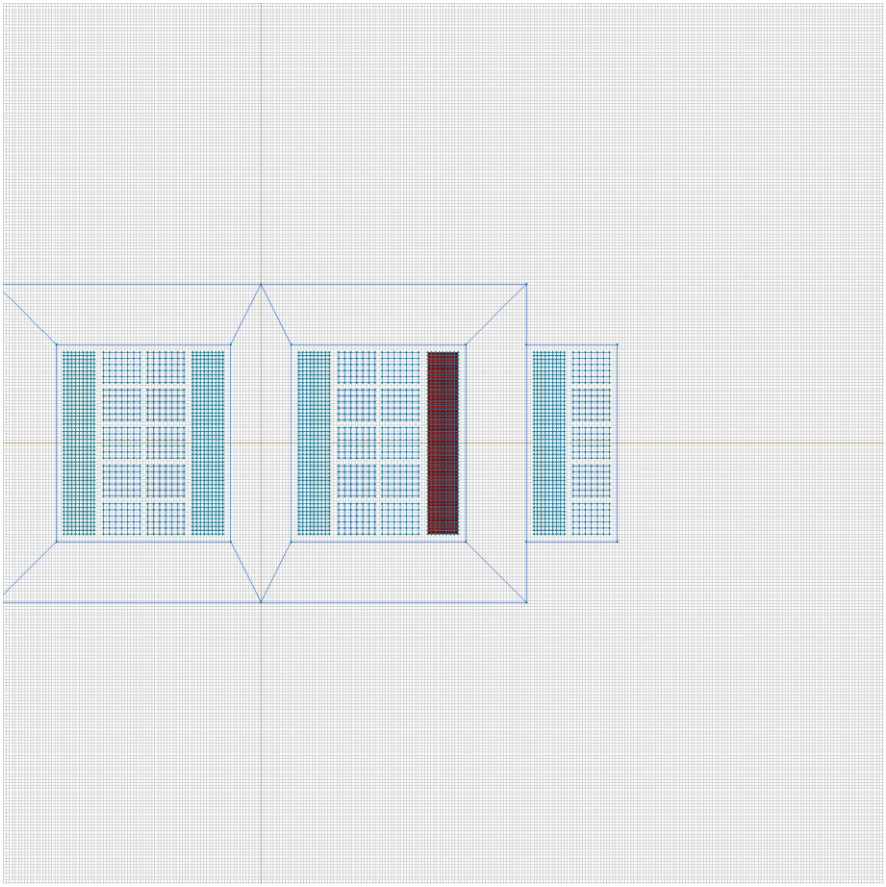
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "C1-"

There are (384) objects with this label

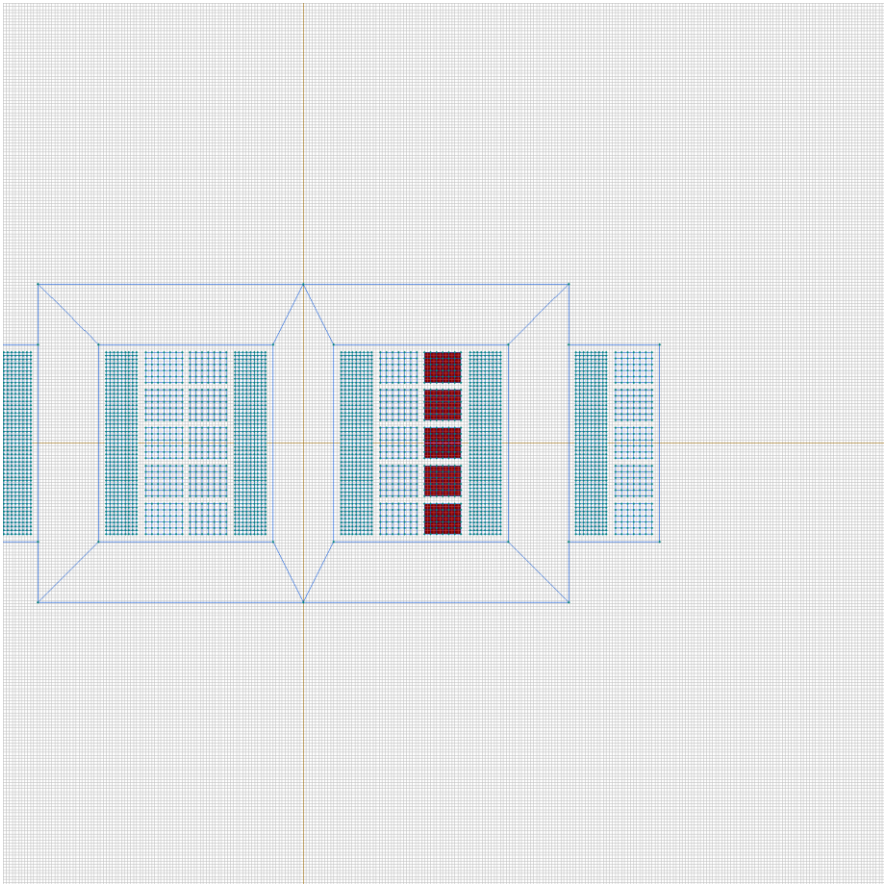
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "C2-"

There are (150) objects with this label

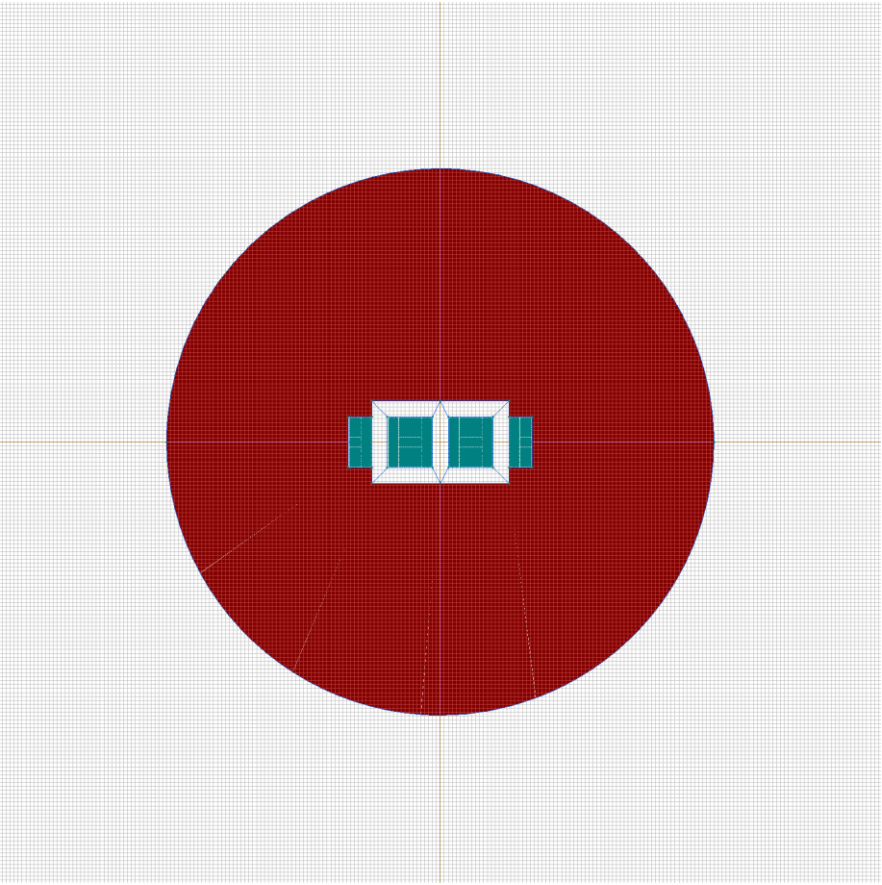
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in series



Labelled objects: block "air"

There are (1) objects with this label

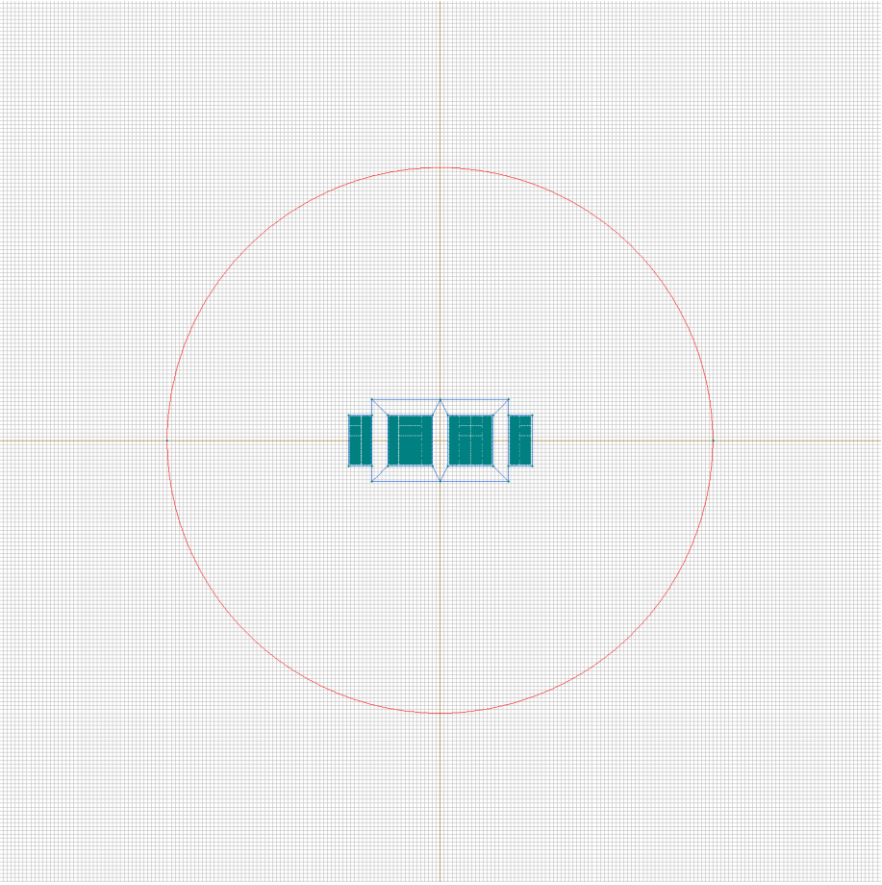
Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel



Labelled objects: edge "boundary"

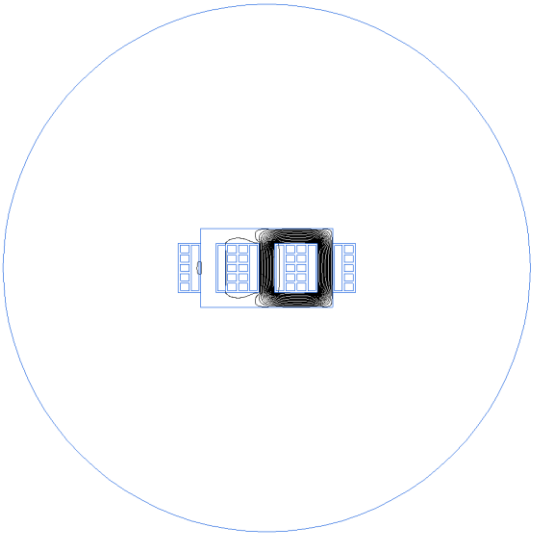
There are (2) objects with this label

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



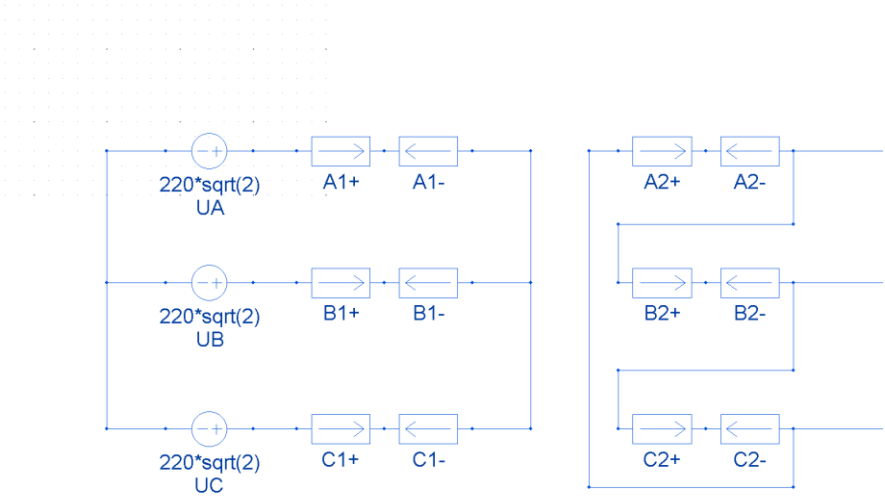
Results

Field lines



Results

Electric circuit currents



Circuit elements:

B1-. I=13.412 [A], phase=-61.98 [deg]

B1+. I=13.394 [A], phase=118.25 [deg]

A2-. I=45.77 [A], phase=-31.62 [deg]

A2+. I=45.76 [A], phase=148.27 [deg]

RA. I=29.164 [A], phase=-2.1927 [deg]

A1-. I=19.009 [A], phase=145.69 [deg]

A1+. I=19.031 [A], phase=-34.41 [deg]

C1-. I=9.444 [A], phase=6.497 [deg]

C1+. I=9.403 [A], phase=-173.42 [deg]

B2-. I=35.39 [A], phase=121.11 [deg]

B2+. I=35.49 [A], phase=-58.99 [deg]

RB. I=60.22 [A], phase=117.74 [deg]

C2-. I=23.064 [A], phase=-170.97 [deg]

C2+. I=23.116 [A], phase=9.166 [deg]

LC. I=37.79 [A], phase=-30.643 [deg]

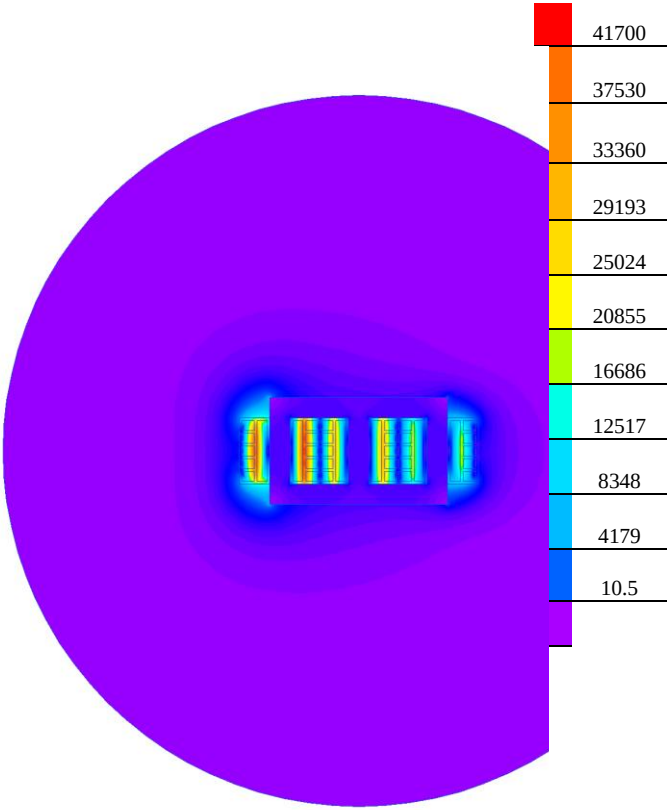
UB. I=13.394 [A], phase=118.25 [deg]

UA. I=18.995 [A], phase=-34.36 [deg]

UC. I=9.403 [A], phase=-173.42 [deg]

Results

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



Nonlinear dependencies

No non-linear dependencies are used in this problem data