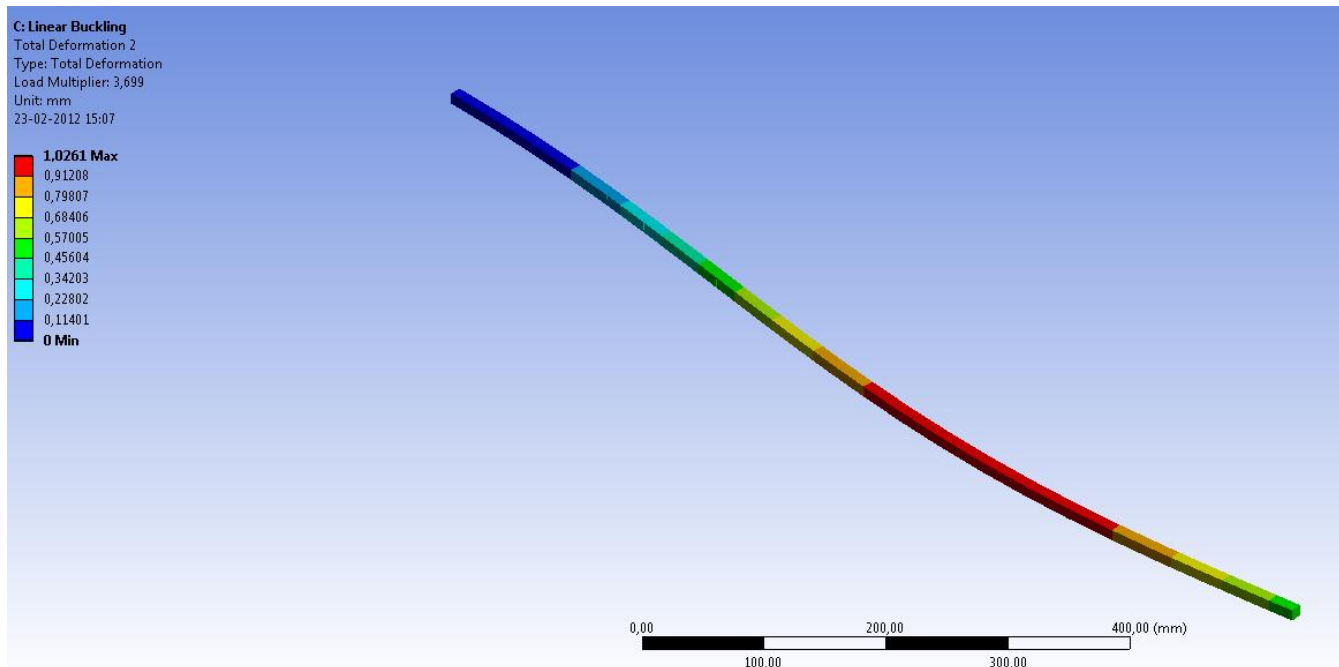


Simple buckling analysis Workbench 14.0



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Outline

- Project
- Model (B4)
 - Geometry
 - Coordinate Systems
 - Mesh
 - Static Structural (B5)
 - Analysis Settings
 - Fixed Support
 - Force
 - Solution (B6)
 - Solution Information
 - Total Deformation

B: Static Structural
Force
Time: 1, s
23-02-2012 15:04
Force: 1000, N
Components: -1000, 0, 0, N

Details of "Force"

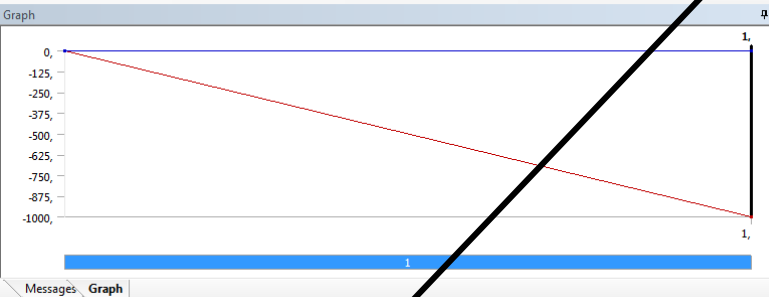
Scope

Scoping Method	Geometry Selection
Geometry	1 Vertex

Definition

Type	Force
Define By	Components
Coordinate System	Global Coordinate System
X Component	-1000, N (ramped)
Y Component	0, N (ramped)
Z Component	0, N (ramped)
Suppressed	No

Geometry | Print Preview | Report Preview



Tabular Data

Steps	Time [s]	X [N]	Y [N]	Z [N]
1	0	0	0	0
2	1	-1000	0	0

Start a static structural analysis and insert the boundary condition. In this ensample a Force at 1000 N is used.

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 - Force
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 - Solution Information
 - Total Deformation

B: Static Structural
Static Structural
Time: 1, s
23-02-2012 15:04

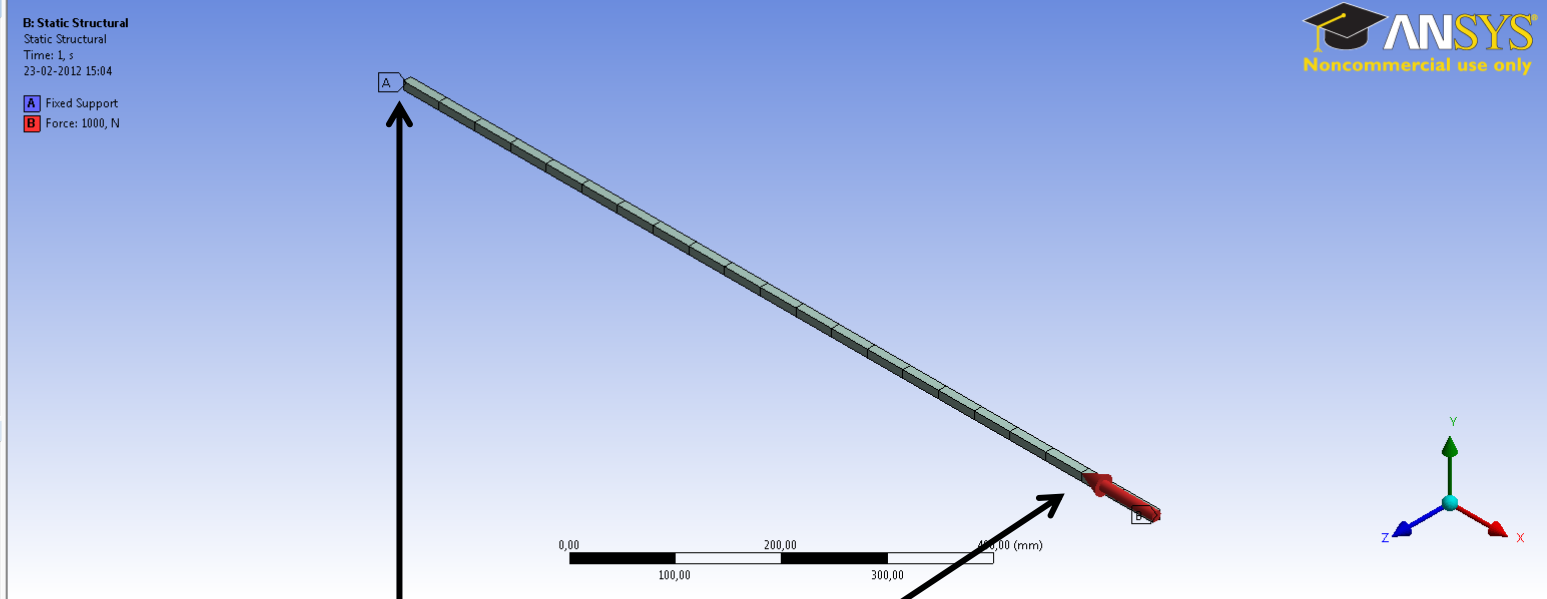
- A** Fixed Support
- B** Force: 1000, N



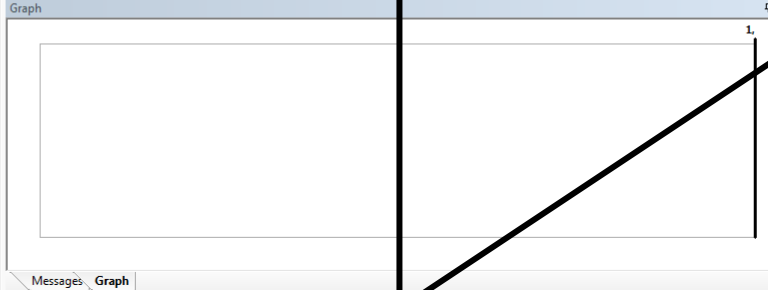
Details of "Static Structural (B5)"

Definition	
Physics Type	Structural
Analysis Type	Static Structural
Solver Target	Mechanical APDL

Options	
<input type="checkbox"/> Environment Temperature	22, °C
<input type="checkbox"/> Generate Input Only	No



Geometry | Print Preview | Report Preview



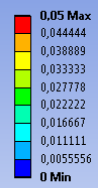
Messages | Graph

1000 N force and a fixed support.

Outline

- Project
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 - Analysis Settings
 - Fixed Support
 - Force
 - Solution (B6)
 - Solution Information
 - Total Deformation

B: Static Structural
Total Deformation
Type: Total Deformation
Unit: mm
Time: 1
23-02-2012 15:05



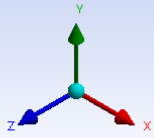
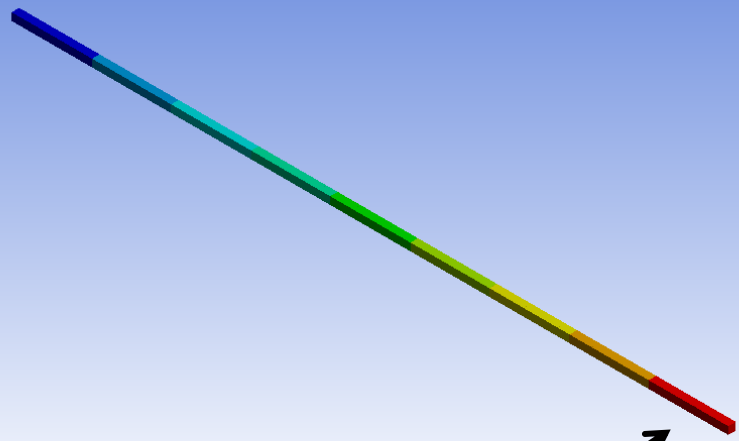
Details of "Total Deformation"

Scope	
Scoping Method	Geometry Selection
Geometry	All Bodies
Definition	
Type	Total Deformation
By	Time
Display Time	Last
Calculate Time History	Yes
Identifier	
Suppressed	No
Results	
Minimum	0, mm
Maximum	5,e-002 mm
Information	

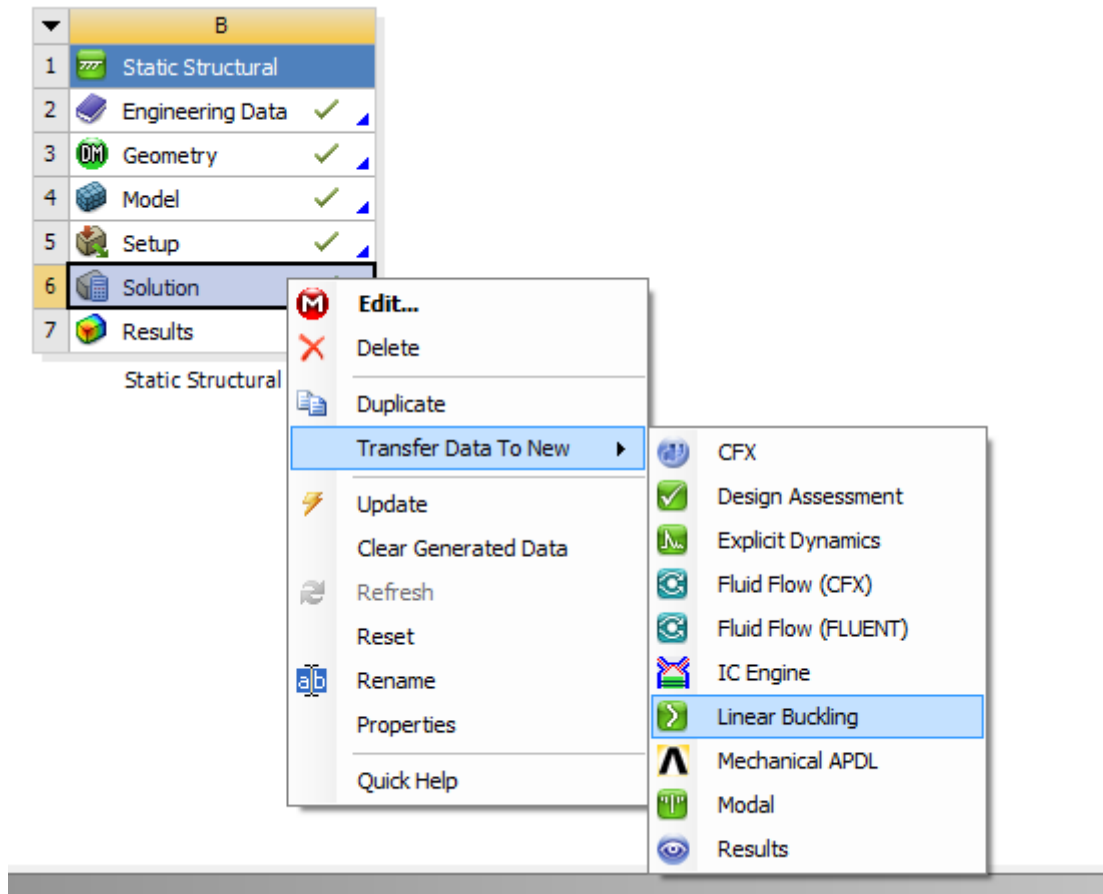
Geometry | Print Preview | Report Preview

Graph

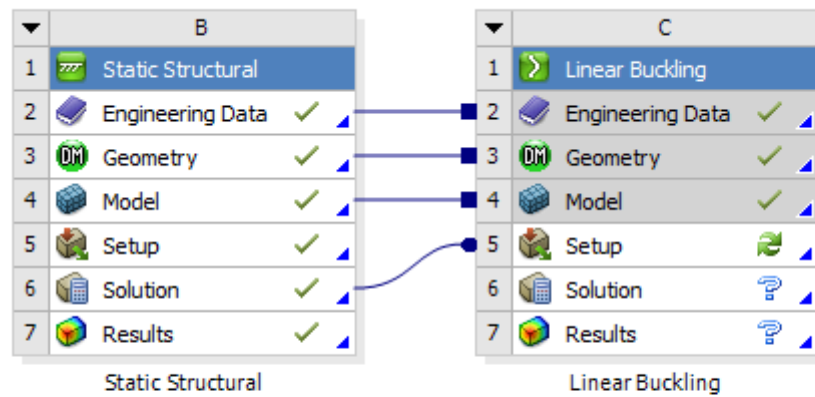
Animation | 10 Frames | 2 Sec (Auto) | 3 Cycles



Then solve and plot the deformation and close the window.



Right click on the solution and click on Linear buckling.

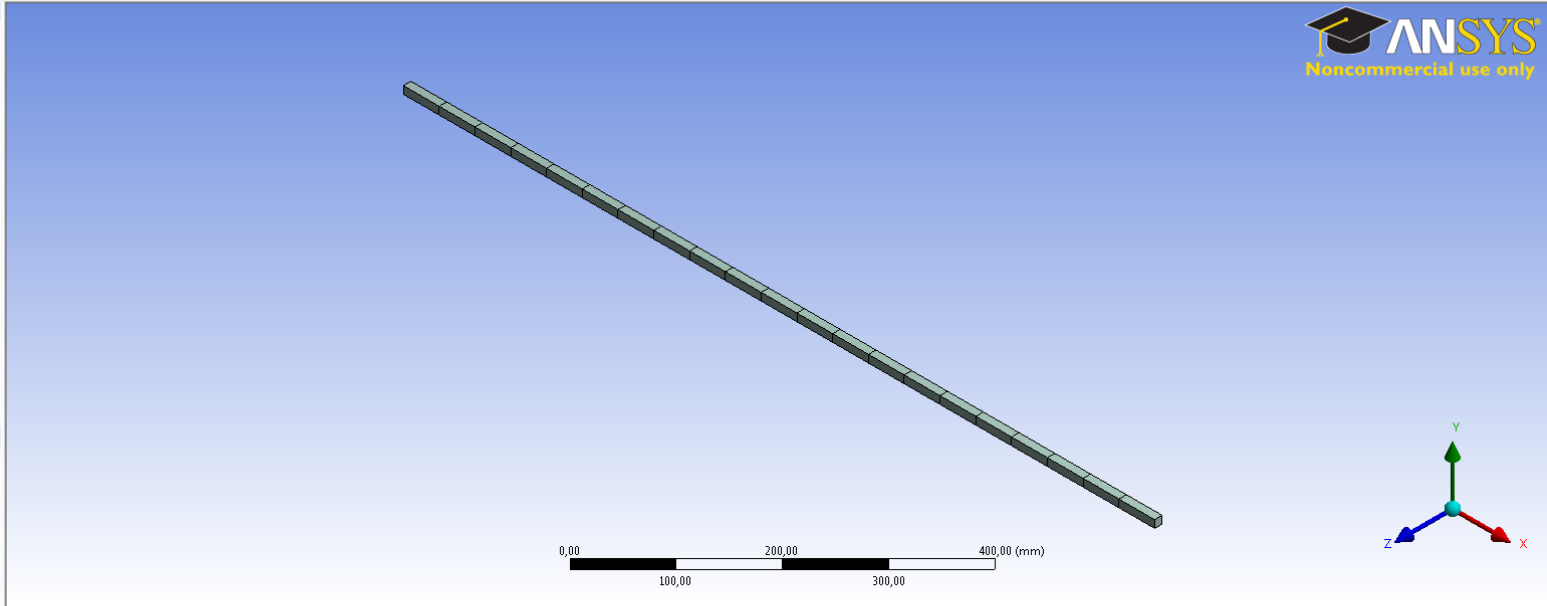


A Linear Buckling will start and use the data from the Static Structural. Double click on Setup at the Linear Buckling analysis



Outline

- Project
 - Model (B4, C4)
 - Geometry
 - Coordinate Systems
 - Mesh
 - Static Structural (B5)
 - Analysis Settings
 - Fixed Support
 - Force
 - Solution (B6)
 - Solution Information
 - Total Deformation
 - Linear Buckling (C5)
 - Pre-Stress (Static Structural)
 - Analysis Settings
 - Solution (C6)
 - Solution Information



Details of "Linear Buckling"

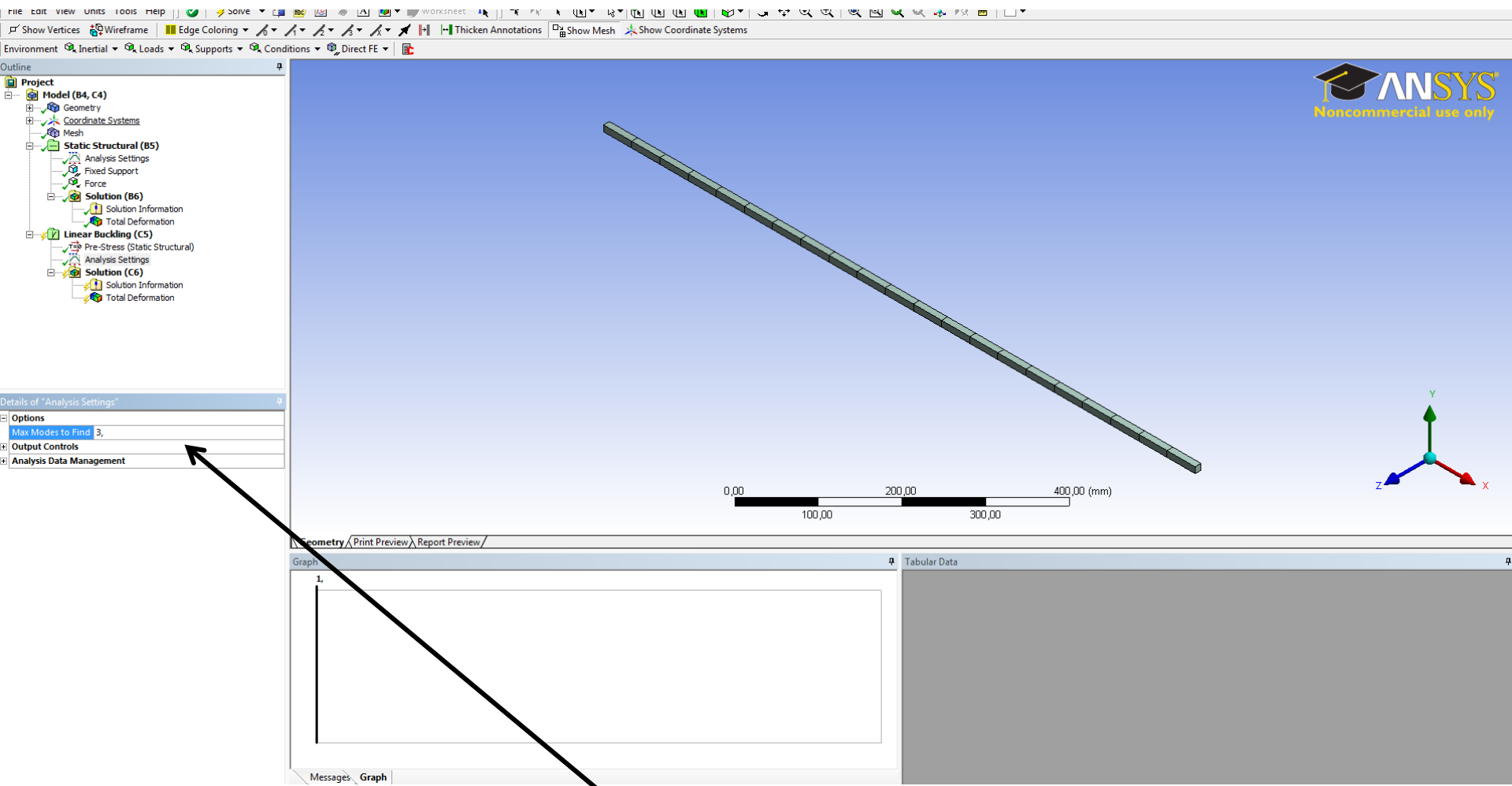
Definition	
Physics Type	Structural
Analysis Type	Linear Buckling
Solver Target	Mechanical APDL
Options	
Generate Input Only	No

Geometry | Print Preview | Report Preview

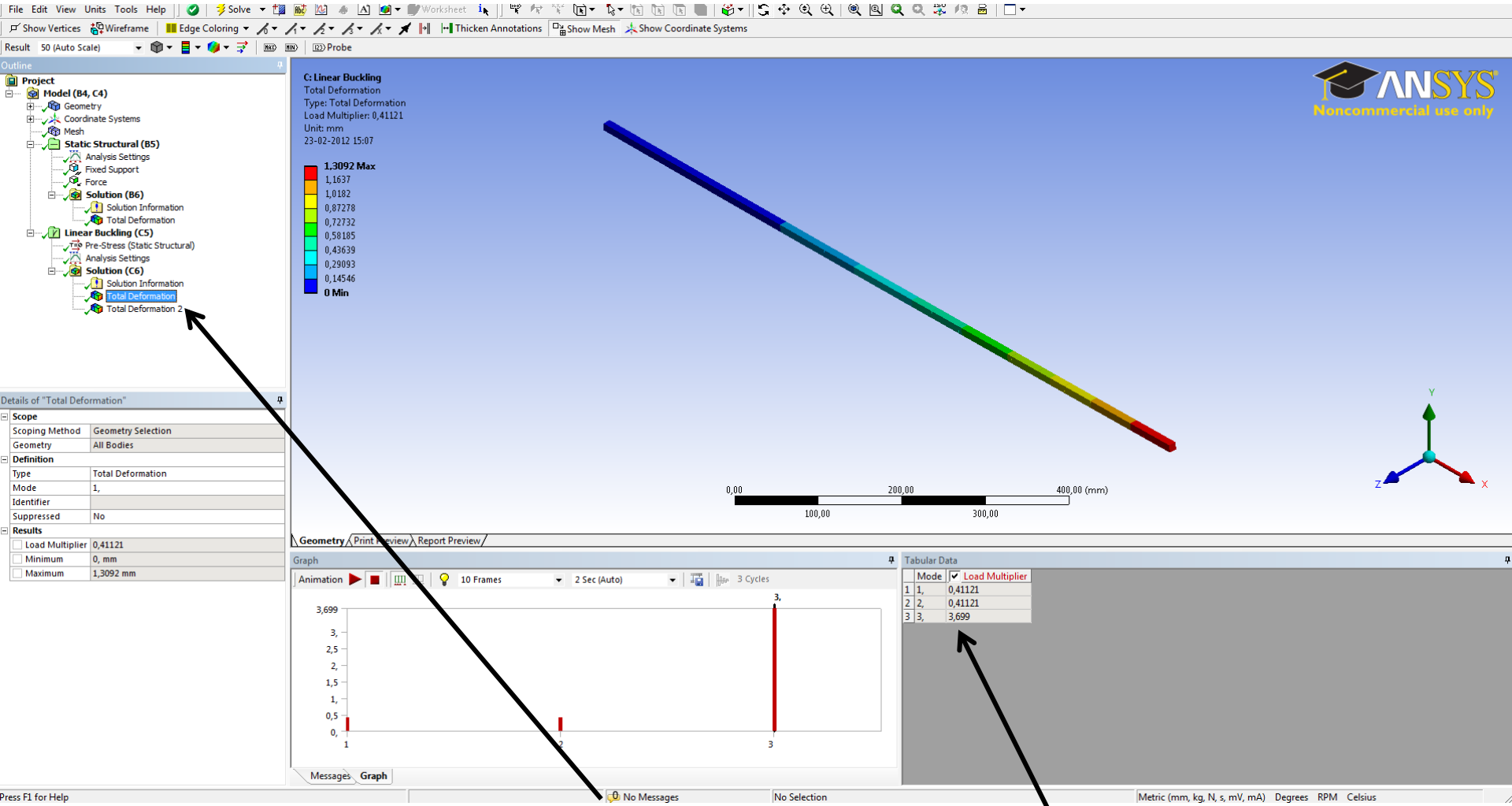
Graph

Tabular Data

Then this windows will appear



To find the first 3 mode by set the max modes to find to 3 and solve

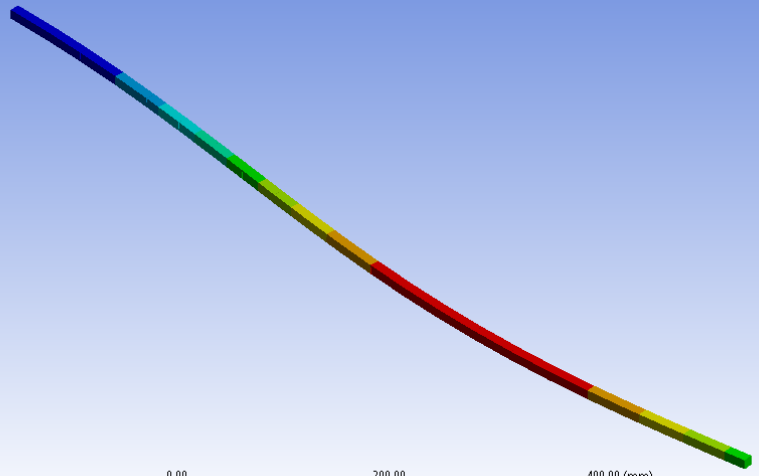
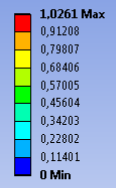


Plot the deformation at the left the buckling multiplier level are shown.

Outline

- Project
 - Model (B4, C4)
 - Geometry
 - Coordinate Systems
 - Mesh
 - Static Structural (B5)
 - Analysis Settings
 - Fixed Support
 - Force
 - Solution (B6)
 - Solution Information
 - Total Deformation
 - Linear Buckling (C5)
 - Pre-Stress (Static Structural)
 - Analysis Settings
 - Solution (C6)
 - Solution Information
 - Total Deformation
 - Total Deformation 2

C: Linear Buckling
Total Deformation 2
Type: Total Deformation
Load Multiplier: 3,699
Unit: mm
23-02-2012 15:07



Details of "Total Deformation 2"

Scope

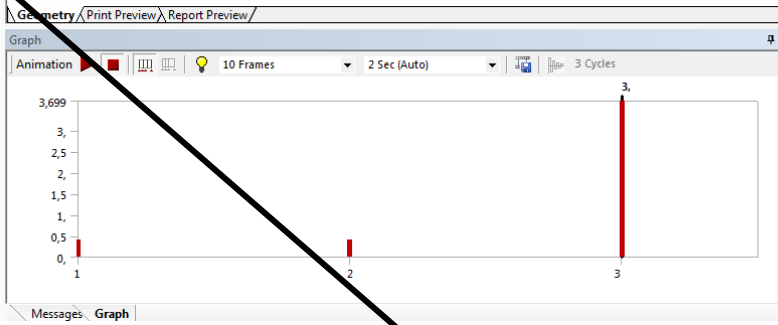
Scoping Method	Geometry Selection
Geometry	All Bodies

Definition

Type	Total Deformation
Mode	3,
Identifier	
Suppressed	No

Results

Load Multiplier	3,699
Minimum	0, mm
Maximum	1,0261 mm



Tabular Data

Mode	Load Multiplier
1	0,41121
2	0,41121
3	3,699

Plot buckling mode 3 by changing the mode number to 3 and solve.