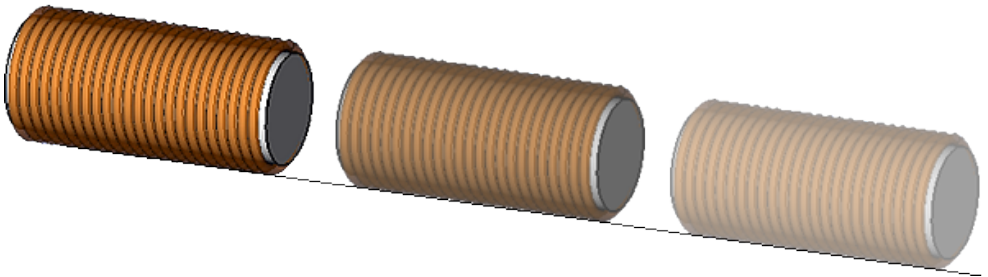


QuickField simulation report

Virtual test lab for MagWeb magnetic materials

Simulation environment for testing the materials from
MagWeb.dms library



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/magweb_test.htm

Problem info

Problem type: Magnetostatics

Geometry model class: Axisymmetric

Problem database file names:

- Problem: *solenoid_problem_1018.pbm*
- Geometry: *Solenoid_model.mod*
- Material Data: *Core_data_1018.dms*
- Material Data 2 (library): *none*
- Electric circuit: *none*

Results taken from other problems:

- *none*

Geometry model

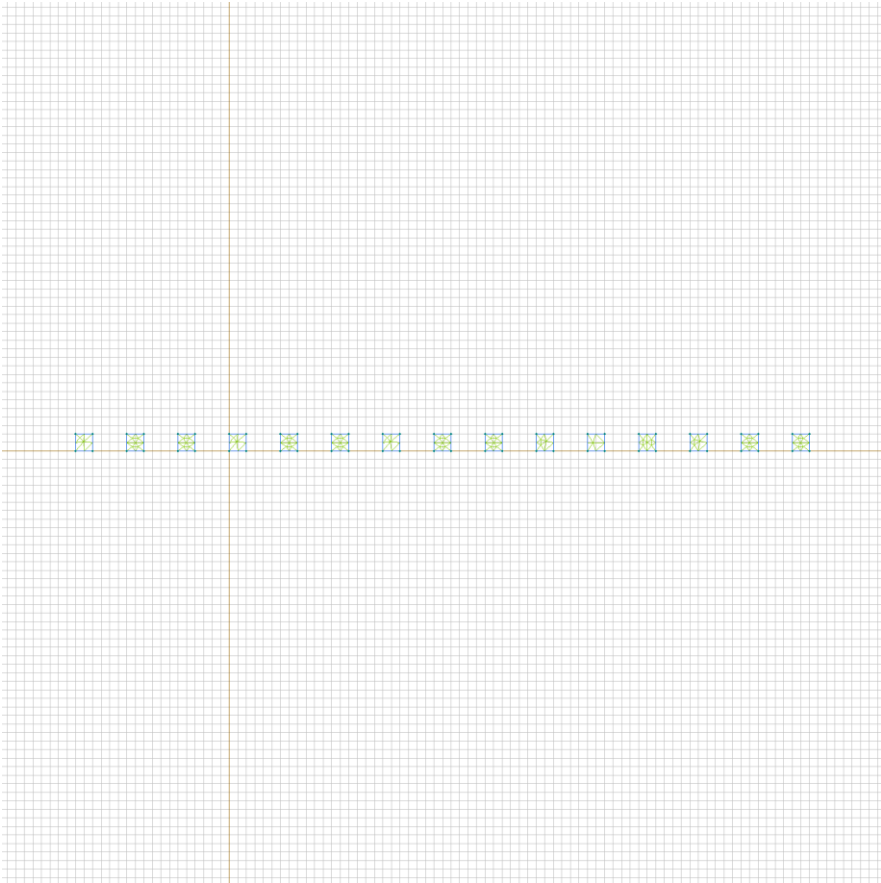


Table 1. Geometry model statistics

	With Label	Total
Blocks	1	15
Edges	16	60
Vertices	0	60

Number of nodes: 178.

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:

- [core](#)
-

Edges:

- [axis](#)
- [h_200k](#)
- [h_500k](#)
- [h_100k](#)
- [h_200](#)
- [h_20](#)
- [h_50](#)
- [h_10](#)
- [h_20k](#)
- [h_50k](#)
- [h_10k](#)
- [h_2k](#)
- [h_5k](#)
- [h_1k](#)
- [h_100](#)
- [h_500](#)
-

Vertices:

Detailed information about each label is listed below.

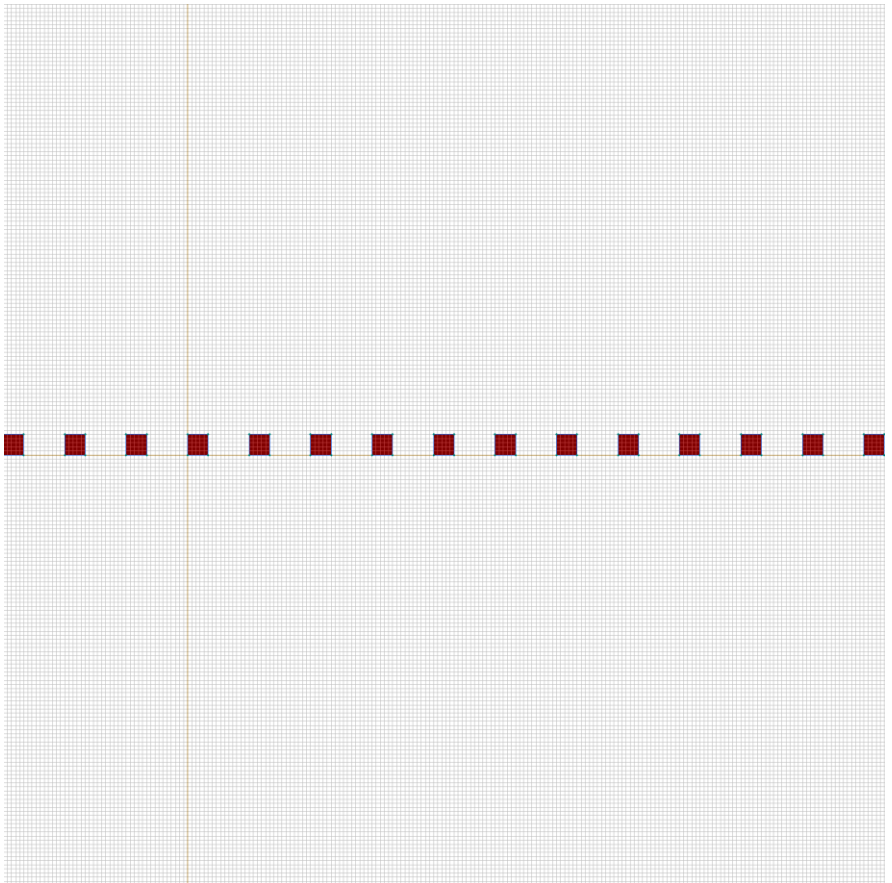
Labelled objects: block "core"

There are (15) objects with this label

Relative magnetic permeability: μ =nonlinear (see Table 2 in the "Nonlinear dependencies" section)

Current density: $j=0$ [A/m²]

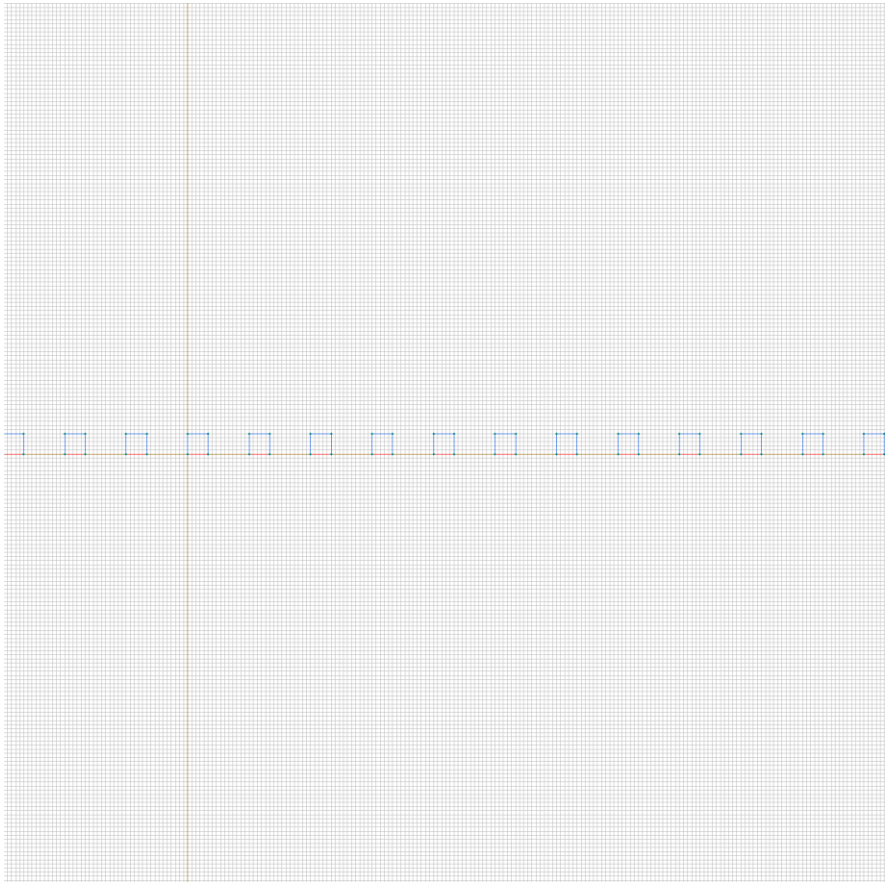
Conductor's connection: in parallel



Labelled objects: edge "axis"

There are (15) objects with this label

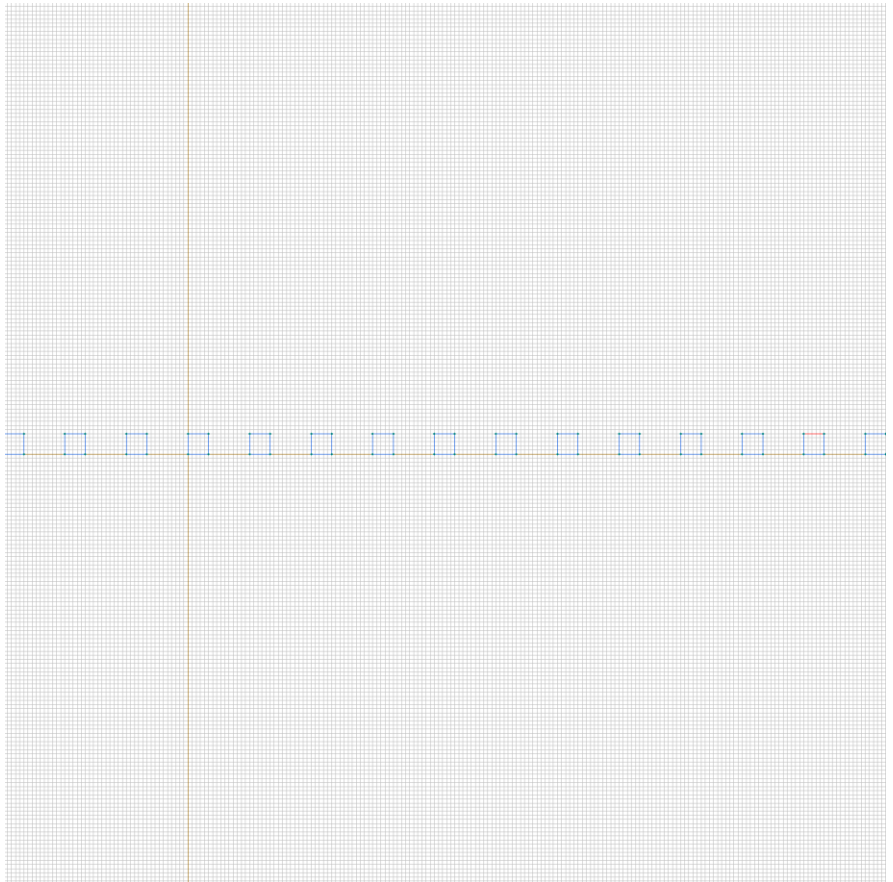
Magnetic potential: $A=0$ [Wb/m]



Labelled objects: edge "h_200k"

There are (1) objects with this label

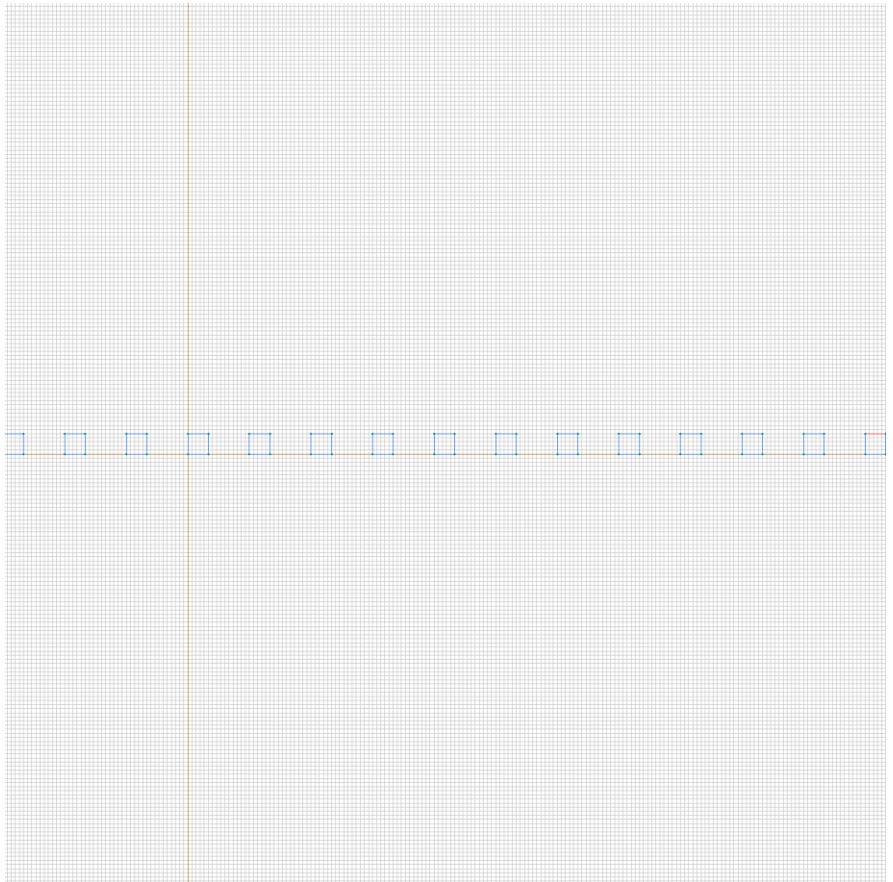
Tangential field: $H_t=0.2*1e6$ [A/m]



Labelled objects: edge "h_500k"

There are (1) objects with this label

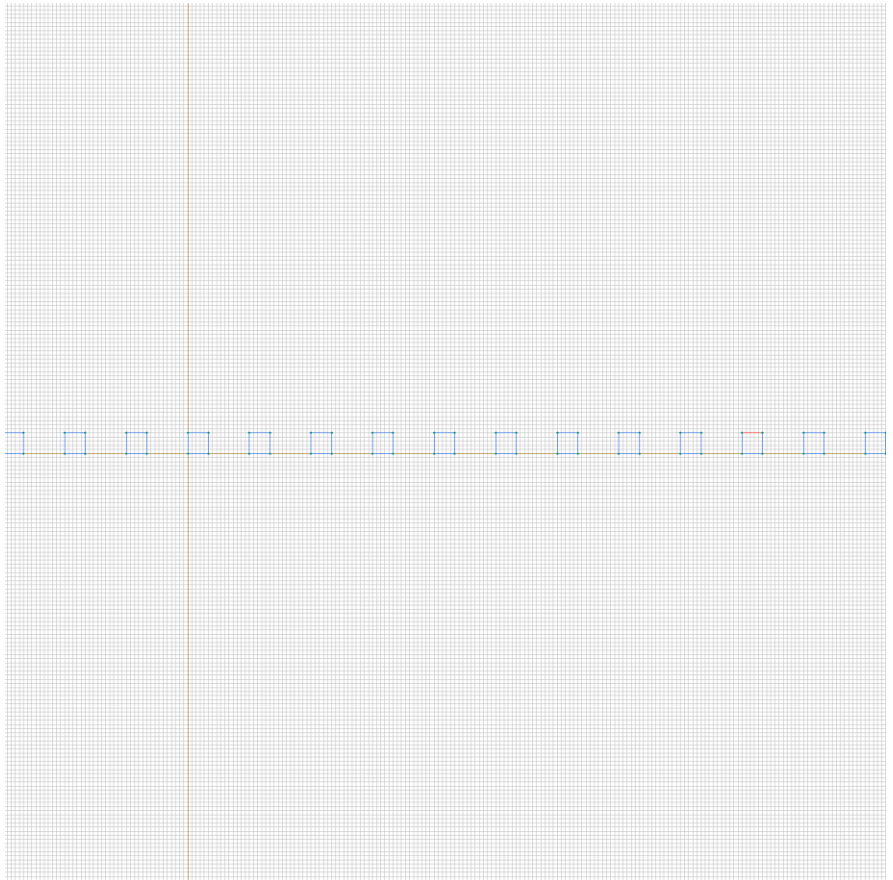
Tangential field: $H_t=0.5 \cdot 1e6$ [A/m]



Labelled objects: edge "h_100k"

There are (1) objects with this label

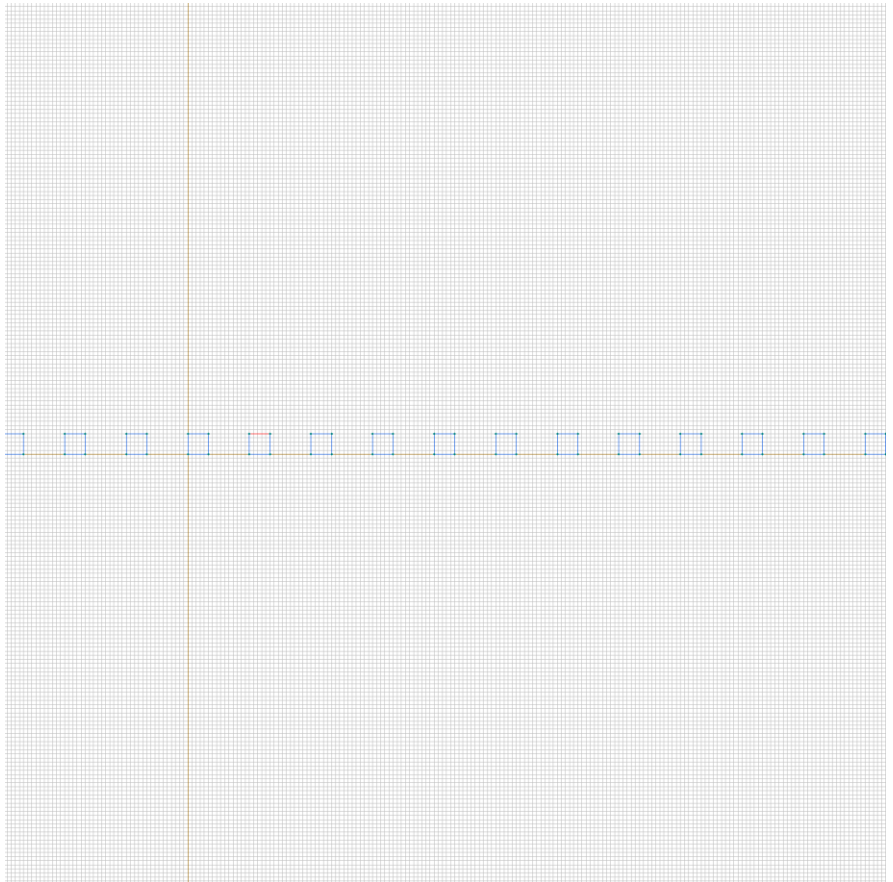
Tangential field: $H_t=0.1*1e6$ [A/m]



Labelled objects: edge "h_200"

There are (1) objects with this label

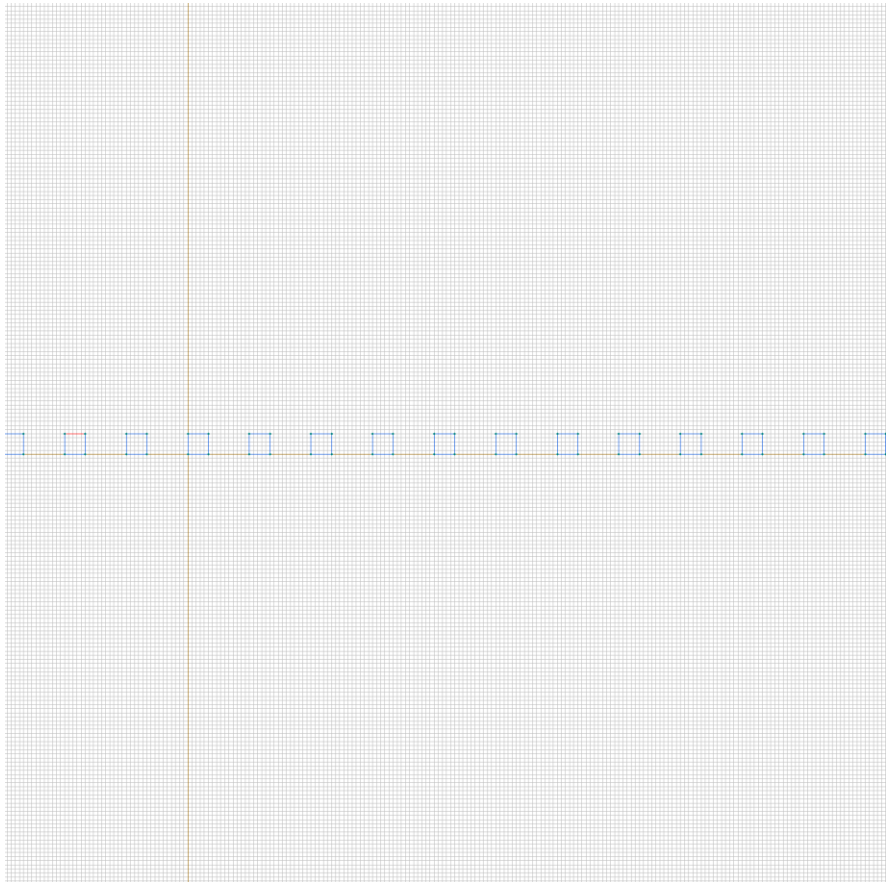
Tangential field: $H_t=0.0002*1e6$ [A/m]



Labelled objects: edge "h_20"

There are (1) objects with this label

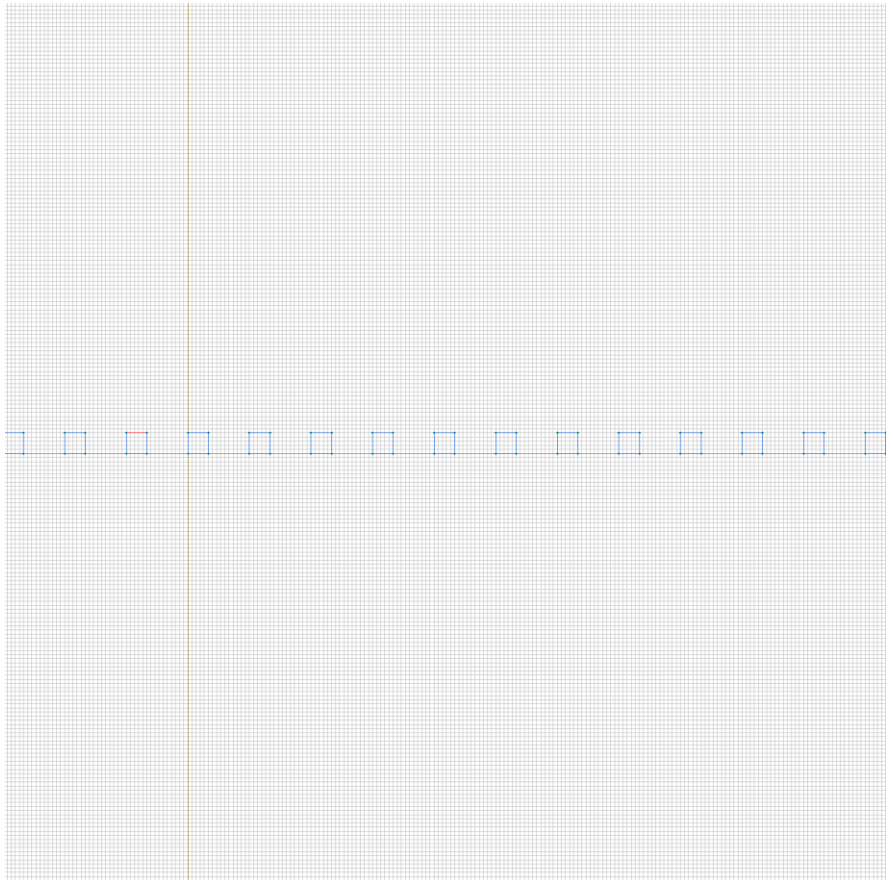
Tangential field: $H_t=0.00002*1e6$ [A/m]



Labelled objects: edge "h_50"

There are (1) objects with this label

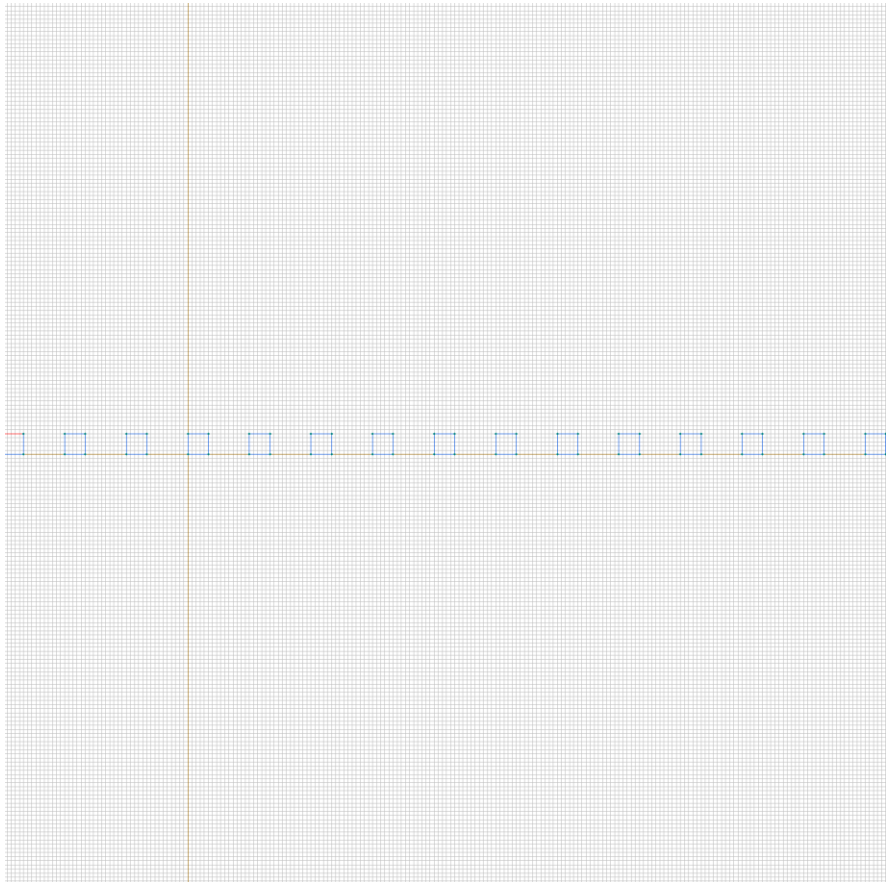
Tangential field: $H_t=0.00005*1e6$ [A/m]



Labelled objects: edge "h_10"

There are (1) objects with this label

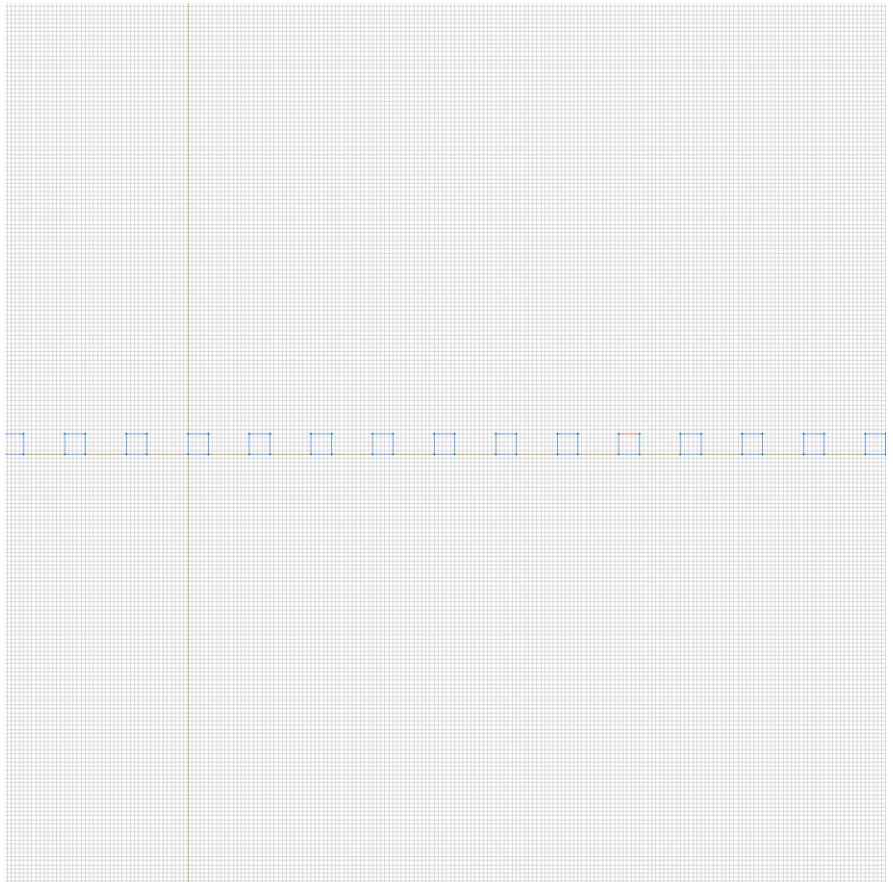
Tangential field: $H_t=0.00001*1e6$ [A/m]



Labelled objects: edge "h_20k"

There are (1) objects with this label

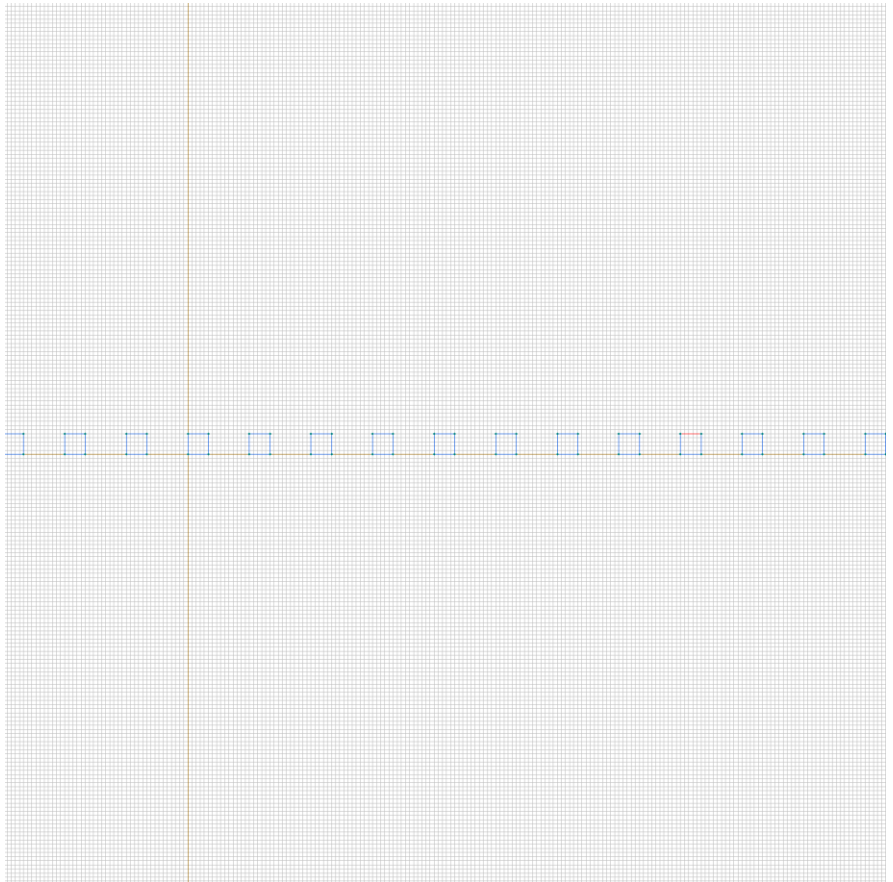
Tangential field: $H_t=0.02*1e6$ [A/m]



Labelled objects: edge "h_50k"

There are (1) objects with this label

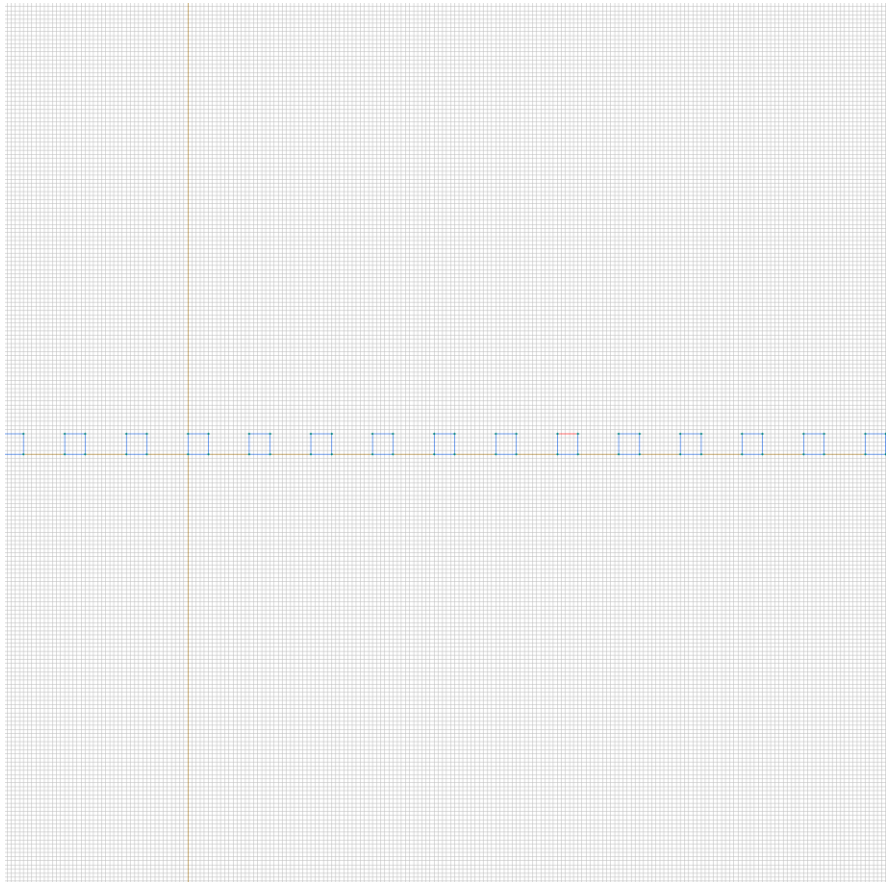
Tangential field: $H_t=0.05 \cdot 1e6$ [A/m]



Labelled objects: edge "h_10k"

There are (1) objects with this label

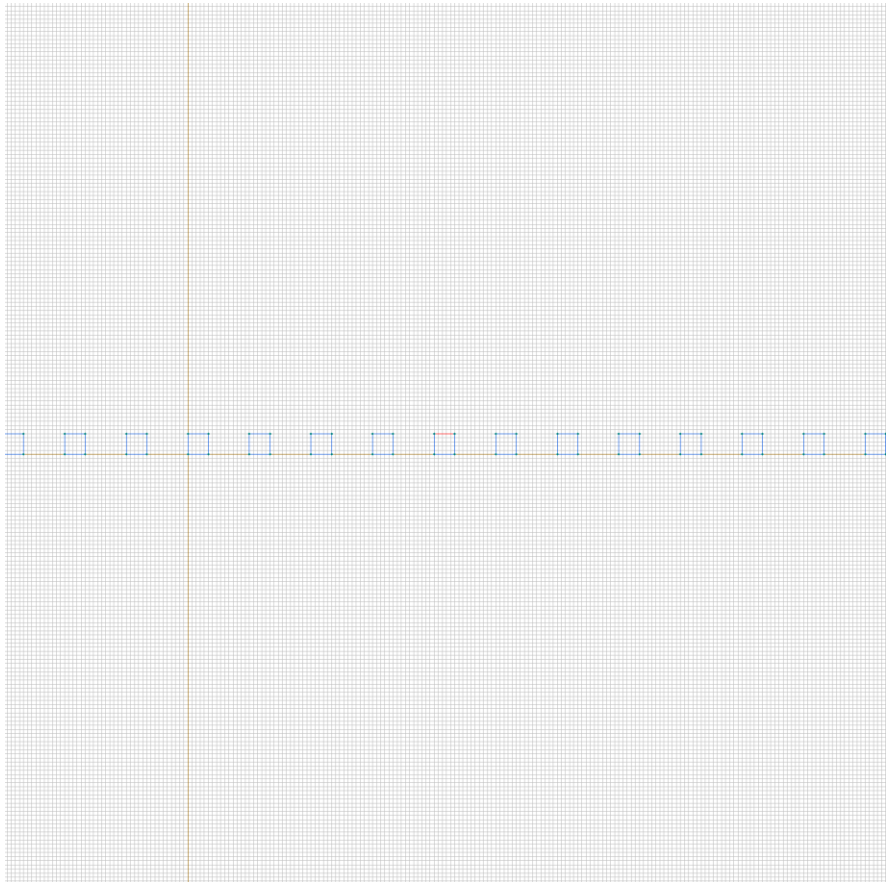
Tangential field: $H_t=0.01 * 1e6$ [A/m]



Labelled objects: edge "h_2k"

There are (1) objects with this label

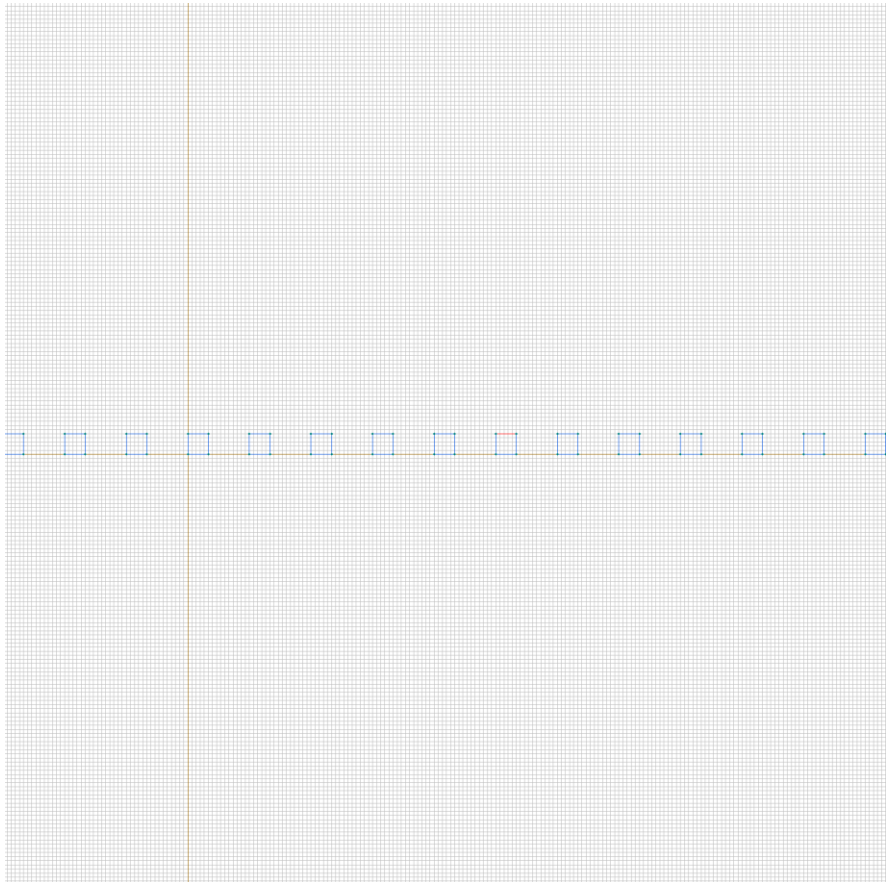
Tangential field: $H_t=0.002*1e6$ [A/m]



Labelled objects: edge "h_5k"

There are (1) objects with this label

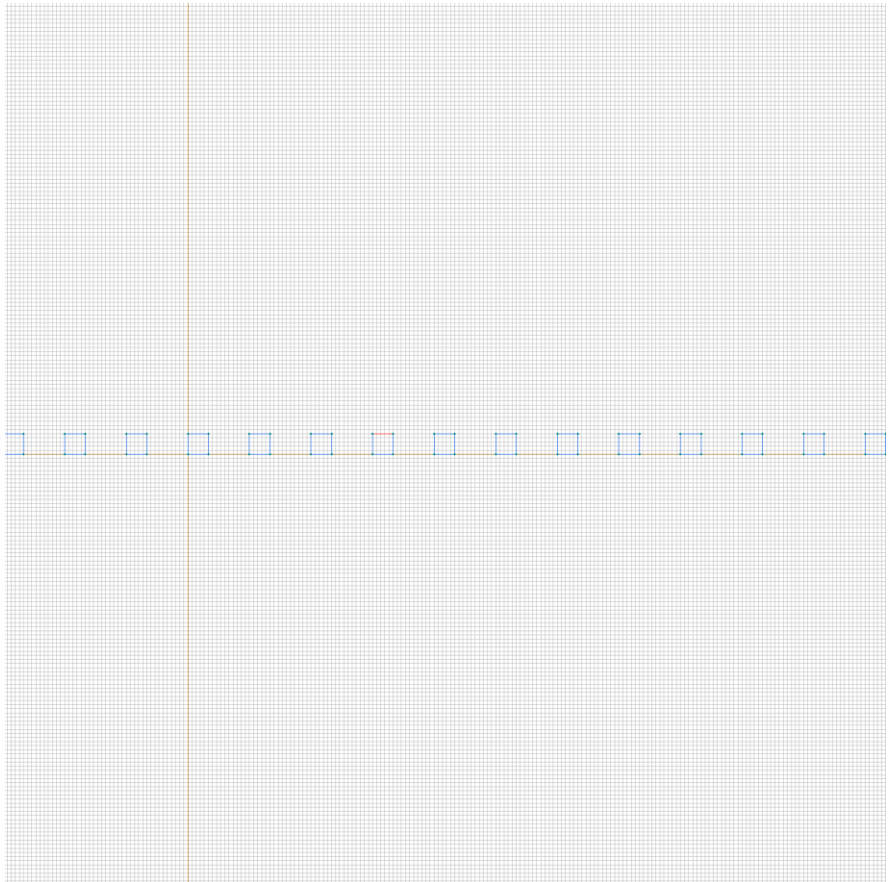
Tangential field: $H_t=0.005*1e6$ [A/m]



Labelled objects: edge "h_1k"

There are (1) objects with this label

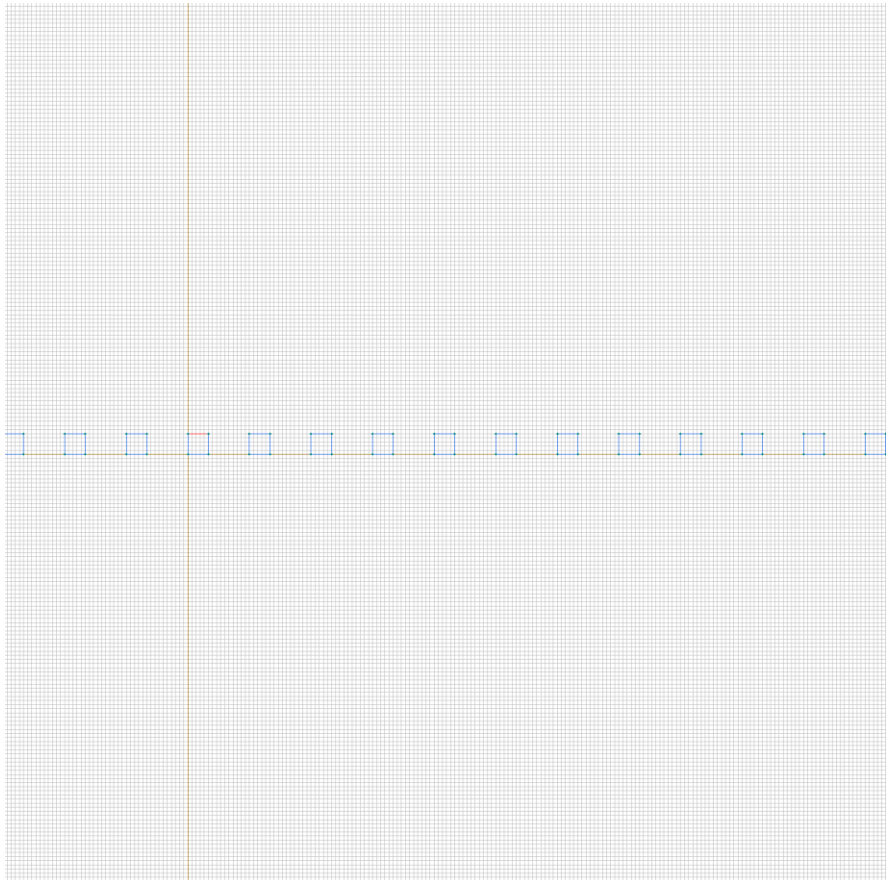
Tangential field: $H_t=0.001*1e6$ [A/m]



Labelled objects: edge "h_100"

There are (1) objects with this label

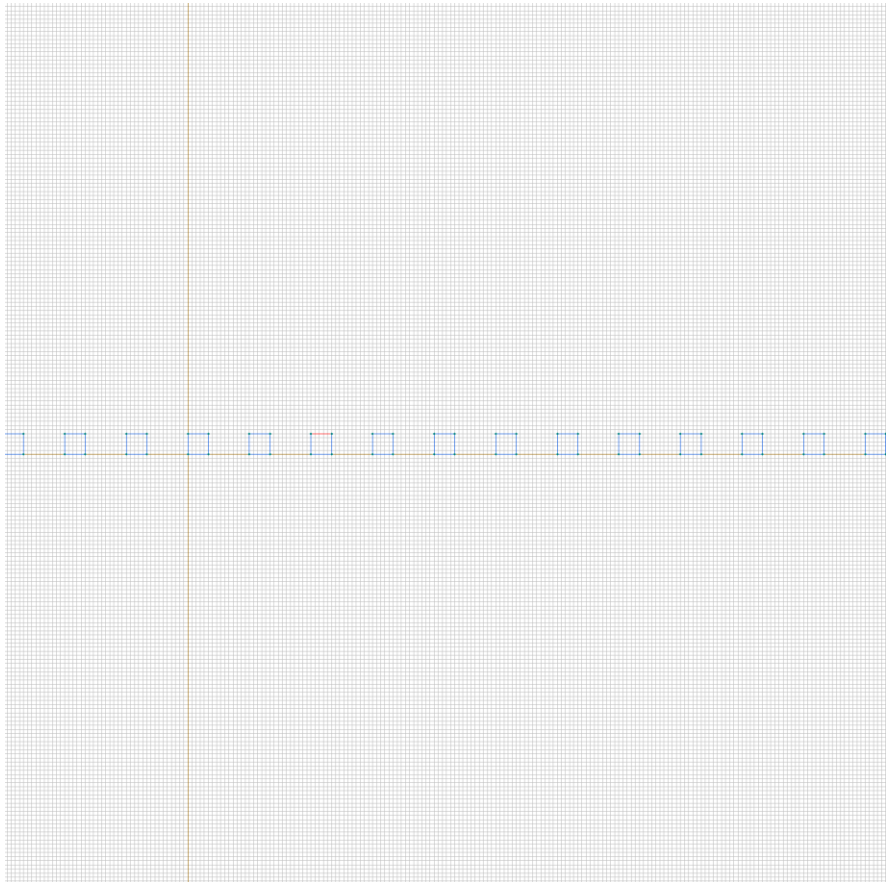
Tangential field: $H_t=0.0001*1e6$ [A/m]



Labelled objects: edge "h_500"

There are (1) objects with this label

Tangential field: $H_t=0.0005*1e6$ [A/m]



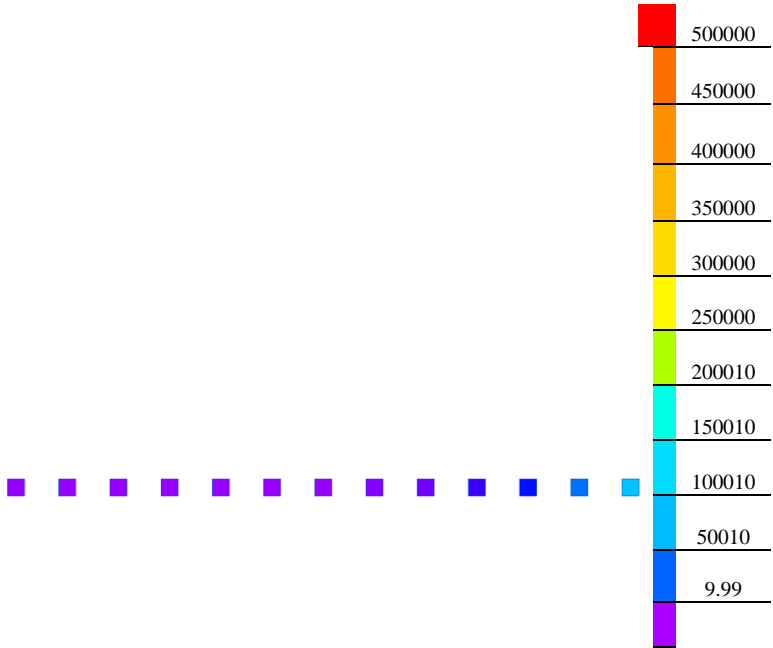
Results

Field lines



Results

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



Nonlinear dependencies

Table 2. BH-curve

B [T]	H [A/m]
0	0
0.0506	48
0.1046	99
0.1655	155
0.2367	218
0.3217	292
0.4222	378
0.5336	476
0.6496	585
0.7639	705
0.87	836
0.963	975
1.0431	1123
1.1117	1276
1.1702	1433
1.22	1592
1.2626	1752
1.2995	1918
1.3321	2098
1.3618	2296
1.39	2520
1.4181	2777
1.4464	3078
1.4754	3437
1.5054	3865

[Problem info](#) [Geometry model](#) [Labelled Objects](#) [Results](#) [Nonlinear dependencies](#)

1.5367	4377
1.5694	4984
1.6032	5699
1.6377	6535
1.6723	7505
1.7067	8621
1.7402	9889
1.7725	11284
1.8033	12775
1.832	14329
1.8583	15916
1.882	17518
1.9032	19183
1.9222	20977
1.9393	22961
1.955	25200
1.9695	27767
1.9832	30781
1.9968	34370
2.0105	38650
2.025	43770
2.0406	49840
2.0574	56990
2.0754	65350
2.0946	75050
2.115	86210
2.1367	98990
2.1599	113690
2.1852	130610
2.2129	150080
2.2433	172420

Problem info	Geometry model	Labelled Objects	Results	Nonlinear dependencies
2.2766	197610			
2.3112	224320			
2.3451	250910			
2.3765	275720			
2.4033	297090			
2.4253	314580			
2.4479	332600			
2.4782	356700			
2.5232	392500			
2.59	445600			
2.6834	520000			
2.7999	612700			
2.9337	719100			
3.079	834700			
3.23	954900			