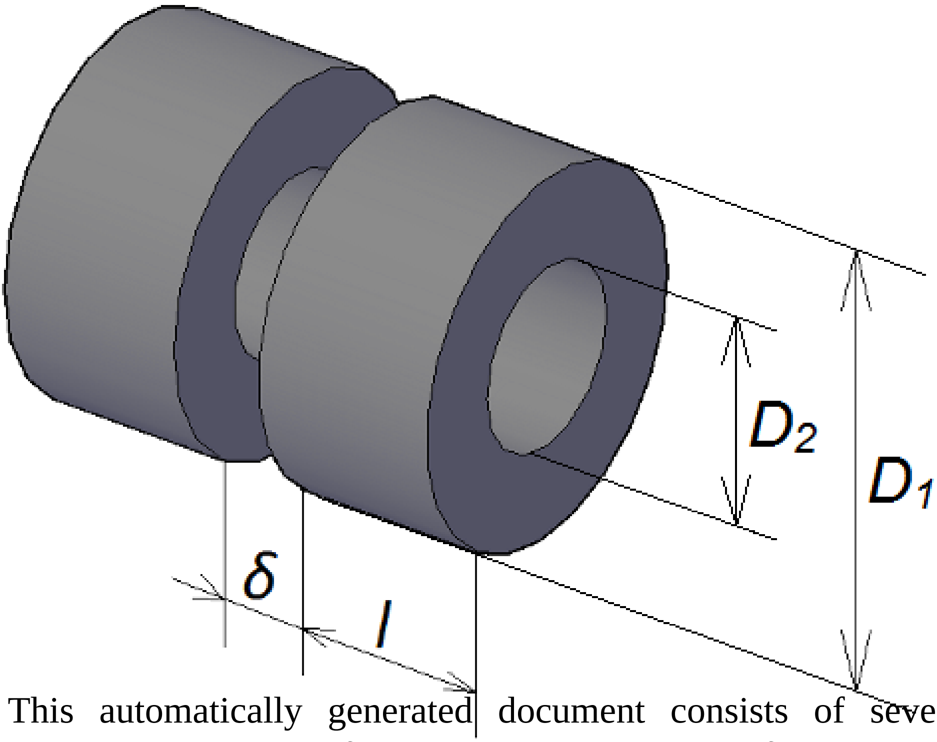
QuickField simulation report

Attraction of the ring-shaped magnets

Two coaxial permanent ring-shaped magnets are pulled to each other. Calculate the pulling force between two coaxial ring-shaped permanent magnets.



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/two_ring_pm_pull.htm

Problem info

Problem type: Stress Analysis
Geometry model class: Axisymmetric
Problem database file names:

- Problem: *Coupl2SA.pbm*
- Geometry: *Coupl2.mod*
- Material Data: *Coupl2sa.dsa*
- Material Data 2 (library): *none*
- Electric circuit: *none*

Results taken from other problems:

- *Temperature Field: Coupl2ht.pbm*

Geometry model

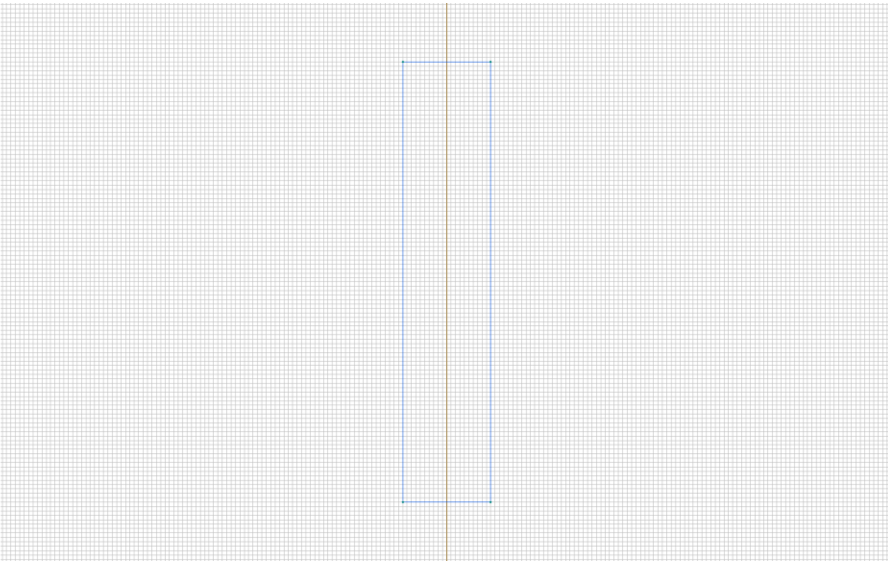


Table 1. Geometry model statistics

	With Label	Total
Blocks	1	1
Edges	3	4
Vertices	0	4

Number of nodes: 5106.

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)

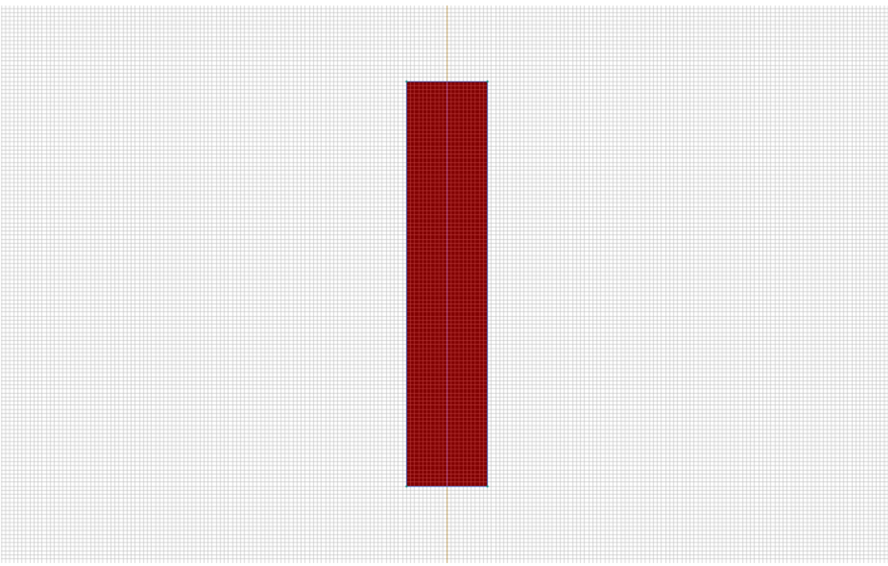
Blocks:	Edges:	Vertices:
• cylinder •	• no axial displ. • outer • inner •	

Detailed information about each label is listed below.

Labelled objects: block "cylinder"

There are (1) objects with this label

Young's moduli: Ex=300000000000 [N/m2], Ey=300000000000 [N/m2], Ez=300000000000 [N/m2]
Poisson's ratios: v_yx=0.3, v_zx=0.3, v_zy=0.3
Shear modulus: G_xy=115380000000 [N/m2]
Coefficient of thermal expansion: a_x=9.99999997475243E-07 [1/K], a_y=9.99999997475243E-07 [1/K], a_z=9.99999997475243E-07 [1/K]
Difference of temperature: DeltaT=0 [K]
Allowable tension: sigma_x=0 [N/m2], sigma_y=0 [N/m2]
Allowable compression: sigma_x=0 [N/m2], sigma_y=0 [N/m2]
Allowable shear: tau_xy(+)=0 [N/m2], tau_xy(-)=0 [N/m2]



Labelled objects: edge "no axial displ."

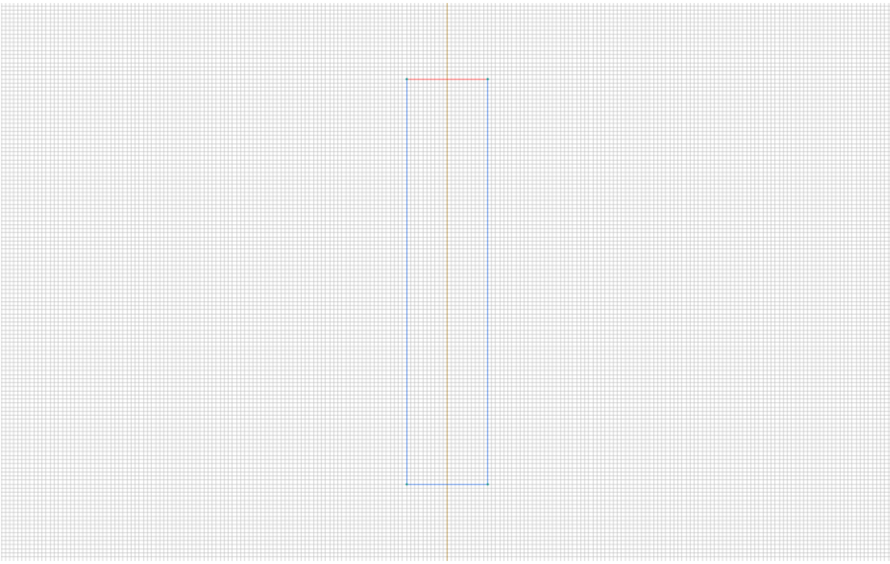
There are (2) objects with this label

Prescribed displacement: d_x=0 [m]
Surface force: f_y=0 [N/m2]

Labelled objects: edge "outer"

There are (1) objects with this label

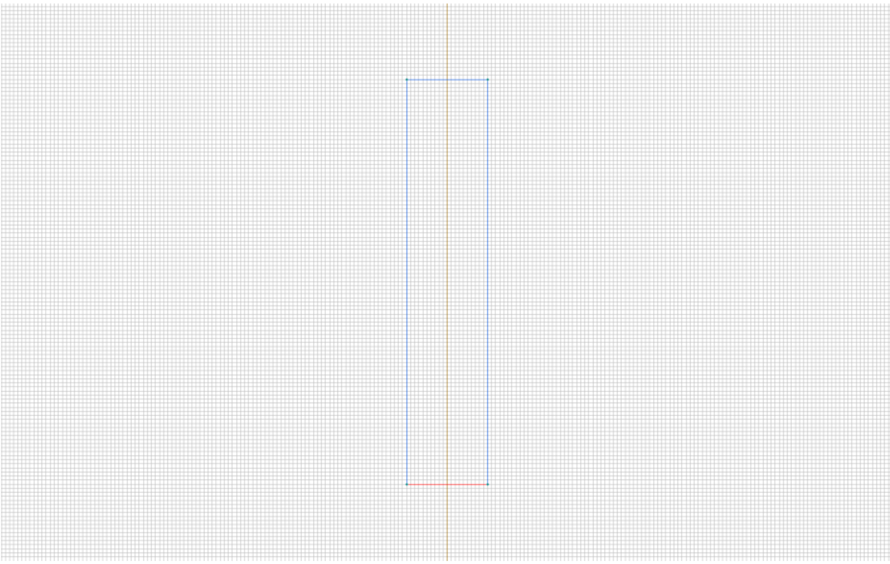
Surface force: f_x=0 [N/m2]
Surface force: f_y=0 [N/m2]



Labelled objects: edge "inner"

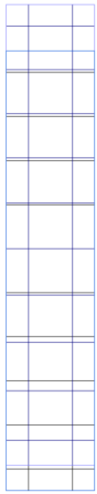
There are (1) objects with this label

Surface force: f_x=0 [N/m2]
Surface force: f_y=0 [N/m2]
Normal pressure: P=1000000 [N/m2]



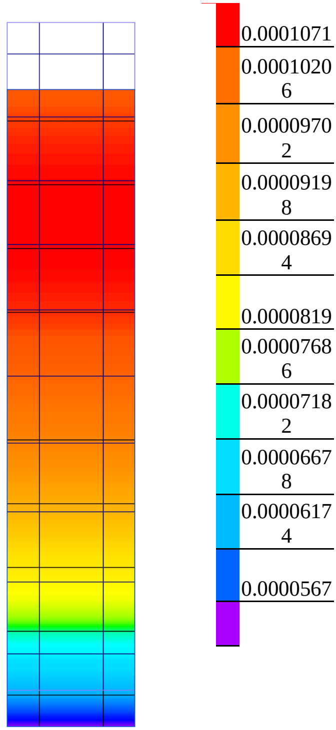
Results

Field lines



Results

Color map of Displacement [m]



Nonlinear dependencies

No non-linear dependencies are used in this problem data