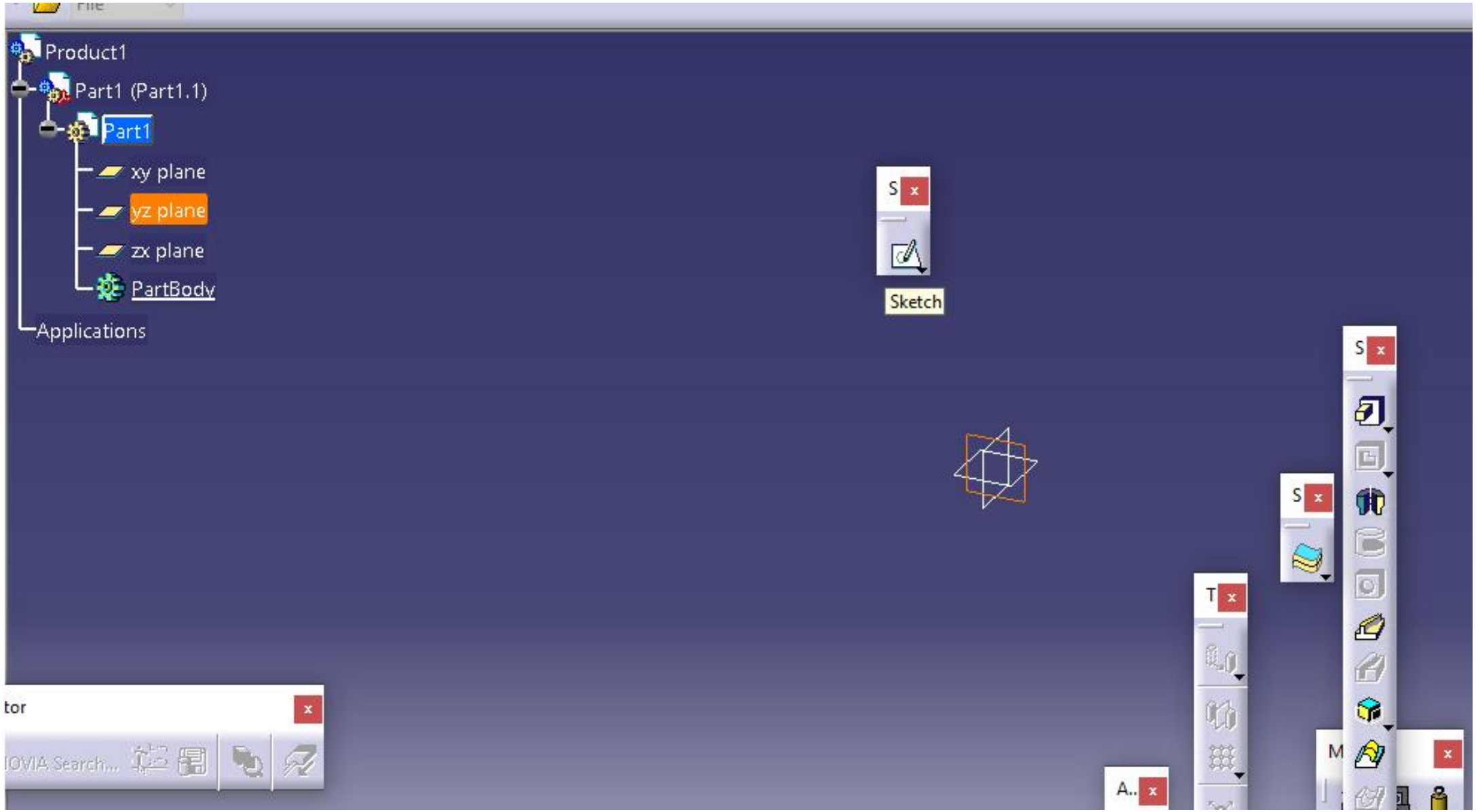
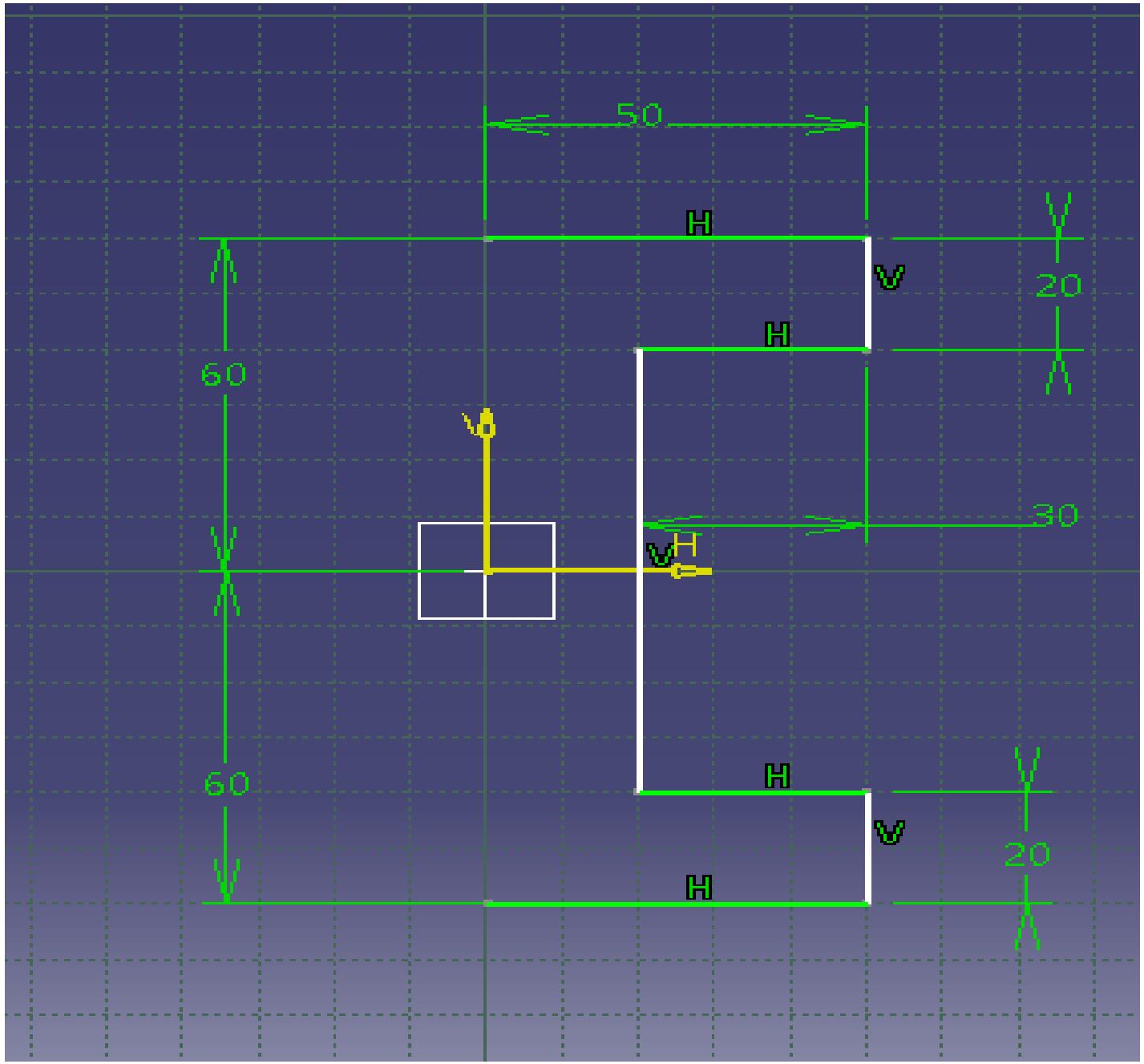
# المحاضرة الثانية عشرة

# التصميم بمساعدة الحاسب

جامعة المنارة

MANARA UNIVERSITY


Product1
Part1 (Part1.1)
Part1
xy plane
yz plane
zx plane
PartBody
Applications
Sketch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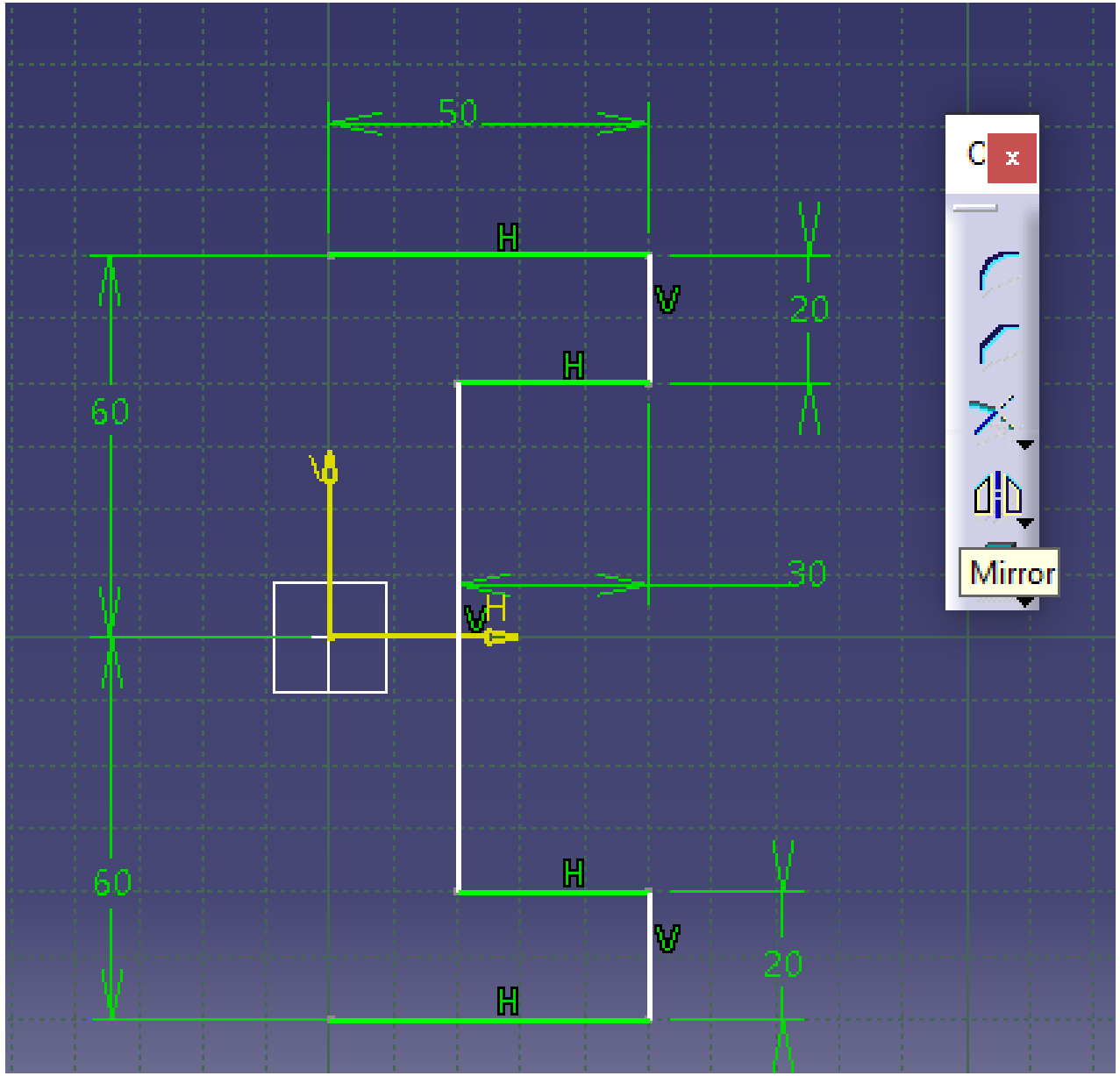
H
V
20
H
60
V
H
30
V
H
60
H
V
20
H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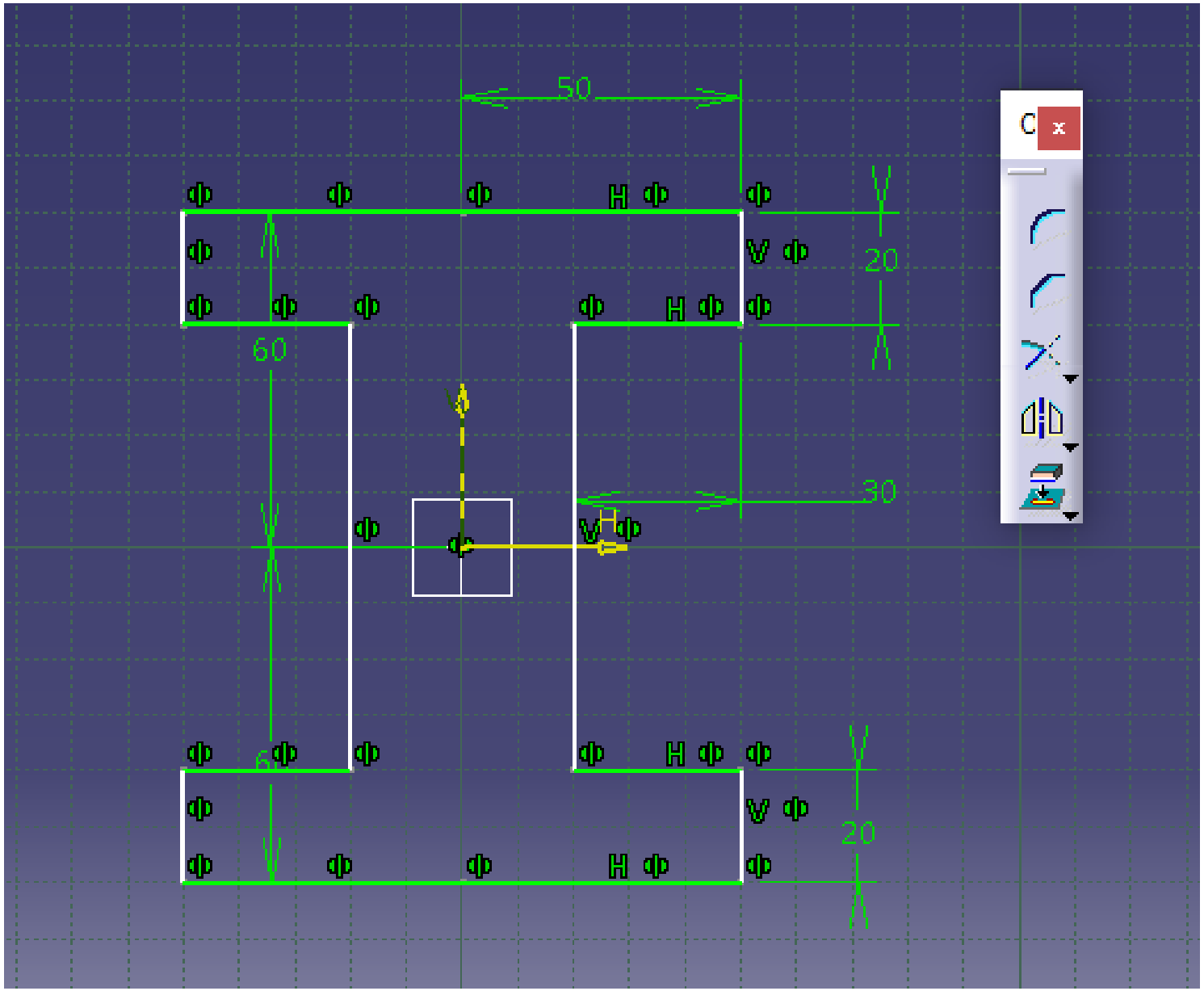
H
V
20
H
60
V
30
H
V
60
H
V
20
H
Mirror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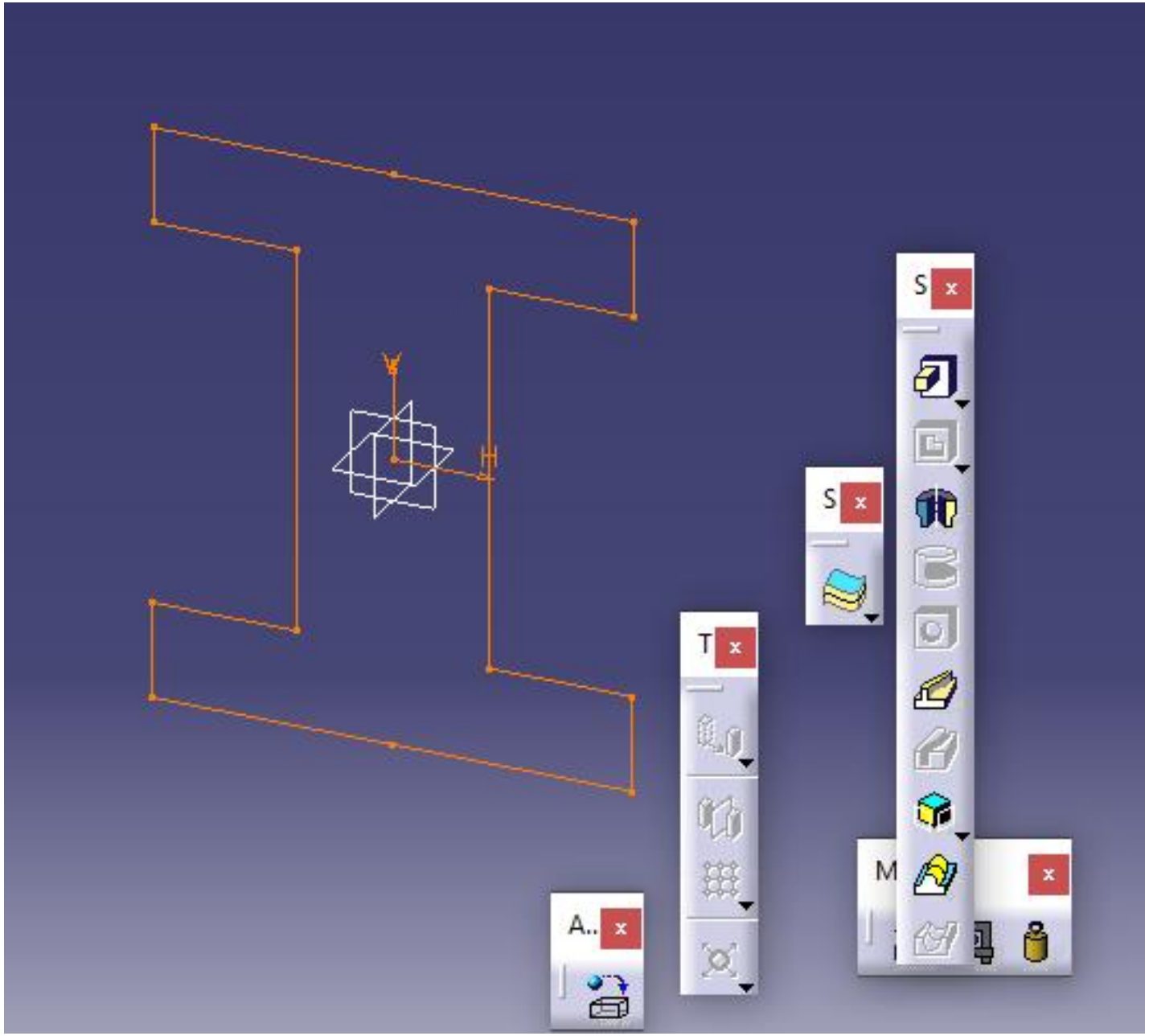
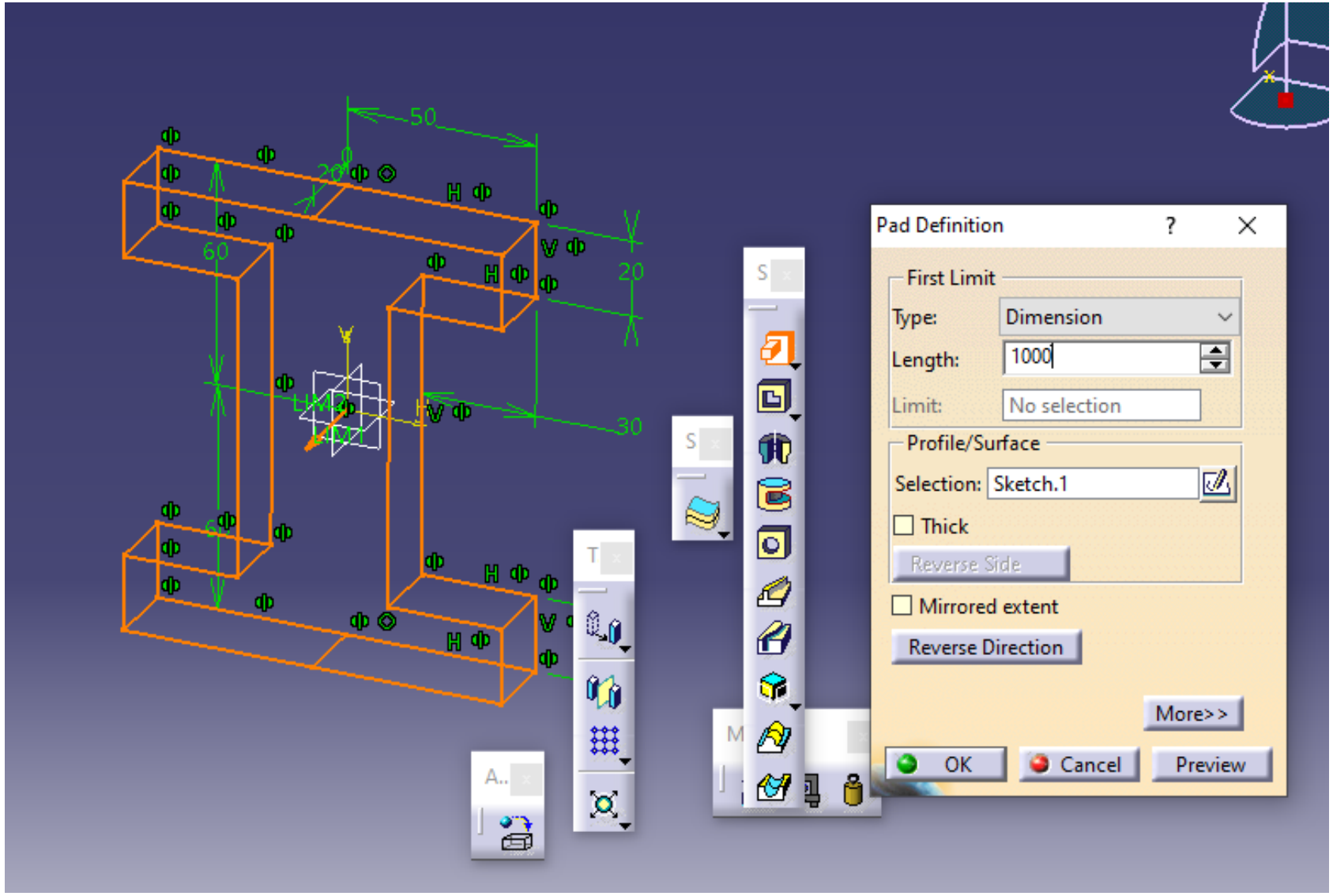
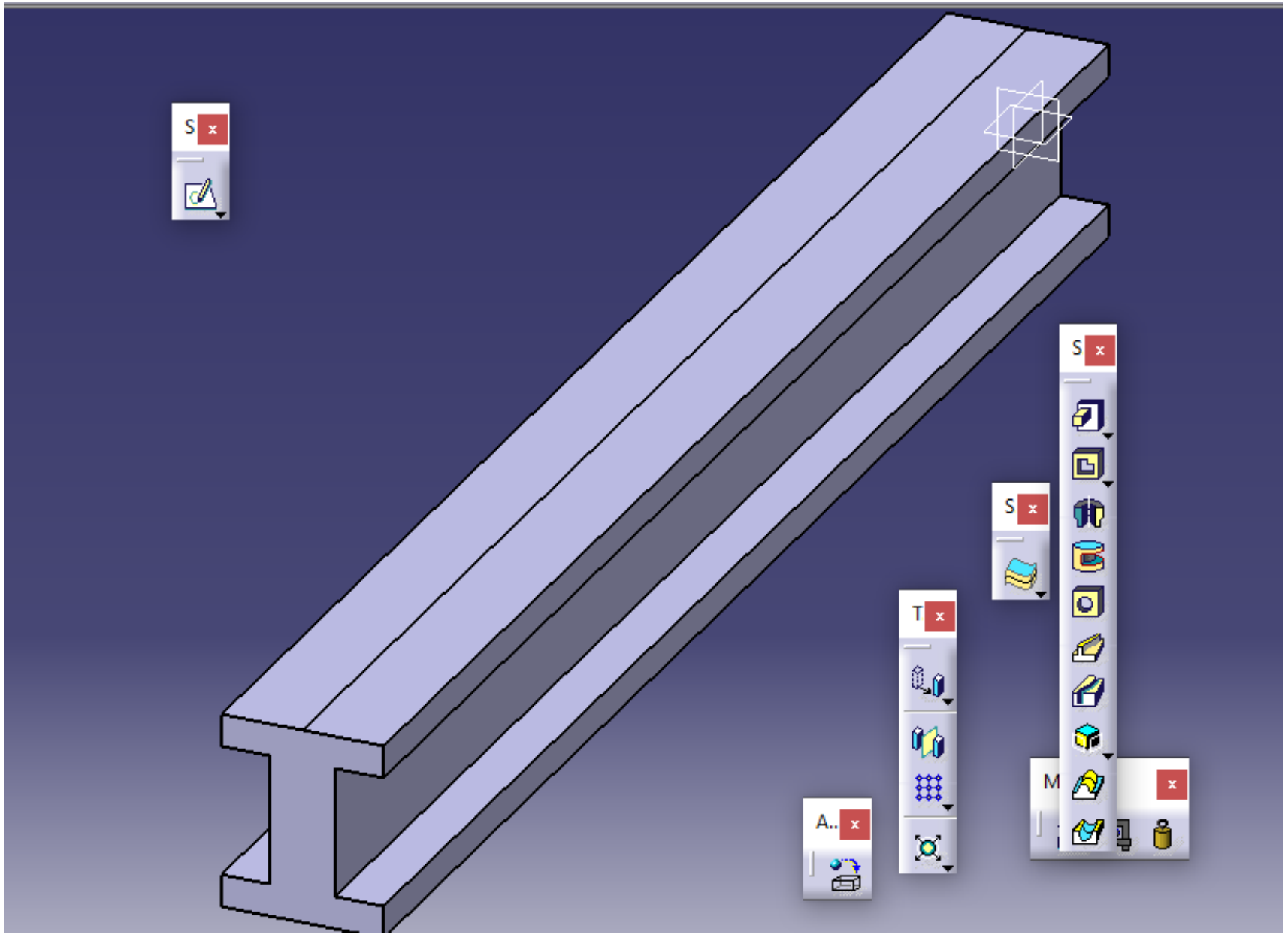
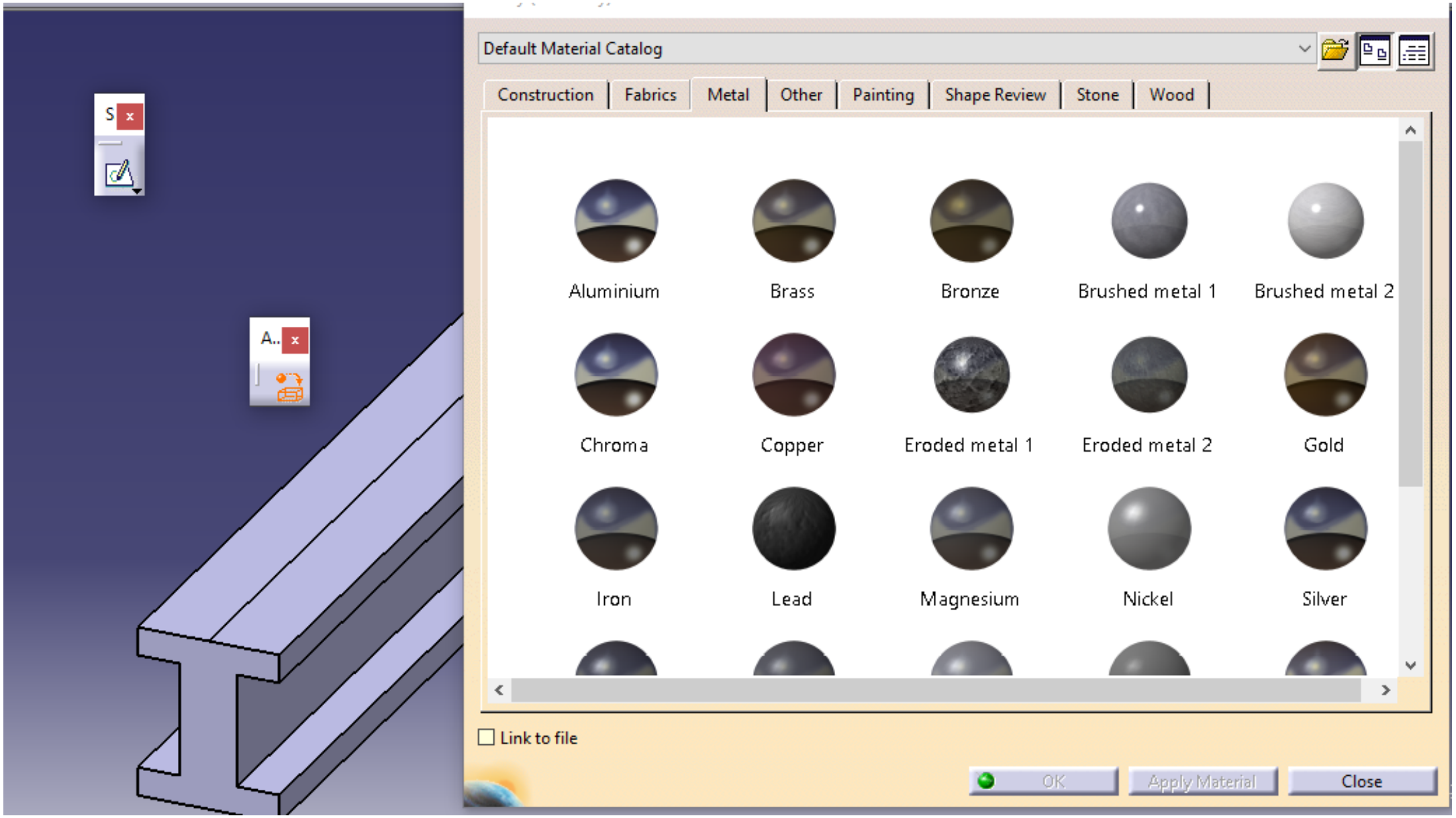
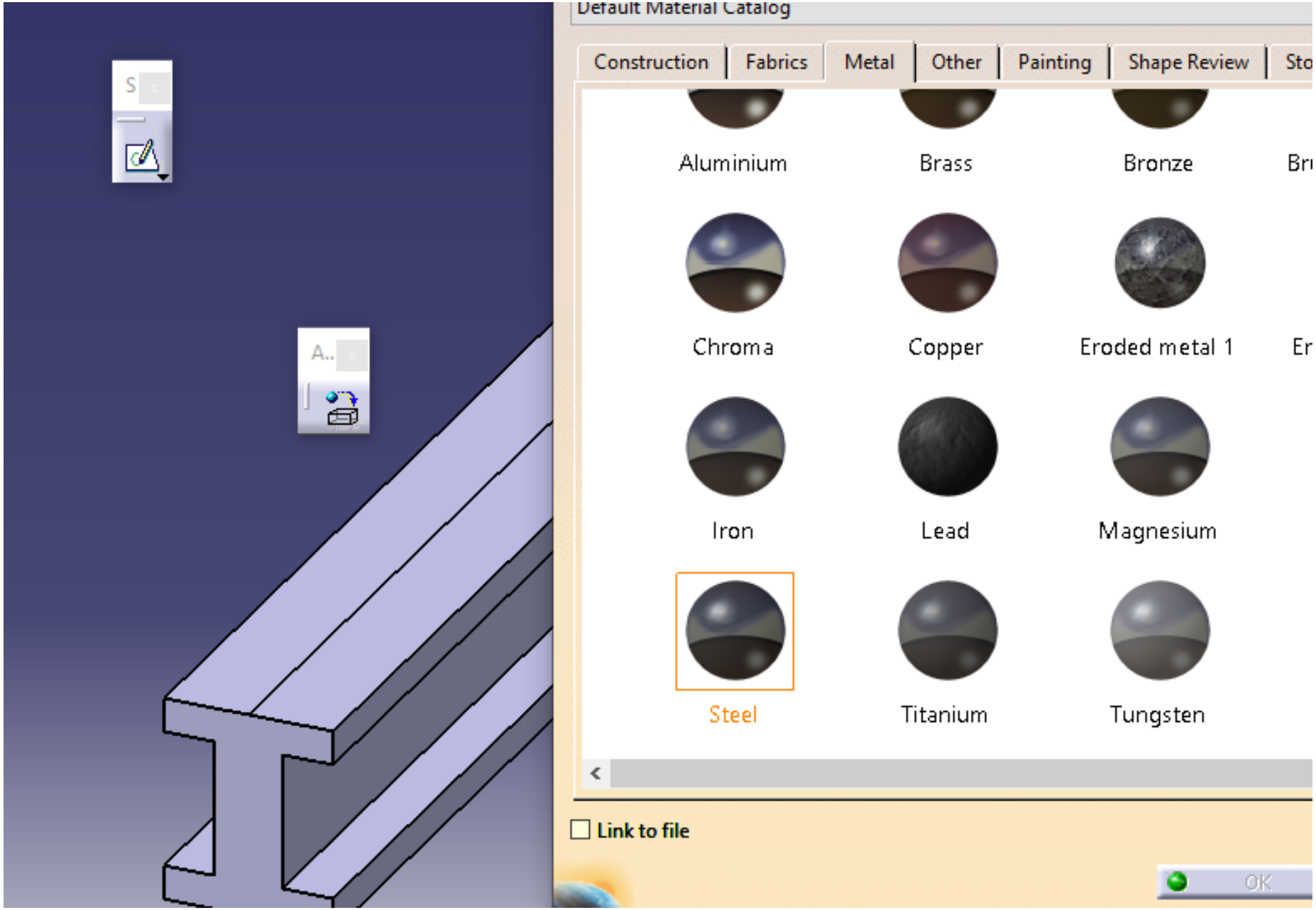
H
V
20
60
30
H
V
20

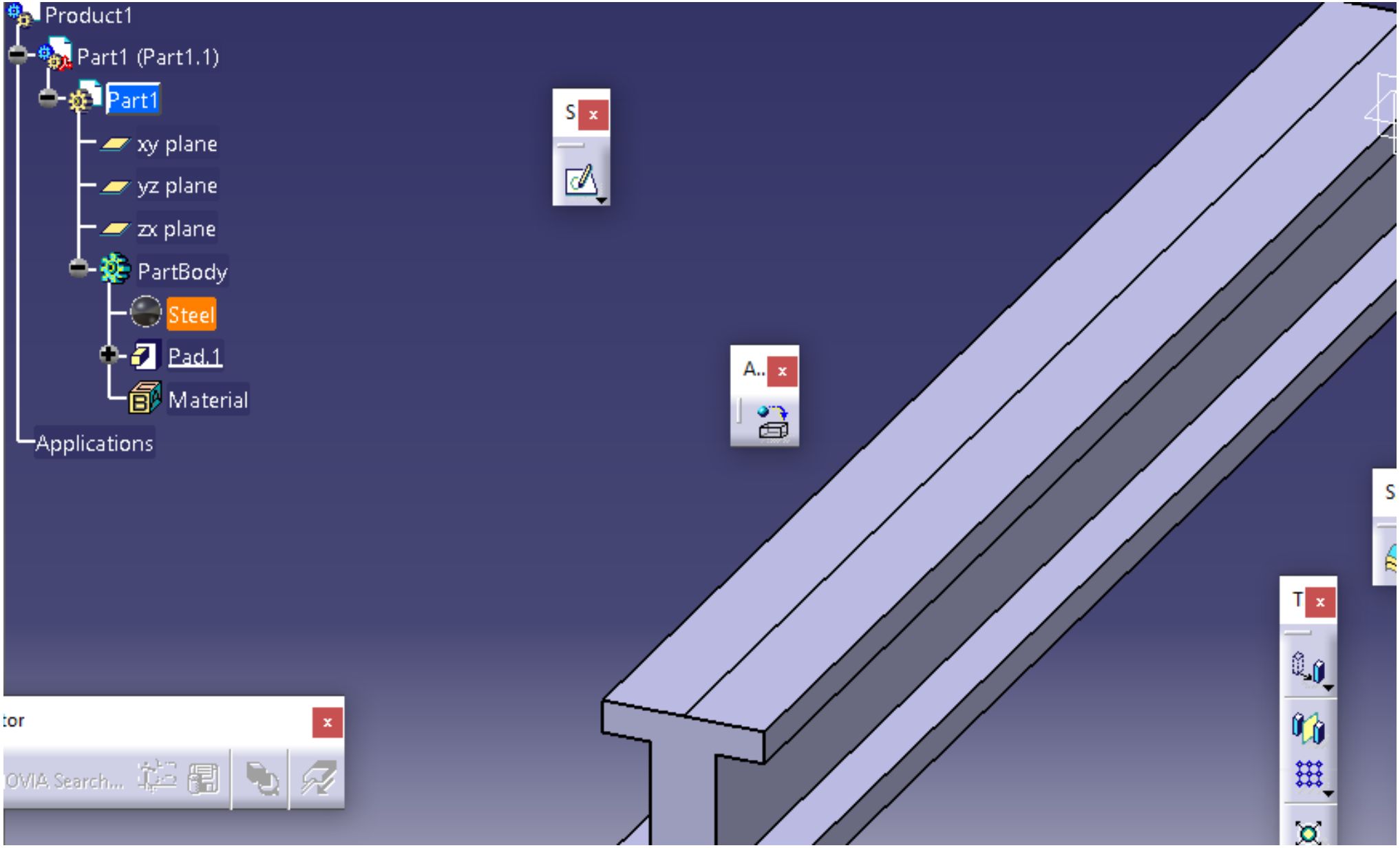

S
S
T
A..
M

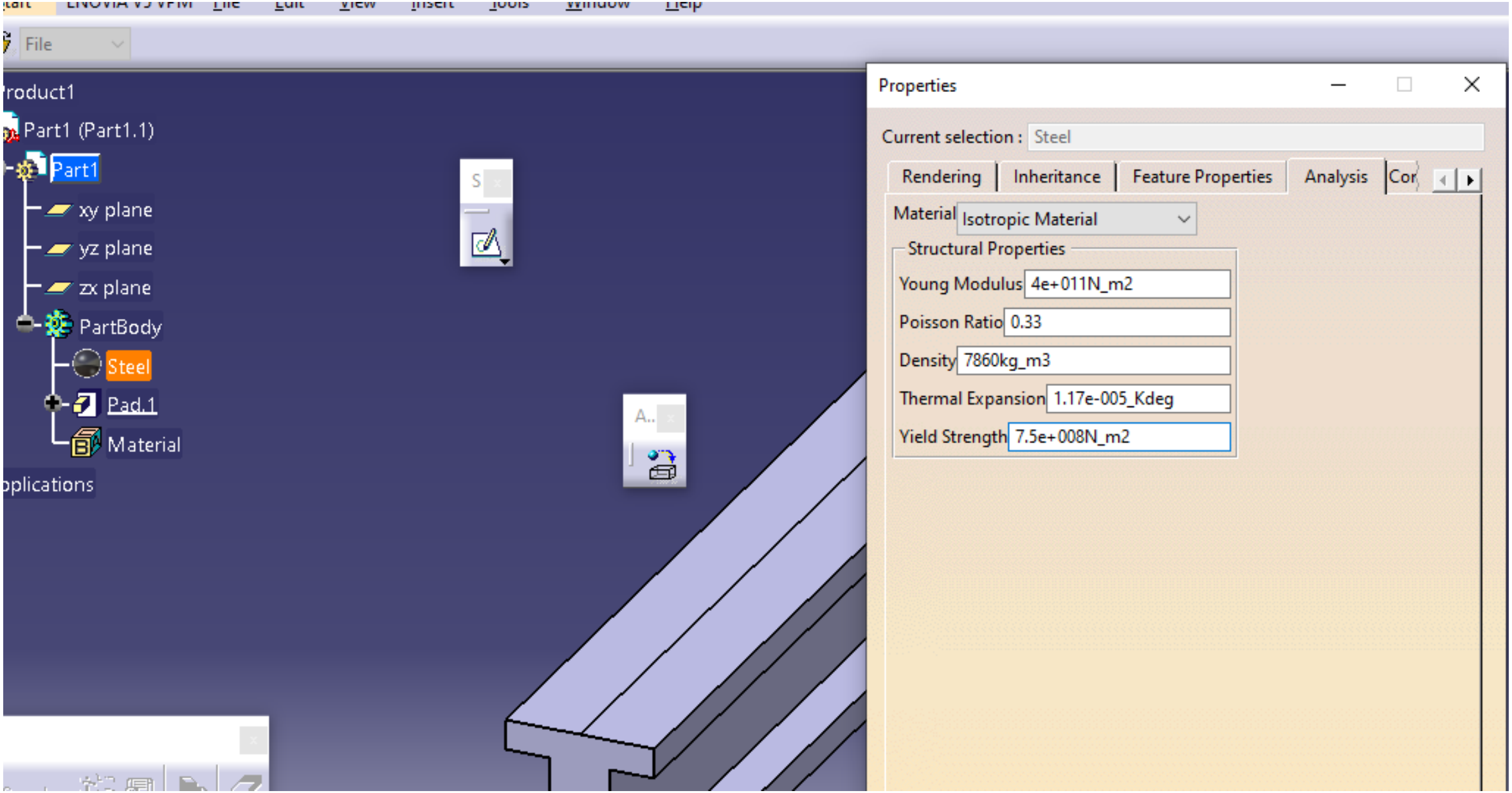

50
20
60
20
30
Pad Definition
First Limit
Type:
Dimension
Length:
1000
Limit:
No selection
Profile/Surface
Selection:
Sketch.1
Thick
Reverse Side
Mirrored extent
Reverse Direction
More>>
OK
Cancel
Preview

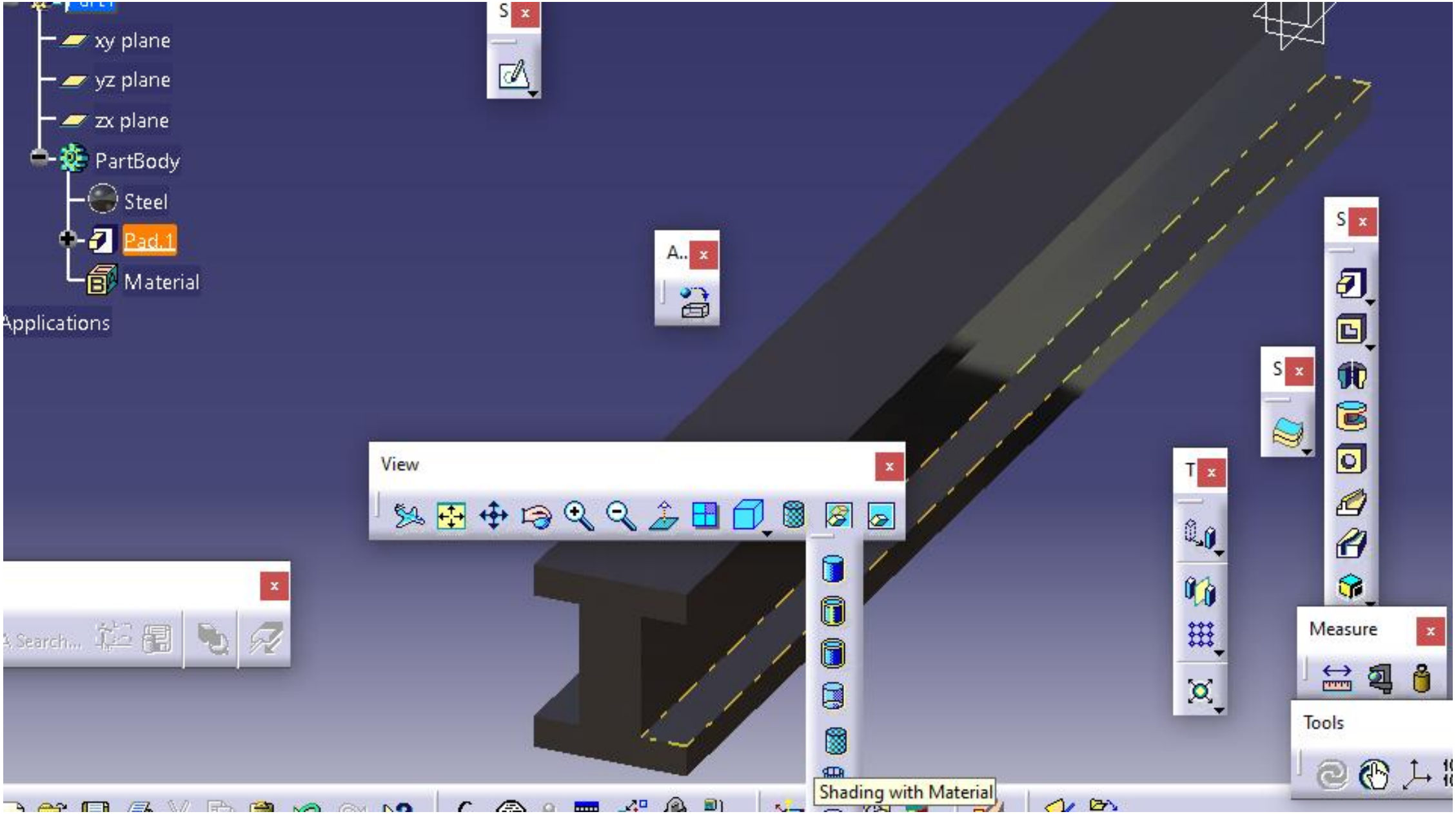

S
S
S
T
A...
M

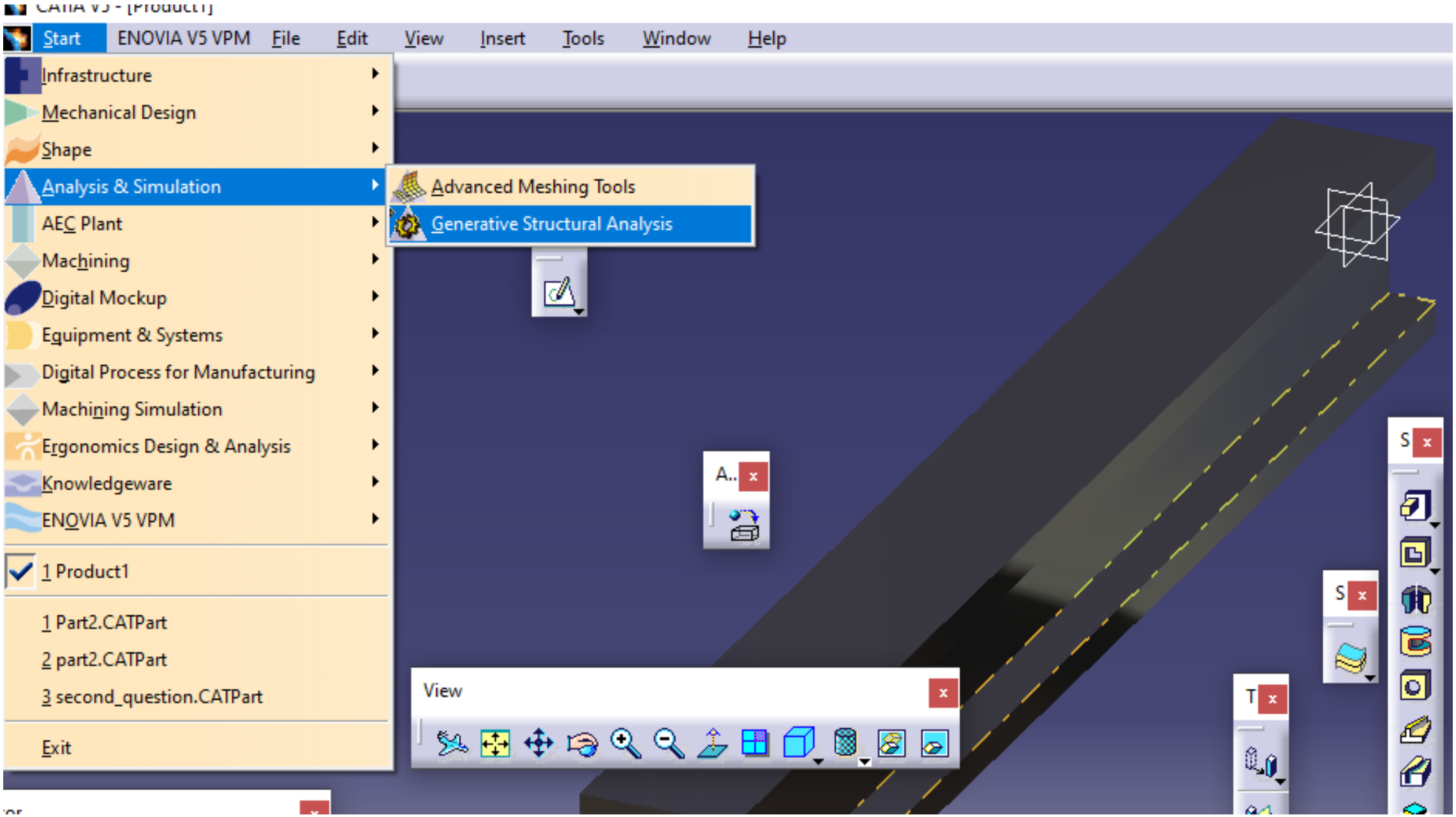

Default Material Catalog
Construction
Fabrics
Metal
Other
Painting
Shape Review
Stone
Wood
Aluminium
Brass
Bronze
Brushed metal 1
Brushed metal 2
Chroma
Copper
Eroded metal 1
Eroded metal 2
Gold
Iron
Lead
Magnesium
Nickel
Silver
Link to file
OK
Apply Material
Close

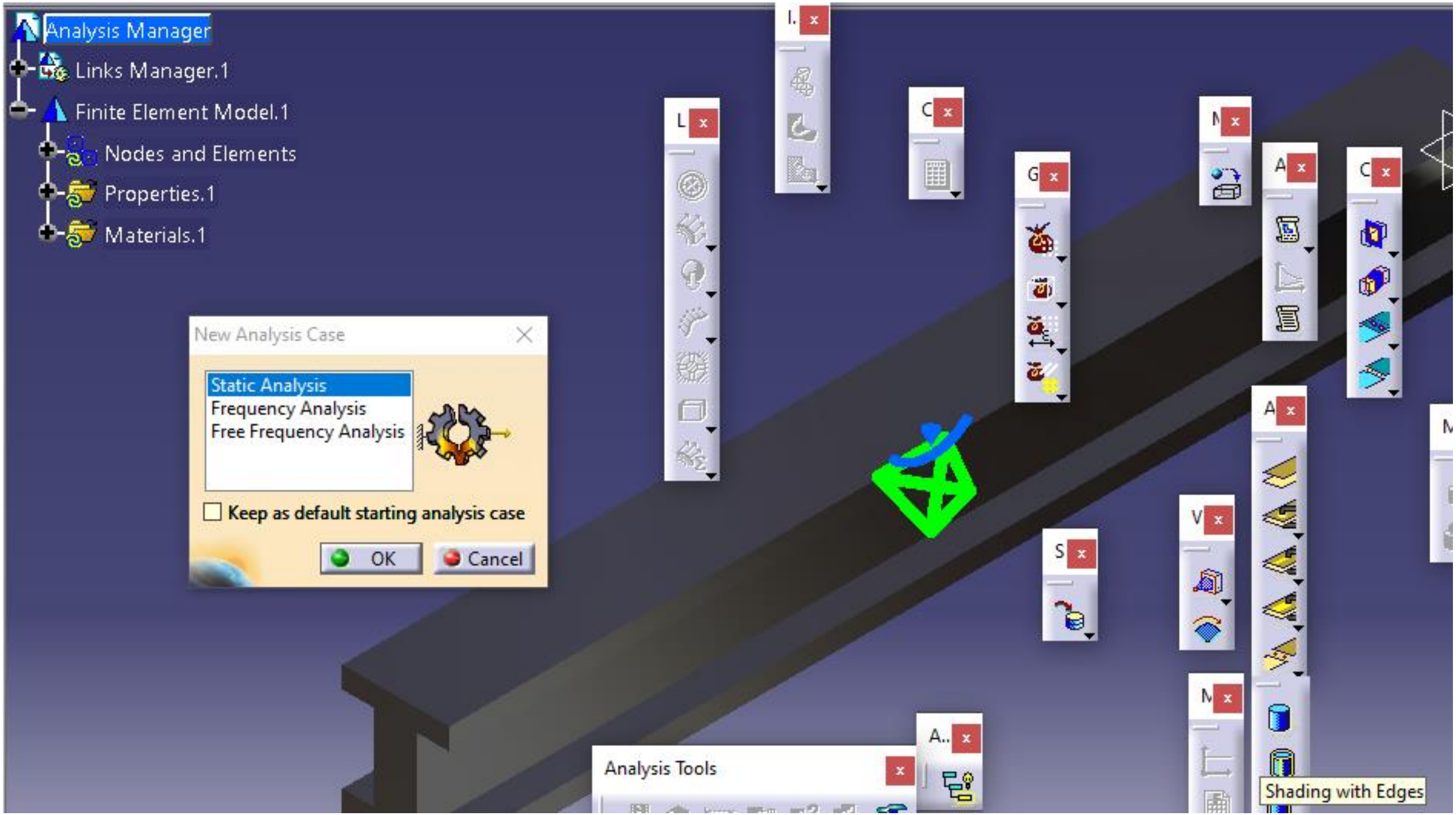

Default Material Catalog
Construction
Fabrics
Metal
Other
Painting
Shape Review
Aluminium
Brass
Bronze
Chroma
Copper
Eroded metal 1
Iron
Lead
Magnesium
Steel
Titanium
Tungsten
Link to file
OK

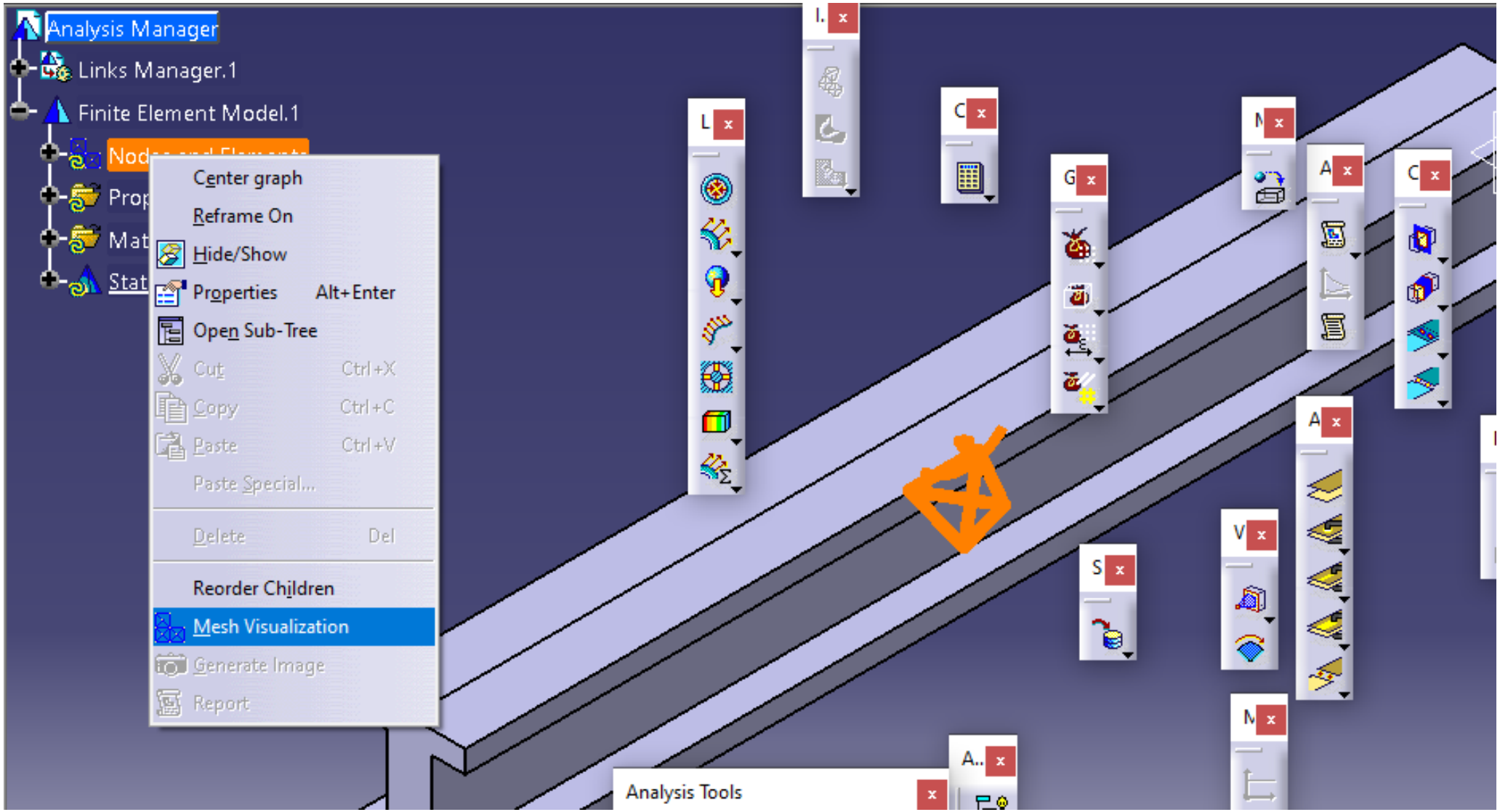

Product1
Part1 (Part1.1)
Part1
xy plane
yz plane
zx plane
PartBody
Steel
Pad.1
Material
Applications
S
A...
T
OVIA Search...

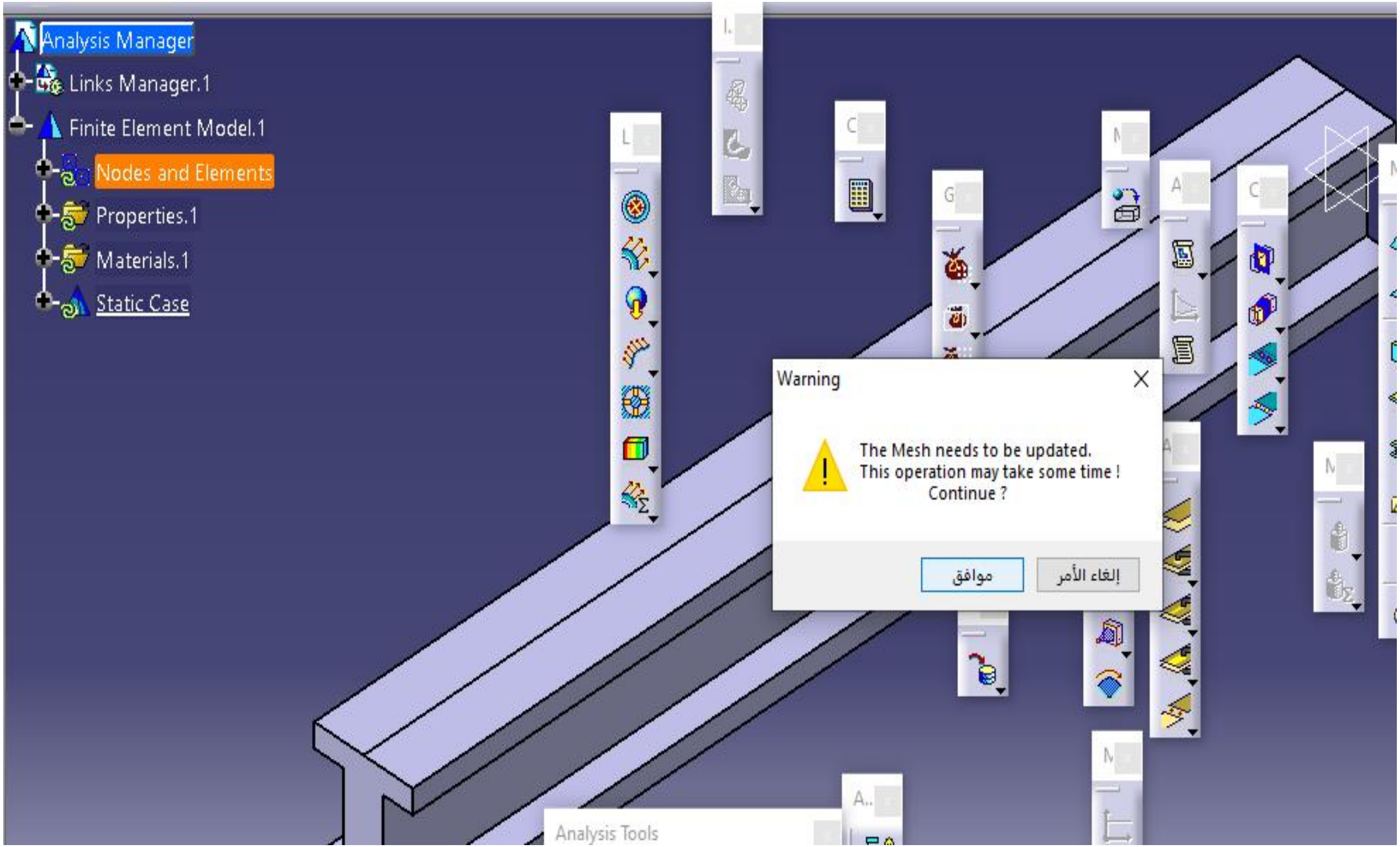

File
Product1
Part1 (Part1.1)
Part1
xy plane
yz plane
zx plane
PartBody
Steel
Pad.1
Material
Applications
Properties
Current selection : Steel
Rendering
Inheritance
Feature Properties
Analysis
Material Isotropic Material
Structural Properties
Young Modulus 4e+011N_m2
Poisson Ratio 0.33
Density 7860kg_m3
Thermal Expansion 1.17e-005_Kdeg
Yield Strength 7.5e+008N_m2

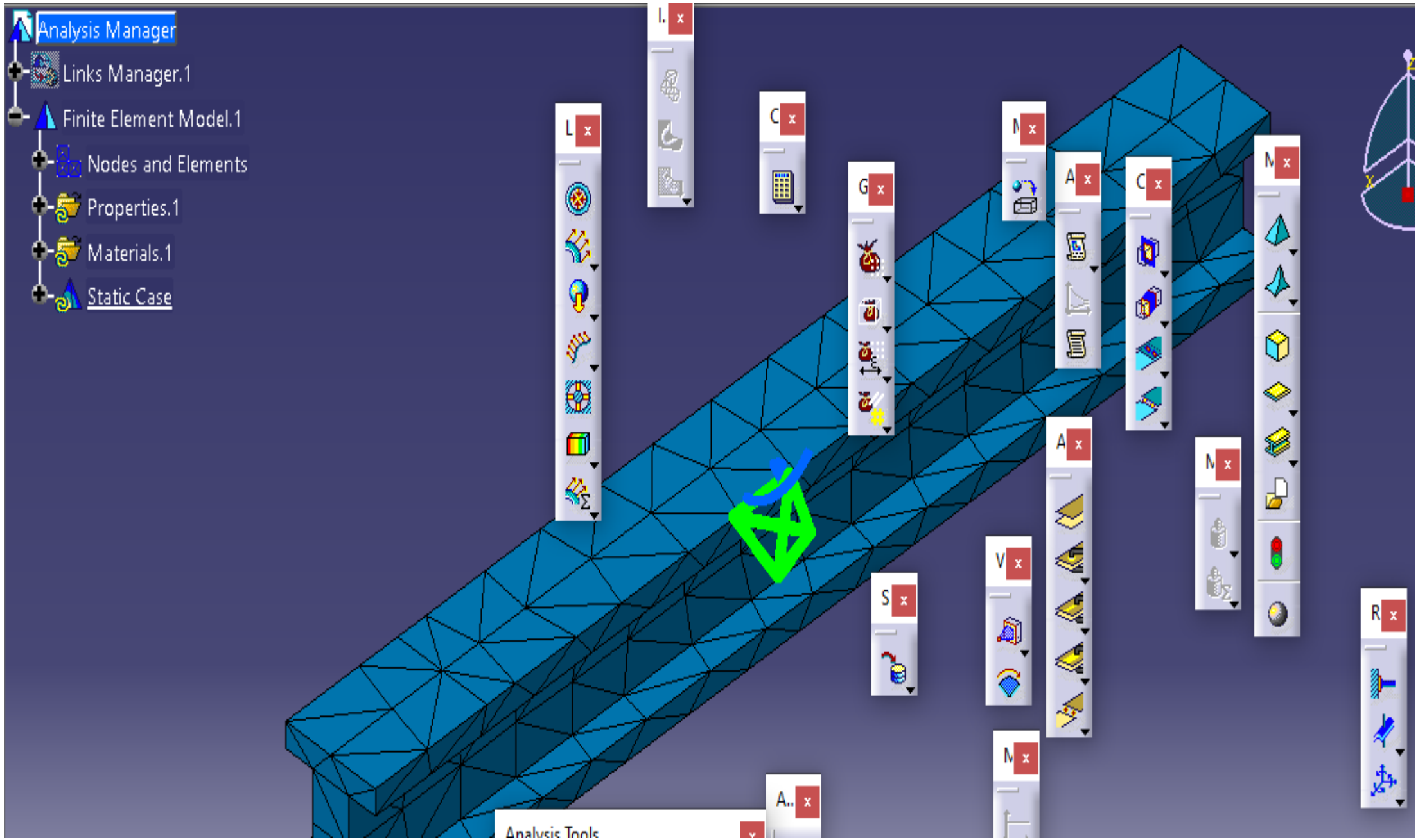

xy plane
yz plane
zx plane
PartBody
Steel
Pad.1
Material
Applications
View
Search...
Measure
Tools
Shading with Material

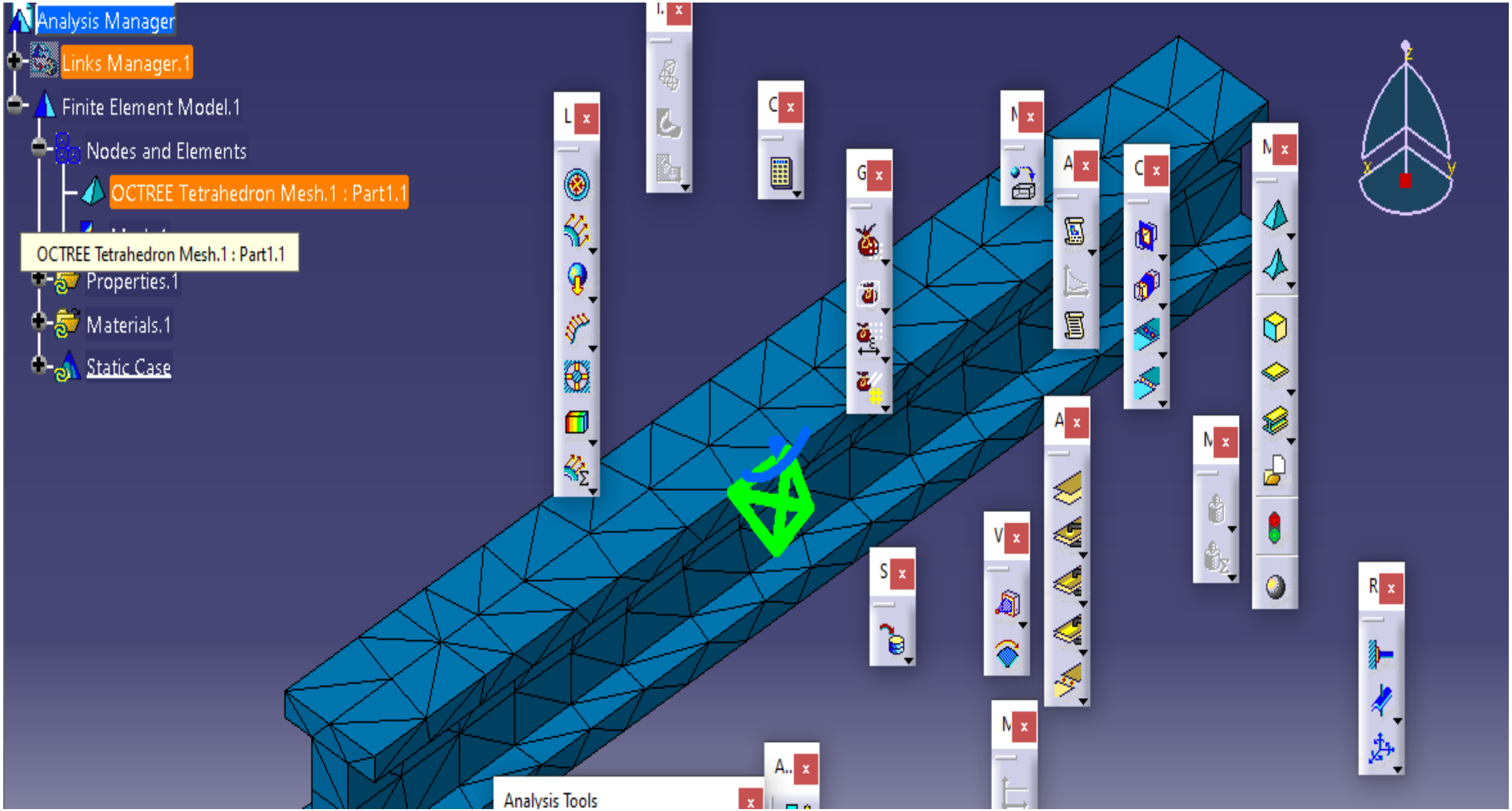

Start
ENOVIA V5 VPM
File
Edit
View
Insert
Tools
Window
Help
Infrastructure
Mechanical Design
Shape
Analysis & Simulation
AEC Plant
Machining
Digital Mockup
Equipment & Systems
Digital Process for Manufacturing
Machining Simulation
Ergonomics Design & Analysis
Knowledgeware
ENOVIA V5 VPM
1 Product1
1 Part2.CATPart
2 part2.CATPart
3 second_question.CATPart
Exit
Advanced Meshing Tools
Generative Structural Analysis
View

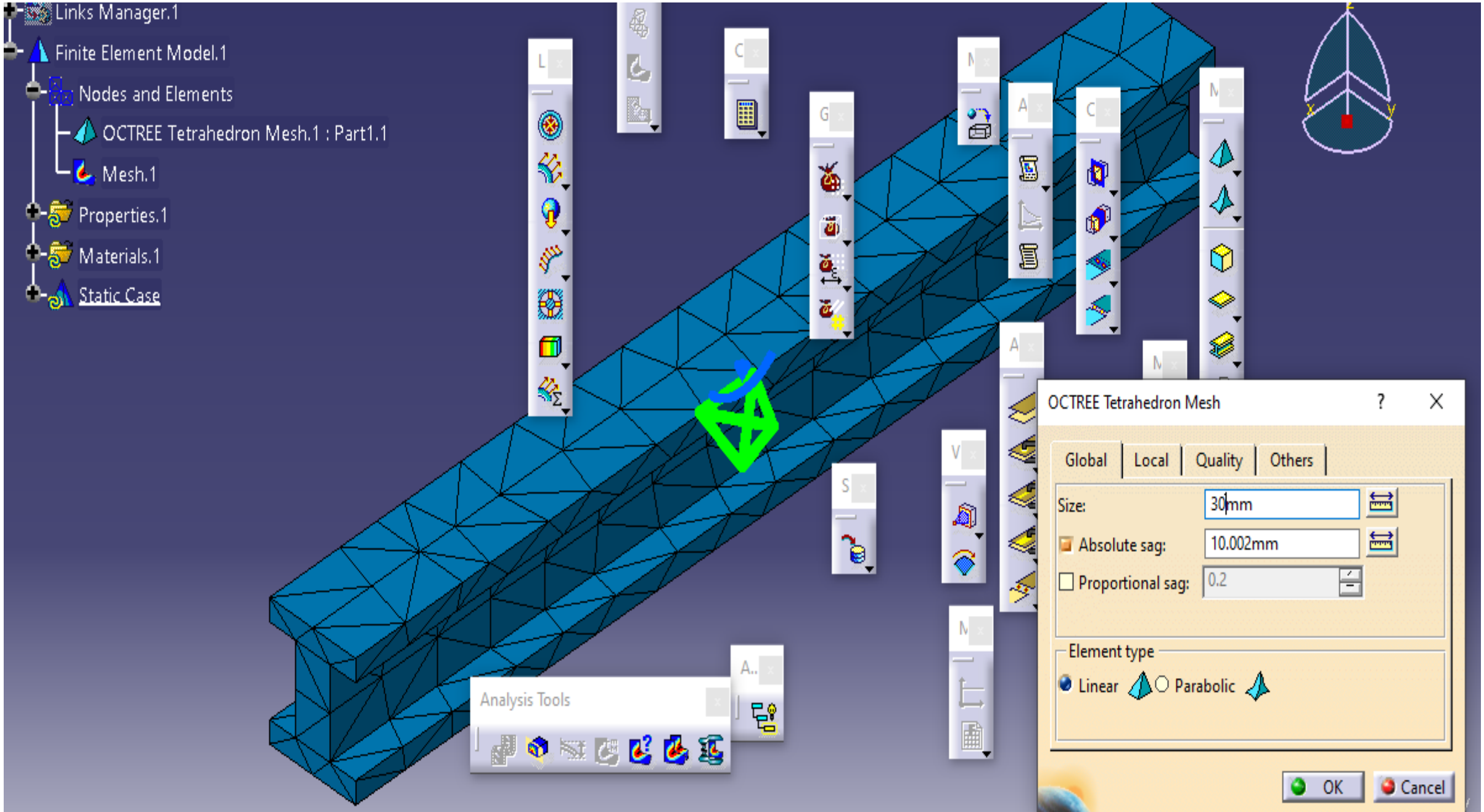

Analysis Manager
Links Manager.1
Finite Element Model.1
Nodes and Elements
Properties.1
Materials.1
New Analysis Case
Static Analysis
Frequency Analysis
Free Frequency Analysis
Keep as default starting analysis case
OK
Cancel
Analysis Tools
Shading with Edges

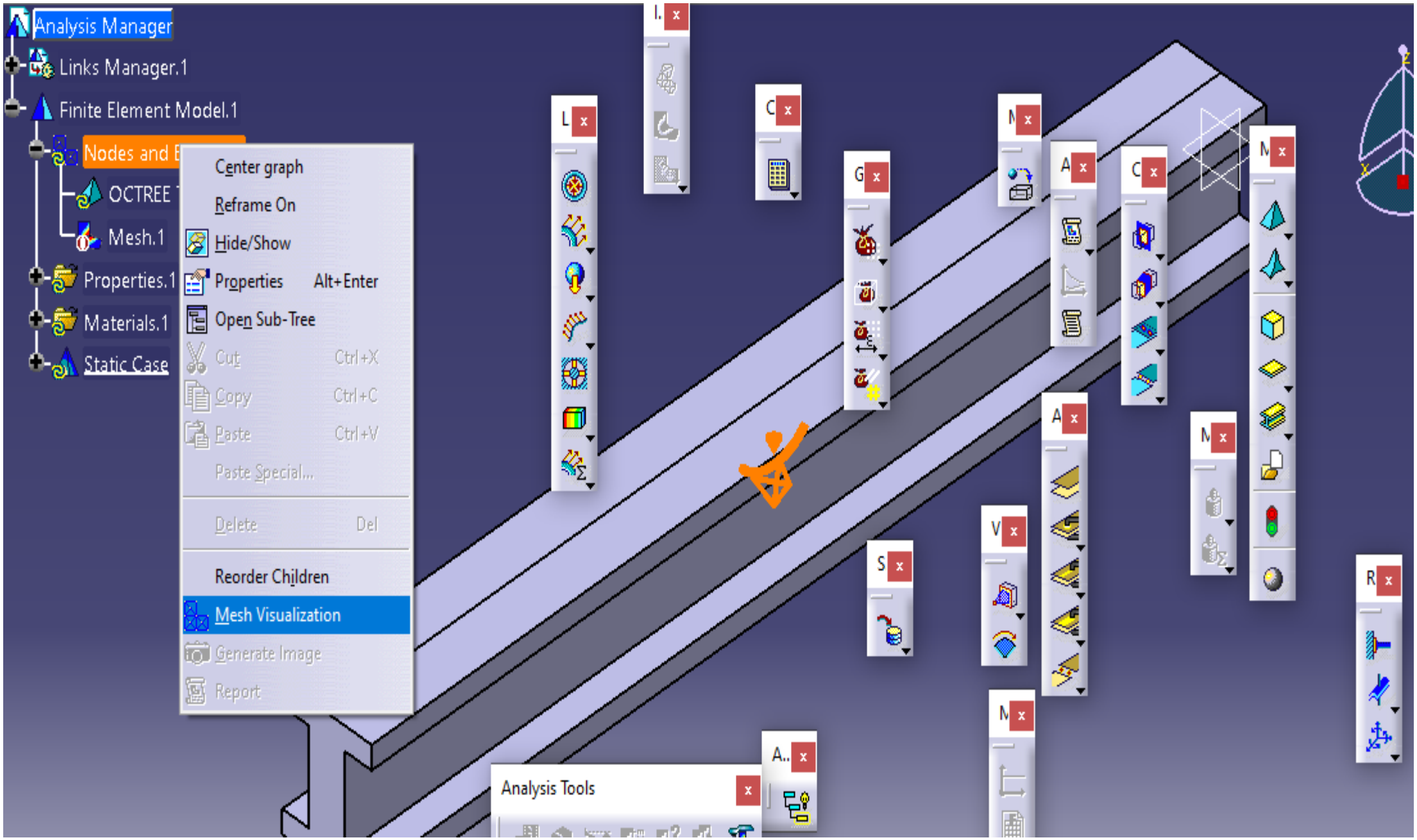

Analysis Manager
Links Manager.1
Finite Element Model.1
Center graph
Reframe On
Hide/Show
Properties Alt+Enter
Open Sub-Tree
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Paste Special...
Delete Del
Reorder Children
Mesh Visualization
Generate Image
Report
Analysis Tools

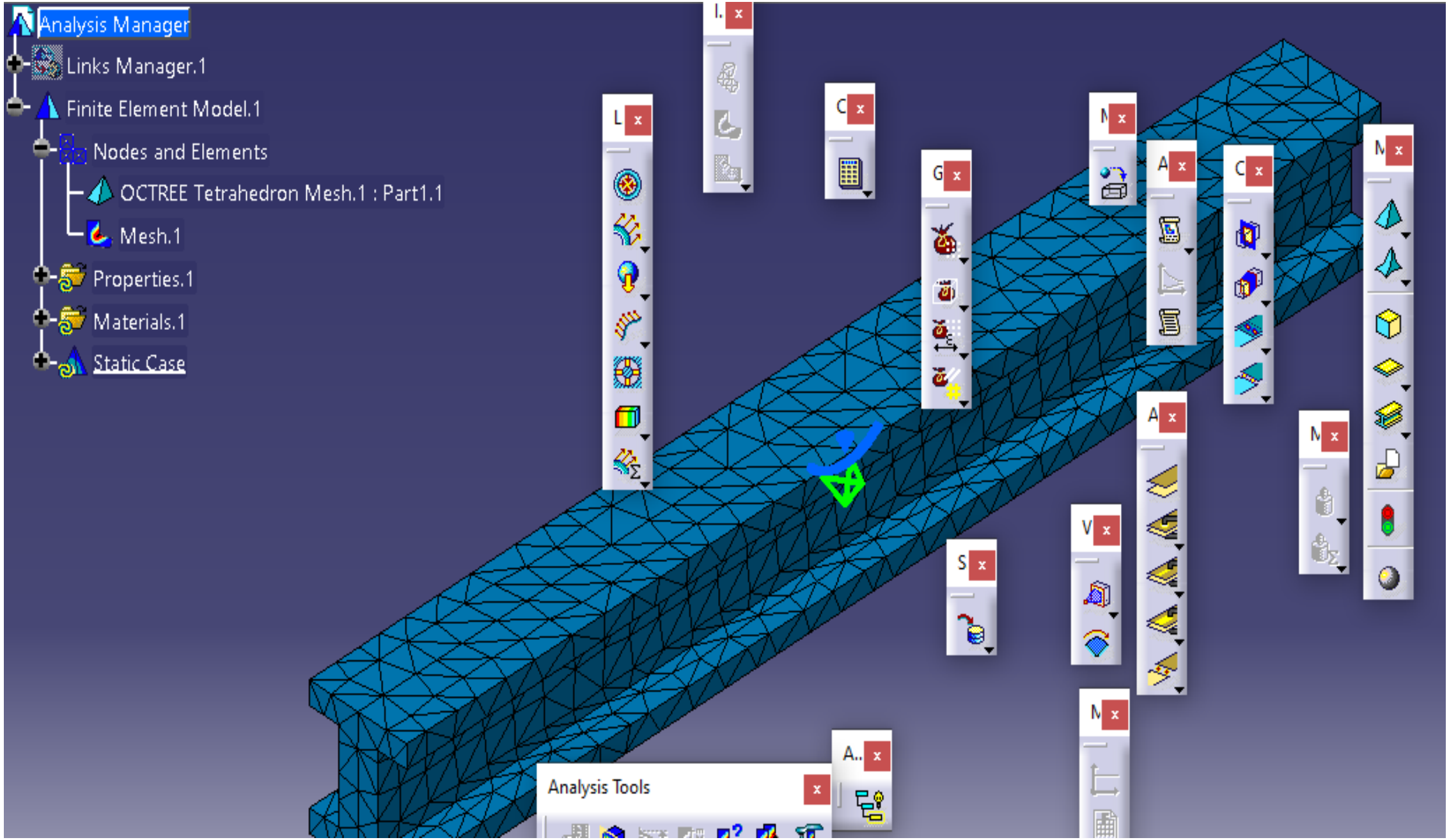

Analysis Manager
Links Manager.1
Finite Element Model.1
Nodes and Elements
Properties.1
Materials.1
Static Case
Warning
The Mesh needs to be updated.
This operation may take some time !
Continue ?
موافق
إلغاء الأمر
Analysis Tools

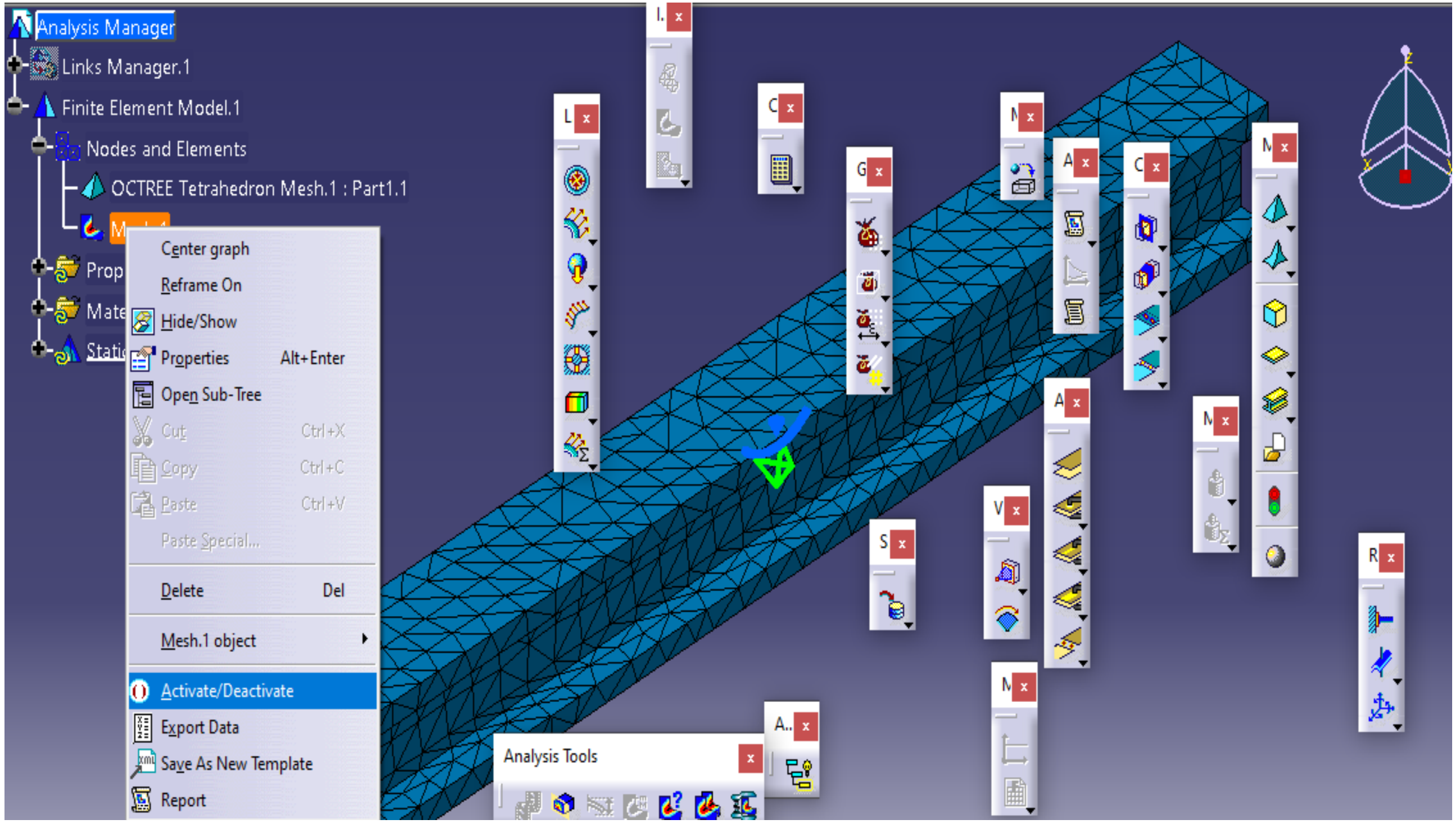

Analysis Manager
Links Manager.1
Finite Element Model.1
Nodes and Elements
Properties.1
Materials.1
Static Case
Analysis Tools

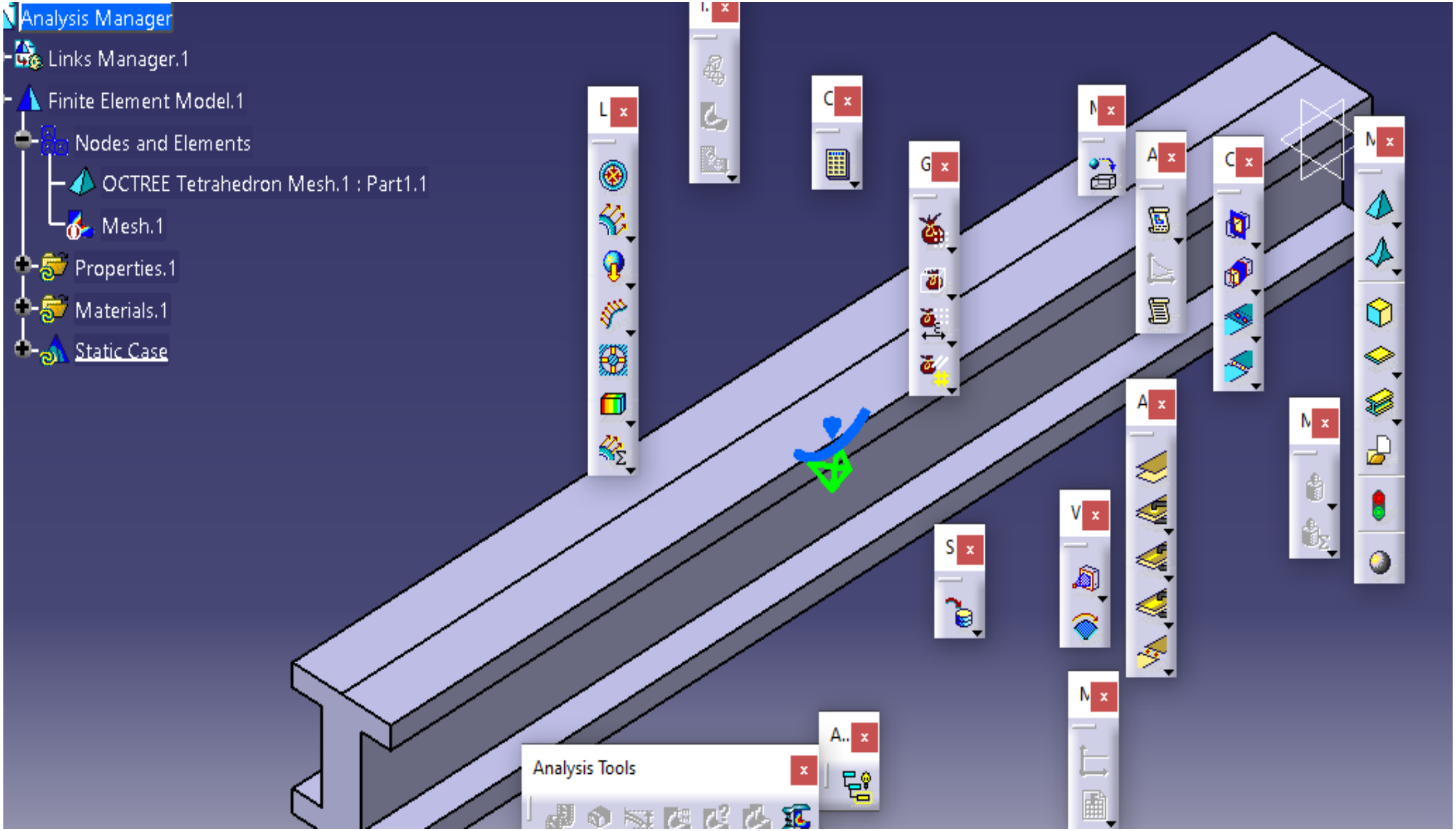

Analysis Manager
Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
OCTREE Tetrahedron Mesh.1 : Part1.1
Properties.1
Materials.1
Static Case
Analysis Tools

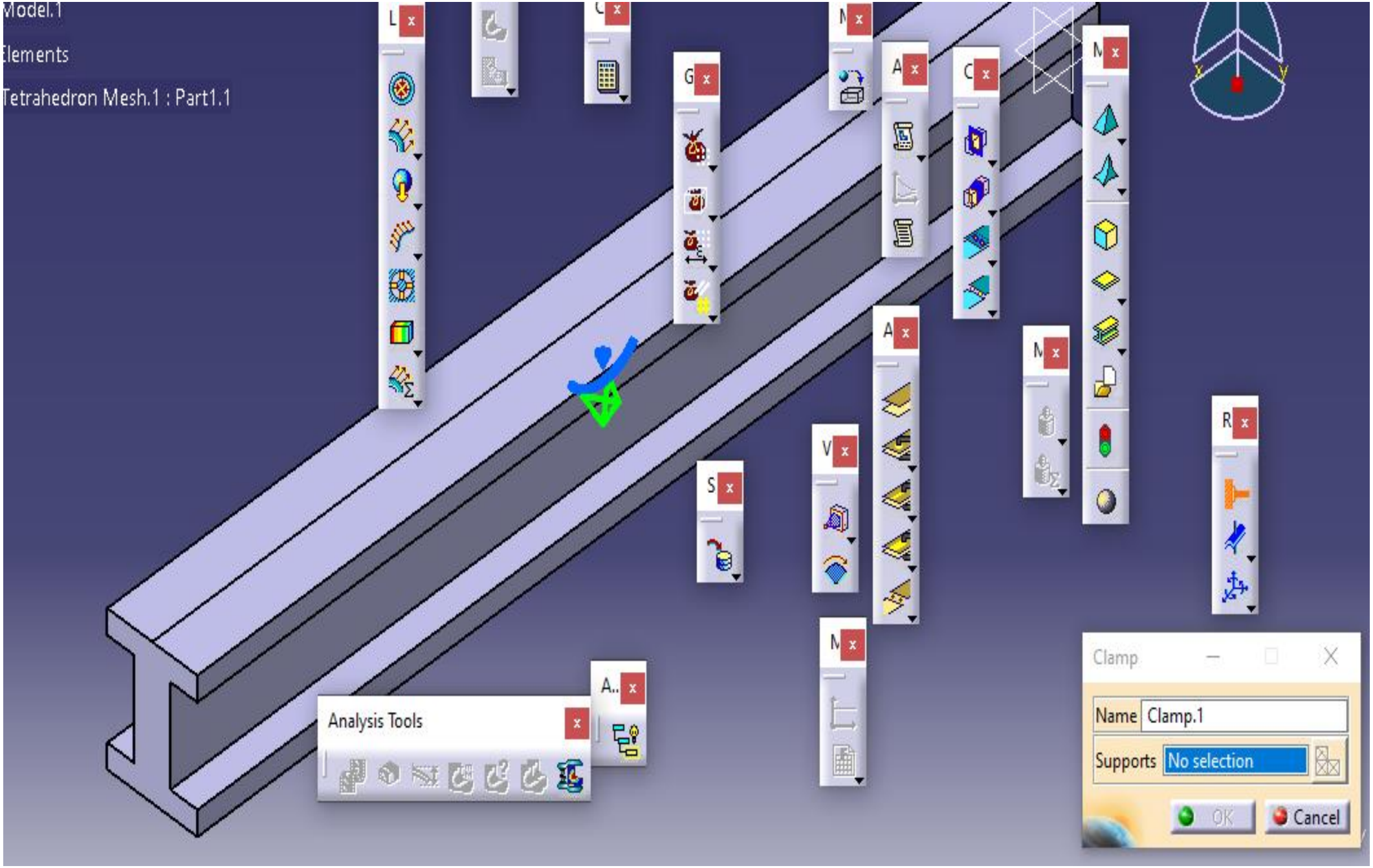

Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Analysis Tools
OCTREE Tetrahedron Mesh
Global
Local
Quality
Others
Size:
30mm
Absolute sag:
10.002mm
Proportional sag:
0.2
Element type
Linear
Parabolic
OK
Cancel

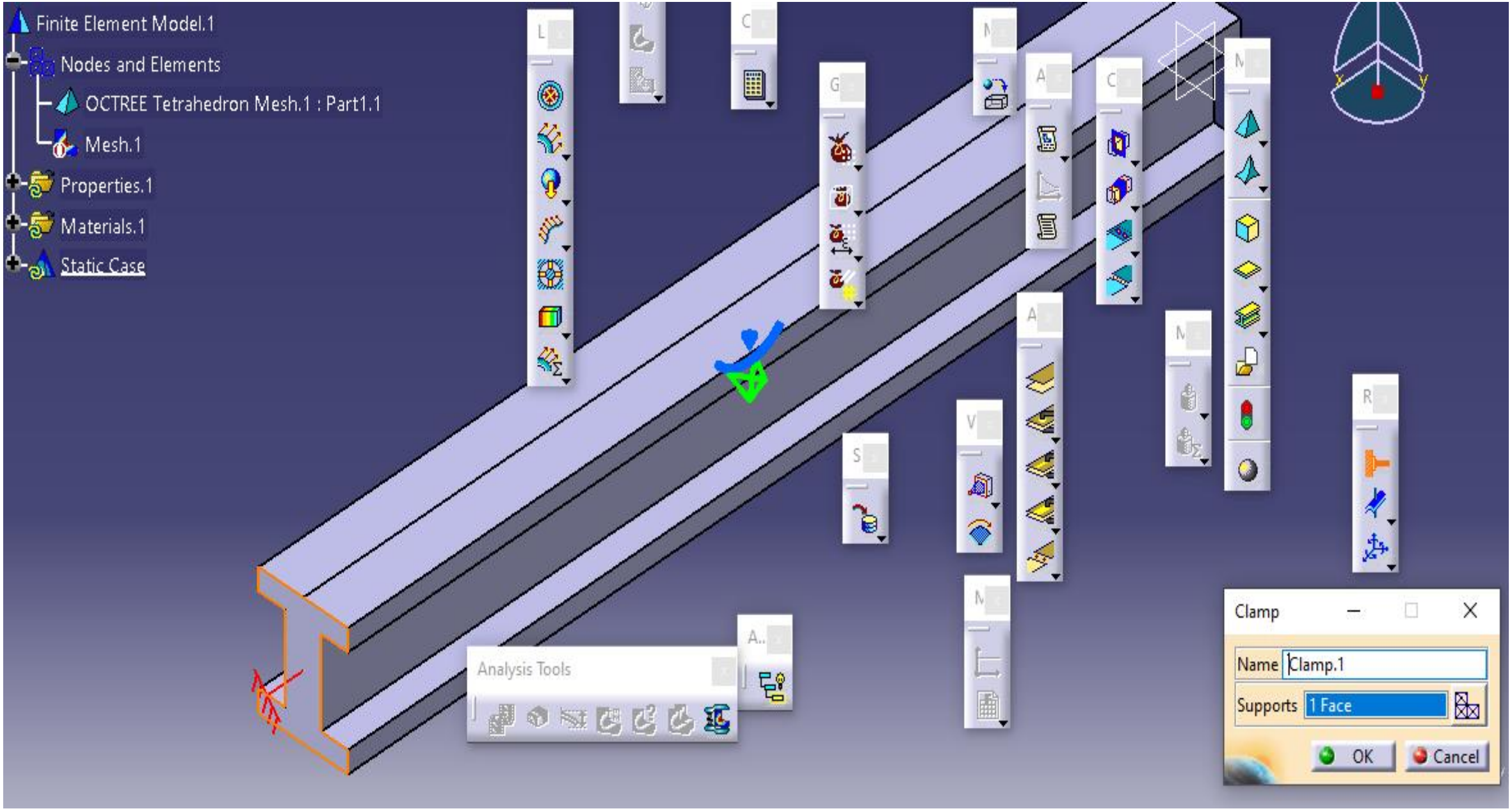

Analysis Manager
Links Manager.1
Finite Element Model.1
Nodes and E
OCTREE
Mesh.1
Properties.1
Materials.1
Static Case
Center graph
Reframe On
Hide/Show
Properties Alt+Enter
Open Sub-Tree
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Paste Special...
Delete Del
Reorder Children
Mesh Visualization
Generate Image
Report
Analysis Tools

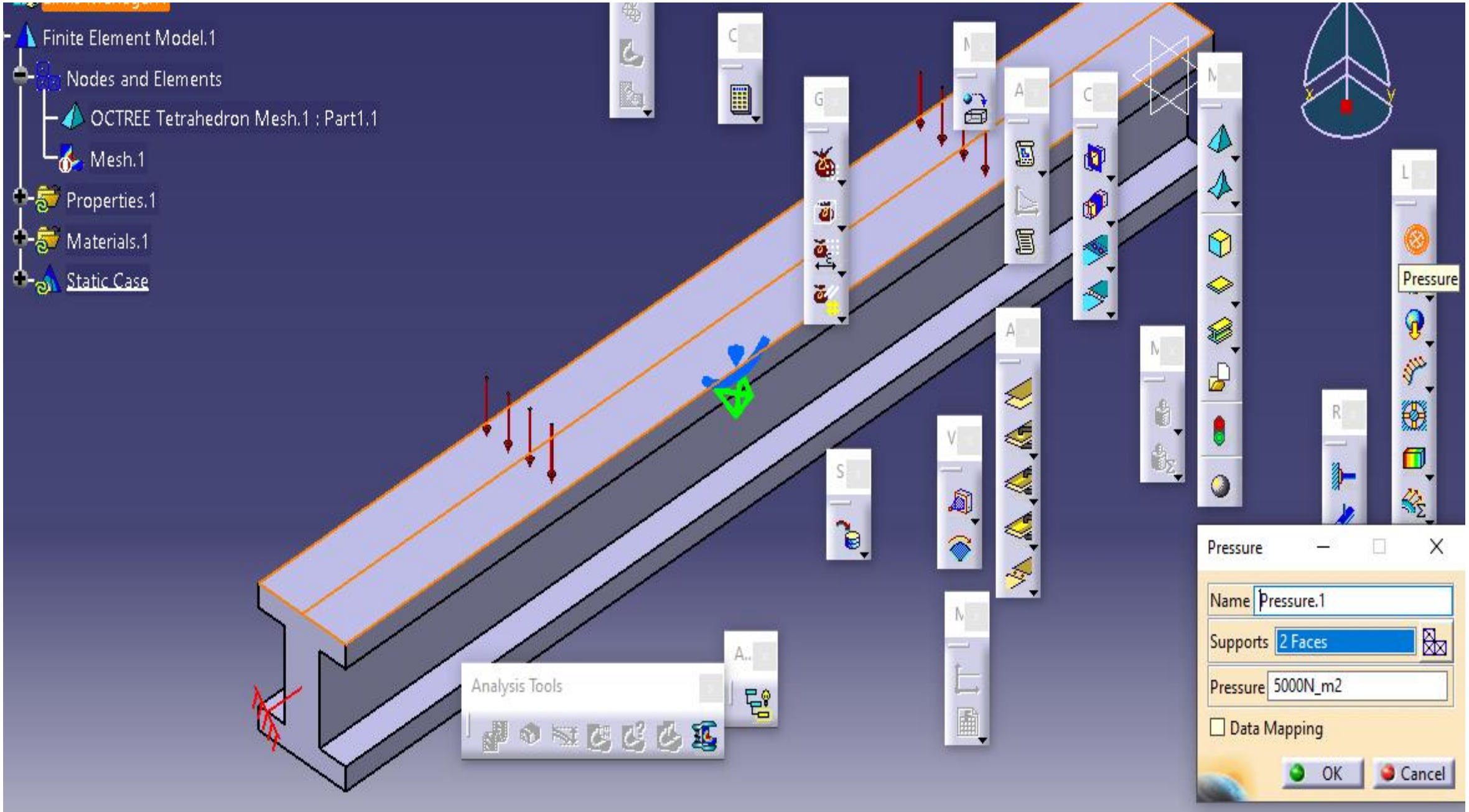

Analysis Manager
Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Analysis Tools

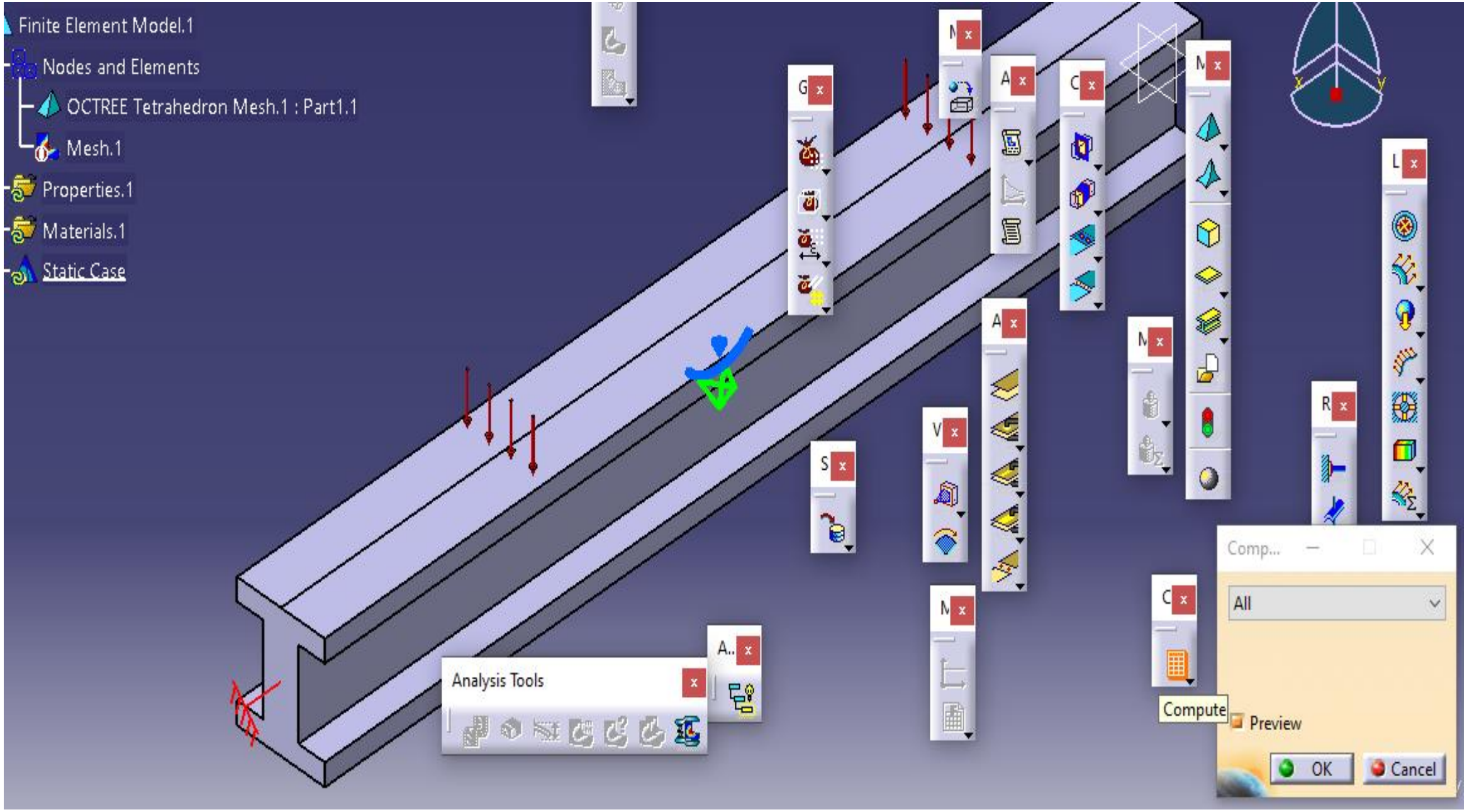

Analysis Manager
Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Center graph
Reframe On
Hide/Show
Properties Alt+Enter
Open Sub-Tree
Cut Ctrl+X
Copy Ctrl+C
Paste Ctrl+V
Paste Special...
Delete Del
Mesh.1 object
Activate/Deactivate
Export Data
Save As New Template
Report
Analysis Tools

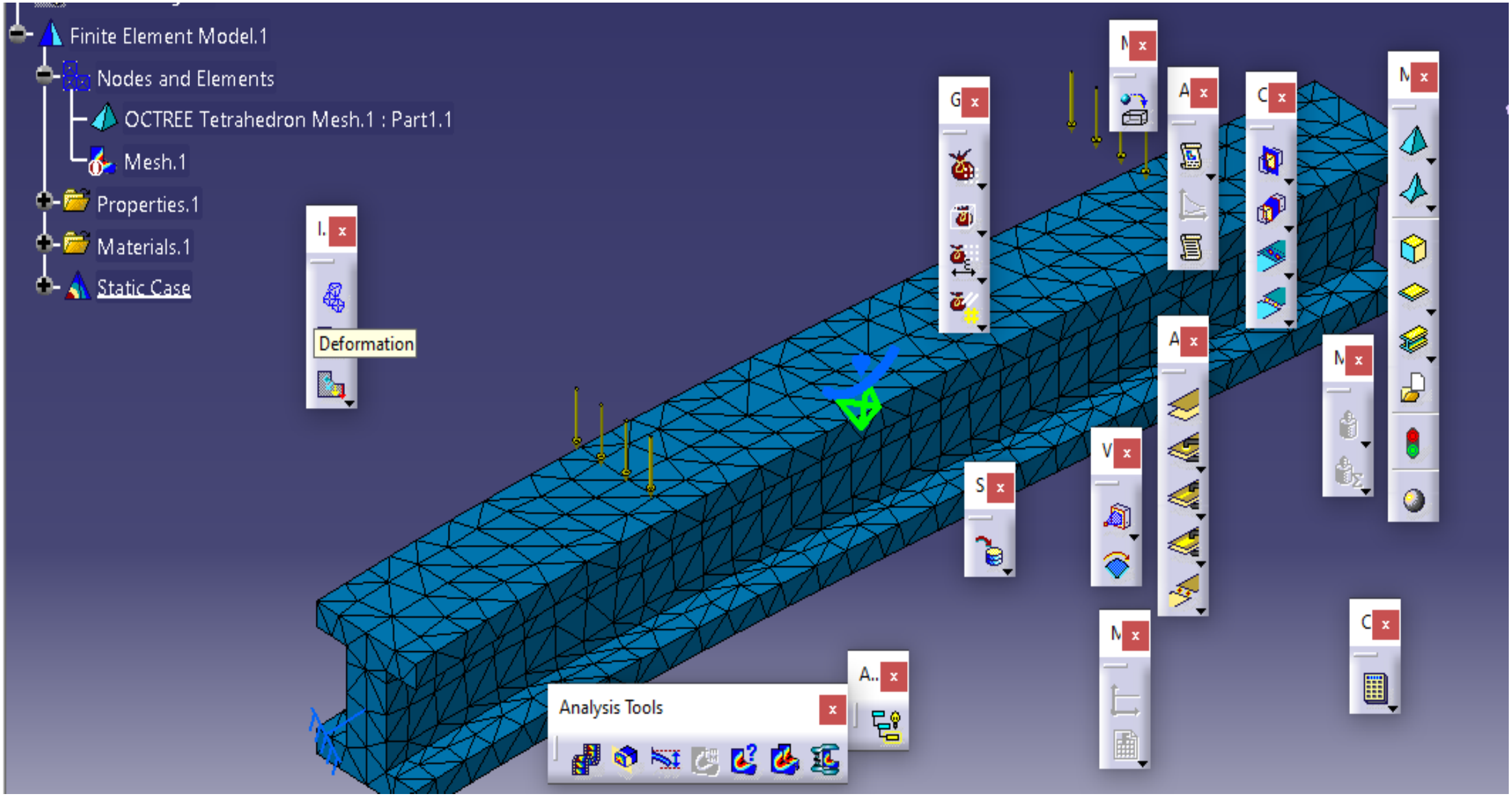

Analysis Manager
Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Analysis Tools

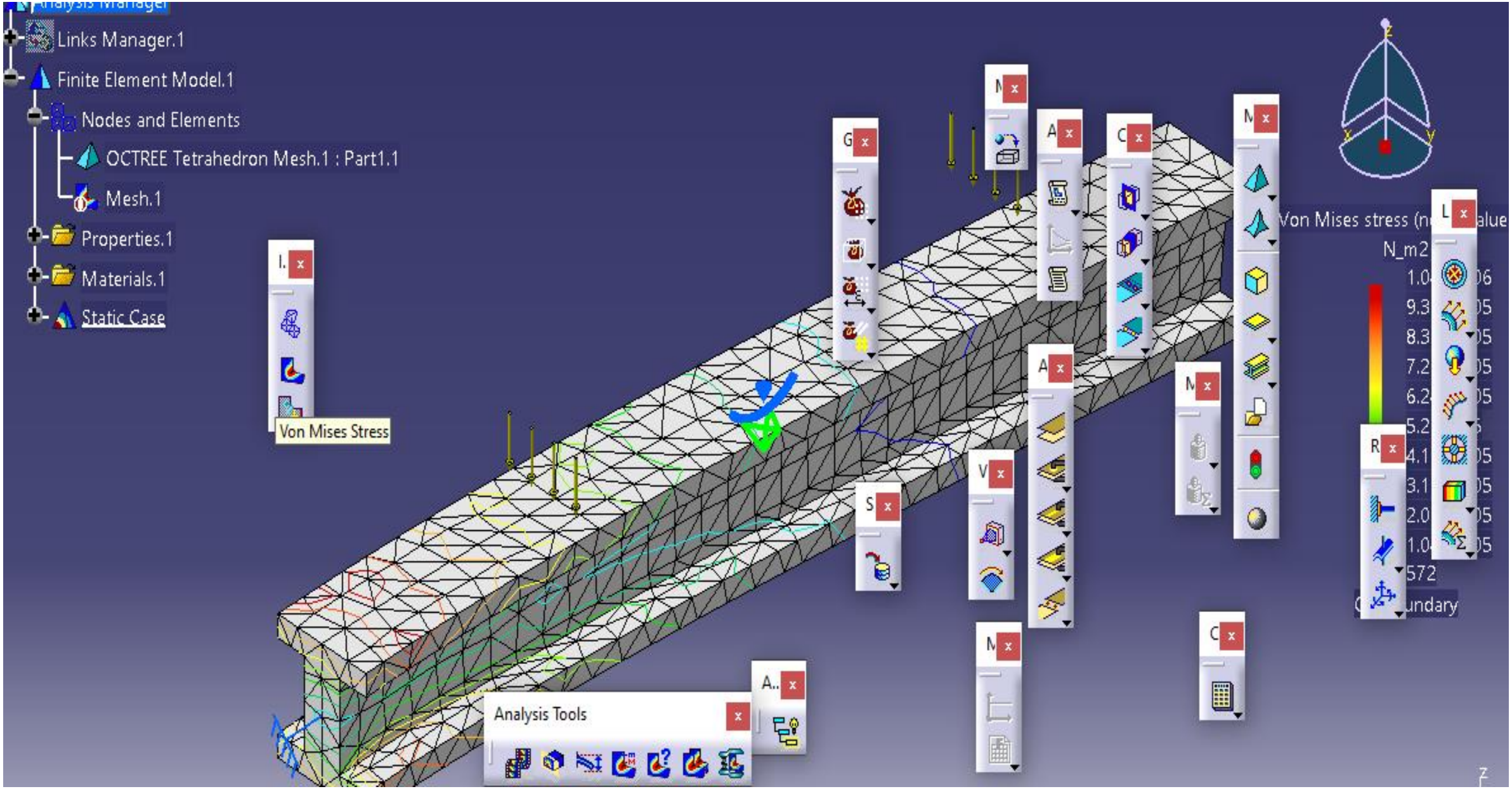

Model.1
Elements
Tetrahedron Mesh.1 : Part1.1
Analysis Tools
Clamp
Name
Clamp.1
Supports
No selection
OK
Cancel

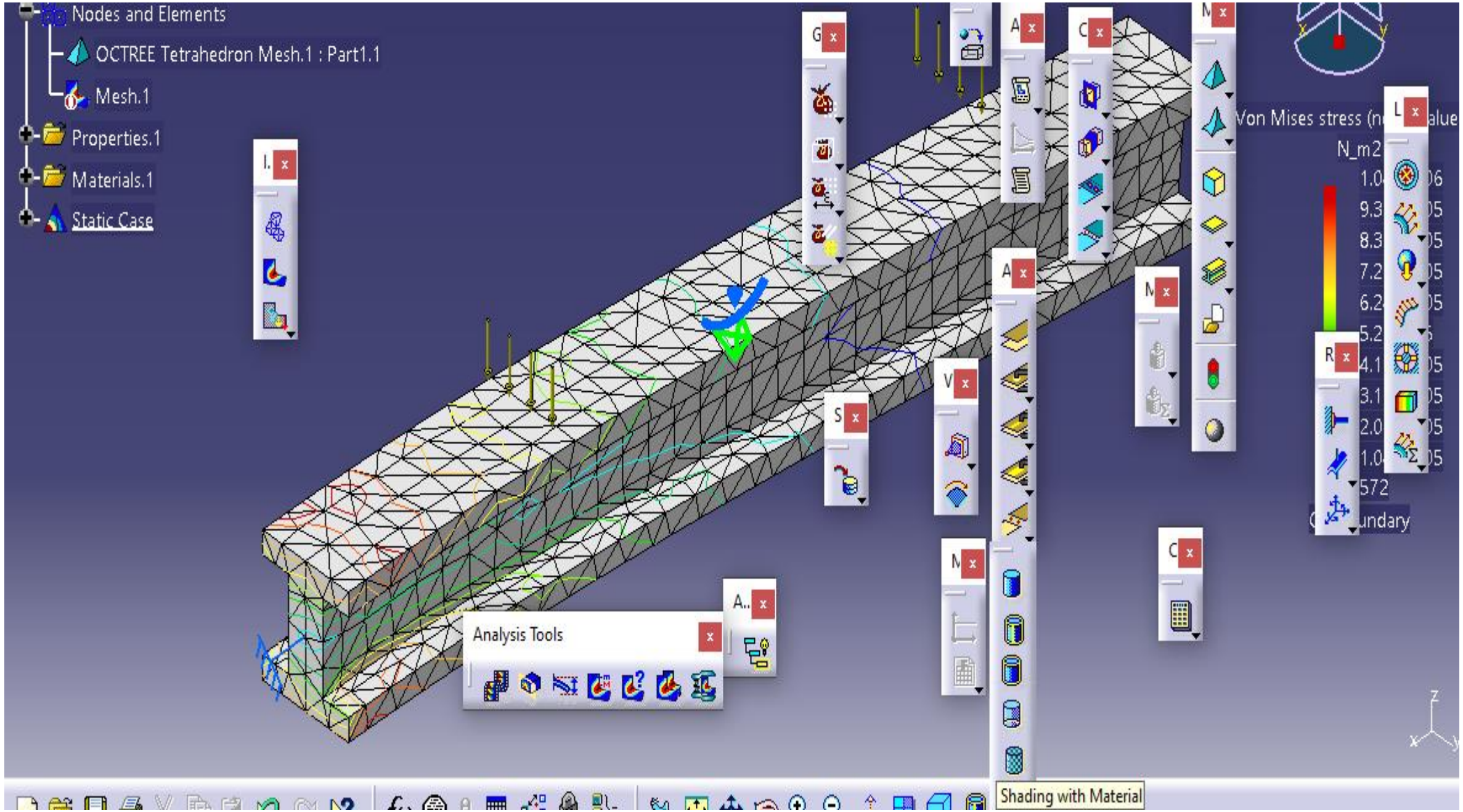

Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Analysis Tools
Clamp
Name
Clamp.1
Supports
1 Face
OK
Cancel

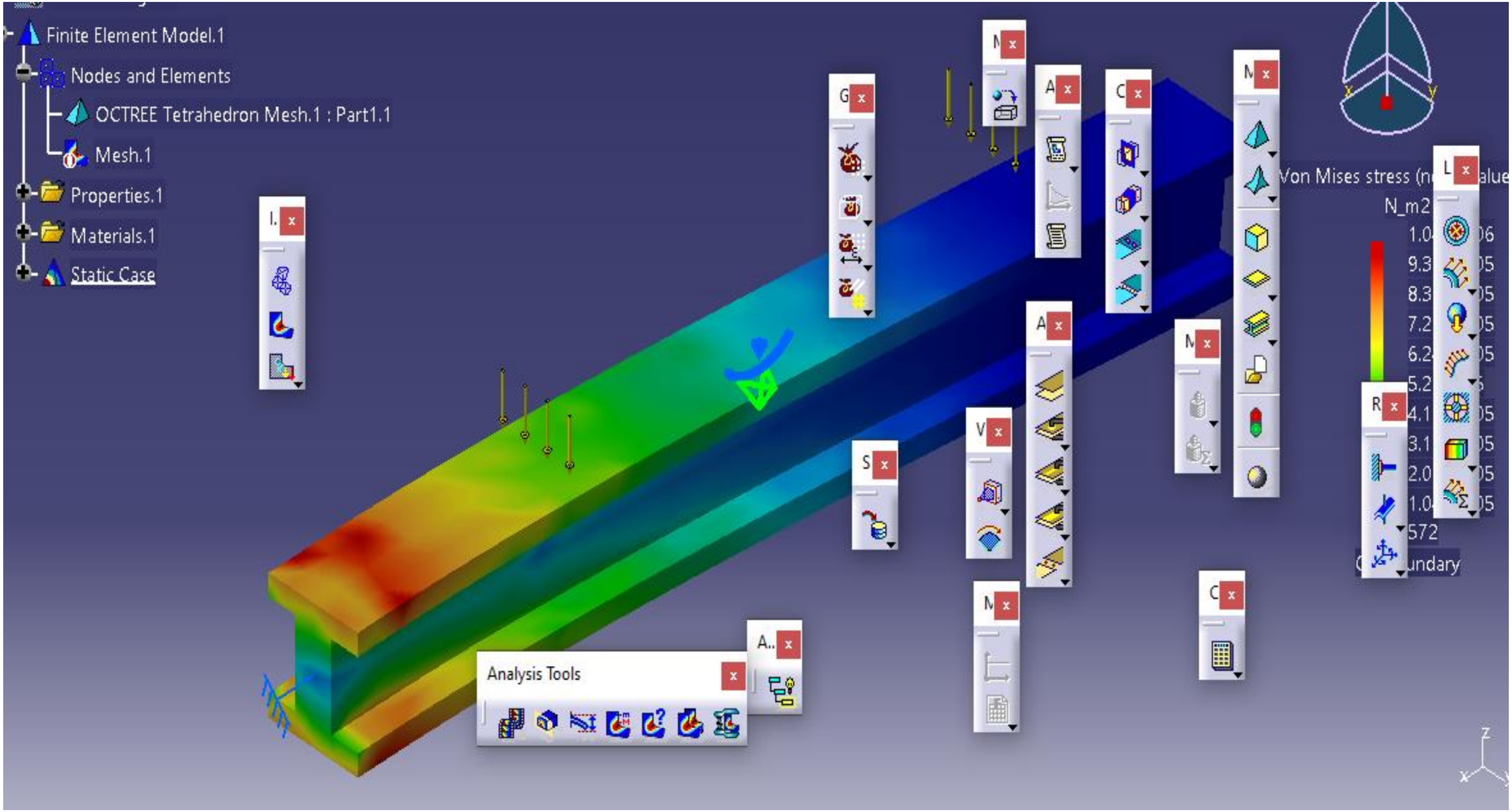

Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Pressure
Analysis Tools
Pressure
Name Pressure.1
Supports 2 Faces
Pressure 5000N_m2
Data Mapping
OK
Cancel

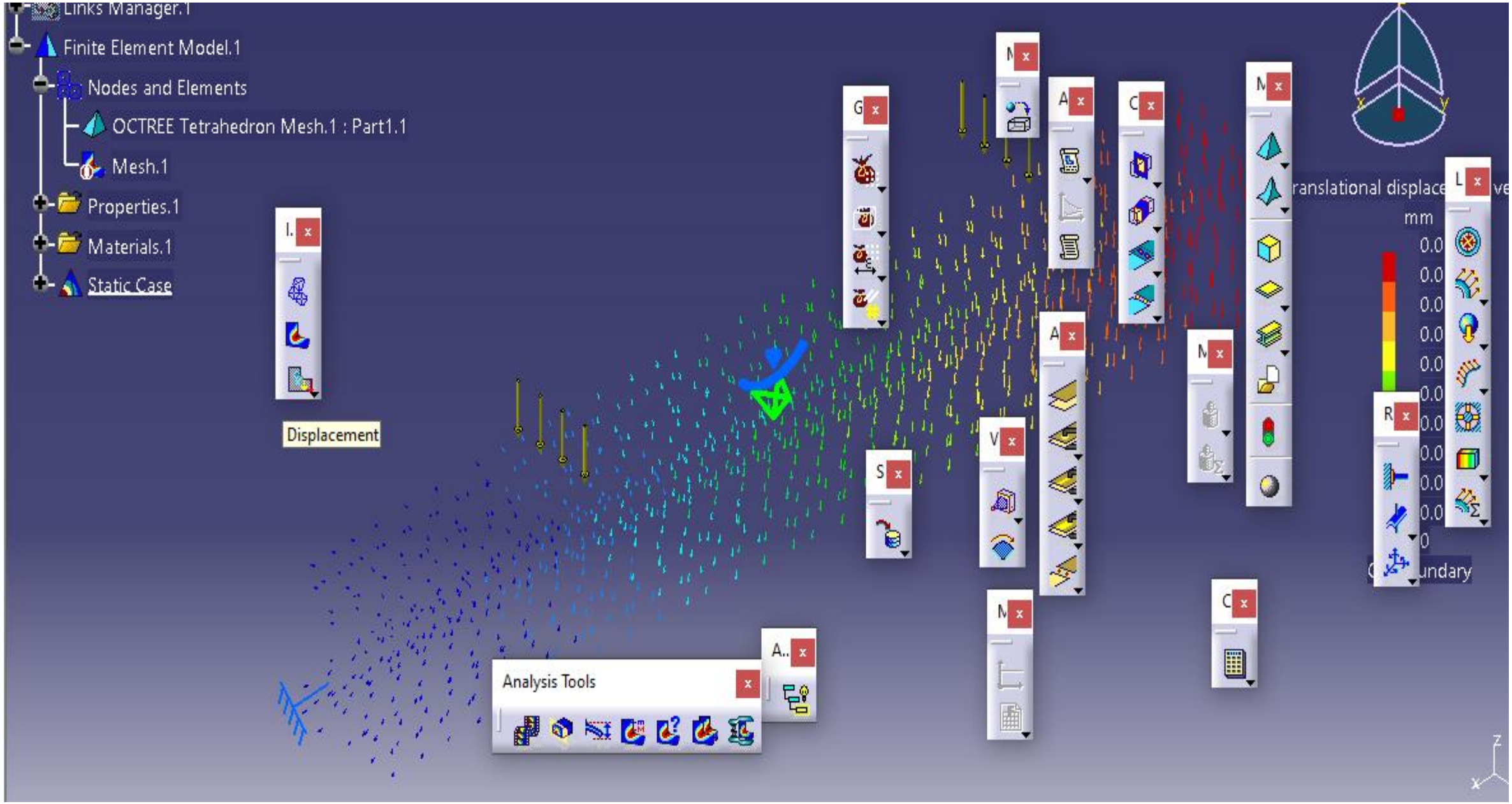

Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Analysis Tools
Comp...
All
Compute
Preview
OK
Cancel


Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Deformation
Analysis Tools


Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Von Mises Stress
Analysis Tools
Von Mises stress
N_m2
9.3
8.3
7.2
572


Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Von Mises stress
N_m2
Analysis Tools
Shading with Material


Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Analysis Tools
Von Mises stress
N_m2


Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Displacement
Analysis Tools
translational displace
mm
0.0
0.0
0.0
0.0
0.0
0.0
0.0
0.0
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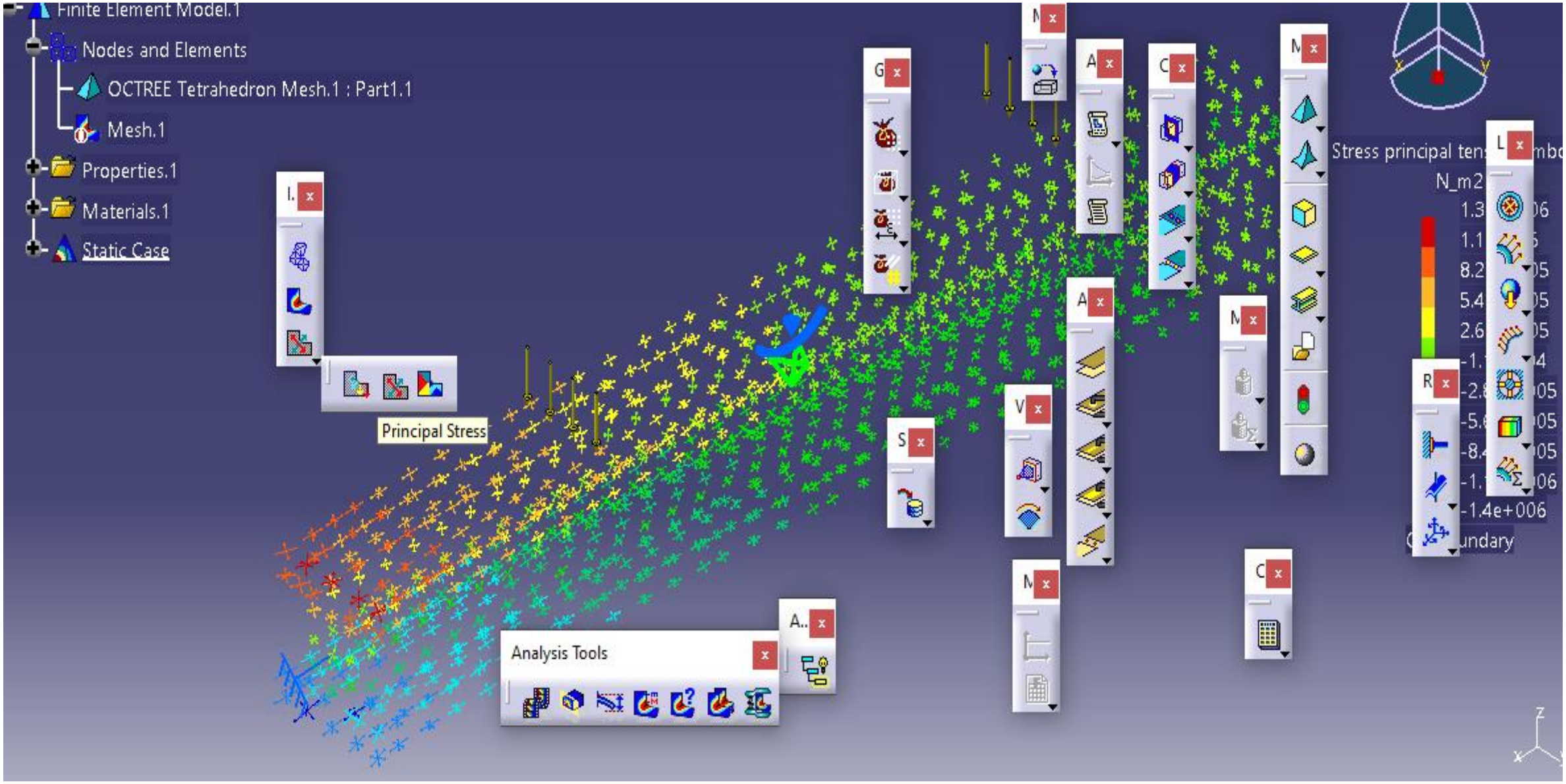
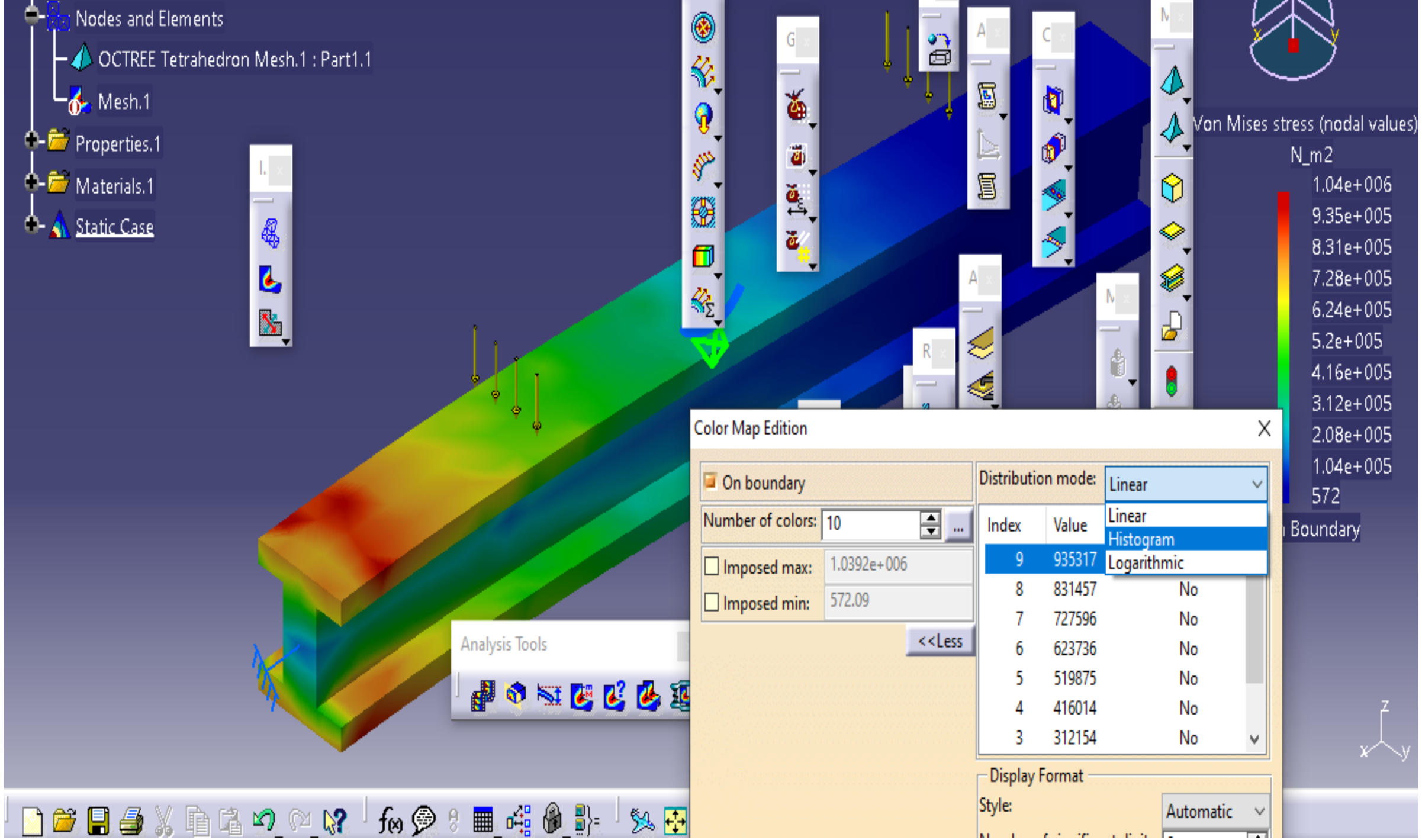
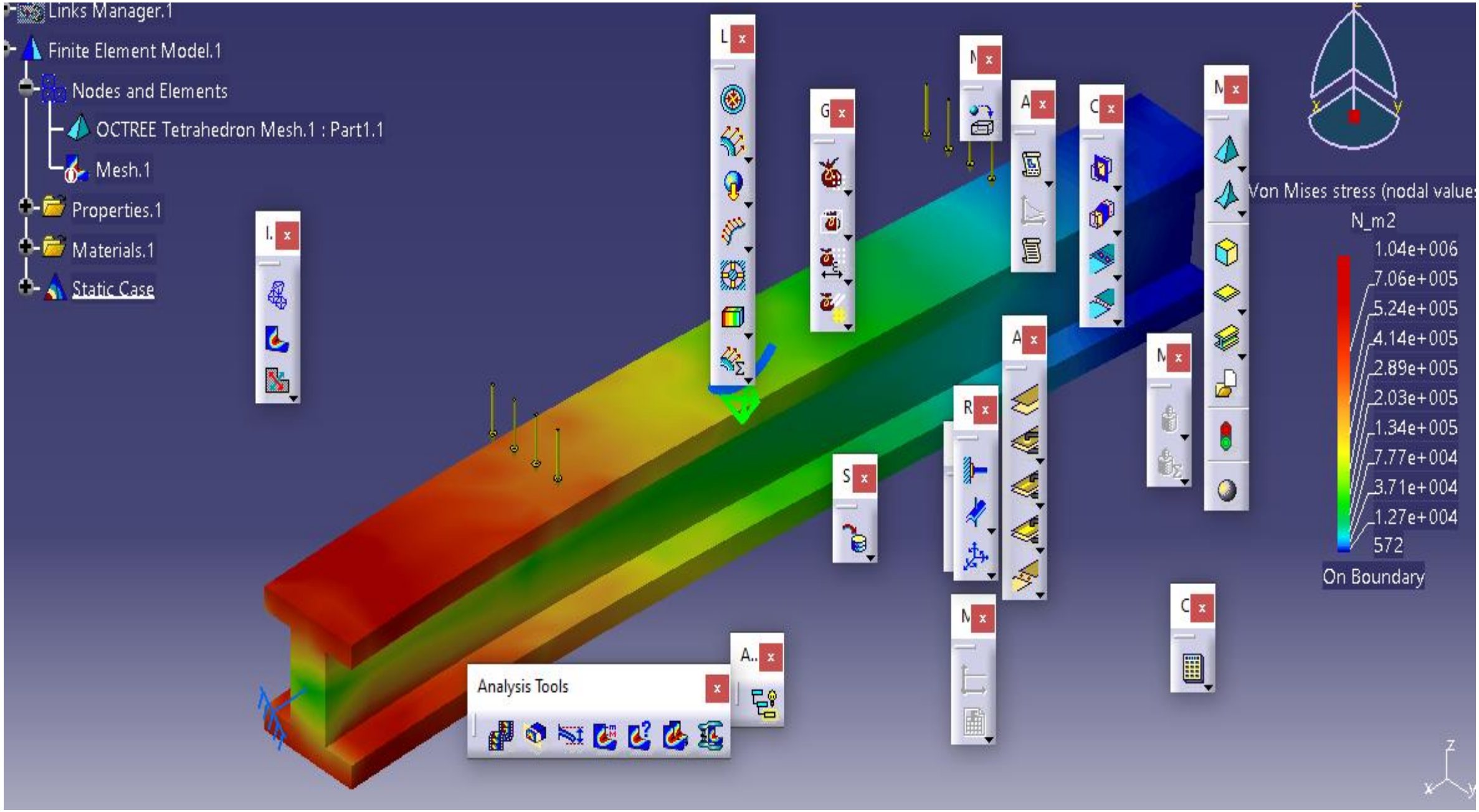
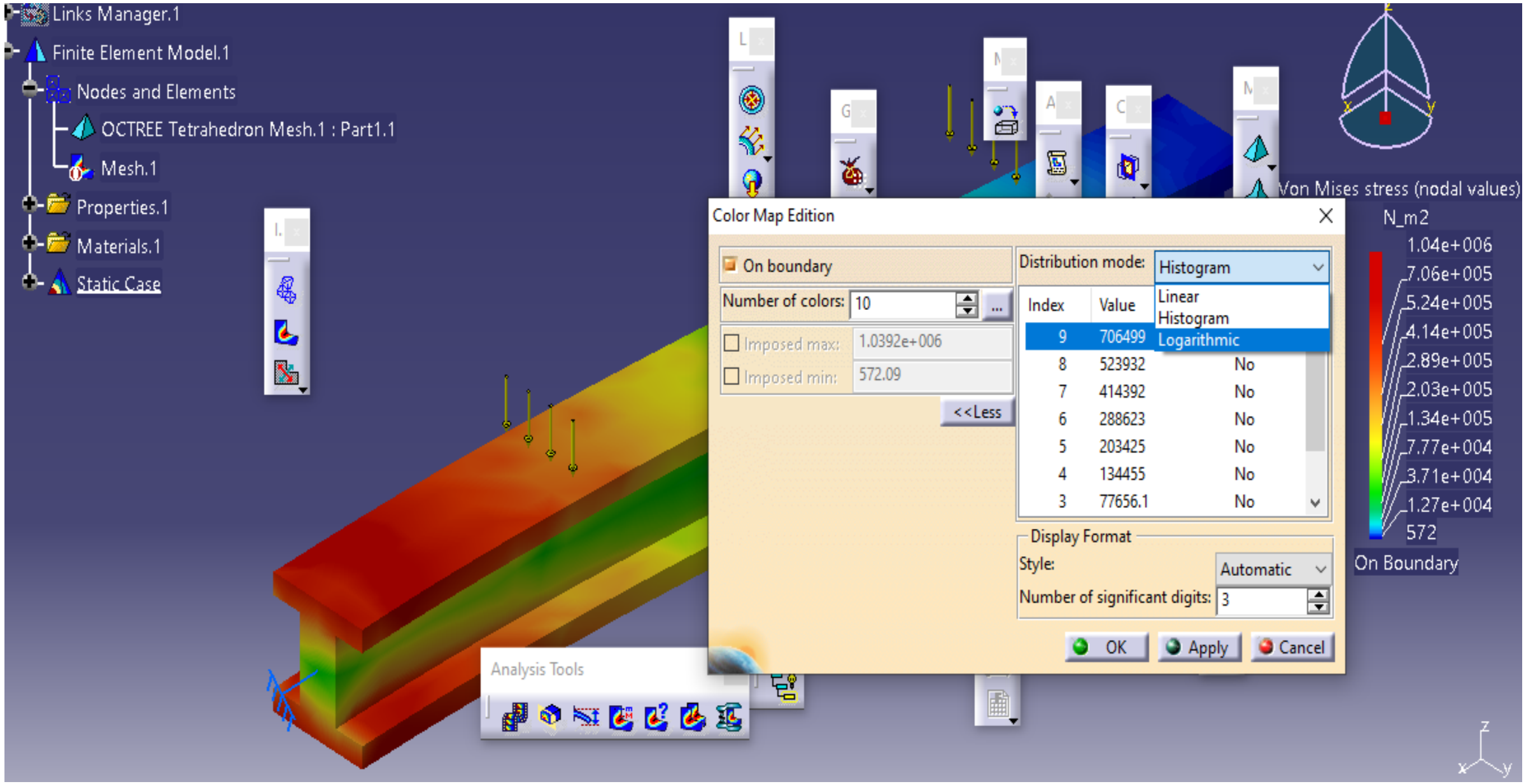
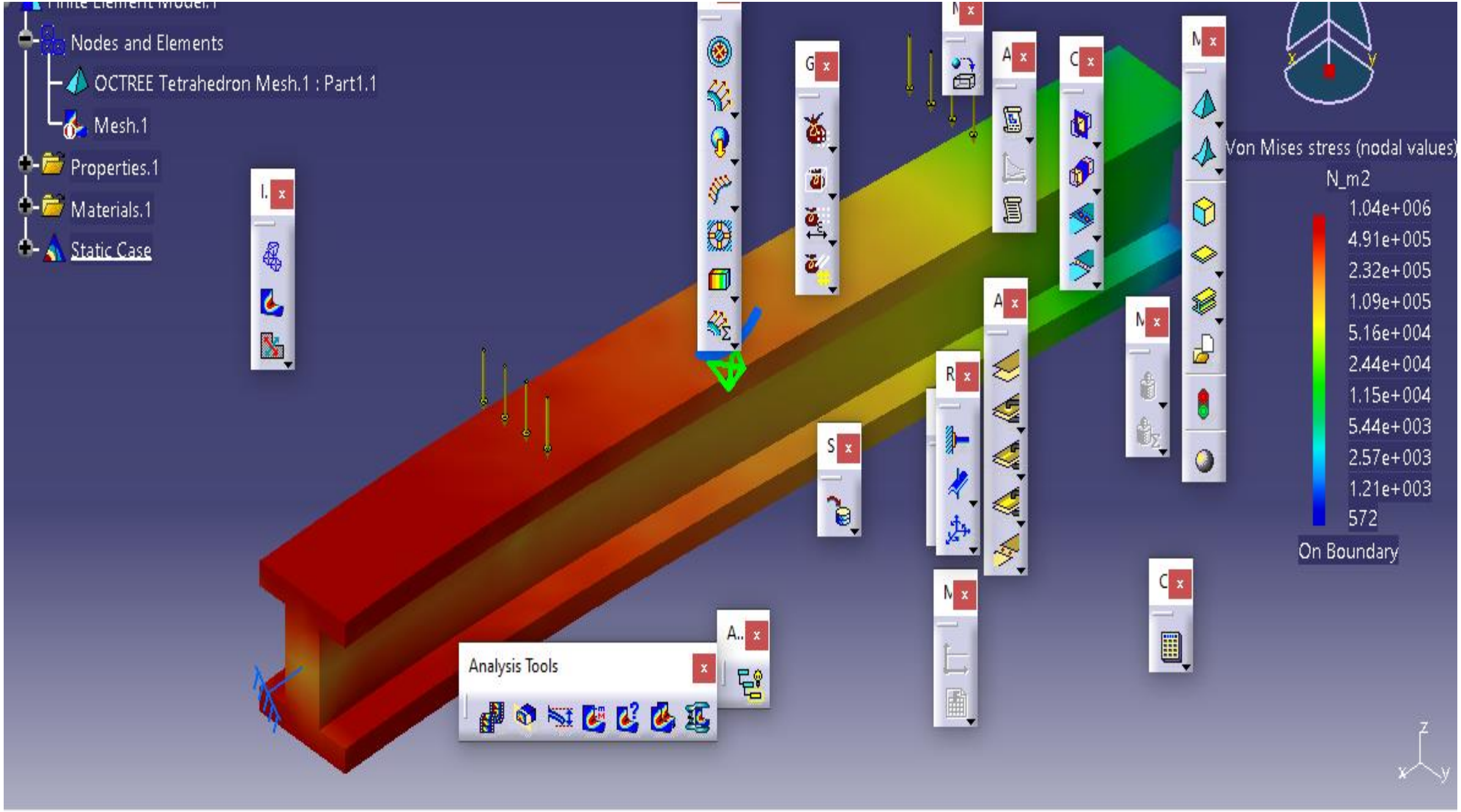
ndary

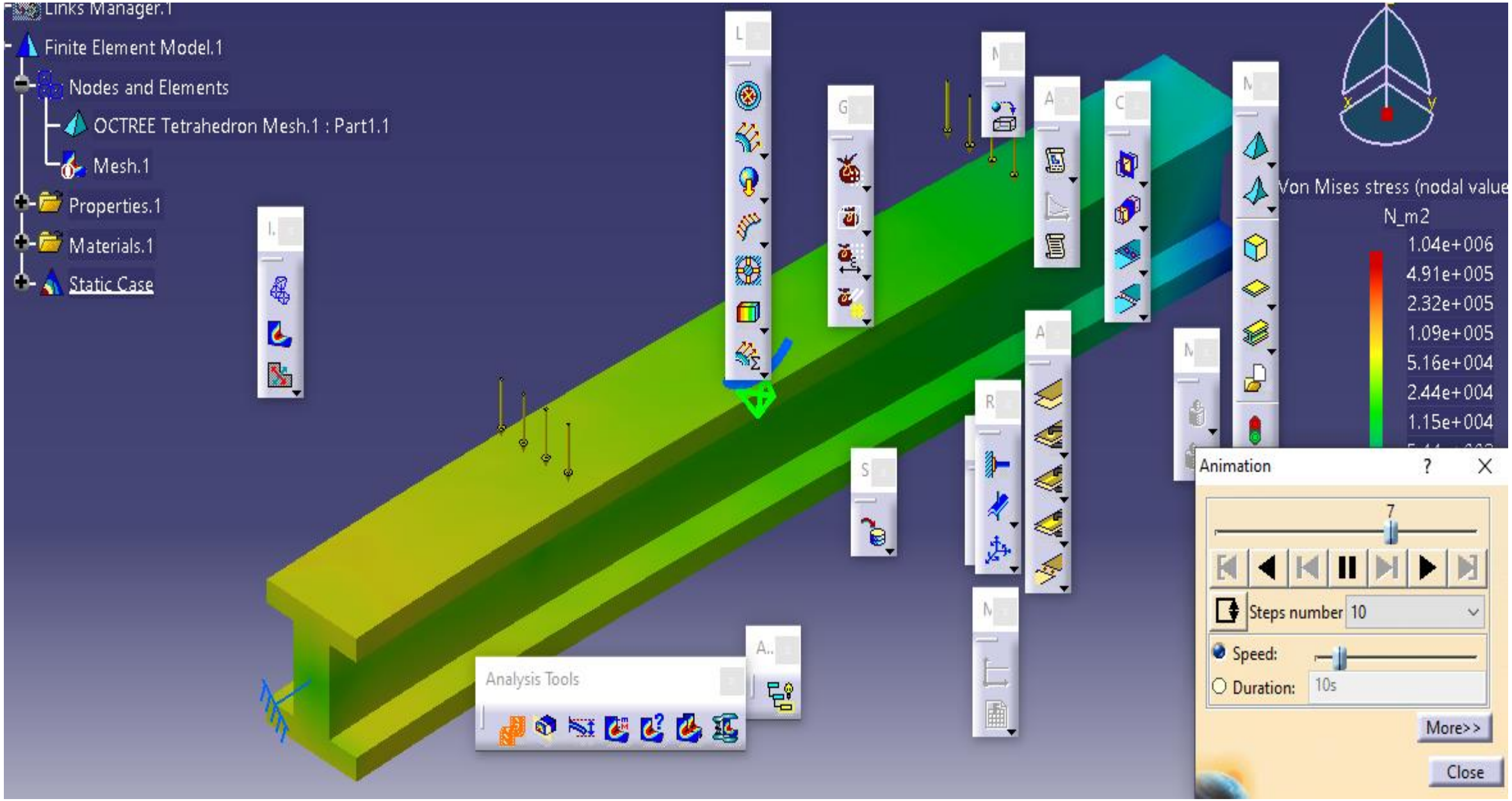

Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Principal Stress
Analysis Tools
Stress principal ten
N_m2
1.3
1.1
8.2
5.4
2.6
-1.4e+006

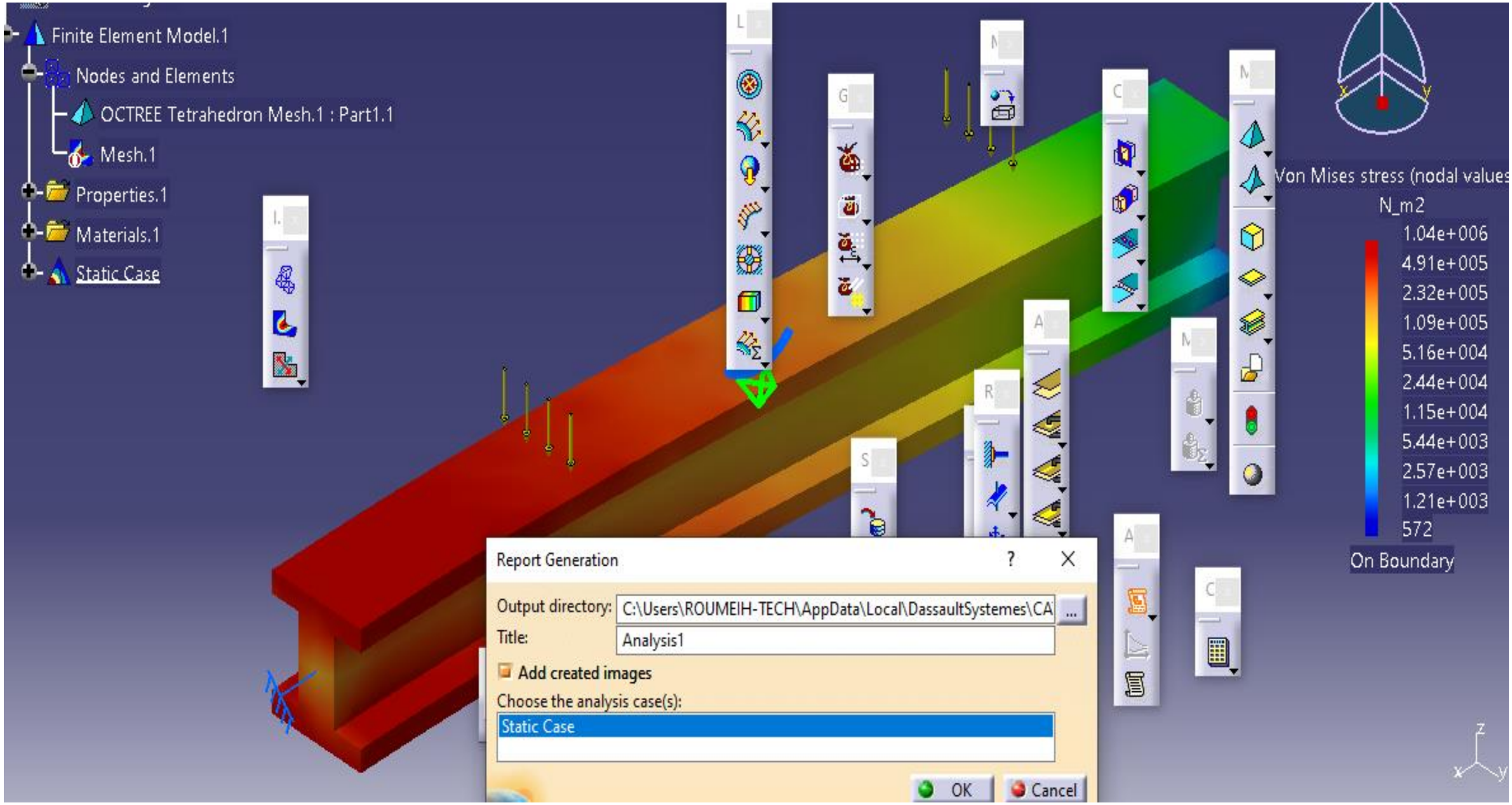

Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Von Mises stress (nodal values)
N_m2
1.04e+006
9.35e+005
8.31e+005
7.28e+005
6.24e+005
5.2e+005
4.16e+005
3.12e+005
2.08e+005
1.04e+005
572
Boundary
Analysis Tools
Color Map Edition
On boundary
Number of colors: 10
Imposed max: 1.0392e+006
Imposed min: 572.09
<<Less
Distribution mode: Linear
Linear
Histogram
Logarithmic
Index Value
9 935317
8 831457 No
7 727596 No
6 623736 No
5 519875 No
4 416014 No
3 312154 No
Display Format
Style: Automatic


Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Analysis Tools
Von Mises stress (nodal values
N_m2
1.04e+006
7.06e+005
5.24e+005
4.14e+005
2.89e+005
2.03e+005
1.34e+005
7.77e+004
3.71e+004
1.27e+004
572
On Boundary


Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Von Mises stress (nodal values)
N_m2
1.04e+006
7.06e+005
5.24e+005
4.14e+005
2.89e+005
2.03e+005
1.34e+005
7.77e+004
3.71e+004
1.27e+004
572
On Boundary
Color Map Edition
On boundary
Number of colors: 10
Imposed max: 1.0392e+006
Imposed min: 572.09
<<Less
Distribution mode: Histogram
Linear
Histogram
Logarithmic
Index Value
9 706499
8 523932 No
7 414392 No
6 288623 No
5 203425 No
4 134455 No
3 77656.1 No
Display Format
Style: Automatic
Number of significant digits: 3
OK
Apply
Cancel
Analysis Tools


Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Analysis Tools
Von Mises stress (nodal values)
N_m2
1.04e+006
4.91e+005
2.32e+005
1.09e+005
5.16e+004
2.44e+004
1.15e+004
5.44e+003
2.57e+003
1.21e+003
572
On Boundary


Links Manager.1
Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Von Mises stress (nodal value
N_m2
1.04e+006
4.91e+005
2.32e+005
1.09e+005
5.16e+004
2.44e+004
1.15e+004
Analysis Tools
Animation
7
Steps number 10
Speed:
Duration: 10s
More>>
Close


Finite Element Model.1
Nodes and Elements
OCTREE Tetrahedron Mesh.1 : Part1.1
Mesh.1
Properties.1
Materials.1
Static Case
Von Mises stress (nodal values
N_m2
1.04e+006
4.91e+005
2.32e+005
1.09e+005
5.16e+004
2.44e+004
1.15e+004
5.44e+003
2.57e+003
1.21e+003
572
On Boundary
Report Generation
Output directory:
C:\Users\ROUMEIH-TECH\AppData\Local\DassaultSystemes\CA
Title:
Analysis1
Add created images
Choose the analysis case(s):
Static Case
OK
Cancel

# Analysis1

## MESH:

| Entity | Size |
|---|---|
| Nodes | 1075 |
| Elements | 3204 |

## ELEMENT TYPE:

| Connectivity | Statistics |
|---|---|
| TE4 | 3204 ( 100.00% ) |

## ELEMENT QUALITY:

| Criterion | Good | Poor | Bad | Worst | Average |
|---|---|---|---|---|---|
| Stretch | 3204 ( 100.00% ) | 0 ( 0.00% ) | 0 ( 0.00% ) | 0.397 | 0.630 |