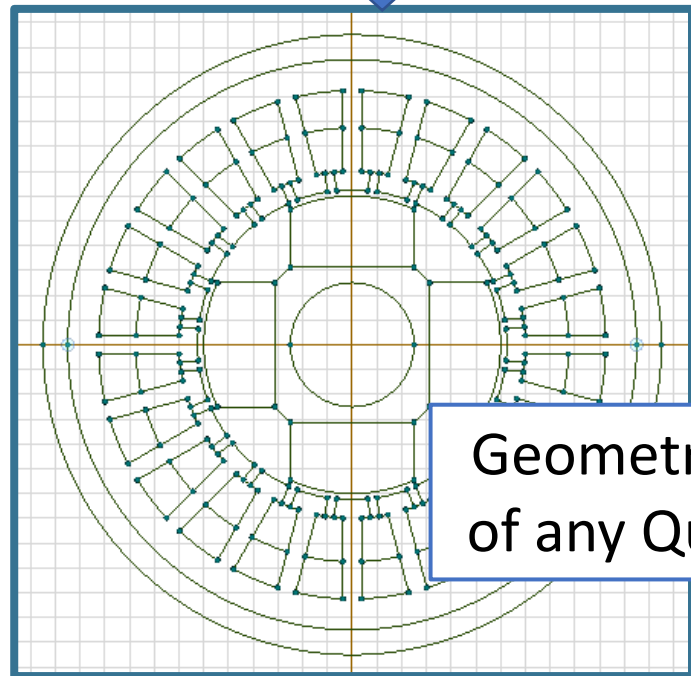
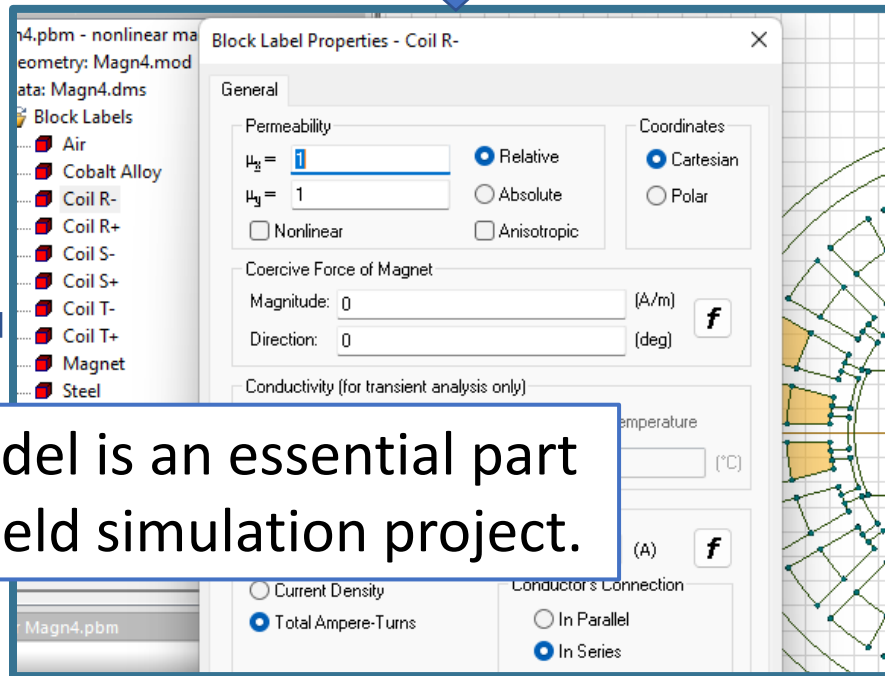


QuickField Model Editor 2D

Problem setup

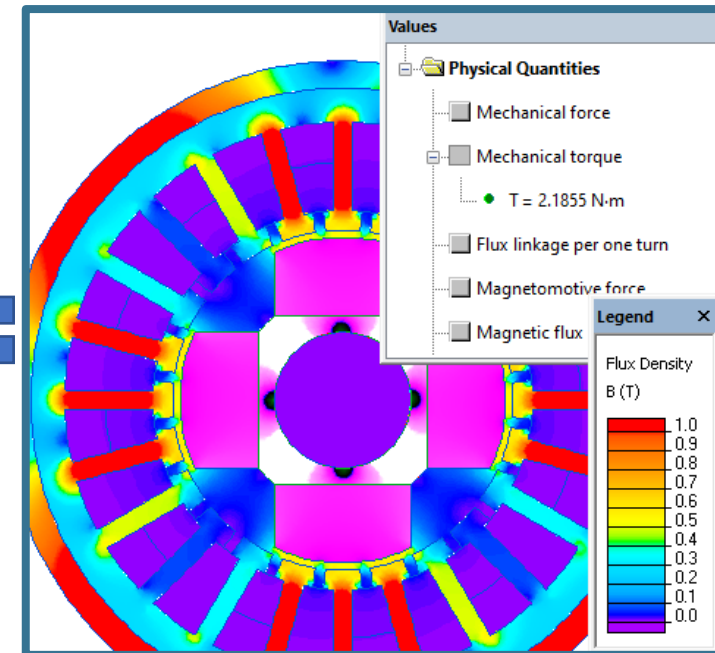


Model editor



**Material physical properties,
field sources and
boundary conditions**

Geometry model is an essential part
of any QuickField simulation project.



Results analysis

File Edit View Tools Window Help

- New Problem... Ctrl+N
- Open Problem...
- New File
- Open File
- Print Setup...
- 1 Magn2.pbm
- Exit

Start QuickField and locate the problem file (.pbm) you want to work with or create a new one.

Open

Public Documents > QuickField 6.6 Examples

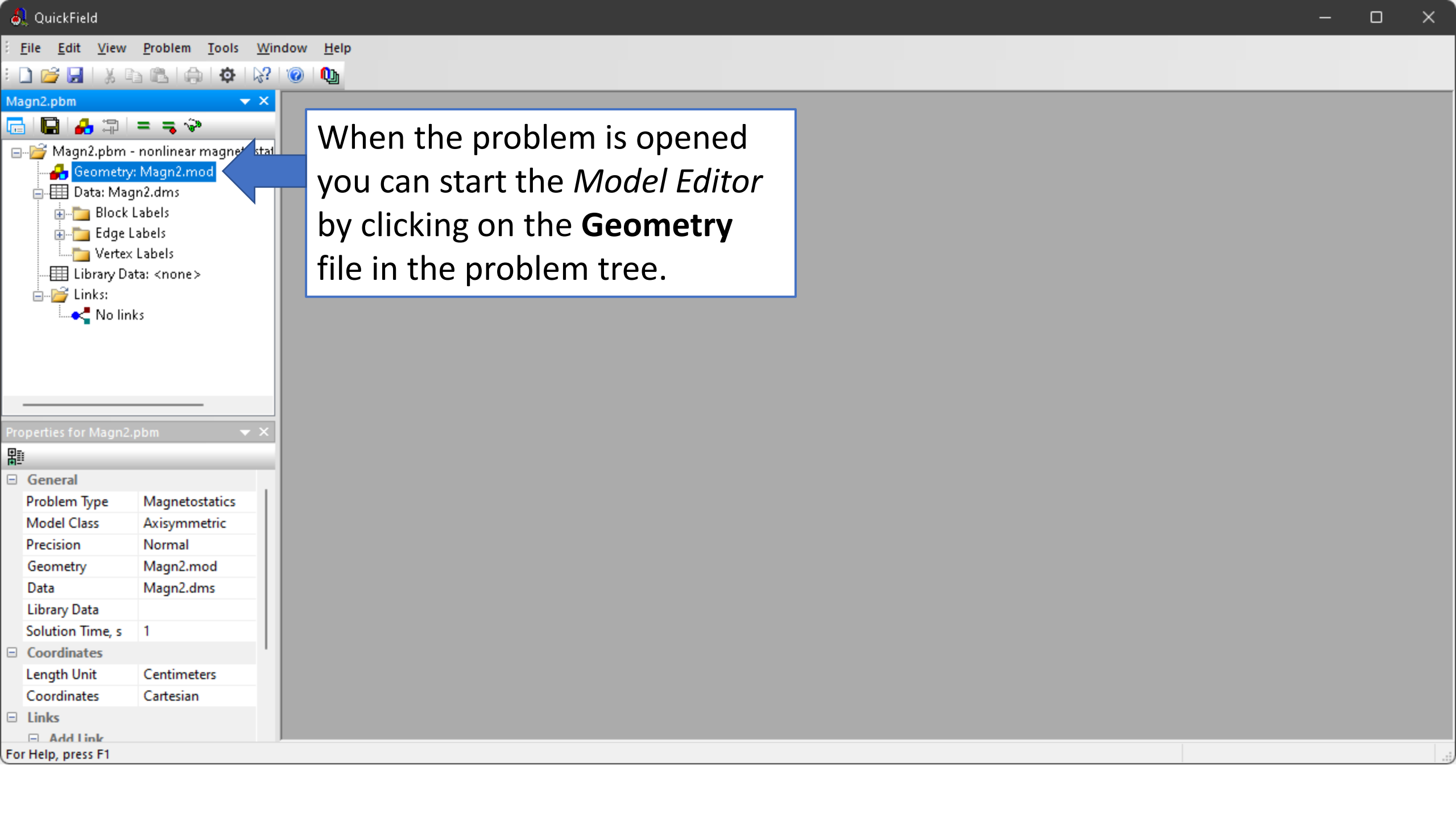
Search QuickField 6.6 Examp...

Organize New folder

Name	Date modified	Type	Size
iso_10211_2007_case3.pbm	17/12/2019 22:05	PBM File	1 KB
iso_10211_2007_case4.pbm	26/11/2018 13:11	PBM File	1 KB
laminated_core_iron_loss.pbm	26/11/2018 13:11	PBM File	1 KB
Magn1.pbm	26/11/2018 13:11	PBM File	1 KB
Magn2.pbm	26/11/2018 13:11	PBM File	1 KB
Magn3.pbm	26/11/2018 13:11	PBM File	1 KB
Magn4.pbm	26/11/2018 13:11	PBM File	1 KB

File name: Magn2.pbm QuickField Problems (*.pbm)

Open Cancel



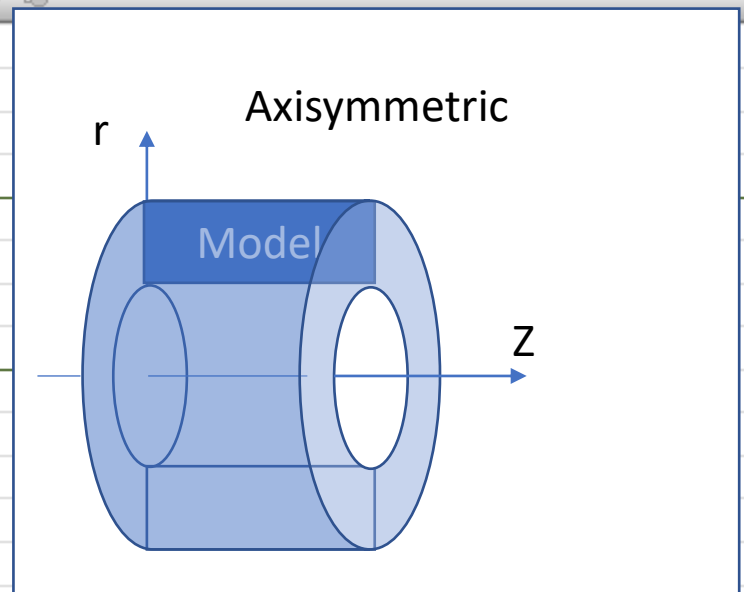
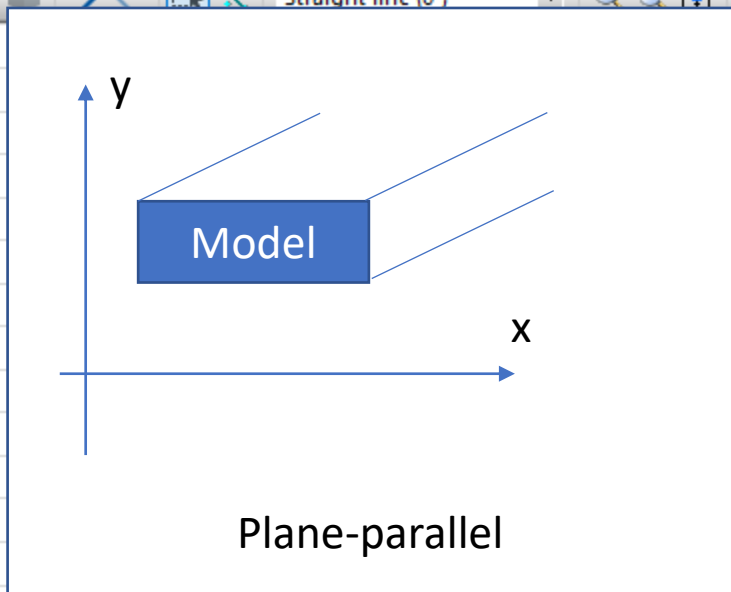
When the problem is opened you can start the *Model Editor* by clicking on the **Geometry** file in the problem tree.

Magn2.pbm - nonlinear magnetostat

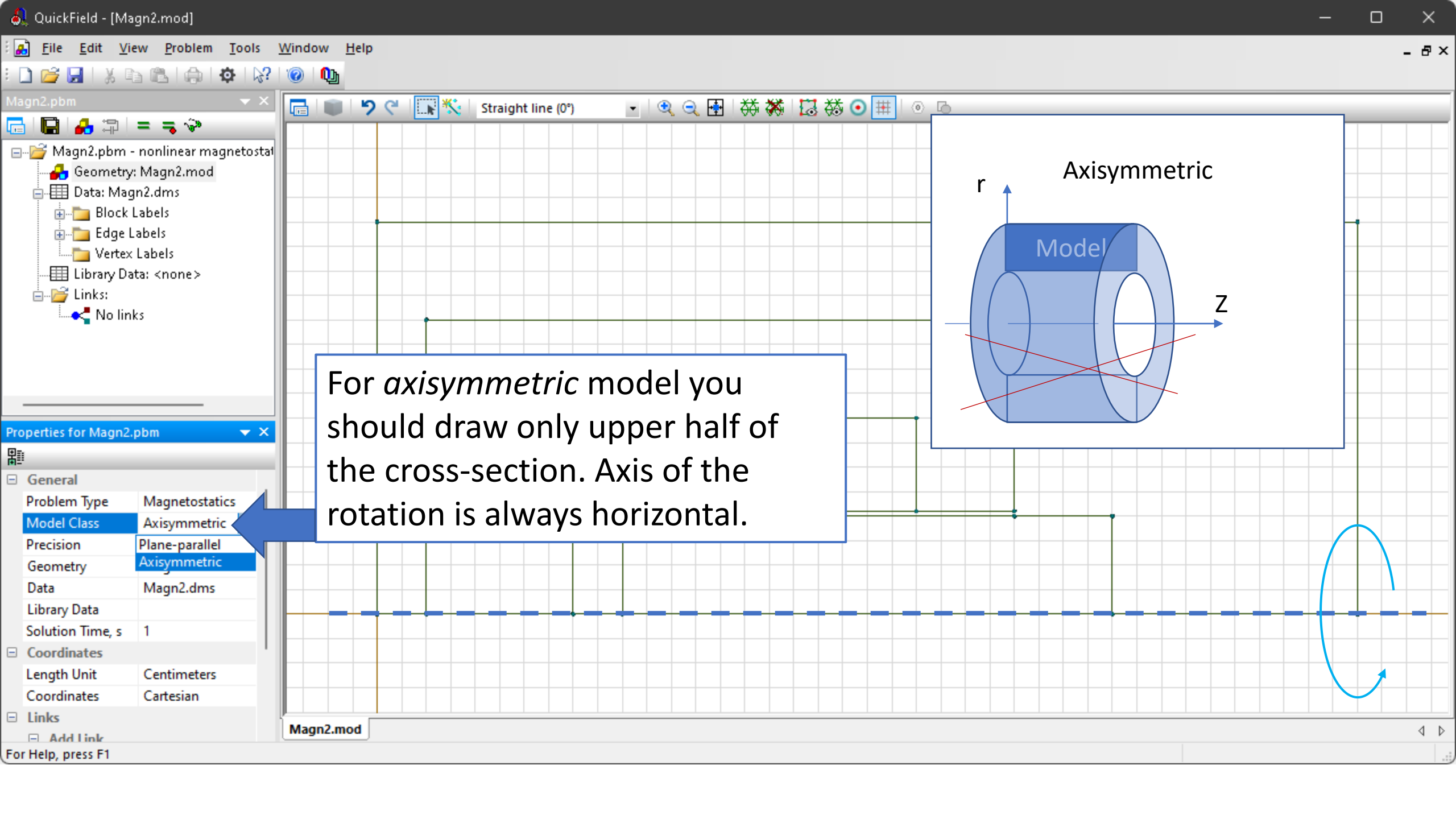
- Geometry: Magn2.mod
- Data: Magn2.dms
 - Block Labels
 - Edge Labels
 - Vertex Labels
- Library Data: <none>
- Links:
 - No links

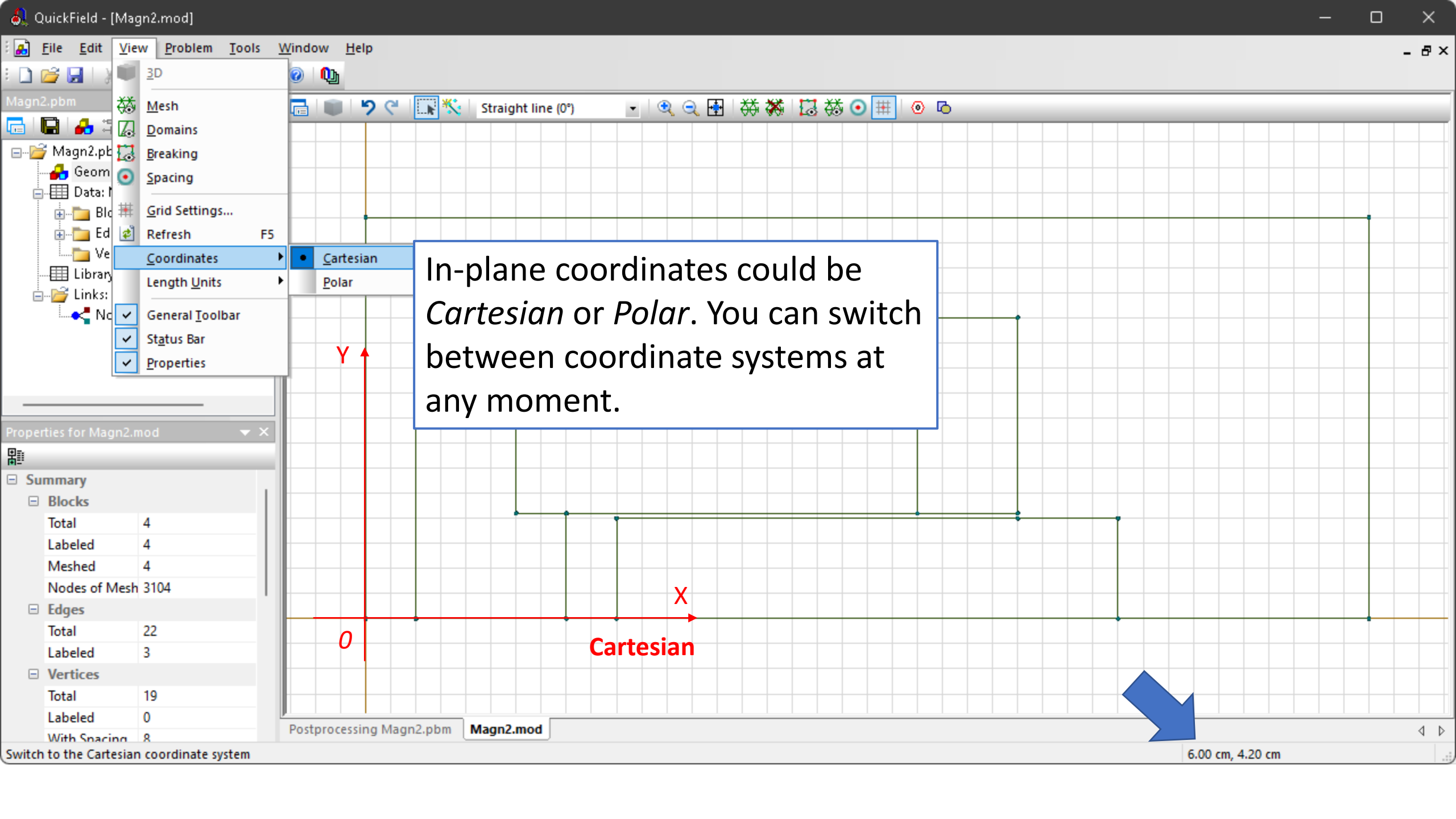
Properties for Magn2.pbm

General	
Problem Type	Magnetostatics
Model Class	Axisymmetric
Precision	Plane-parallel
Geometry	Axisymmetric
Data	Magn2.dms
Library Data	
Solution Time, s	1
Coordinates	
Length Unit	Centimeters
Coordinates	Cartesian
Links	
Add Link	



Depending on the model class the 2D model represents a cross-section of either infinitely long or cylindrical body.





In-plane coordinates could be *Cartesian* or *Polar*. You can switch between coordinate systems at any moment.

Y

X

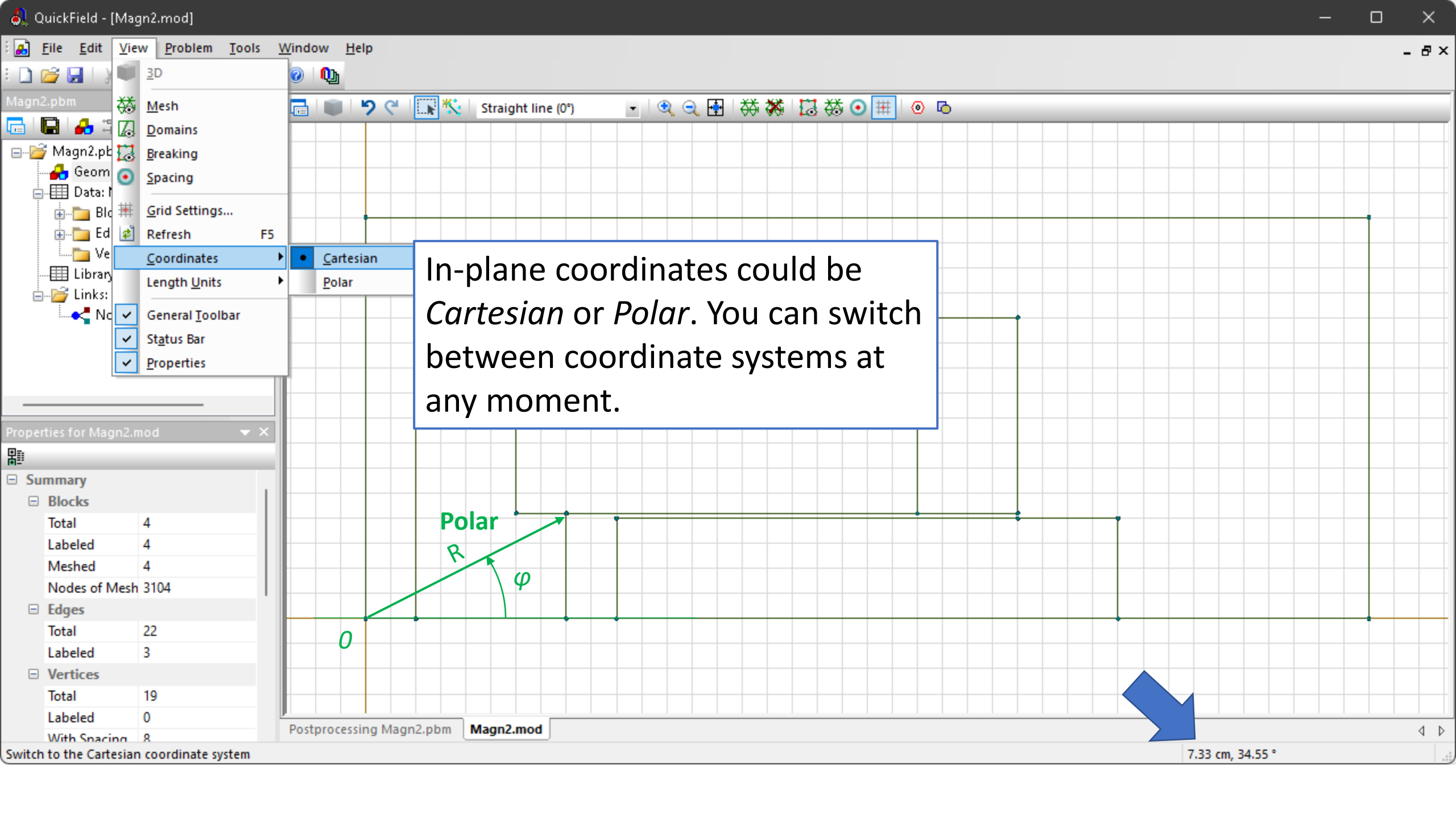
0

Cartesian

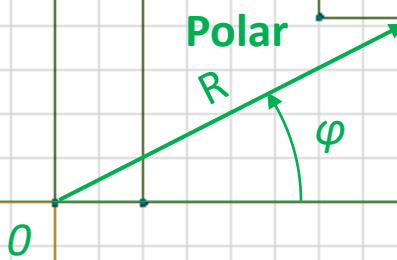
Postprocessing Magn2.pbm Magn2.mod

6.00 cm, 4.20 cm

Switch to the Cartesian coordinate system



In-plane coordinates could be *Cartesian* or *Polar*. You can switch between coordinate systems at any moment.



Postprocessing Magn2.pbm **Magn2.mod**

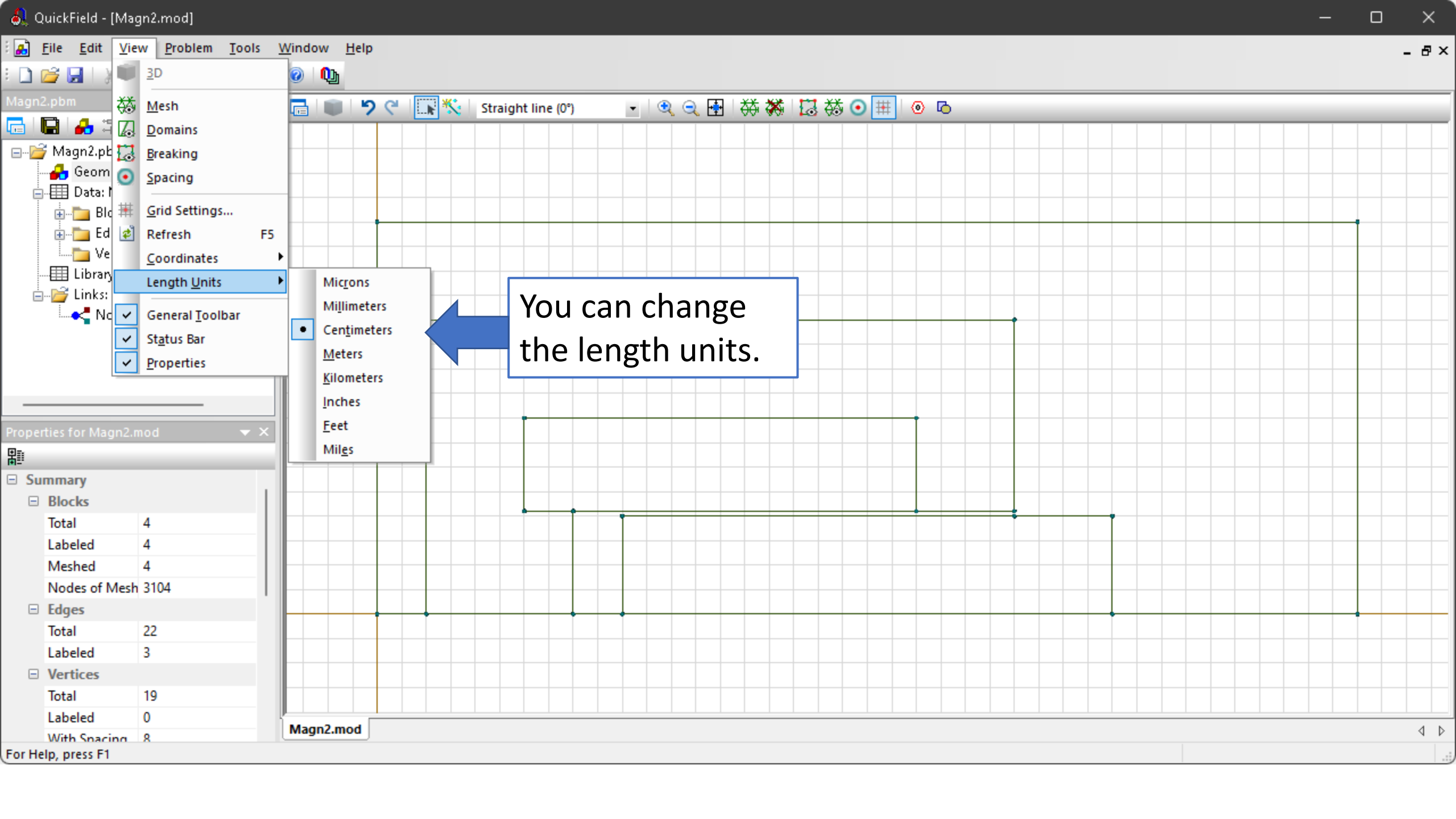
7.33 cm, 34.55 °

Switch to the Cartesian coordinate system

- Magn2.pbm
 - Geom
 - Data: M
 - Blc
 - Ed
 - Ve
 - Library
 - Links: No
- 3D
 - Mesh
 - Domains
 - Breaking
 - Spacing
 - Grid Settings...
 - Refresh F5
 - Coordinates
 - Cartesian
 - Polar
 - Length Units
 - General Toolbar
 - Status Bar
 - Properties

Properties for Magn2.mod

- Summary
- Blocks
 - Total 4
 - Labeled 4
 - Meshed 4
 - Nodes of Mesh 3104
- Edges
 - Total 22
 - Labeled 3
- Vertices
 - Total 19
 - Labeled 0
 - With Spacing 8

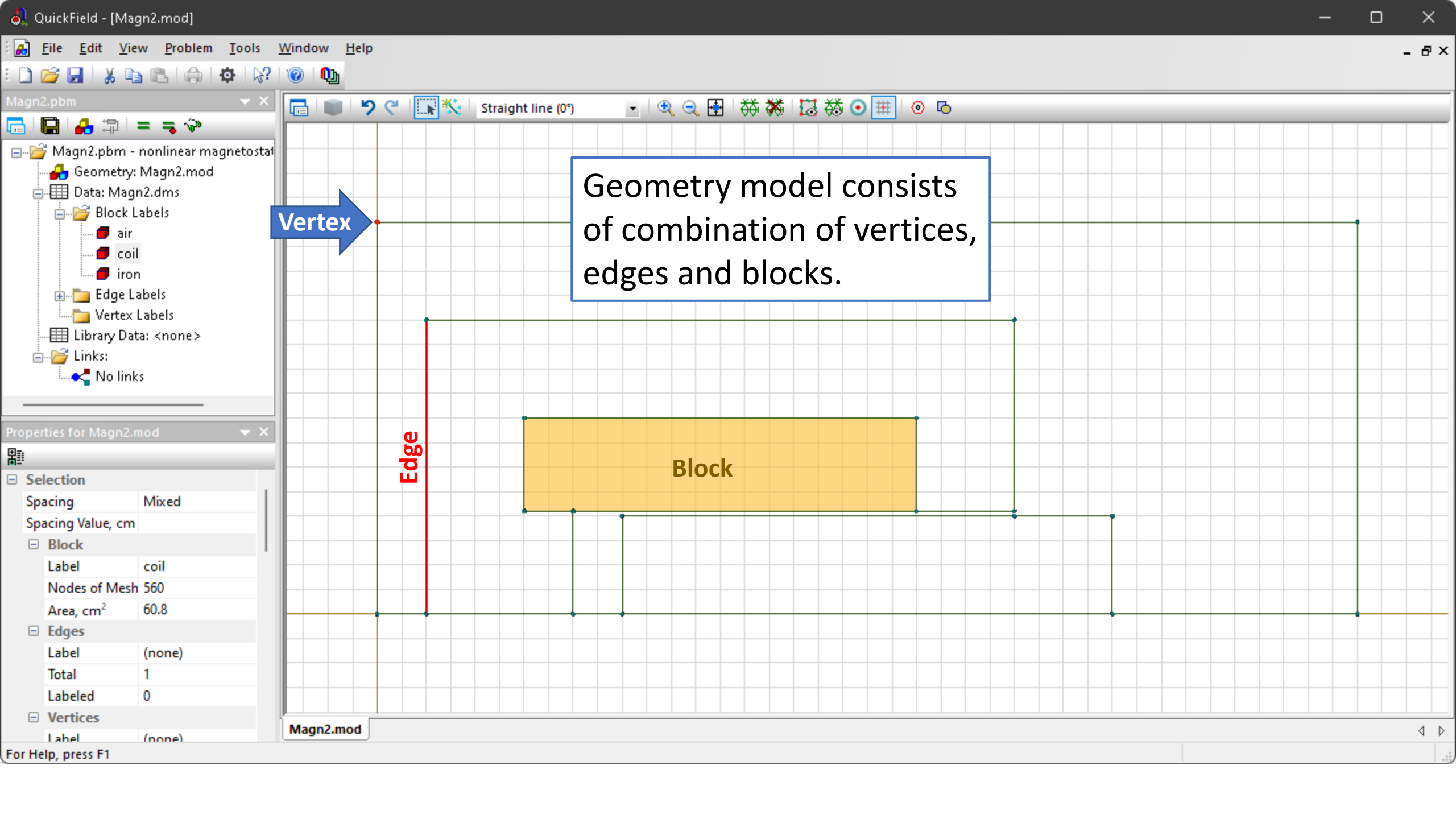


You can change the length units.

- Microns
- Millimeters
- Centimeters
- Meters
- Kilometers
- Inches
- Feet
- Milgs

Properties for Magn2.mod

Summary	
Blocks	
Total	4
Labeled	4
Meshed	4
Nodes of Mesh	3104
Edges	
Total	22
Labeled	3
Vertices	
Total	19
Labeled	0
With Spacing	8





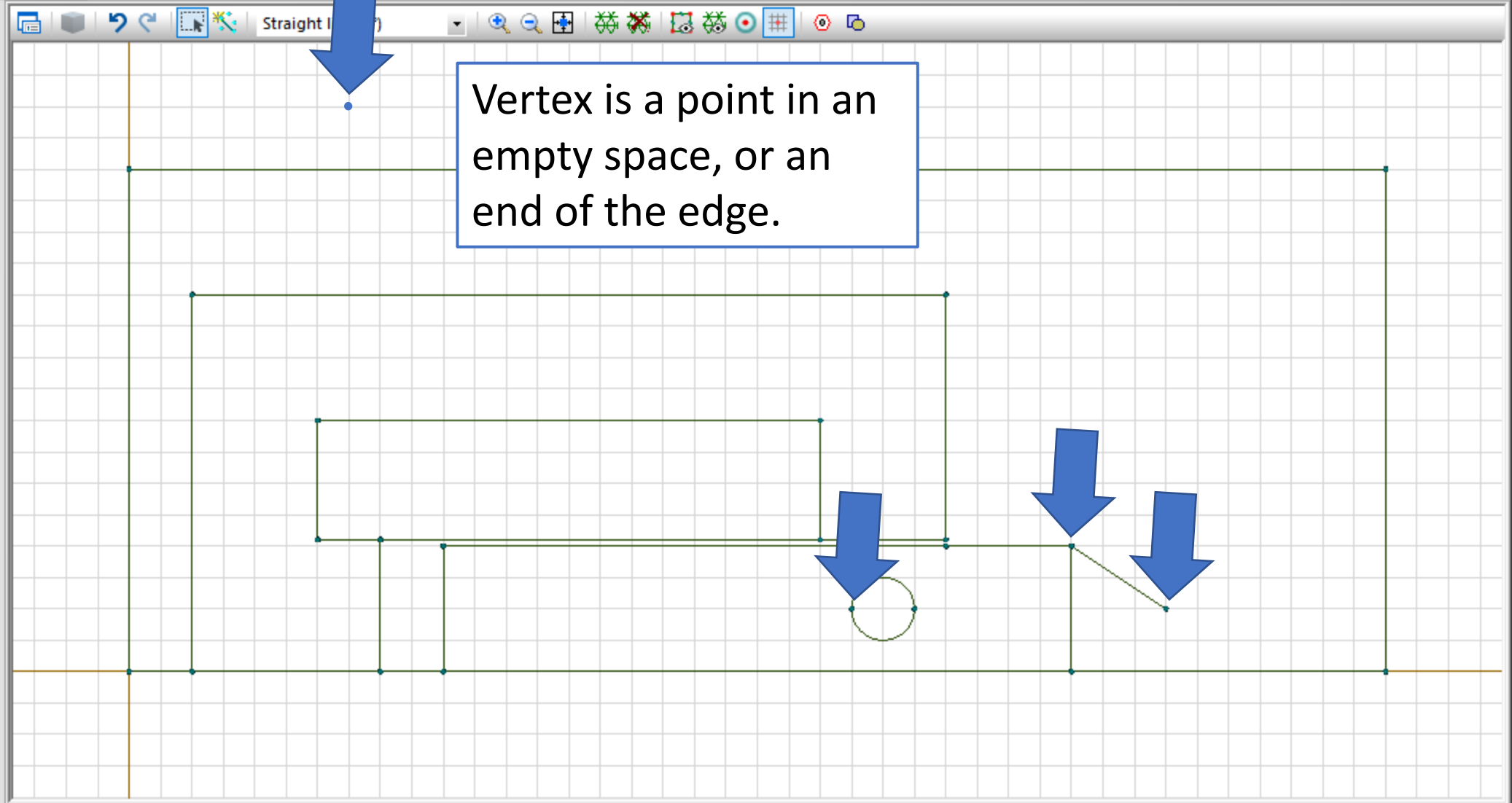
Magn2.pbm

- Magn2.pbm - nonlinear magnetostat
 - Geometry: Magn2.mod
 - Data: Magn2.dms
 - Library Data: <none>
 - Links:
 - No links

Properties for Magn2.mod

Summary

Blocks	
Total	5
Labeled	5
Meshed	5
Nodes of Mesh	3343
Edges	
Total	25
Labeled	3
Vertices	
Total	22
Labeled	0
With Spacing	8



Vertex is a point in an empty space, or an end of the edge.

Magn2.mod



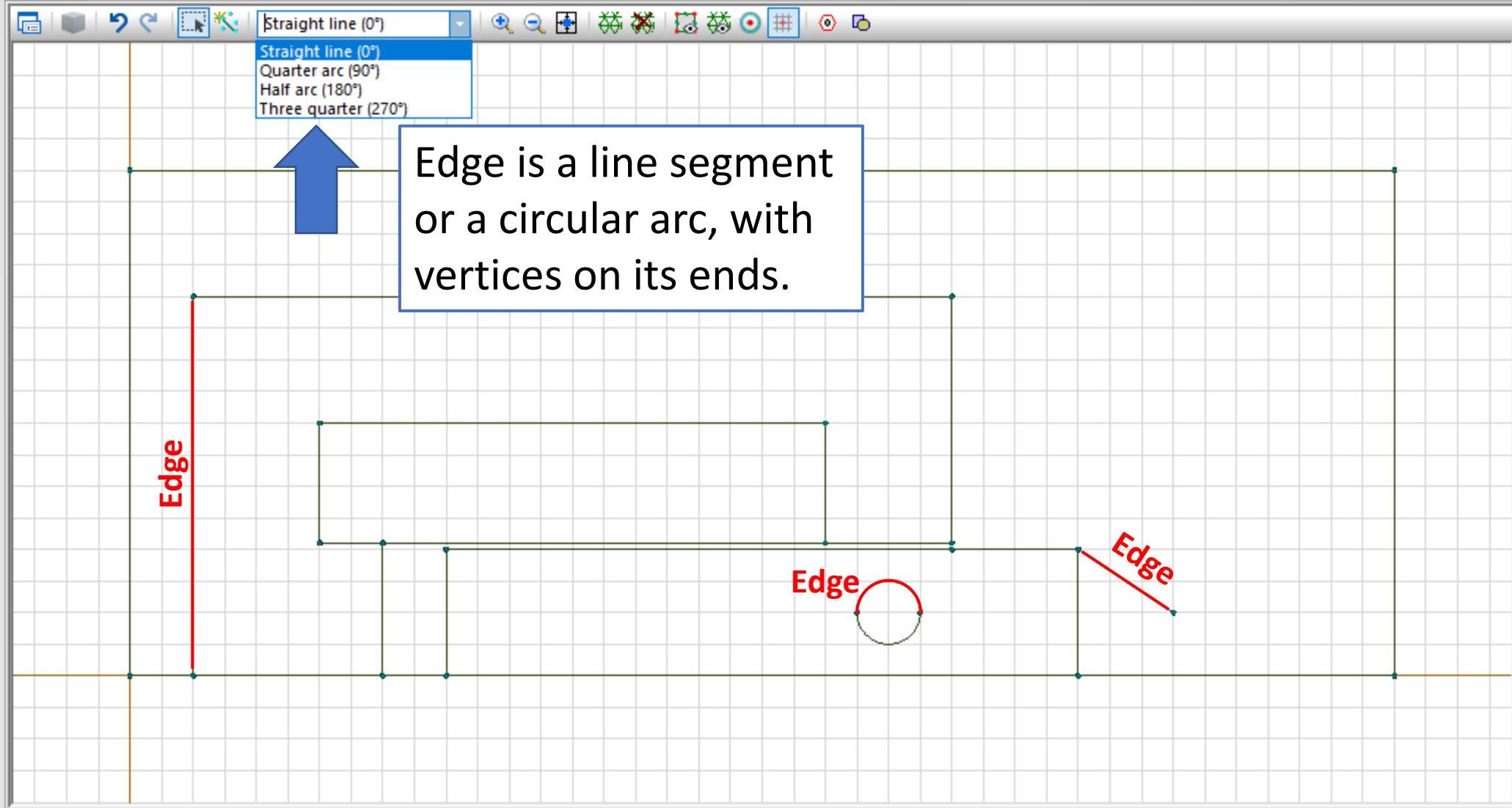
Magn2.pbm

- Magn2.pbm - nonlinear magnetostat
 - Geometry: Magn2.mod
 - Data: Magn2.dms
 - Library Data: <none>
 - Links:
 - No links

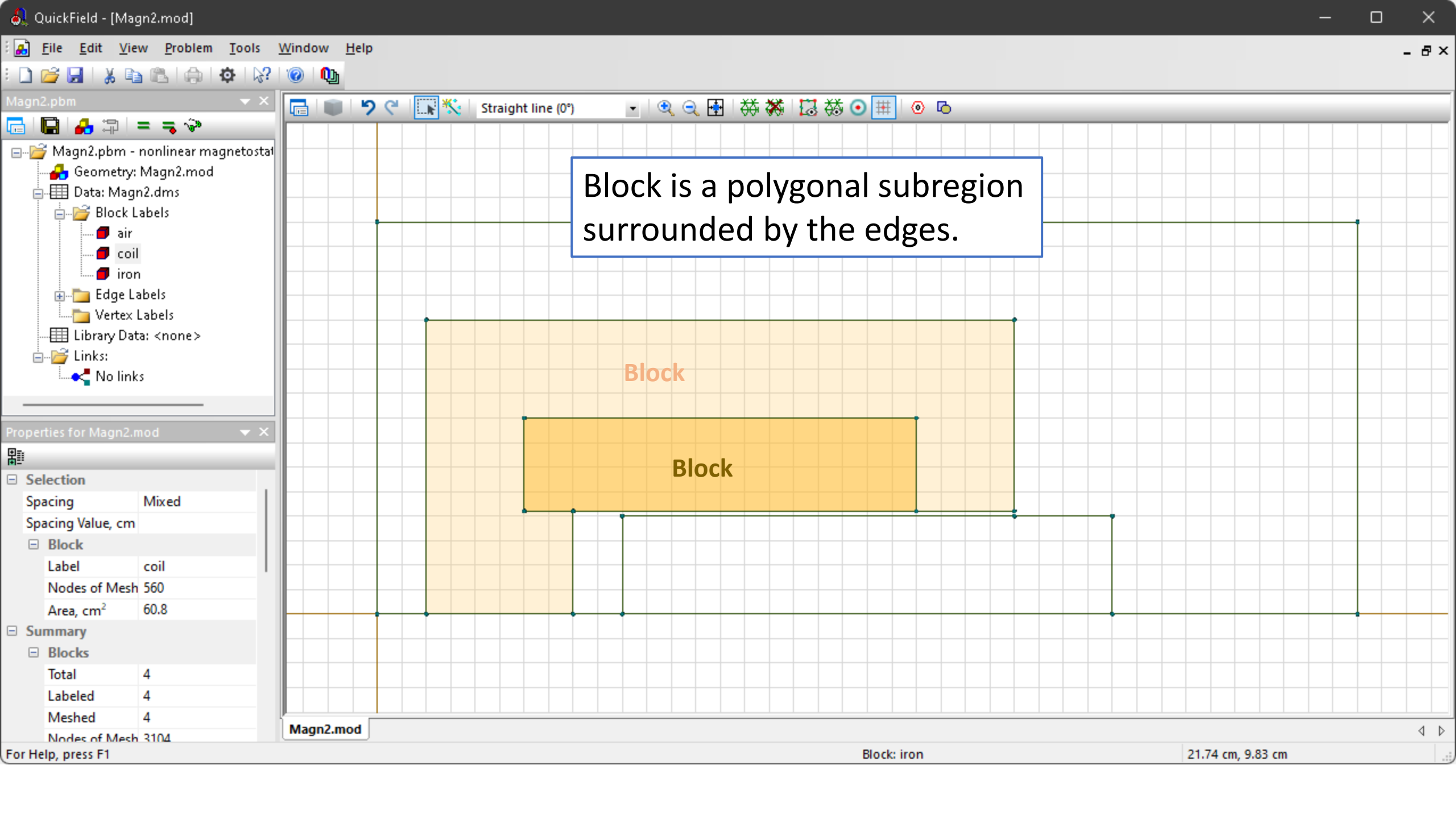
Properties for Magn2.mod

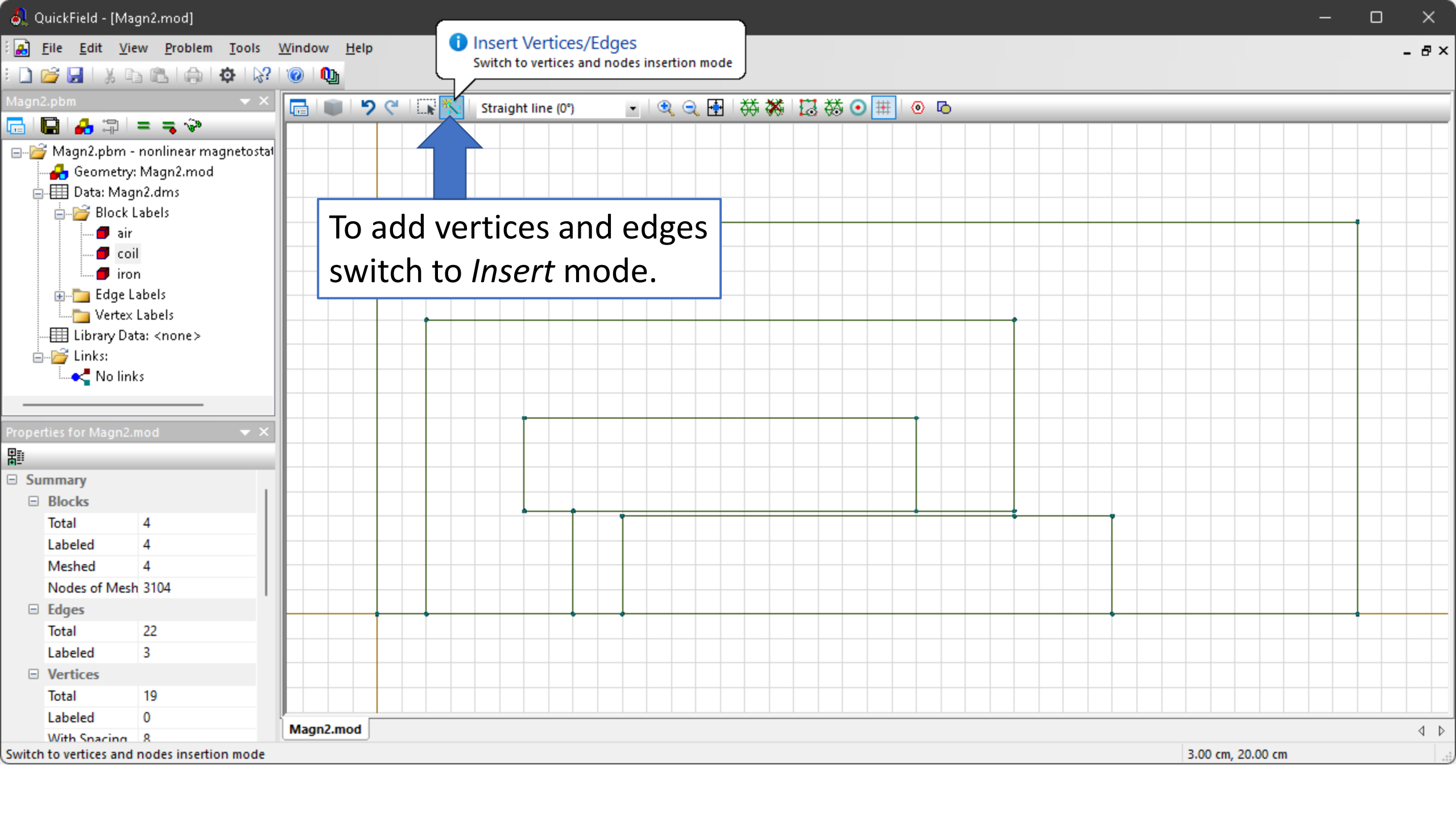
Summary

- Blocks
 - Total: 5
 - Labeled: 5
 - Meshed: 5
 - Nodes of Mesh: 3343
- Edges
 - Total: 25
 - Labeled: 3
- Vertices
 - Total: 22
 - Labeled: 0
 - With Spacing: 8



Magn2.mod





To add vertices and edges switch to *Insert* mode.

Insert Vertices/Edges
Switch to vertices and nodes insertion mode

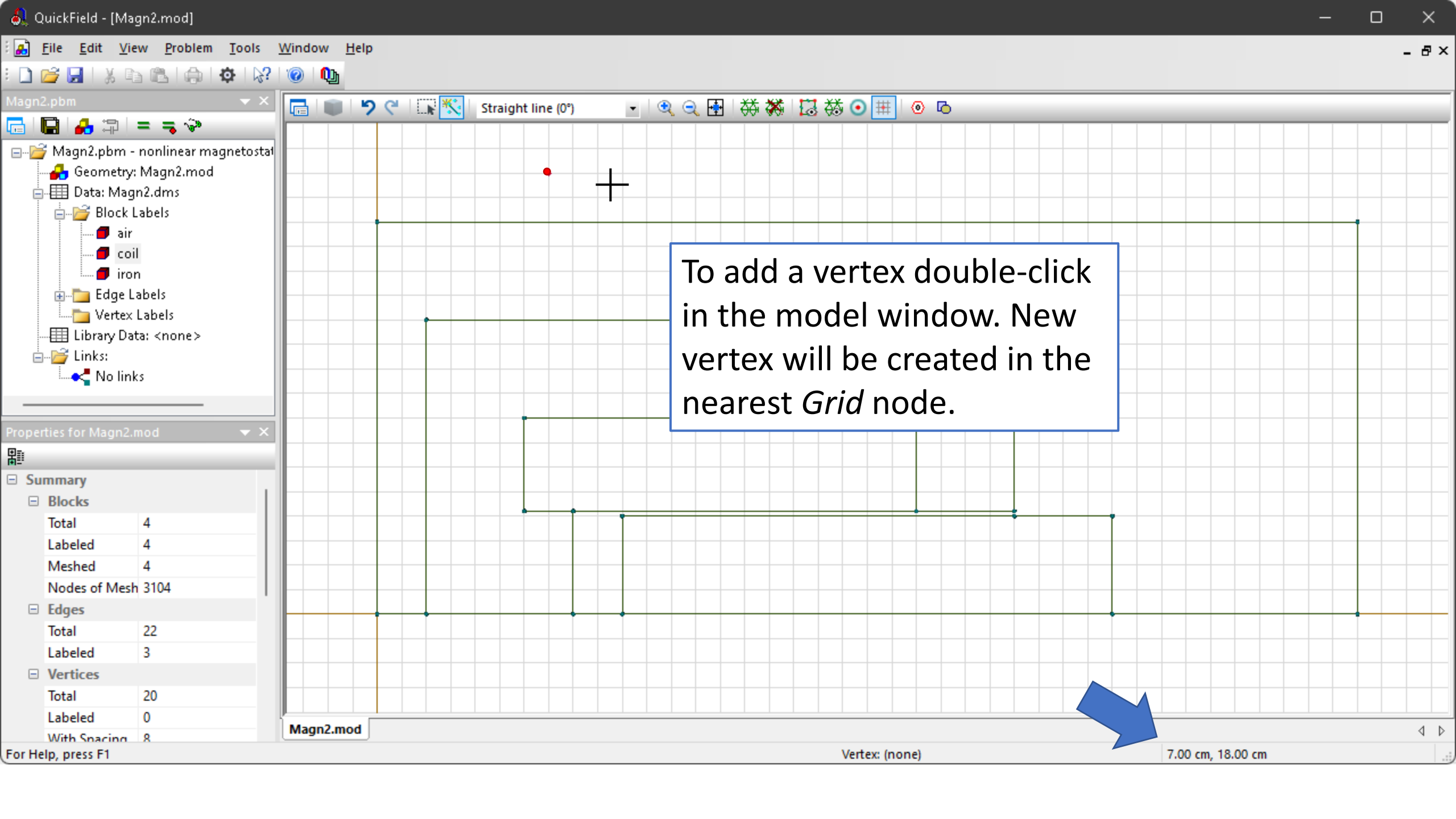
Properties for Magn2.mod

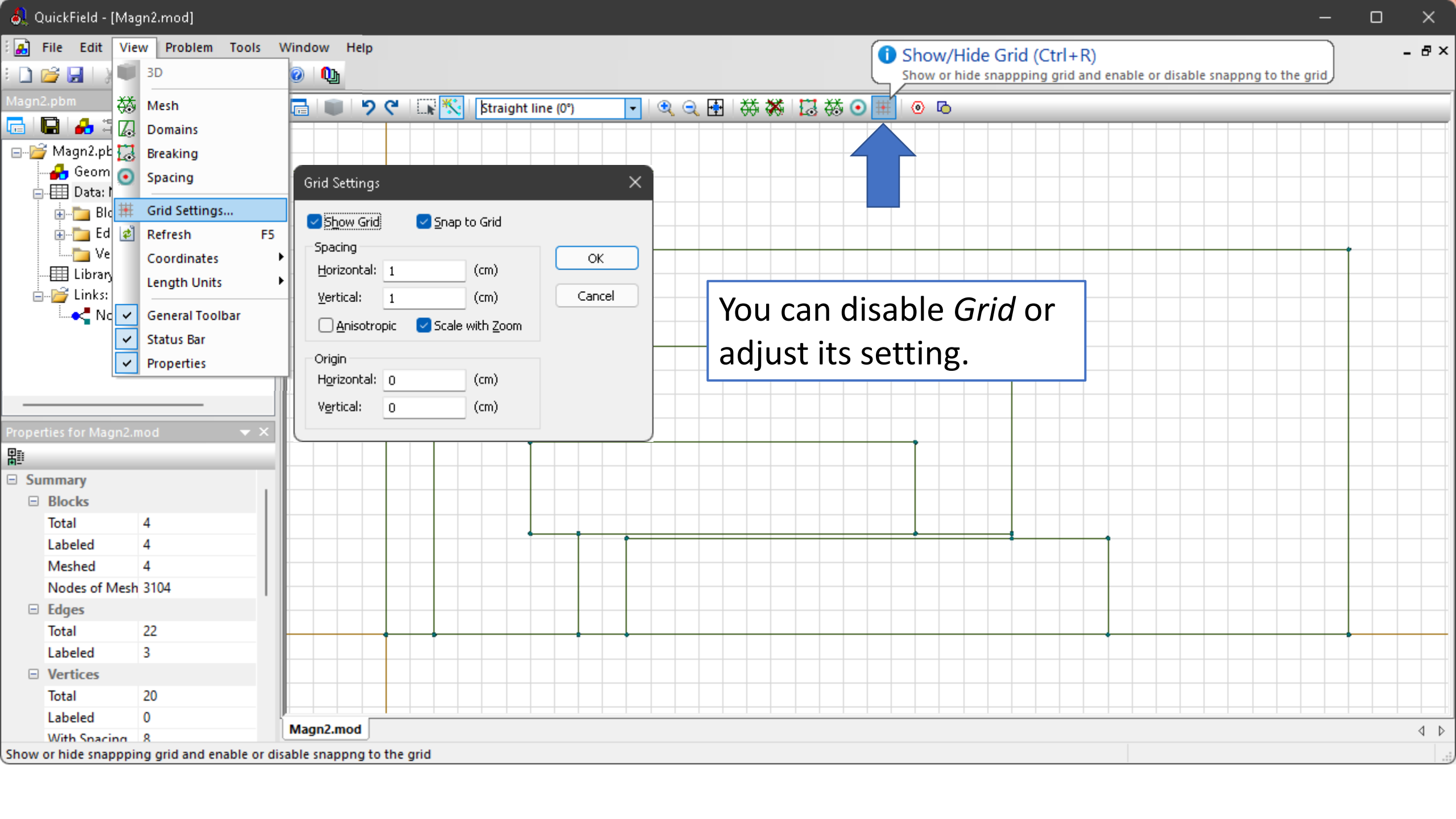
Summary

Blocks	
Total	4
Labeled	4
Meshed	4
Nodes of Mesh	3104
Edges	
Total	22
Labeled	3
Vertices	
Total	19
Labeled	0
With Spacing	8

Switch to vertices and nodes insertion mode

3.00 cm, 20.00 cm





File Edit View Problem Tools Window Help

- Undo Add Vertices Alt+Backspace; Ctrl+Z
- Redo Ctrl+Y
- Cut Ctrl+X; Shift+Delete
- Copy Ctrl+C; Ctrl+Insert
- Paste Ctrl+V; Shift+Insert
- Delete Selection Delete
- Duplicate Selection...
- Move Selection...
- Copy Visible Picture Ctrl+C
- Select All Ctrl+A
- Unselect All Ctrl+D
- Add Vertices...**
- Insert Mode Insert
- Build Mesh
- Remove Mesh
- Properties Alt+Enter
- Import from SolidWorks...
- Insert Shape...

Straight line (0°)



Adding New Vertices

z = 11.5 (cm) Add

r = 18 (cm) Close

To add a vertex in arbitrary place use **Edit > Add Vertices...**

Properties f

Summary

- Meshed 4
- Nodes of Mesh 3104
- Edges
 - Total 22
 - Labeled 3
- Vertices
 - Total 21
 - Labeled 0
 - With Spacing 8

Magn2.mod



Magn2.pbm

- Magn2.pbm - nonlinear magnetostat
 - Geometry: Magn2.mod
 - Data: Magn2.dms
 - Block Labels
 - Edge Labels
 - Vertex Labels
 - Library Data: <none>
 - Links:
 - No links

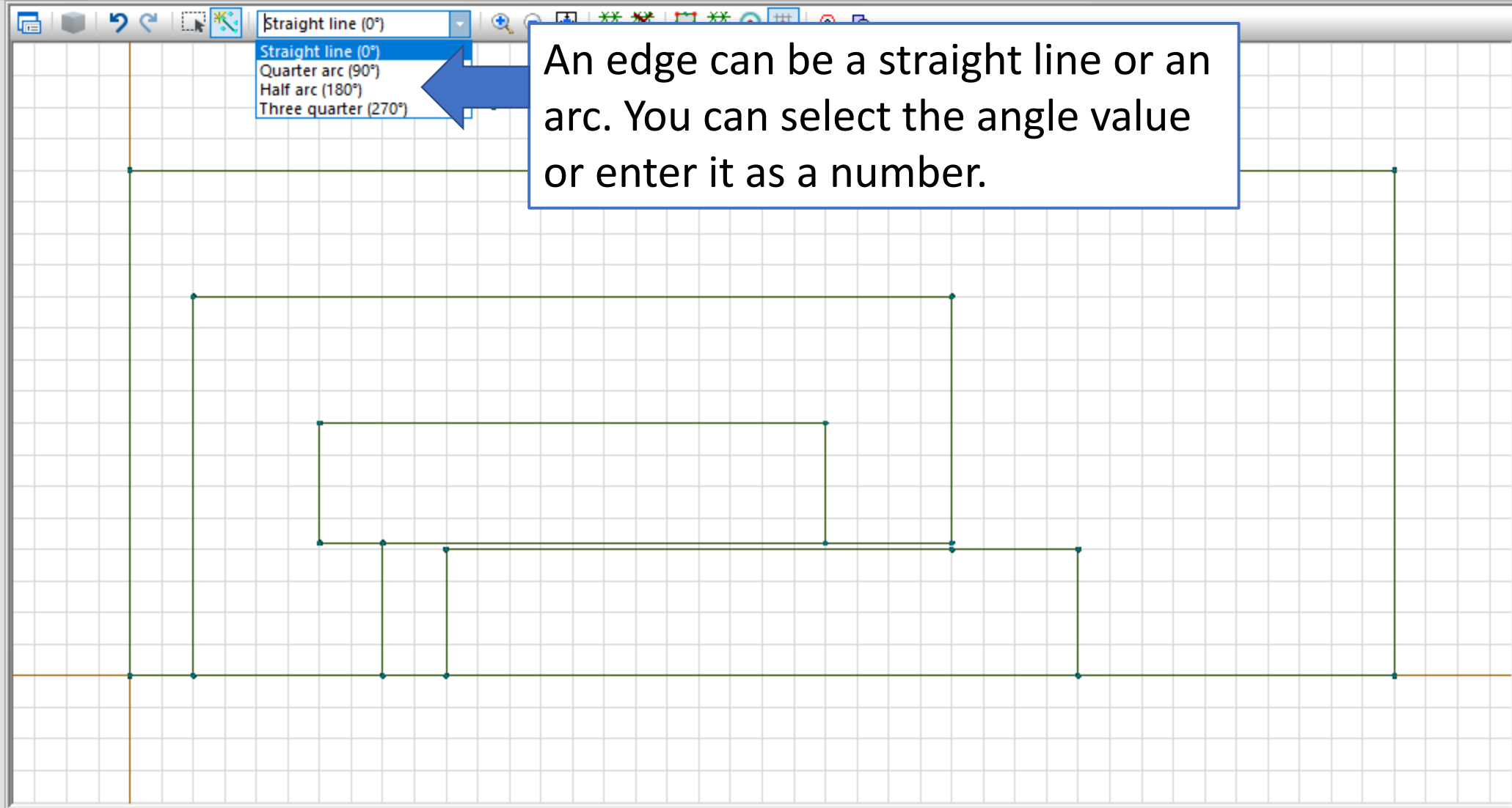
Properties for Magn2.mod

Summary

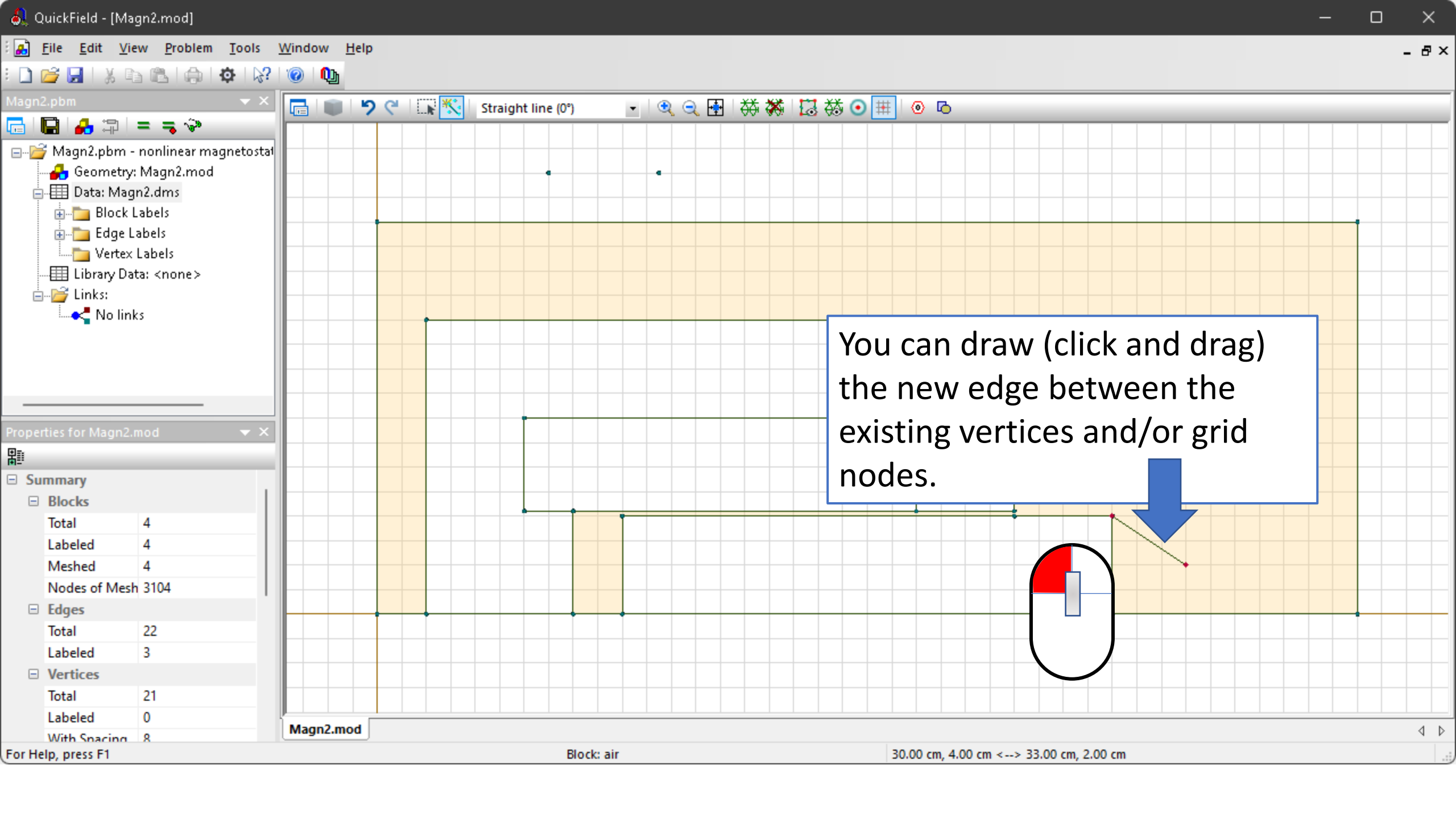
- Blocks
 - Total 4
 - Labeled 4
 - Meshed 4
 - Nodes of Mesh 3104
- Edges
 - Total 22
 - Labeled 3
- Vertices
 - Total 21
 - Labeled 0
 - With Spacing 8

Straight line (0°)
Straight line (0°)
Quarter arc (90°)
Half arc (180°)
Three quarter (270°)

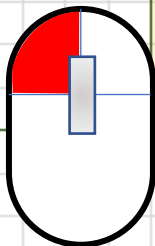
An edge can be a straight line or an arc. You can select the angle value or enter it as a number.



Magn2.mod



You can draw (click and drag) the new edge between the existing vertices and/or grid nodes.



Properties for Magn2.mod

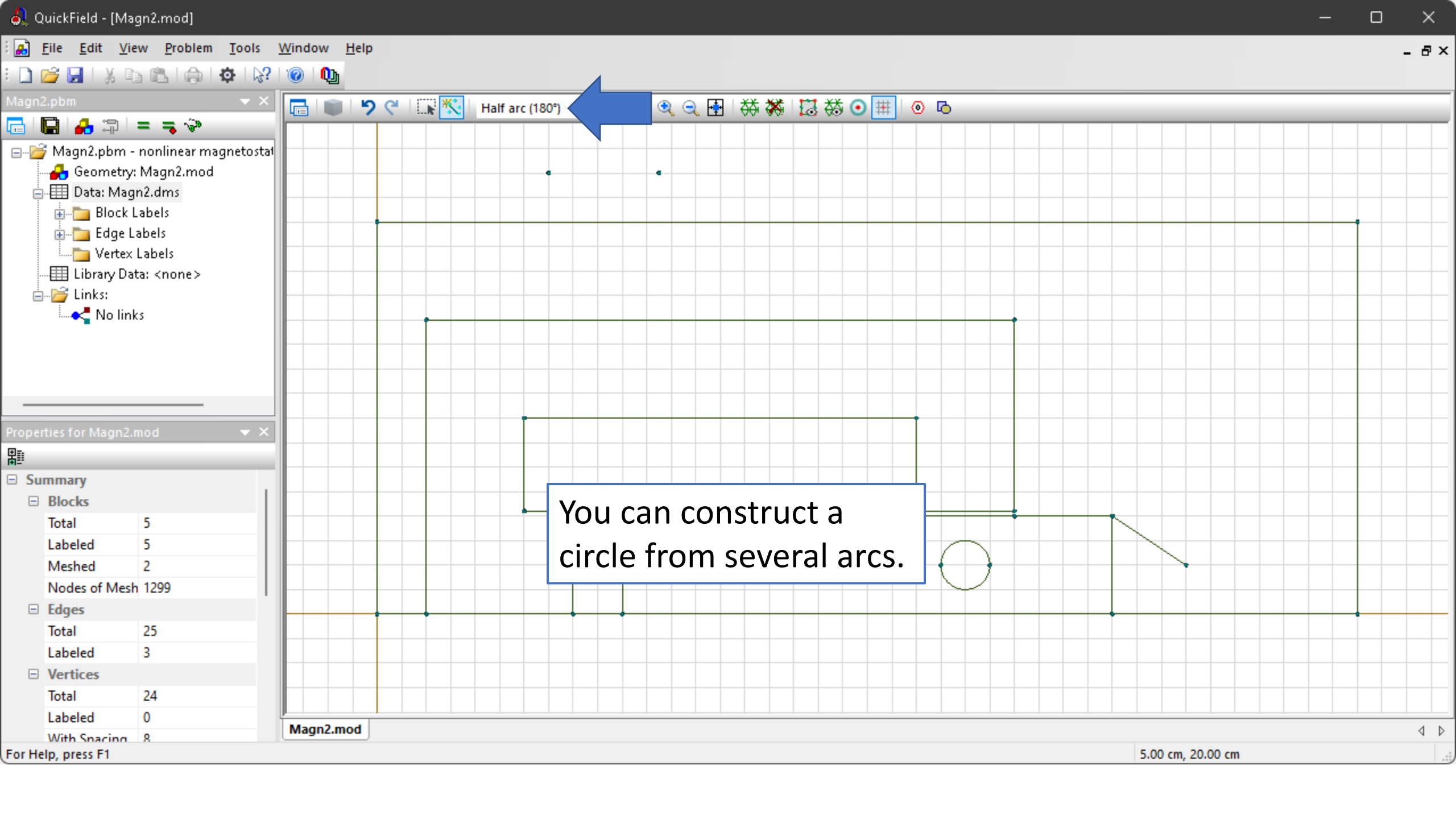
Summary

Blocks	
Total	4
Labeled	4
Meshed	4
Nodes of Mesh	3104
Edges	
Total	22
Labeled	3
Vertices	
Total	21
Labeled	0
With Spacing	8

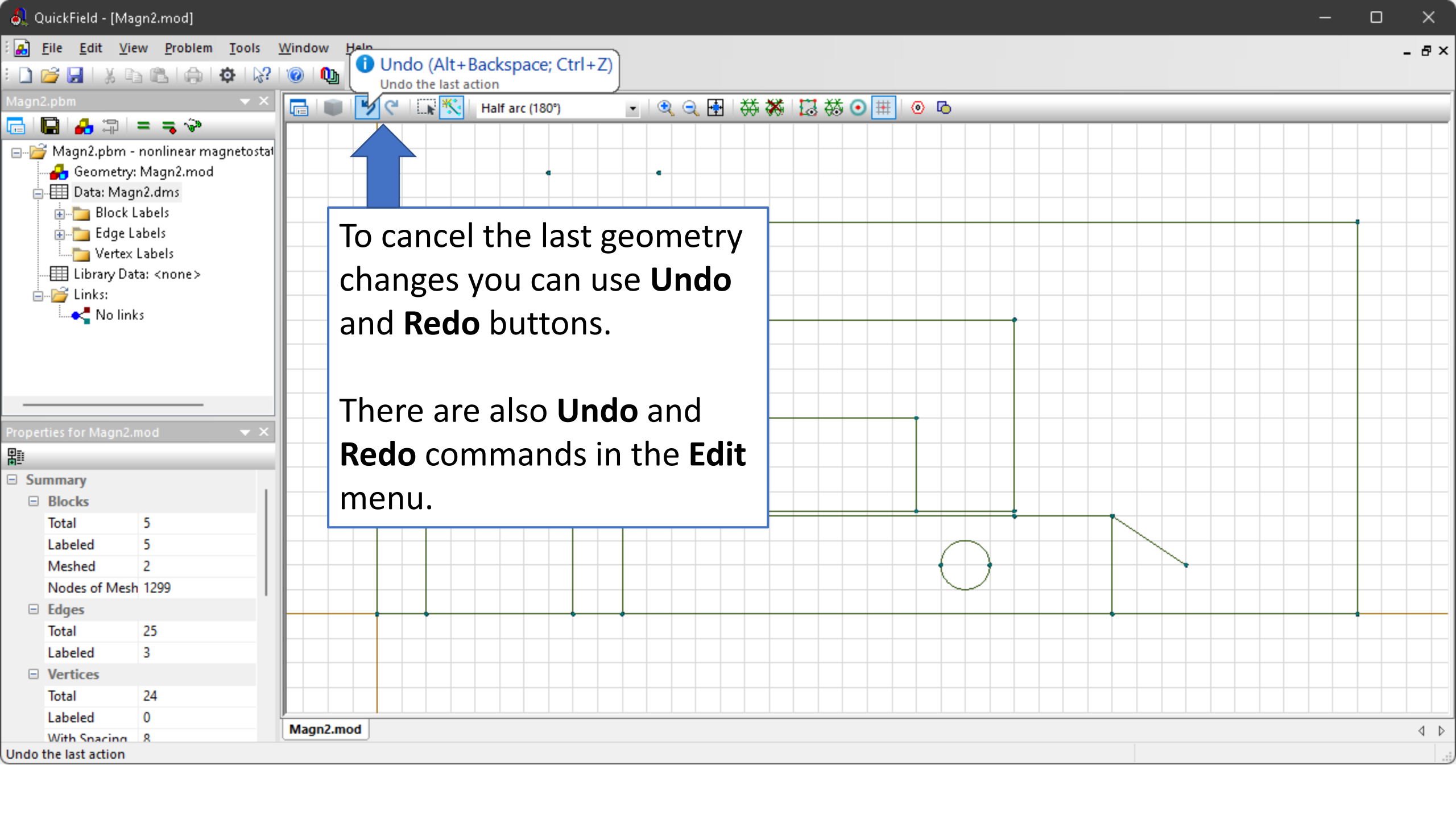
Magn2.mod

Block: air

30.00 cm, 4.00 cm <--> 33.00 cm, 2.00 cm



You can construct a circle from several arcs.



Undo (Alt+Backspace; Ctrl+Z)
Undo the last action

To cancel the last geometry changes you can use **Undo** and **Redo** buttons.

There are also **Undo** and **Redo** commands in the **Edit** menu.

Magn2.pbm

- Magn2.pbm - nonlinear magnetostat
 - Geometry: Magn2.mod
 - Data: Magn2.dms
 - Block Labels
 - Edge Labels
 - Vertex Labels
 - Library Data: <none>
 - Links:
 - No links

Properties for Magn2.mod

Summary

- Blocks
 - Total: 5
 - Labeled: 5
 - Meshed: 2
 - Nodes of Mesh: 1299
- Edges
 - Total: 25
 - Labeled: 3
- Vertices
 - Total: 24
 - Labeled: 0
 - With Spacing: 8

Magn2.mod

Undo the last action



Magn2.pbm

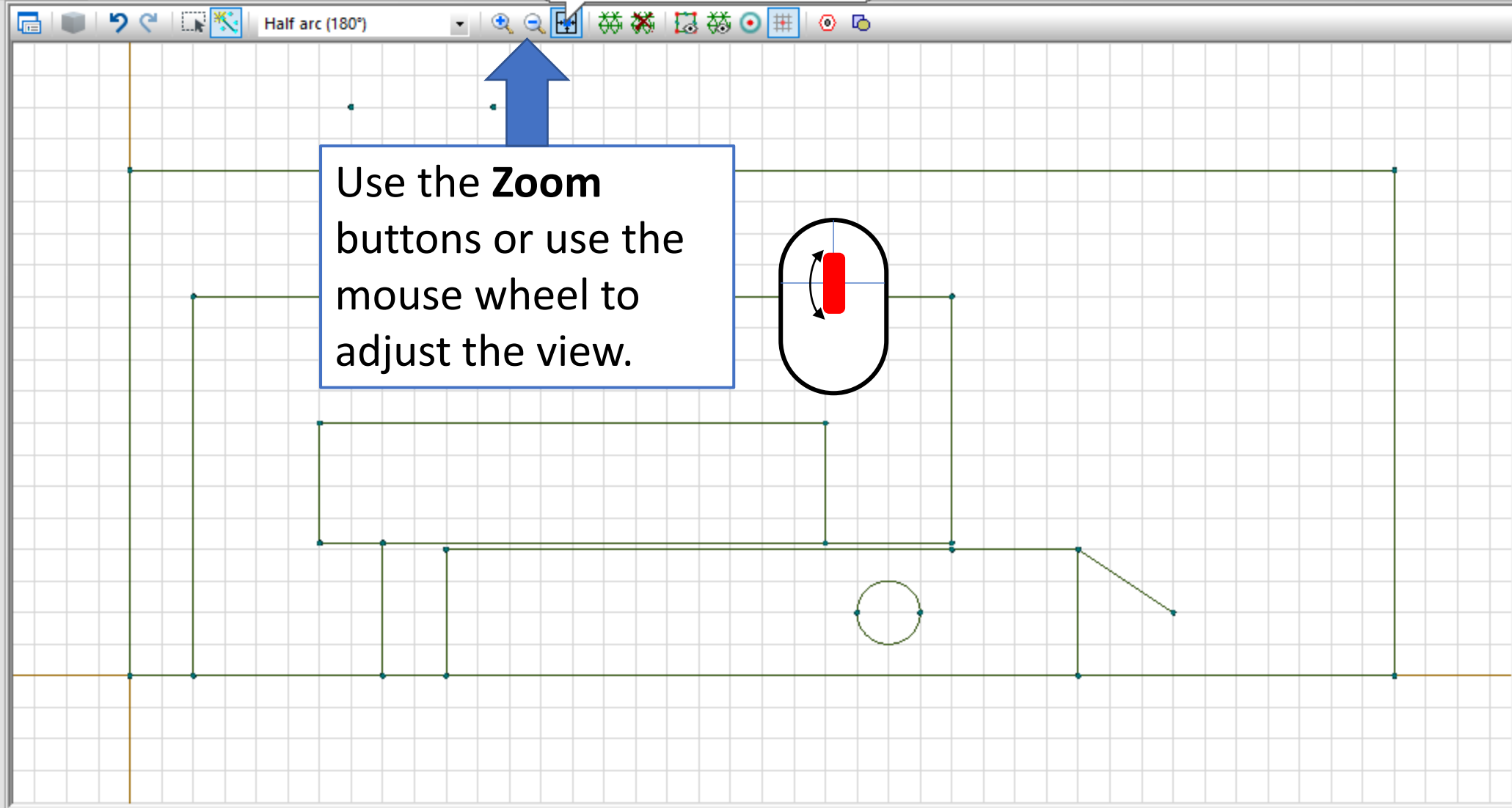
- Magn2.pbm - nonlinear magnetostat
 - Geometry: Magn2.mod
 - Data: Magn2.dms
 - Block Labels
 - Edge Labels
 - Vertex Labels
 - Library Data: <none>
 - Links:
 - No links

Properties for Magn2.mod

Summary

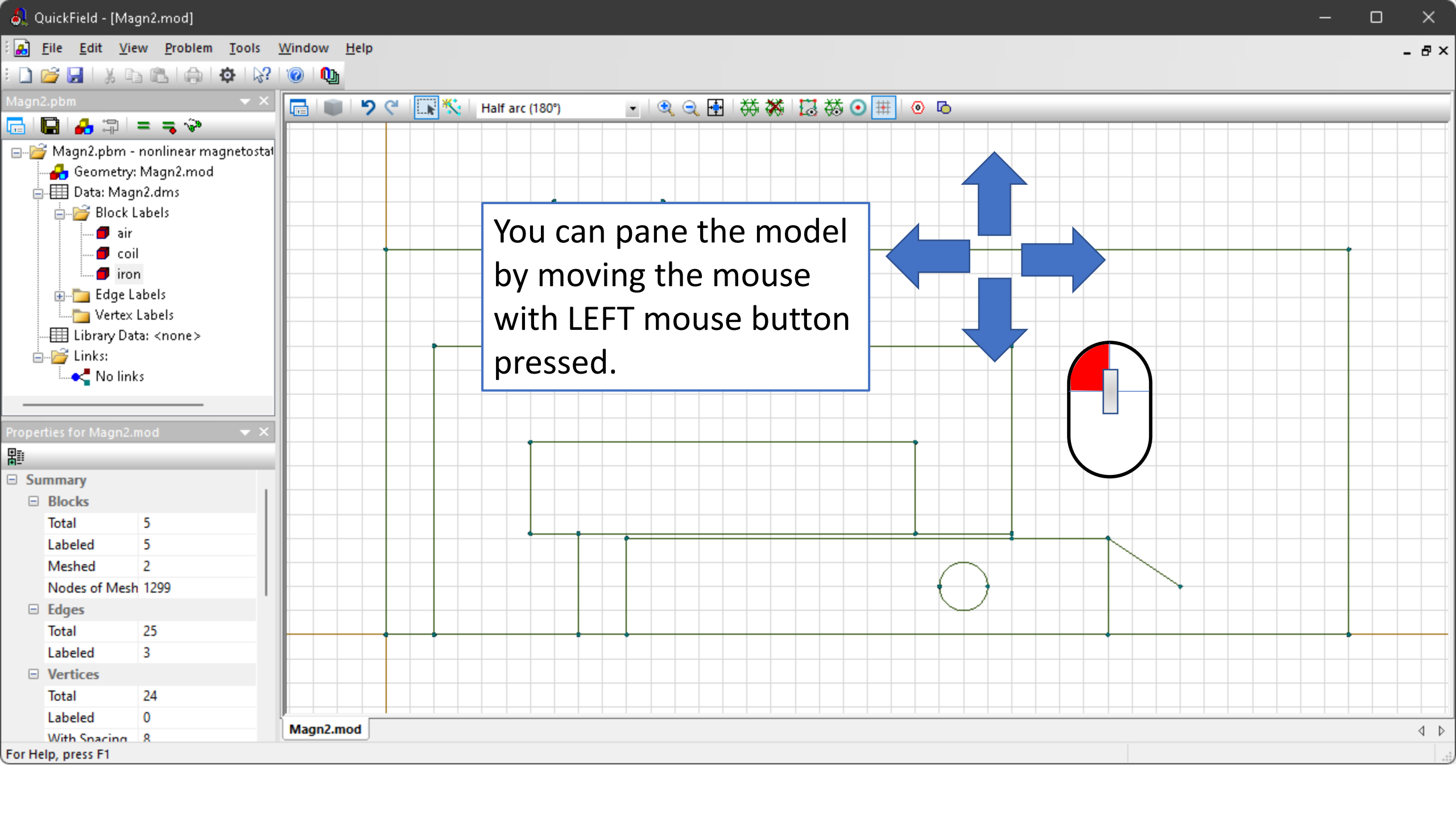
Blocks	
Total	5
Labeled	5
Meshed	2
Nodes of Mesh	1299
Edges	
Total	25
Labeled	3
Vertices	
Total	24
Labeled	0
With Spacing	8

Zoom to Fit (Ctrl+0)
Scale the window to fit the full extent

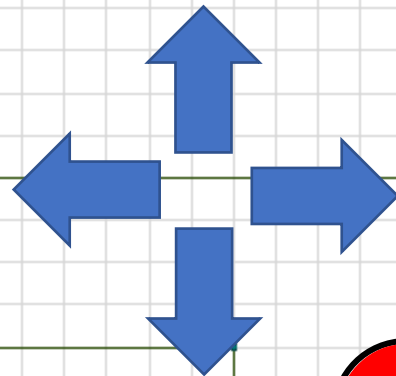
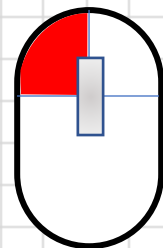


Use the **Zoom** buttons or use the mouse wheel to adjust the view.

Magn2.mod



You can pane the model by moving the mouse with LEFT mouse button pressed.



Properties for Magn2.mod

Summary

Blocks	
Total	5
Labeled	5
Meshed	2
Nodes of Mesh	1299
Edges	
Total	25
Labeled	3
Vertices	
Total	24
Labeled	0
With Spacing	8

Magn2.mod

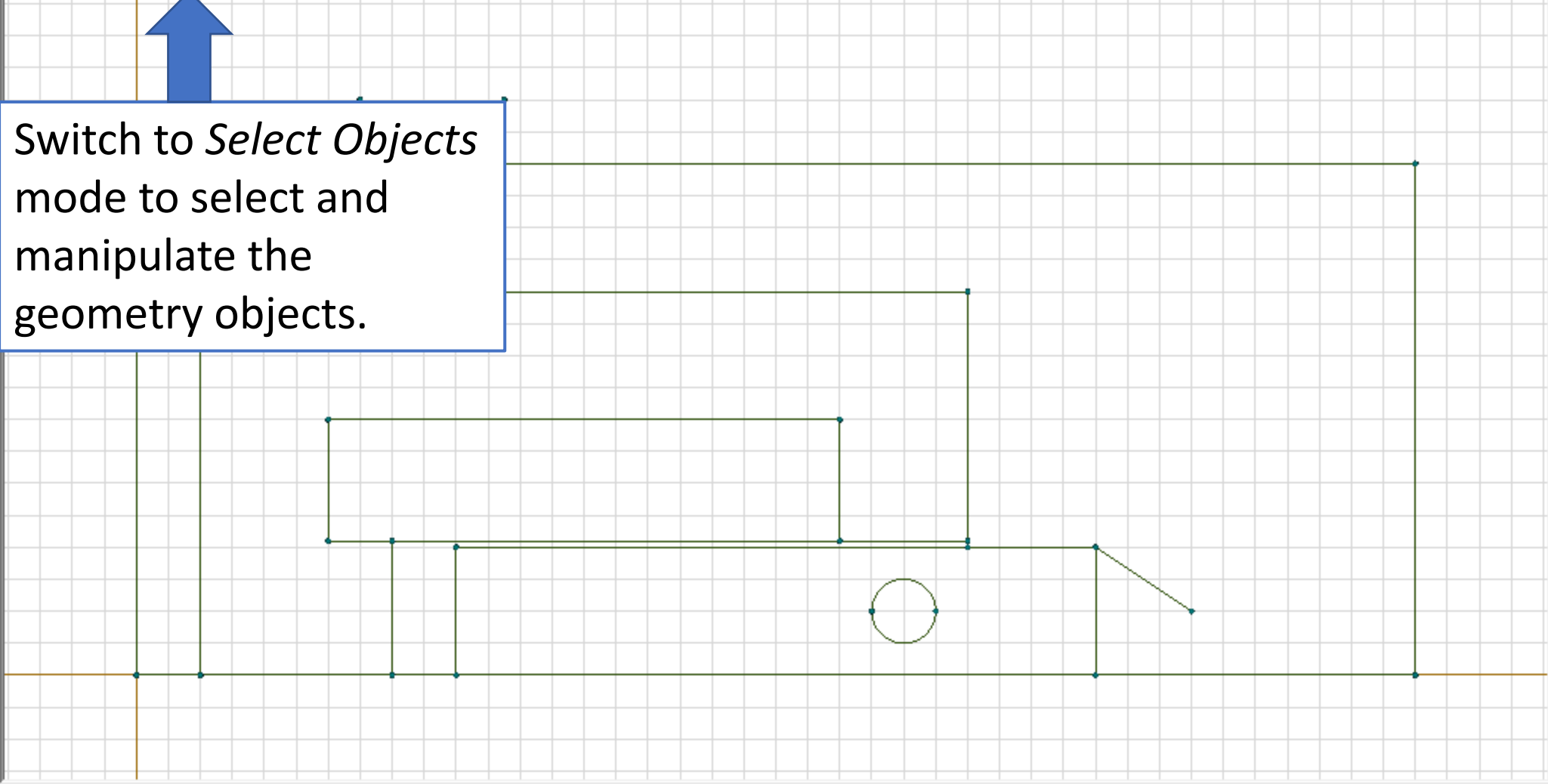
For Help, press F1

Select Objects
Switch to object selection mode

Magn2.pbm - nonlinear magnetostat

- Geometry: Magn2.mod
- Data: Magn2.dms
 - Block Labels
 - air
 - coil
 - iron
 - Edge Labels
 - Vertex Labels
- Library Data: <none>
- Links:
 - No links

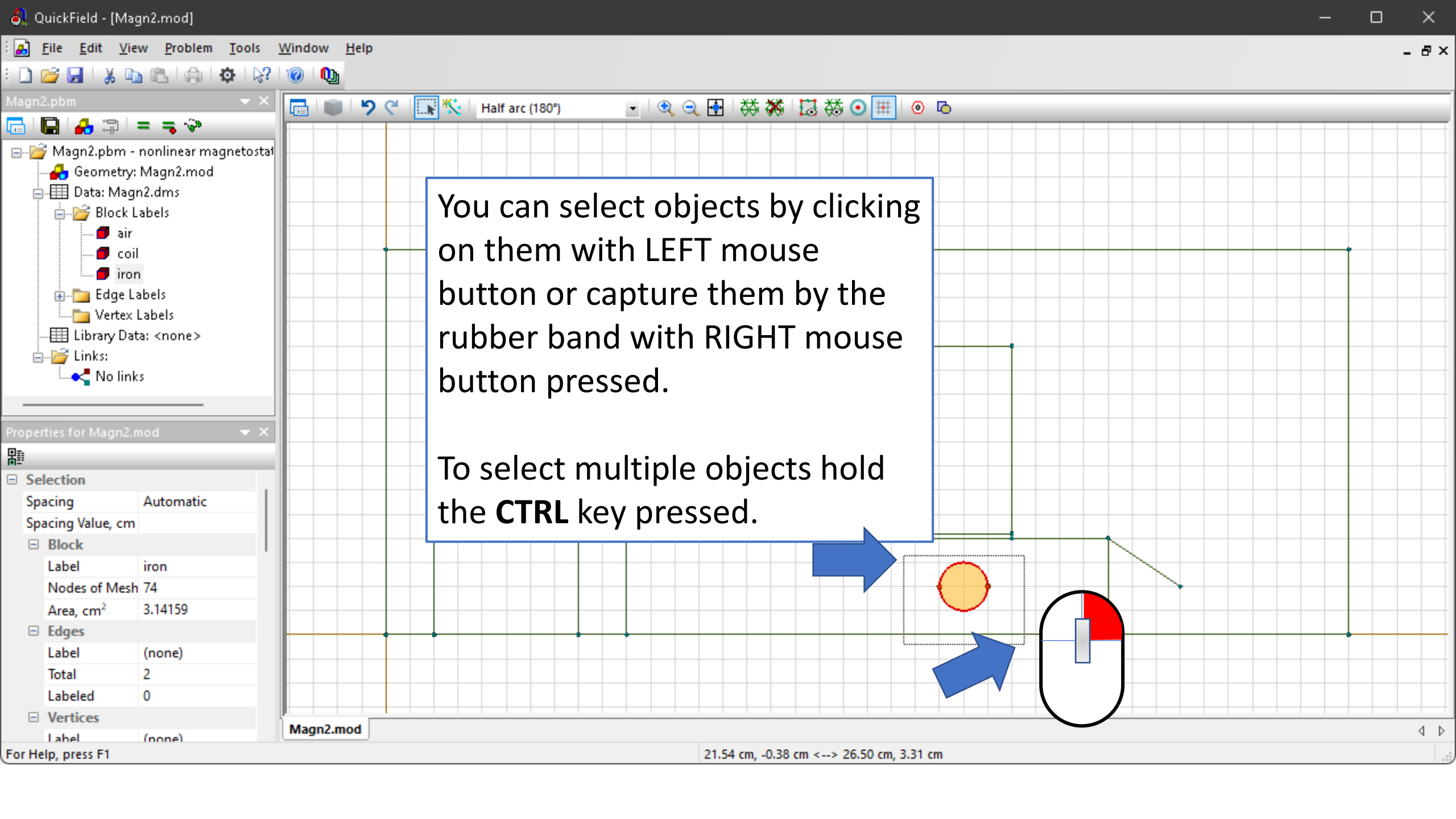
Half arc (180°)



Switch to *Select Objects* mode to select and manipulate the geometry objects.

Summary

Blocks	
Total	5
Labeled	5
Meshed	5
Nodes of Mesh	3343
Edges	
Total	25
Labeled	3
Vertices	
Total	24
Labeled	0
With Spacing	8



You can select objects by clicking on them with LEFT mouse button or capture them by the rubber band with RIGHT mouse button pressed.

To select multiple objects hold the **CTRL** key pressed.

Magn2.pbm

- Magn2.pbm - nonlinear magnetostat
 - Geometry: Magn2.mod
 - Data: Magn2.dms
 - Block Labels
 - air
 - coil
 - iron
 - Edge Labels
 - Vertex Labels
 - Library Data: <none>
 - Links:
 - No links

Properties for Magn2.mod

Selection

Spacing Automatic

Spacing Value, cm

Block

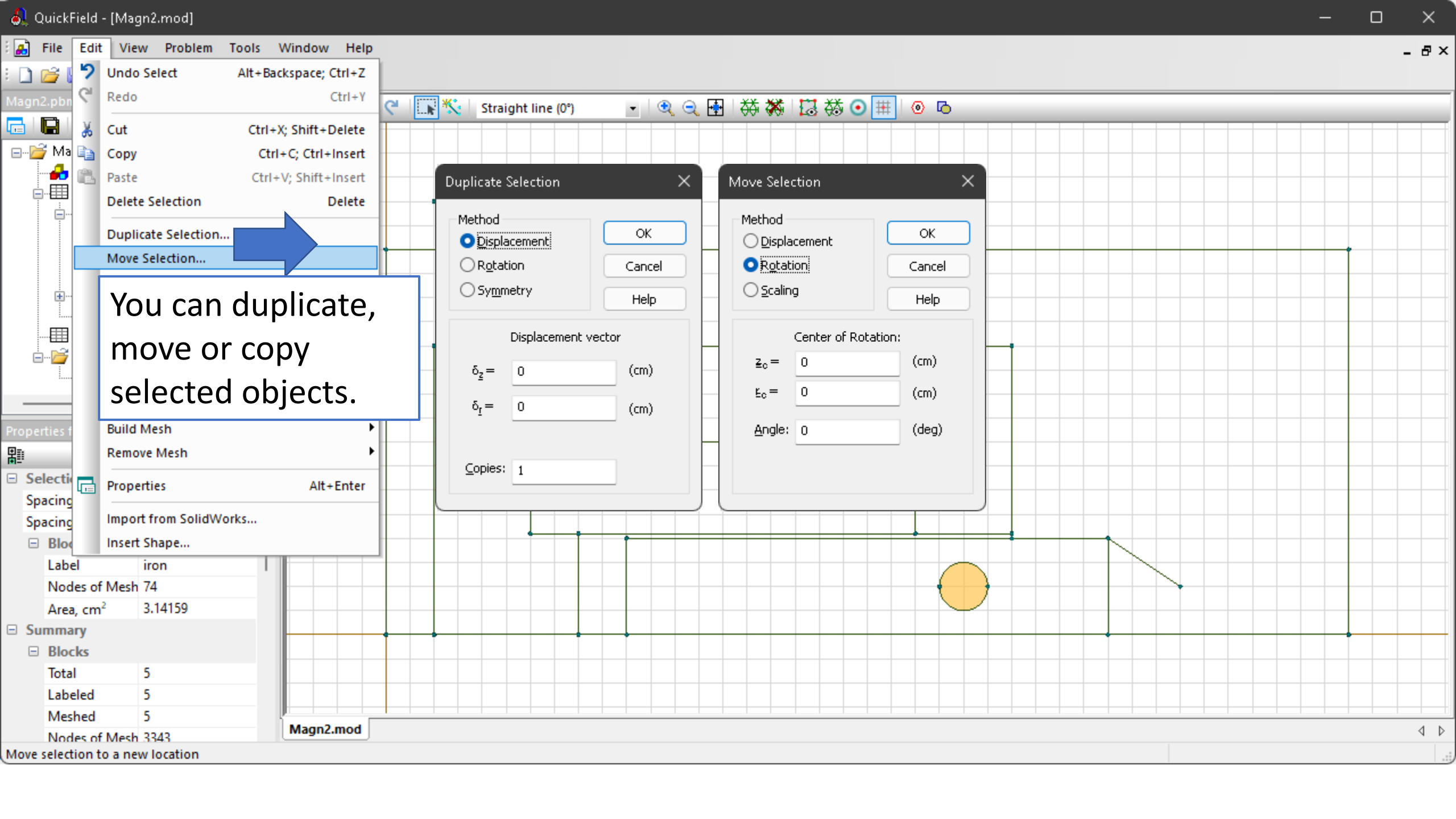
Label	iron
Nodes of Mesh	74
Area, cm ²	3.14159

Edges

Label	(none)
Total	2
Labeled	0

Vertices

Label	(none)
-------	--------



You can duplicate, move or copy selected objects.

Duplicate Selection

Method

- Displacement
- Rotation
- Symmetry

Displacement vector

$\delta_z = 0$ (cm)

$\delta_x = 0$ (cm)

Copies: 1

OK Cancel Help

Move Selection

Method

- Displacement
- Rotation
- Scaling

Center of Rotation:

$z_c = 0$ (cm)

$\epsilon_c = 0$ (cm)

Angle: 0 (deg)

OK Cancel Help

File Edit View Problem Tools Window Help

Undo Select Alt+Backspace; Ctrl+Z

Redo Ctrl+Y

Cut Ctrl+X; Shift+Delete

Copy Ctrl+C; Ctrl+Insert

Paste Ctrl+V; Shift+Insert

Delete Selection Delete

Duplicate Selection...

Move Selection...

Build Mesh

Remove Mesh

Properties Alt+Enter

Import from SolidWorks...

Insert Shape...

Properties

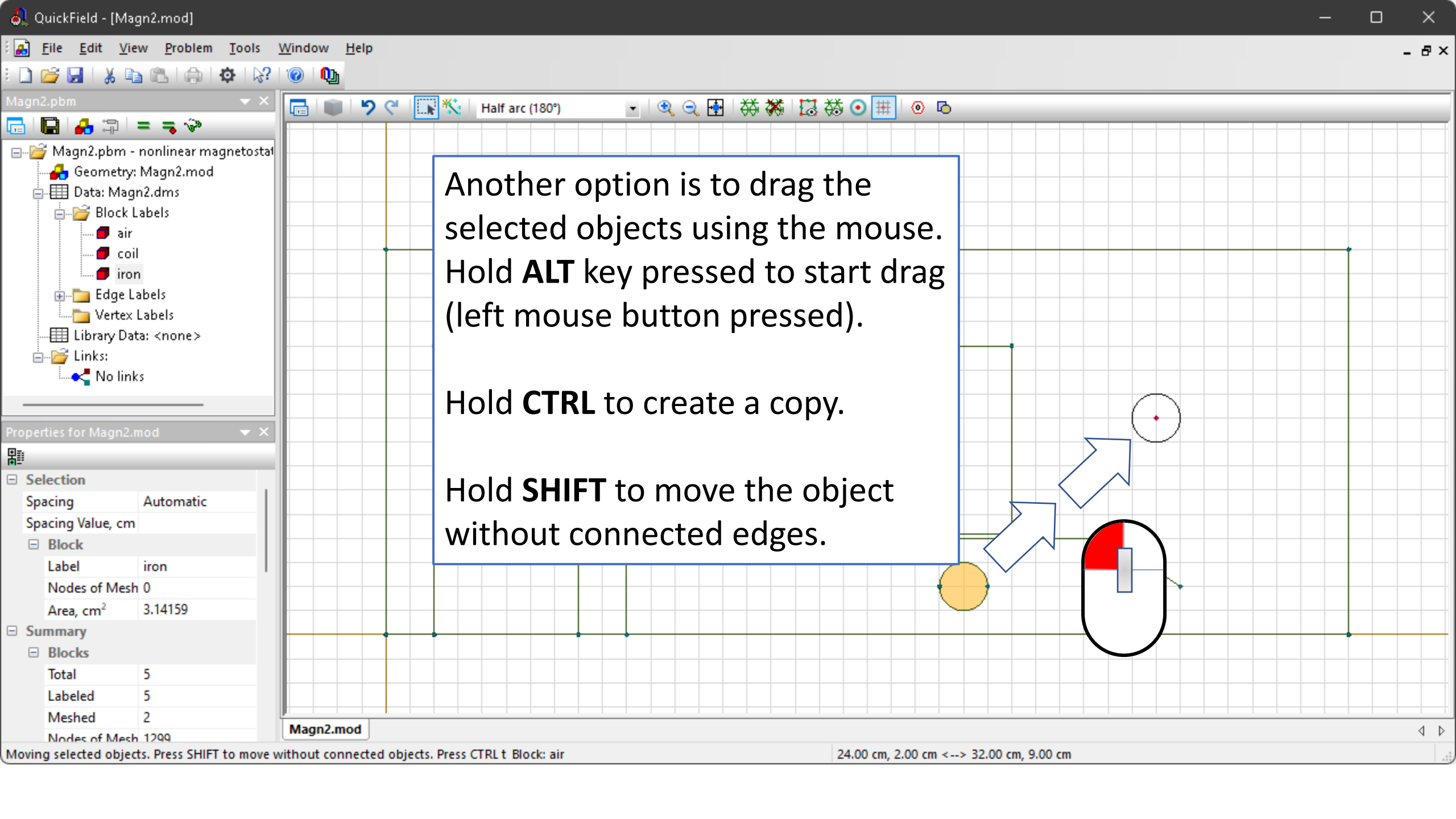
Label	iron
Nodes of Mesh	74
Area, cm ²	3.14159

Summary

Total	5
Labeled	5
Meshed	5
Nodes of Mesh	3343

Magn2.mod

Move selection to a new location



Another option is to drag the selected objects using the mouse. Hold **ALT** key pressed to start drag (left mouse button pressed).

Hold **CTRL** to create a copy.

Hold **SHIFT** to move the object without connected edges.

Magn2.pbm

- Magn2.pbm - nonlinear magnetostat
 - Geometry: Magn2.mod
 - Data: Magn2.dms
 - Block Labels
 - air
 - coil
 - iron
 - Edge Labels
 - Vertex Labels
 - Library Data: <none>
 - Links:
 - No links

Properties for Magn2.mod

Selection

Spacing	Automatic
Spacing Value, cm	

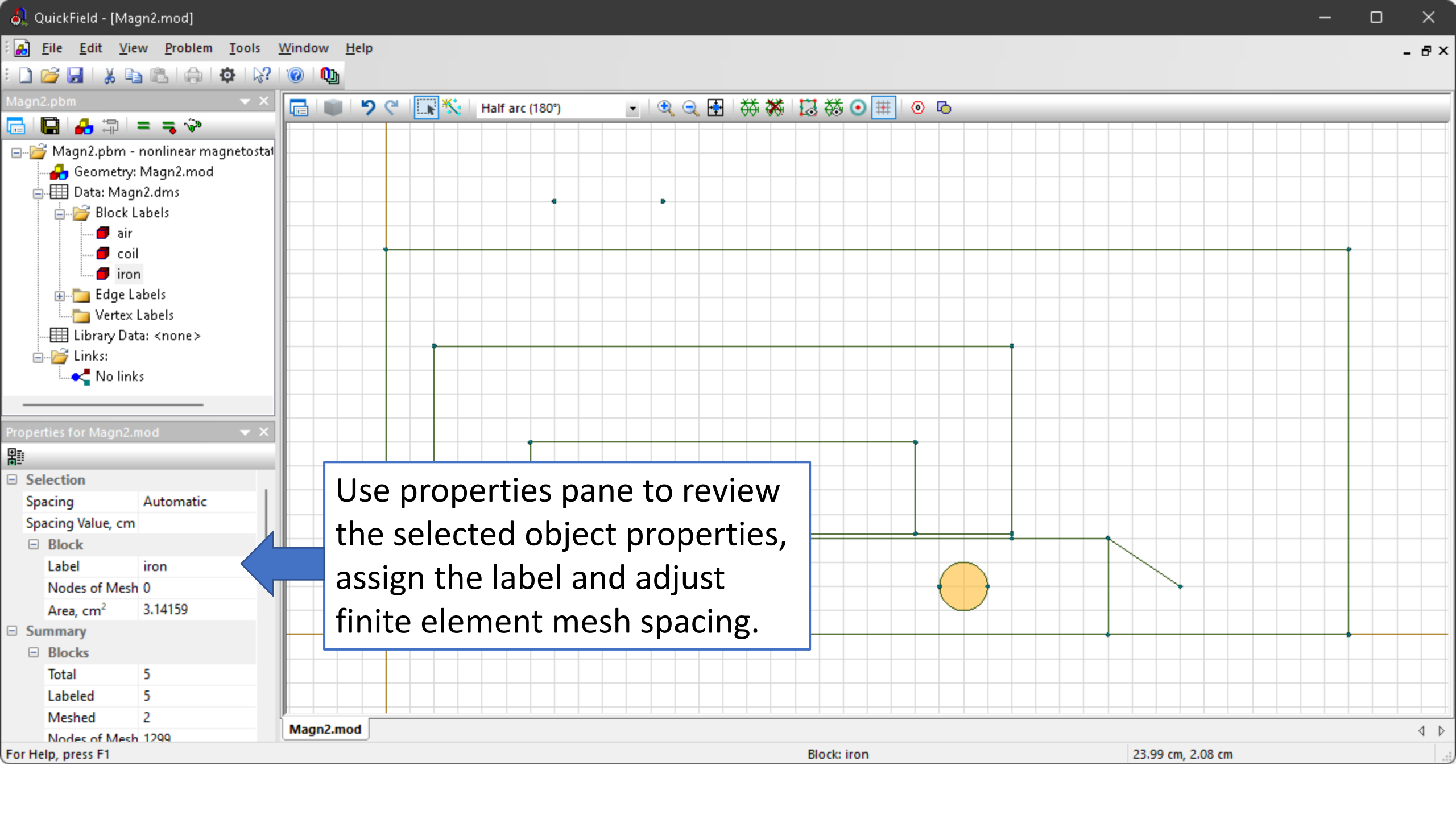
Block

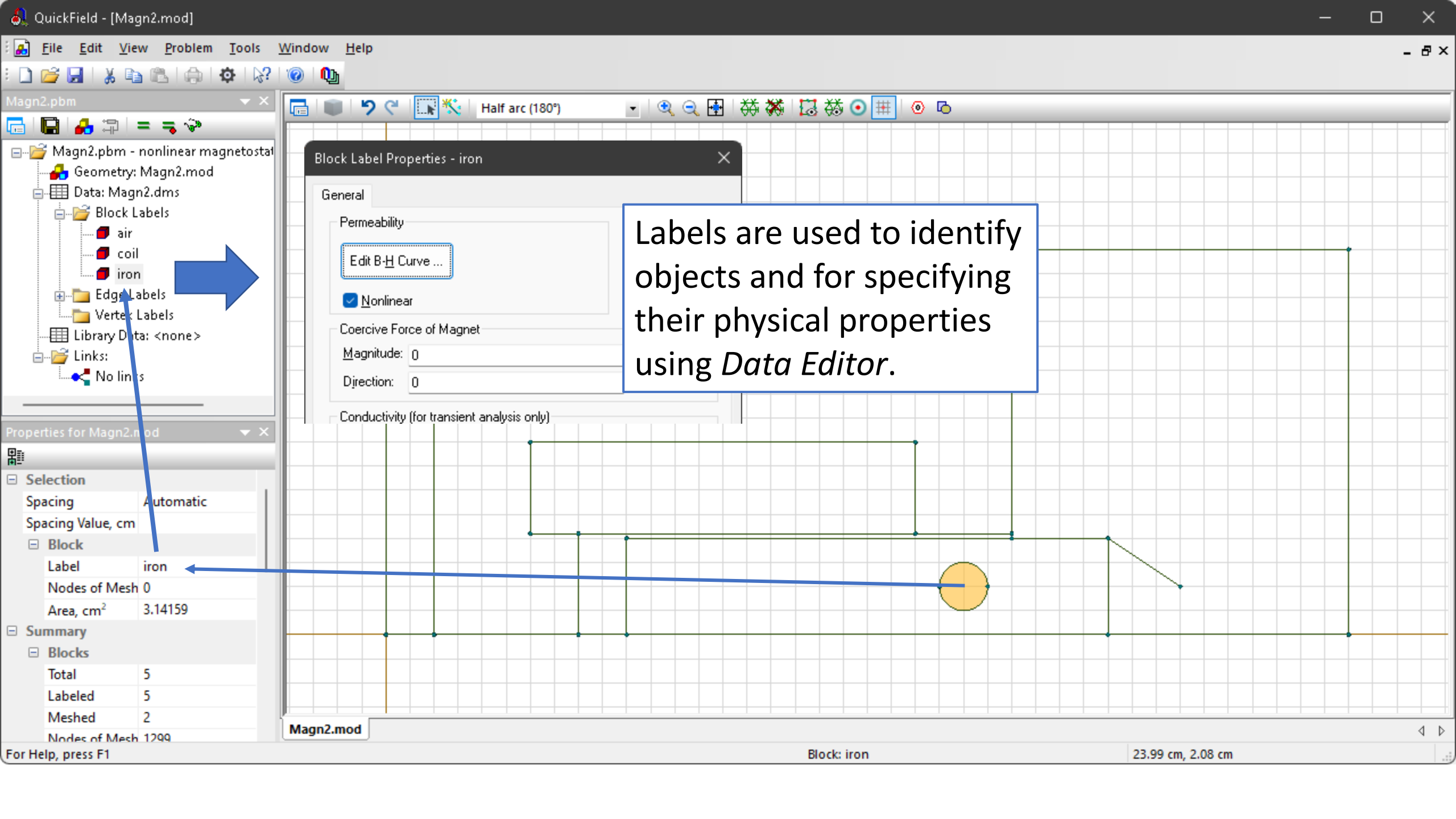
Label	iron
Nodes of Mesh	0
Area, cm ²	3.14159

Summary

Blocks

Total	5
Labeled	5
Meshed	2
Nodes of Mesh	1299





Labels are used to identify objects and for specifying their physical properties using *Data Editor*.

Block Label Properties - iron

General

Permeability

Edit B-H Curve ...

Nonlinear

Coercive Force of Magnet

Magnitude: 0

Direction: 0

Conductivity (for transient analysis only)

Properties for Magn2.mod

Selection

Spacing Automatic

Spacing Value, cm

Block

Label iron

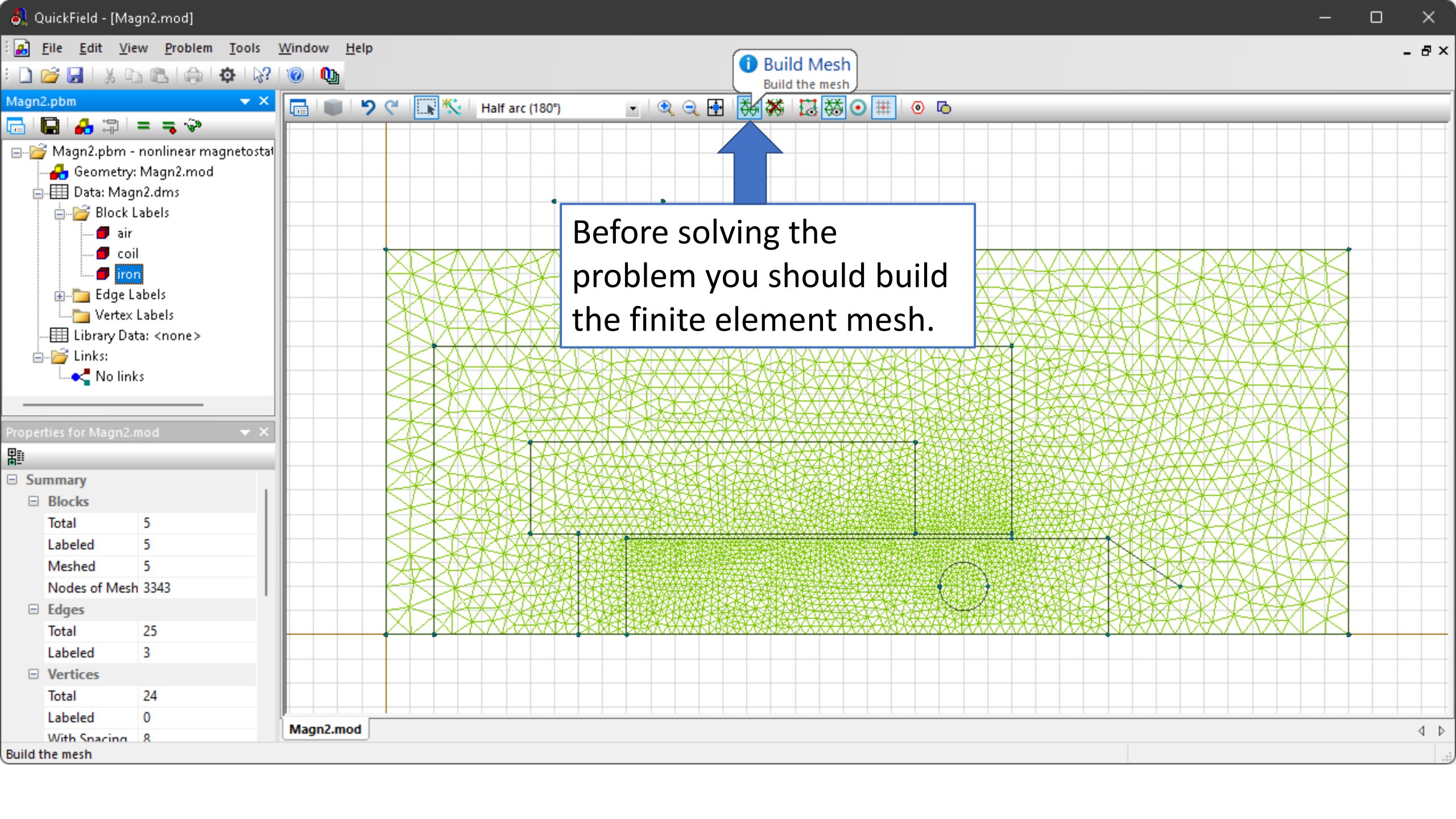
Nodes of Mesh 0

Area, cm² 3.14159

Summary

Blocks

Total	5
Labeled	5
Meshed	2
Nodes of Mesh	1299



Build Mesh
Build the mesh

Before solving the problem you should build the finite element mesh.

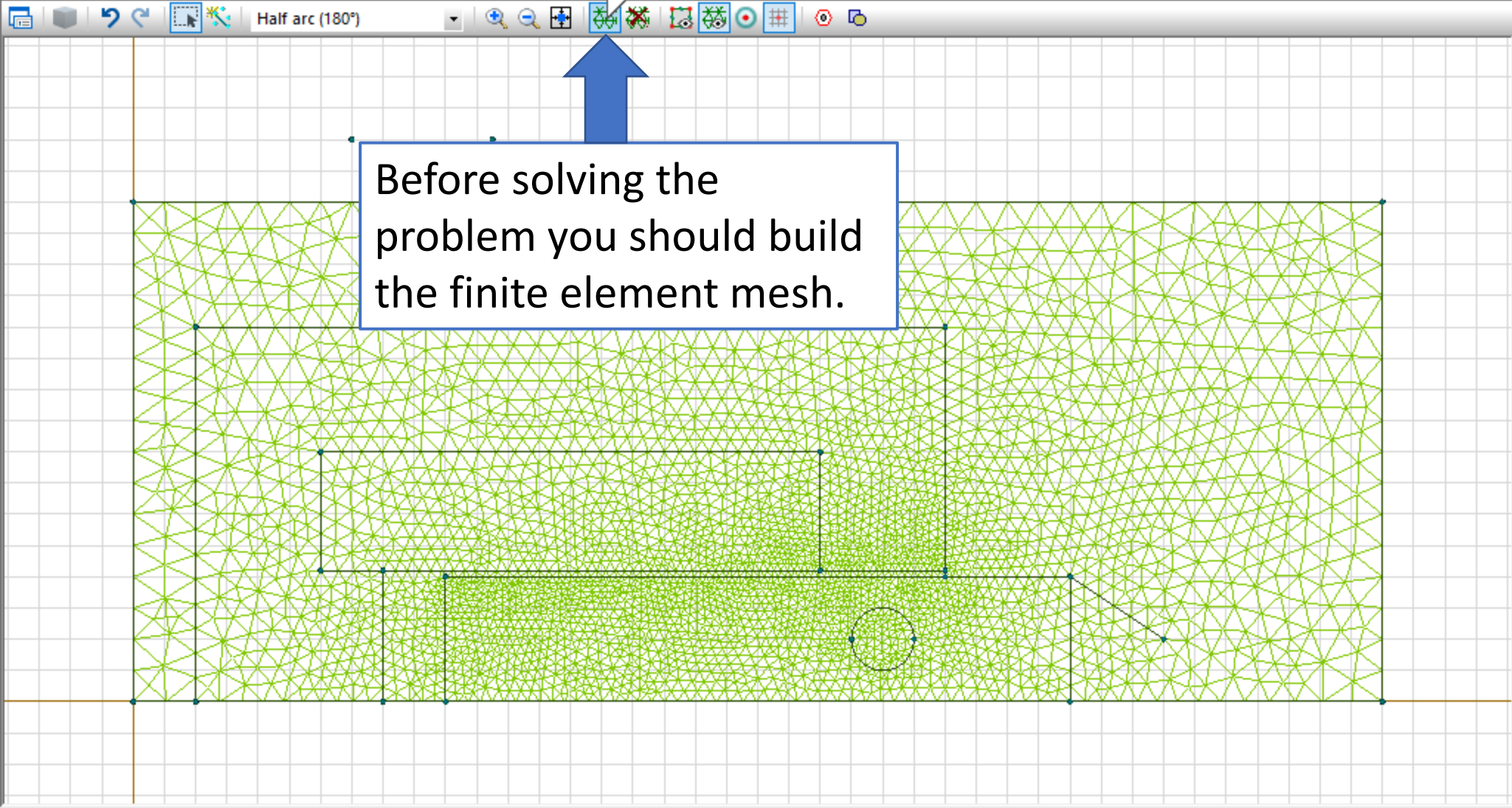
Magn2.pbm

- Magn2.pbm - nonlinear magnetostat
 - Geometry: Magn2.mod
 - Data: Magn2.dms
 - Block Labels
 - air
 - coil
 - iron
 - Edge Labels
 - Vertex Labels
 - Library Data: <none>
 - Links:
 - No links

Properties for Magn2.mod

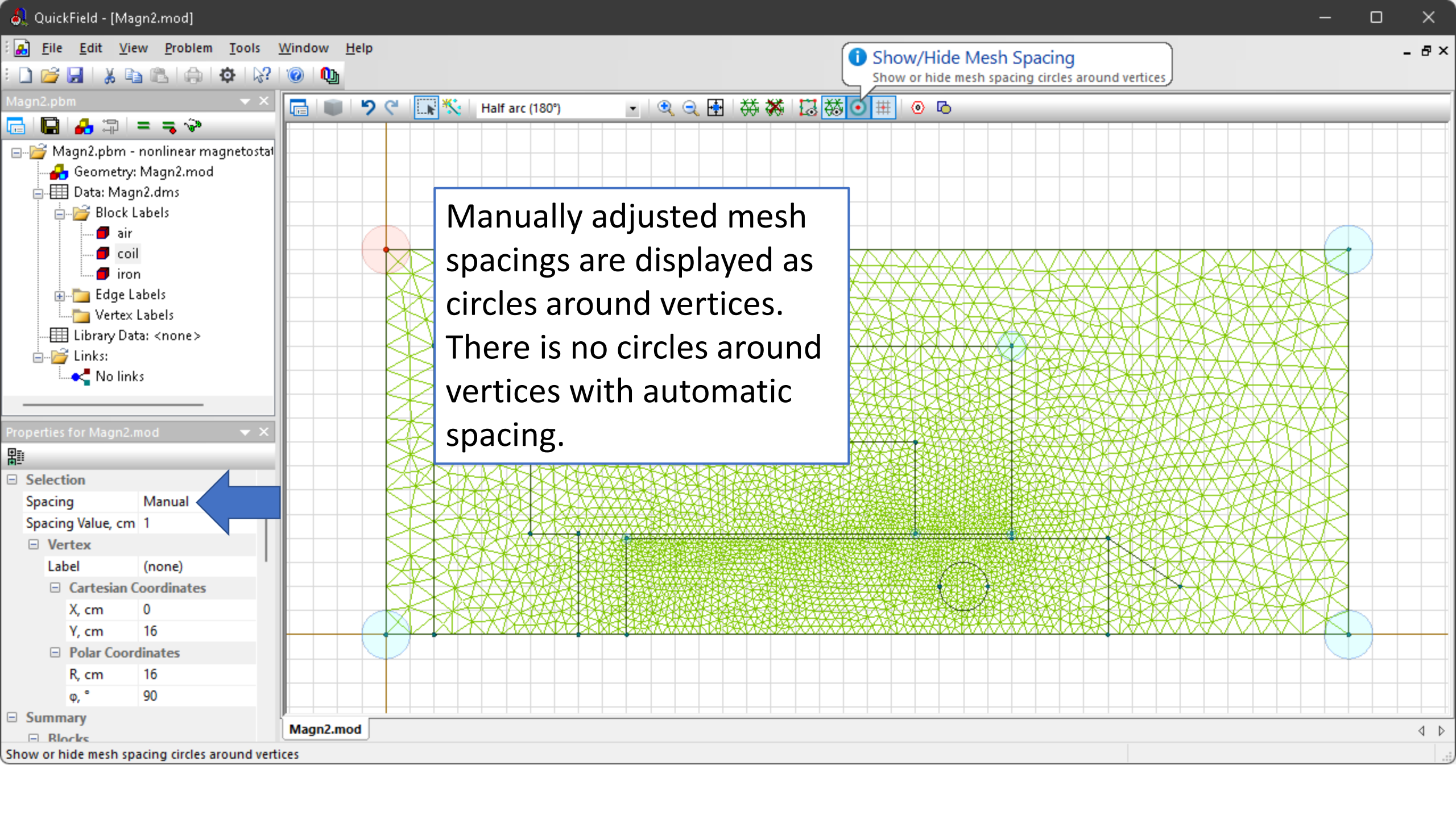
Summary

- Blocks
 - Total: 5
 - Labeled: 5
 - Meshed: 5
 - Nodes of Mesh: 3343
- Edges
 - Total: 25
 - Labeled: 3
- Vertices
 - Total: 24
 - Labeled: 0
 - With Spacing: 8



Magn2.mod

Build the mesh



Manually adjusted mesh spacings are displayed as circles around vertices. There is no circles around vertices with automatic spacing.



Properties for Magn2.mod

Selection

Spacing: Manual

Spacing Value, cm: 1

Vertex

Label: (none)

Cartesian Coordinates

X, cm: 0

Y, cm: 16

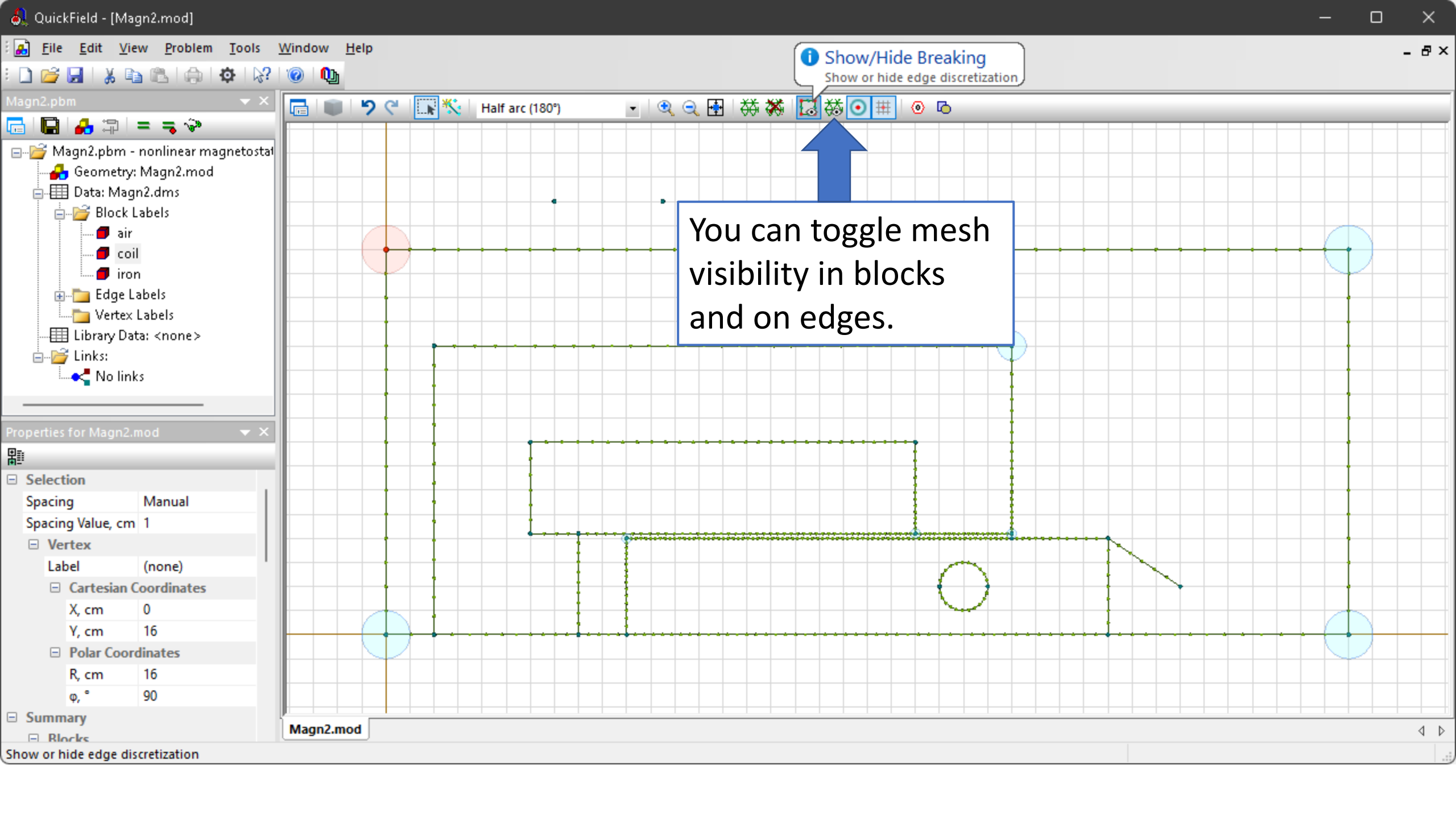
Polar Coordinates

R, cm: 16

phi, °: 90

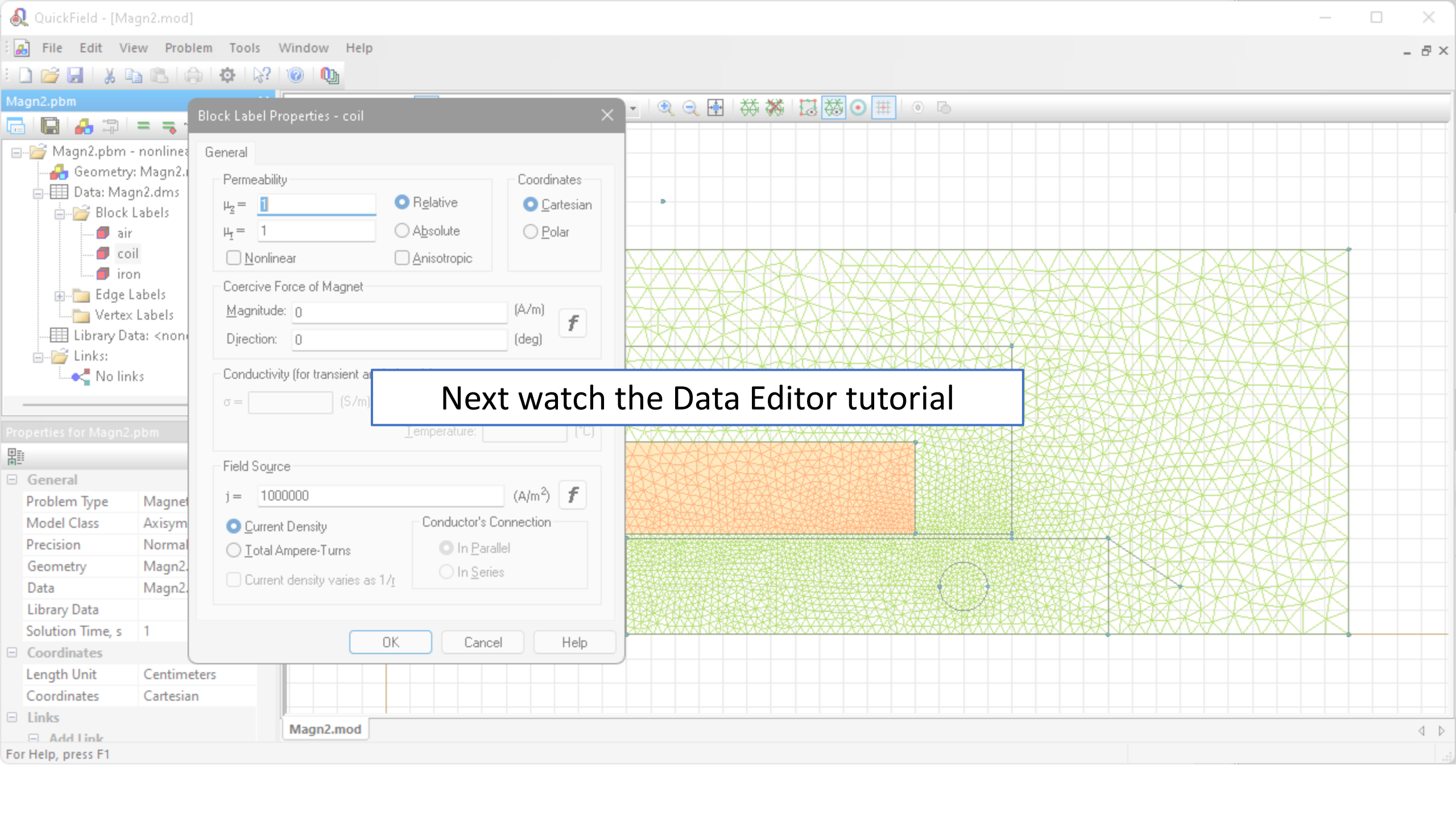
Show/Hide Mesh Spacing
Show or hide mesh spacing circles around vertices

Show or hide mesh spacing circles around vertices



You can toggle mesh visibility in blocks and on edges.

Show/Hide Breaking
Show or hide edge discretization



Next watch the Data Editor tutorial