

Analiza static neliniara

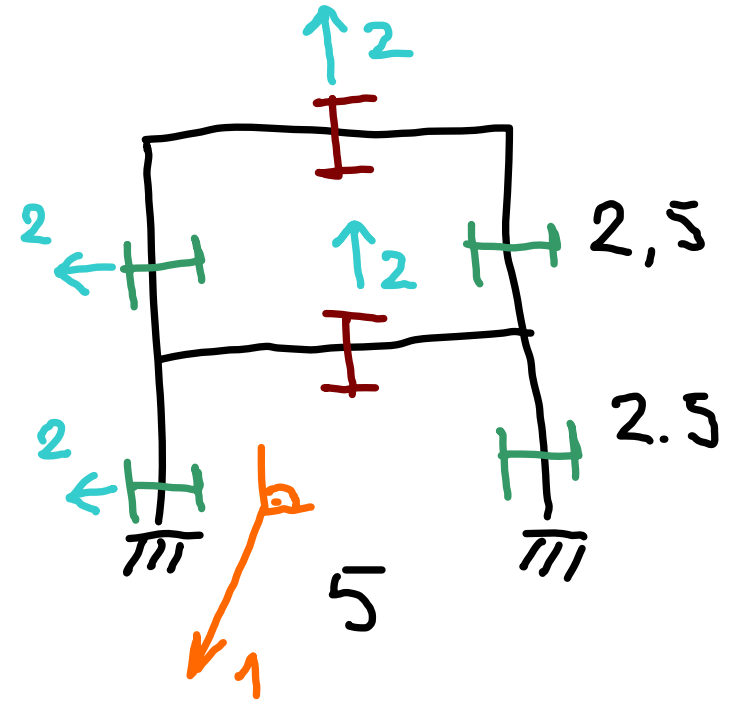
Extragerea de rezultate

- Curba deplasare la varf – forta la baza

- Geometria

- O deschidere
- Doua nivele

5m
2.5m

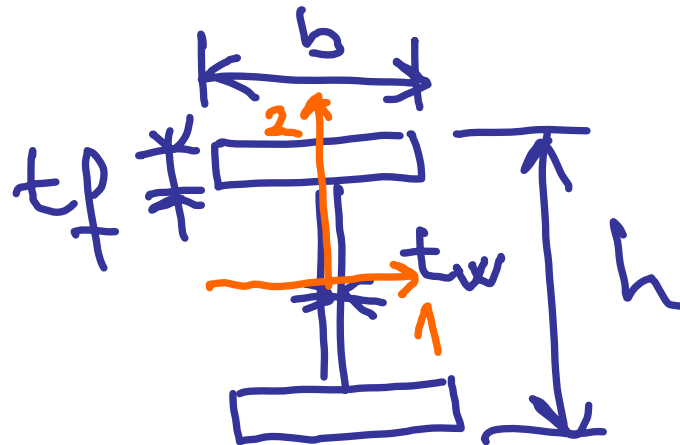
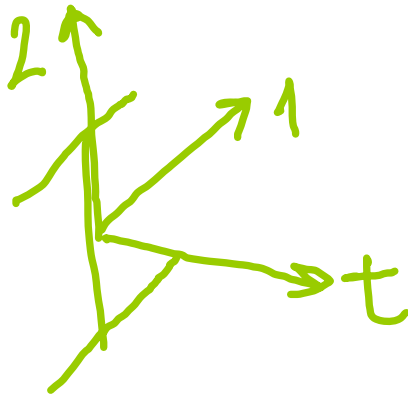


– Grinda

360 x 180 x 12 x 6

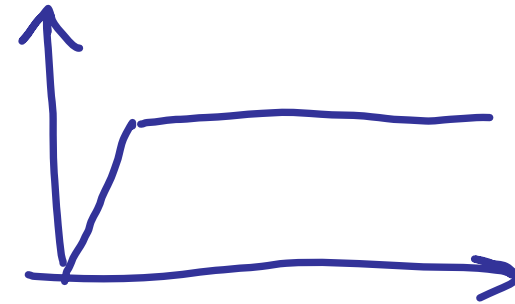
– Stalp

450 x 200 x 16 x 8



$h \times b \times t_f \times t_w$

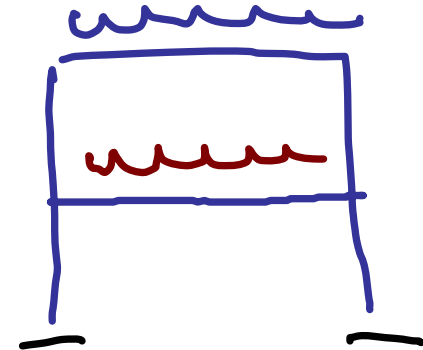
- Material neliniar S235



- Pas de analiza

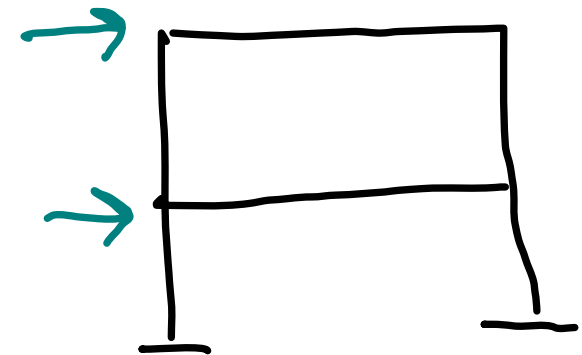
- Vertical – Static general

- Line load – 25 N/mm



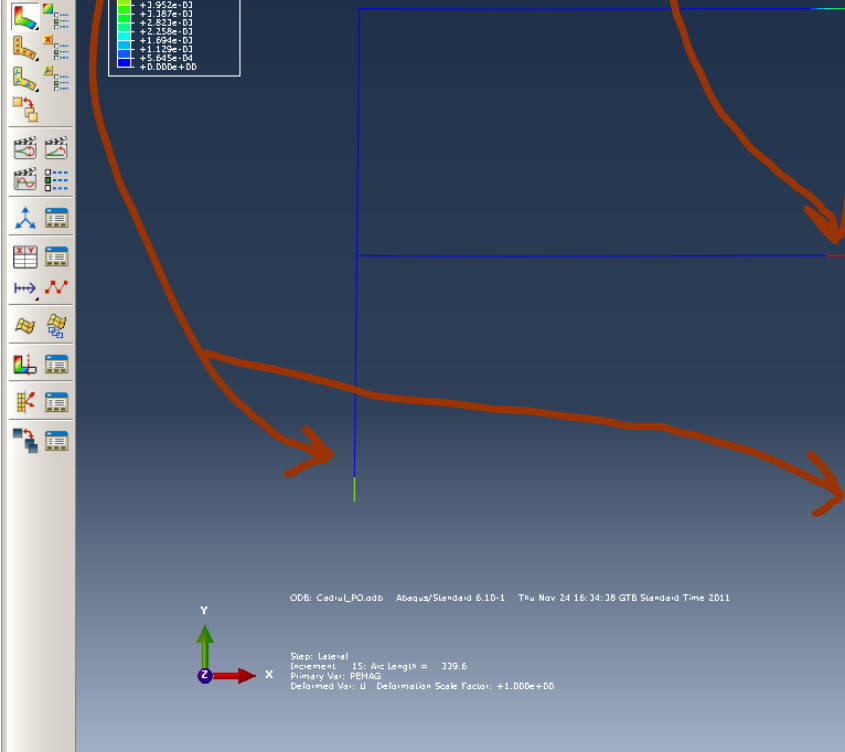
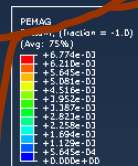
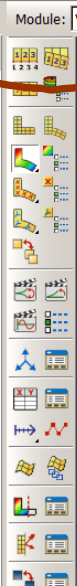
- Lateral – Static Riks

- Concentrated force – 1000 N



- Nlgeom ON

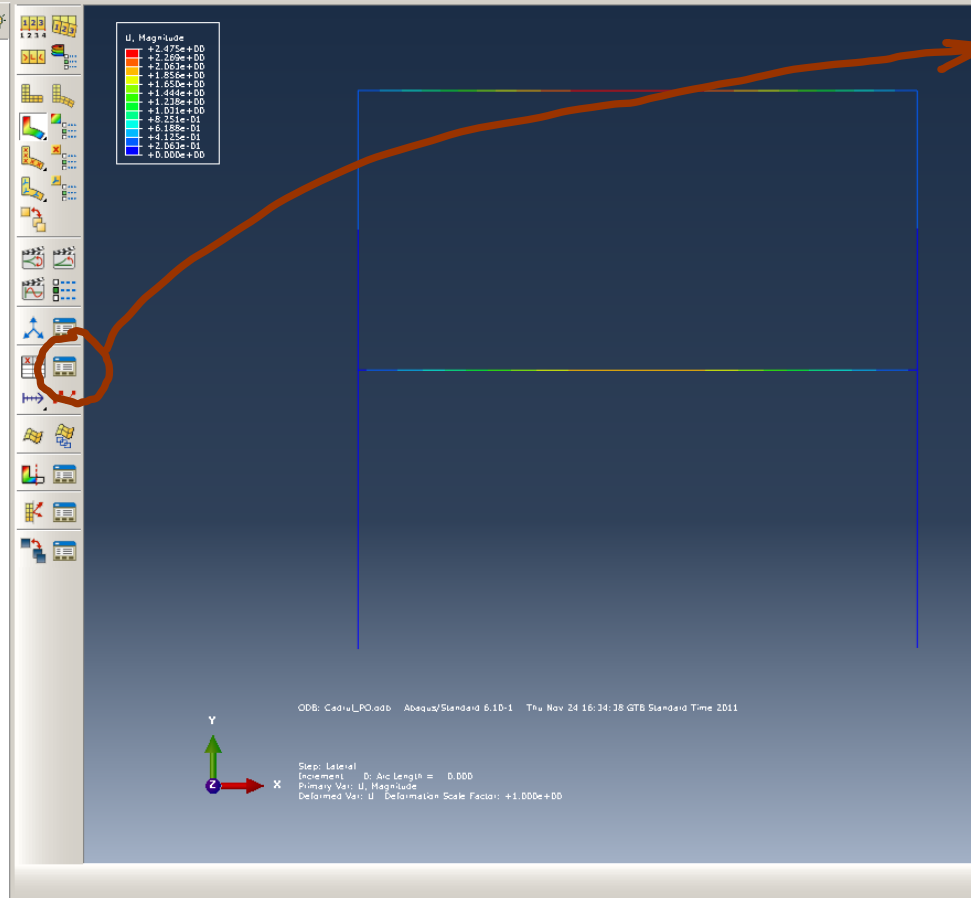
- Output Databases (1)
- Spectrums (7)
- XYPlots (1)
- XYData (4)
- Paths
- Display Groups (1)
- Free Body Cuts
- Movies
- Images



Scale: 1.00000e+000, 1.00000e+000, 1.00000e+000, -
Deformed coordinates (unscaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -
Deformed coordinates (scaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -
Displacement (unscaled): 1.13304e-032, -1.25000e-031, 0.00000e+000, 1.25512e-031
The XY data "Curba de comportare" has been created.
The XY data "Curba de comportare" has been created.
The XY data "Curba de comportare" has been created.

Session Data

- Output Databases (1)
- Spectrums (7)
- XYPlots
- XYData
- Paths
- Display Groups (1)
- Free Body Cuts
- Movies
- Images



XY Data Manager

Data Source

☒ Current session ☐ Current ODB: Cadrul_PO.odb

Name	Description
------	-------------

Create...
Edit...
Copy...
Rename...
Delete...
Plot
Copy to ODB...
Load to Session
Dismiss

Create XY Data

Source

☒ ODB history output
☒ ODB field output
☐ Thickness
☐ Operate on XY data
☐ ASCII file
☐ Keyboard
☐ Path

Continue... Cancel

Session Data

Output Databases (1)

Spectrums (7)

XYPlots

XY Data from ODB Field Output

Steps/Frames

Note: XY Data will be extracted from the active steps/frames

Variables Elements/Nodes

Output Variables

Position: Unique Nodal

Click checkboxes or edit the identifiers shown next to Edit below.

- ☐ RF: Reaction force
- ☐ RM3: Reaction moment
- ☐ S: Stress components
- ☒ U: Spatial displacement
 - ☐ Magnitude
 - ☒ U1
 - ☐ U2
- ☐ UR3: Rotational displacement

Edit: U.U1

Section, unit: All Select Settings...

Save Plot Dismiss

XY Data Manager

Data Source

☒ Current session ☐ Current ODB: Cadrul_PO.odb

Name	Description
------	-------------

Create... Edit... Copy... Rename... Delete... Plot Copy to ODB... Load to Session Dismiss

ODB: Cadrul_PO.odb Abaqus/Standard 6.10-1 Thu Nov 24 16:34:38 GMT Standard Time 2011

Step: Lateral
Increment: 0; Arc Length = 0.000
Primary Var: U, Magnitude
Deformed Var: U, Deformation Scale Factor: +1.000e+00

Job Cadrul_PO: Analysis Input File Processor completed successfully.
Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.
The job input file "Cadrul_PO.inp" has been submitted for analysis.
Job Cadrul_PO: Analysis Input File Processor completed successfully.
Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.

Abaqus/CAE 6.10-1 [Viewport: 1]

File Model Viewport View Result Plot Animate Report Options Tools Plug-ins Help

Module: Visualization ODB: C:/Simulia/Temp/Cadrul_PO.odb

Session Data

Output Databases (1)

Spectrums (7)

XYPlots

XY Data from ODB Field Output

Steps/Frames

Note: XY Data will be extracted from the active steps/frames

Variables Elements/Nodes

Selection

Method

Pick from viewport

Node labels

Node sets

Internal sets

Select nodes in viewport

Highlight items in viewport

Save Plot Dismiss

XY Data Manager

Data Source

Current session Current ODB: Cadrul_PO.odb

Name	Description
------	-------------

Create... Edit... Copy... Rename... Delete... Plot Copy to ODB... Load to Session Dismiss

ODE: Cadrul_PO.odb Abaqus/Standard 6.10-1 Thu Nov 24 16:34:38 GMT Standard Time 2011

Step: Latent Increment: 0 Arc Length = 0.00 Primary Var: U, Magnitude Deformed Var: U, Deformation Scale Factor: +1.00e+00

Select nodes for the display group individually Done

Job Cadrul_PO: Analysis Input File Processor completed successfully.
Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.
The job input file "Cadrul_PO.inp" has been submitted for analysis.
Job Cadrul_PO: Analysis Input File Processor completed successfully.
Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.

Start

RO

16:38 24.11.2011

Session Data

Output Databases (1)

Spectrums (7)

XYPlots

XY Data from ODB Field Output

Steps/Frames

Note: XY Data will be extracted from the active steps/frames

Active Steps/Frames...

Variables Elements/Nodes

Selection

Method Edit Selection Add Selection Delete Selection

Pick from viewport

Node labels

Node sets

Internal sets

1 Nodes selected

Highlight items in viewport

Save Plot Dismiss

Active Steps/Frames

Selection Aids

Select from: Select by: Global range:

☒ All steps ☐ Time/Length Min: 0

☐ Selected steps ☐ Frequency Max: -1

☐ Selected frames ☒ Frame Increment: 1

☐ Unselect base state frames Selected frames: 103

☐ Unselect duplicate first frames Update Selection

Step Name	Description	Time	Period
☒ Vertical		0	1
☒ Lateral	Arc		3146.48

OK Apply Cancel

XY Data Manager

Data Source

☒ Current session ☐ Current ODB: Cadrul_PO.odb

Name	Description
------	-------------

Create... Edit... Copy... Rename... Delete... Plot Copy to ODB... Load to Session Dismiss



Job Cadrul_PO: Analysis Input File Processor completed successfully.
Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.
The job input file "Cadrul_PO.inp" has been submitted for analysis.
Job Cadrul_PO: Analysis Input File Processor completed successfully.
Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.

Session Data

Output Databases (1)

Spectrums (7)

XYPlots

XY Data from ODB Field Output

Steps/Frames

Note: XY Data will be extracted from the active steps/frames

Active Steps/Frames...

Variables Elements/Nodes

Selection

Method

Pick from viewport

Node labels

Node sets

Internal sets

1 Nodes selected

Highlight items in viewport

Save Plot Dismiss

Active Steps/Frames

Selection Aids

Select from:

☒ All steps

☐ Selected steps

☐ Selected frames

Select by:

☐ Time/Length

☐ Frequency

☒ Frame

Global range:

Min: 0

Max: -1

Increment: 1

☐ Unselect base state frames

☐ Unselect duplicate first frames

Selected frames: 103

Update Selection

Step Name	Description	Time	Period
☒ Vertical		0	1
☒ Lateral	Arc		3146.48

OK Apply Cancel

XY Data Manager

Data Source

☒ Current session

☐ Current ODB: Cadrul_PO.odb

Create...

Edit...

Copy...

Rename...

Delete...

Plot

Copy to ODB...

Load to Session

Dismiss

Name	Description
------	-------------



Job Cadrul_PO: Analysis Input File Processor completed successfully.
Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.
The job input file "Cadrul_PO.inp" has been submitted for analysis.
Job Cadrul_PO: Analysis Input File Processor completed successfully.
Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.

Abaqus/CAE 6.10-1 [Viewport: 1]

File Model Viewport View Result Plot Animate Report Options Tools Plug-ins Help

Model Results Module: Visualization ODB: C:/Simulia/Temp/CadruL_PO.odb

Session Data

Output Databases (1)

Spectrums (7)

XYPlots

XY Data from ODB Field Output

Steps/Frames

Note: XY Data will be extracted from the active steps/frames

Variables Elements/Nodes

Selection

Method

Pick from viewport

Node labels

Node sets

Internal sets

Select nodes in viewport

Highlight items in viewport

Save Plot Dismiss

XY Data Manager

Data Source

Current session Current ODB: CadruL_PO.odb

Name	Description
U:U1 P1: CADRU-1 N From Field Data: U:U1 at part instance CADRU-1 n	

Create... Edit... Copy... Rename... Delete... Plot Copy to ODB... Load to Session Dismiss

ODB: CadruL_PO.odb Abaqus/Standard 6.10-1 Thu Nov 24 16:34:11 2011

Step: Lateral Increment: 0.000 Primary Var: U, Magnitude Deformed Var: U, Deformation Scale Factor: 1.000e+00

Select nodes for the display group individually Done

Job CadruL_PO: Abaqus/Standard completed successfully.
Job CadruL_PO completed successfully.
The job input file "CadruL_PO.inp" has been submitted for analysis.
Job CadruL_PO: Analysis Input File Processor completed successfully.
Job CadruL_PO: Abaqus/Standard completed successfully.
Job CadruL_PO completed successfully.
The XY data curves for the requested XY data extraction have been created.

Start

RO 16:40 24.11.2011

Abaqus/CAE 6.10-1 [Viewport: 1]

File Model Viewport View Result Plot Animate Report Options Tools Plug-ins Help

Module: Visualization ODB: C:/Simulia/Temp/Cadrul_PO.odb

Session Data

Output Databases (1)

Spectrums (7)

XYPlots

XY Data from ODB Field Output

Steps/Frames

Note: XY Data will be extracted from the active steps/frames

Active Steps/Frames...

Variables Elements/Nodes

Output Variables

Position: Unique Nodal

Click checkboxes or edit the identifiers shown next to Edit below.

☒ RF: Reaction force

☐ Magnitude

☒ RF1

☐ RF2

☐ RM3: Reaction moment

☐ S: Stress component

☒ U: Spatial displacement

☐ Magnitude

Edit: RF.RF1

Section point: ☐ All ☐ Select Settings...

Save Plot Dismiss

Save XYData

XY data will be extracted from field output using default names.

Note: XYData are saved only for the current Abaqus session.

OK Cancel

XY Data Manager

Data Source

☒ Current session ☐ Current ODB: Cadrul_PO.odb

Create... Edit... Copy... Rename... Delete... Plot Copy to ODB... Load to Session Dismiss

Name	Description
U:U1 P1: CADRU-1 N From Field Data: U:U1	at part instance CADRU-1

ODB: Cadrul_PO.odb Abaqus/Standard 6.10-1 Thu Nov 24 16:34:38 GMT Standard Time 2011

Step: Linear
Increment: 0 Arc Length = 0.000
Primary Var: U, Magnitude
Deformed Var: U, Deformation Scale Factor: +1.000e+00

Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.
The job input file "Cadrul_PO.inp" has been submitted for analysis.
Job Cadrul_PO: Analysis Input File Processor completed successfully.
Job Cadrul_PO: Abaqus/Standard completed successfully.
Job Cadrul_PO completed successfully.
The XY data files for the requested XY data extraction have been created.

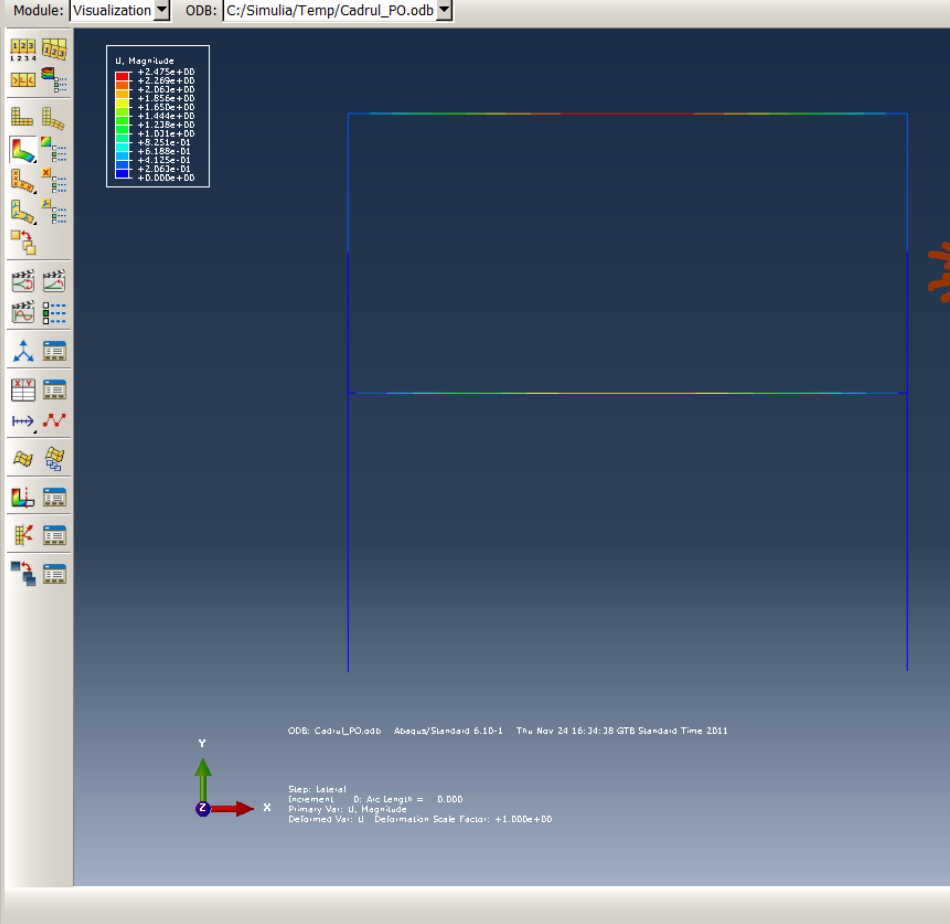
Start

RO

16:40
24.11.2011

Session Data

- Output Databases (1)
- Spectrums (7)
- XYPlots
- XYData (3)
- Paths
- Display Groups (1)
- Free Body Cuts
- Movies
- Images



XY Data Manager

Data Source

☒ Current session ☐ Current ODB: CadruL_PO.odb

Name	Description
RF:RF1 PI: CADRU-1 From Field Data: RF:RF1 at part instance CADRU-1 node 5	
RF:RF1 PI: CADRU-1 From Field Data: RF:RF1 at part instance CADRU-1 node 6	
U:U1 PI: CADRU-1 N From Field Data: U:U1 at part instance CADRU-1 node 3	

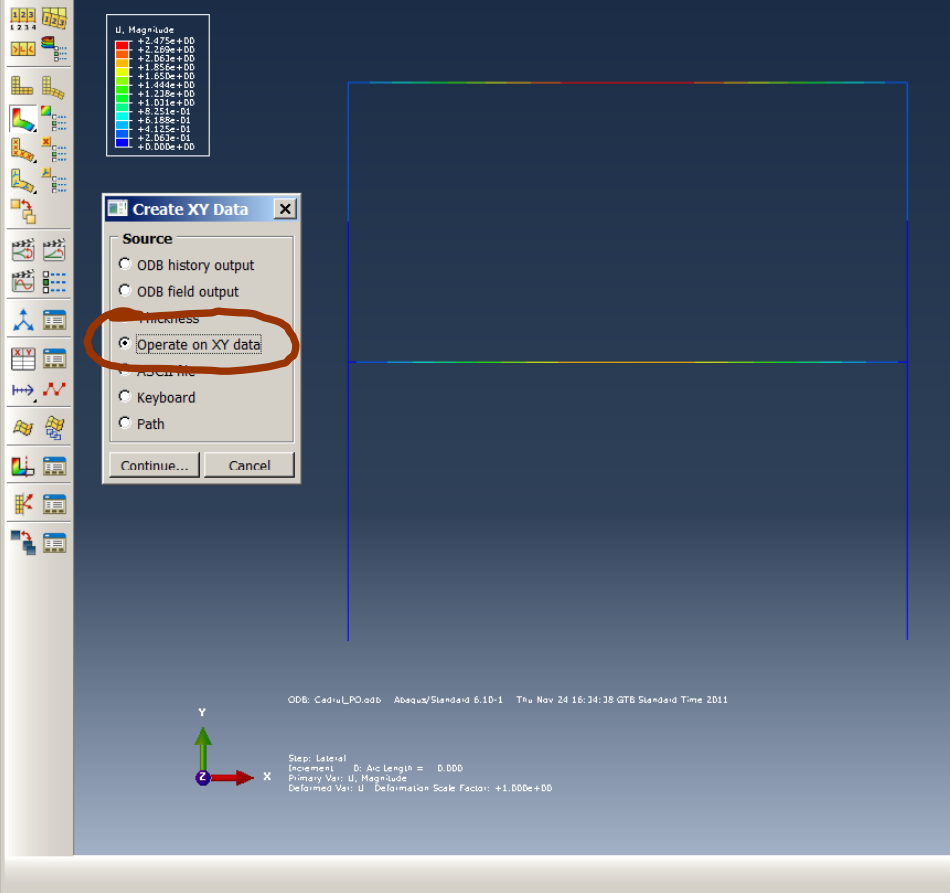
Create... Edit... Copy... Rename... Delete... Plot Copy to ODB... Load to Session Dismiss

Node: CADRU-1.6

	1	2	3	Magnitude
Base coordinates:	5.00000e+003	0.00000e+000	0.00000e+000	-
Scale:	1.00000e+000	1.00000e+000	1.00000e+000	-
Deformed coordinates (unscaled):	5.00000e+003	-1.25000e-031	0.00000e+000	-
Deformed coordinates (scaled):	5.00000e+003	-1.25000e-031	0.00000e+000	-
Displacement (unscaled):	1.13304e-032	-1.25000e-031	0.00000e+000	1.25512e-031

Session Data

- Output Databases (1)
- Spectrums (7)
- XYPlots
- XYData (3)
- Paths
- Display Groups (1)
- Free Body Cuts
- Movies
- Images



Create XY Data

Source

- ☐ ODB history output
- ☐ ODB field output
- ☒ Address
- ☐ ASCII file
- ☐ Keyboard
- ☐ Path

Continue... Cancel

XY Data Manager

Data Source

☒ Current session ☐ Current ODB: CadruL_PO.odb

Name	Description
RF:RF1 PI: CADRU-1 From Field Data: RF:RF1 at part instance CADRU-1 node 5	
RF:RF1 PI: CADRU-1 From Field Data: RF:RF1 at part instance CADRU-1 node 6	
U:U1 PI: CADRU-1 N From Field Data: U:U1 at part instance CADRU-1 node 3	

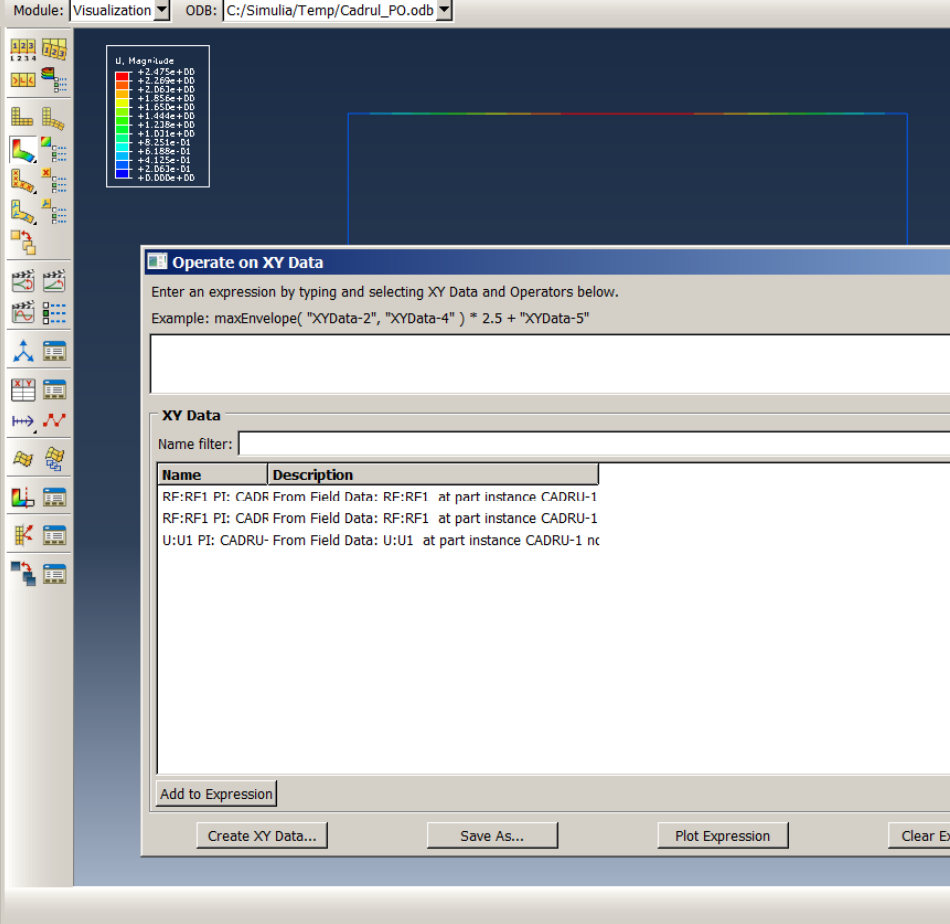
Create... Edit... Copy... Rename... Delete... Plot Copy to ODB... Load to Session Dismiss

Node: CADRU-1.6

	1	2	3	Magnitude
Base coordinates:	5.00000e+003	0.00000e+000	0.00000e+000	-
Scale:	1.00000e+000	1.00000e+000	1.00000e+000	-
Deformed coordinates (unscaled):	5.00000e+003	-1.25000e-031	0.00000e+000	-
Deformed coordinates (scaled):	5.00000e+003	-1.25000e-031	0.00000e+000	-
Displacement (unscaled):	1.13304e-032	-1.25000e-031	0.00000e+000	1.25512e-031

Session Data

- Output Databases (1)
- Spectrums (7)
- XYPlots
- XYData (3)
- Paths
- Display Groups (1)
- Free Body Cuts
- Movies
- Images



XY Data Manager

Data Source: ☒ Current session ☐ Current ODB: CadruL_PO.odb

Name	Description
Instance CADRU-1 node 5	
Instance CADRU-1 node 6	
Instance CADRU-1 node 3	

Create... Edit... Copy... Rename... Delete... Plot Copy to ODB... Load to Session Dismiss

Operate on XY Data

Enter an expression by typing and selecting XY Data and Operators below.
Example: maxEnvelope("XYData-2", "XYData-4") * 2.5 + "XYData-5"

XY Data

Name filter:

Name	Description
RF:RF1 PI: CADRU From Field Data: RF:RF1 at part instance CADRU-1	
RF:RF1 PI: CADRU From Field Data: RF:RF1 at part instance CADRU-1	
U:U1 PI: CADRU- From Field Data: U:U1 at part instance CADRU-1	

Add to Expression

Operators

- A - XYData, float, or integer
- X - XYData
- I - integer
- F - float

- abs(A)
- acos(A)
- append((X,X,...))
- asin(A)
- atan(A)
- avg((A,A,...))
- butterworthFilter(X,F)
- chebyshev1Filter(X,F,F)
- chebyshev2Filter(X,F,F)
- combine(X,X)
- cos(A)
- cosh(A)

Create XY Data... Save As... Plot Expression Clear Expression Cancel

Node: CADRU-1.6

	1	2	3	Magnitude
Base coordinates:	5.00000e+003	0.00000e+000	0.00000e+000	-
Scale:	1.00000e+000	1.00000e+000	1.00000e+000	-
Deformed coordinates (unscaled):	5.00000e+003	-1.25000e-031	0.00000e+000	-
Deformed coordinates (scaled):	5.00000e+003	-1.25000e-031	0.00000e+000	-
Displacement (unscaled):	1.13304e-032	-1.25000e-031	0.00000e+000	1.25512e-031

Operate on XY Data

Enter an expression by typing and selecting XY Data and Operators below.

Example: `maxEnvelope( RF:RF1 PI: CADRU-1 N: 3, RF:RF1 PI: CADRU-1 N: 5, RF:RF1 PI: CADRU-1 N: 6 )`

`combine ( "U:U1 PI: CADRU-1 N: 3", "RF:RF1 PI: CADRU-1 N: 5", "RF:RF1 PI: CADRU-1 N: 6" )`

XY Data

Name filter:

Name	Description
RF:RF1 PI: CADRU-1 N: 5	From Field Data: RF:RF1 at part instance CADRU-1 node 5
RF:RF1 PI: CADRU-1 N: 6	From Field Data: RF:RF1 at part instance CADRU-1 node 6
U:U1 PI: CADRU-1 N: 3	From Field Data: U:U1 at part instance CADRU-1 node 3
_temp_5	

Add to Expression

Operators

A - XYData, float, or integer

X - XYData

I - integer

F - float

0

+

-

*

/

1/A

abs(A)

acos(A)

append((X,X,...))

asin(A)

atan(A)

avg((A,A,...))

Create XY Data... Save As... Plot Expression Clear Expression Cancel

Base coordinates: 5.00000e+003, 0.00000e+000, 0.00000e+000, -

Scale: 1.00000e+000, 1.00000e+000, 1.00000e+000, -

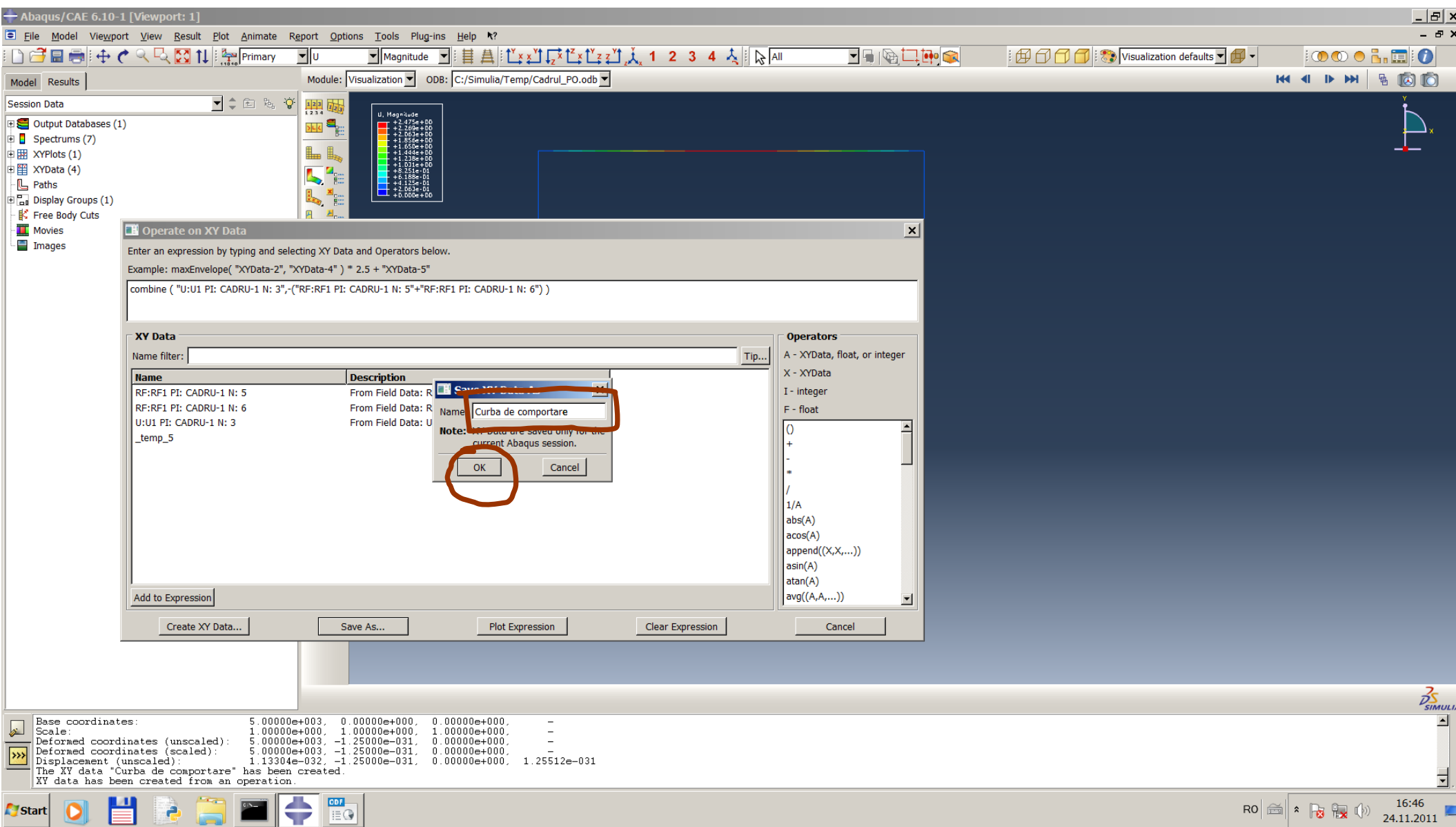
Deformed coordinates (unscaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -

Deformed coordinates (scaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -

Displacement (unscaled): 1.13304e-032, -1.25000e-031, 0.00000e+000, 1.25512e-031

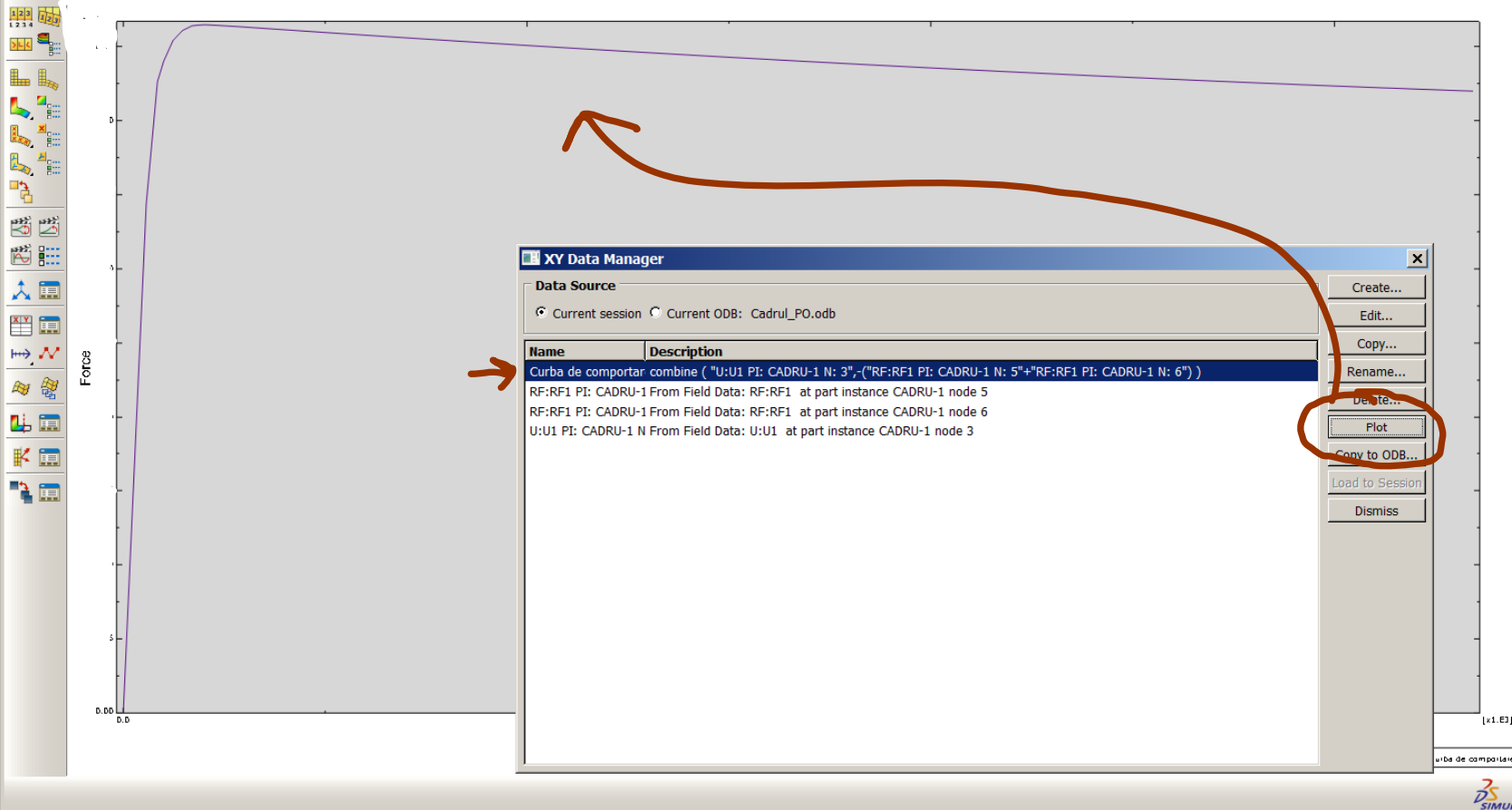
The XY data "Curba de comportare" has been created.

XY data has been created from an operation.



Session Data

- Output Databases (1)
- Spectrums (7)
- XYPlots (1)
- XYData (4)
- Paths
- Display Groups (1)
- Free Body Cuts
- Movies
- Images



Scale: 1.00000e+000, 1.00000e+000, 1.00000e+000, -
Deformed coordinates (unscaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -
Deformed coordinates (scaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -
Displacement (unscaled): 1.13304e-032, -1.25000e-031, 0.00000e+000, 1.25512e-031
The XY data "Curba de comportare" has been created.
The XY data has been created from an operation.
The XY data "Curba de comportare" has been created.

Session Data

- Output Databases (1)
- Spectrums (7)
- XYPlots (1)
- XYData (4)
- Paths
- Display Groups (1)
- Free Body Cuts
- Movies
- Images

Axis Options

X Axis

Axis Id	Title
Chart-1.axis-1	Displacement

Y Axis

Axis Id	Title
Chart-1.axis-1	Force

Scale | Tick Marks | Title | Axes

☒ Linear ☐ 10 dB ☐ Log ☐ 20 dB

Max: ☒ Auto-compute ☐ []

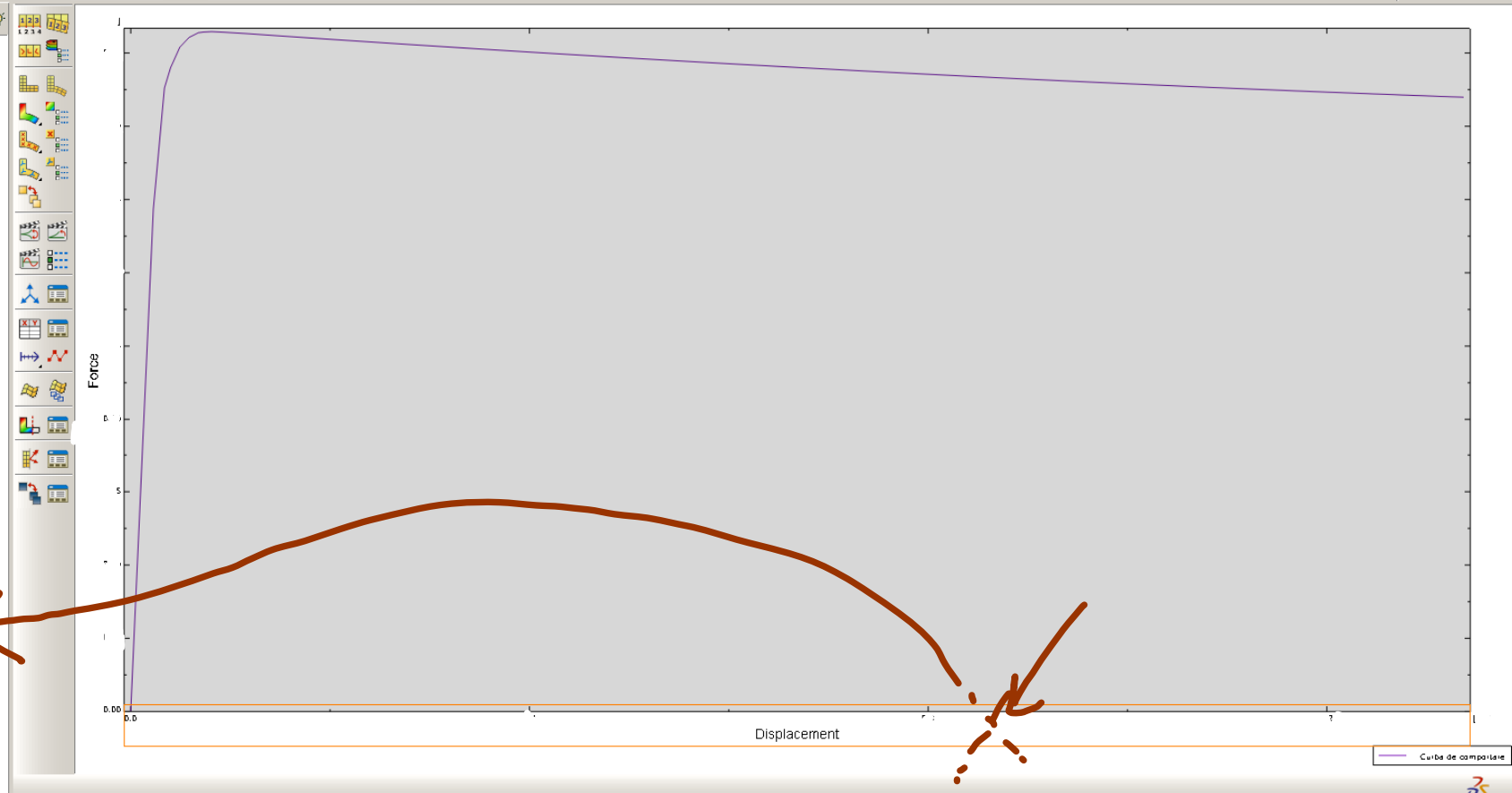
Min: ☒ Auto-compute ☐ []

Tick Mode

Major: ☒ Automatic ☐ By increment ☐ By count

Minor: Ticks per increment:

Dismiss



Scale: 1.00000e+000, 1.00000e+000, 1.00000e+000, -

Deformed coordinates (unscaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -

Deformed coordinates (scaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -

Displacement (unscaled): 1.13304e-032, -1.25000e-031, 0.00000e+000, 1.25512e-031

The XY data "Curba de comportare" has been created.

XY data has been created from an operation.

The XY data "Curba de comportare" has been created.

Session Data

- Output Databases (1)
- Spectrums (7)
- XYPlots (1)
- XYData (4)
- Paths
- Display Groups (1)
- Free Body Cuts
- Movies
- Images

Axis Options

X Axis

Axis Id	Title
Chart-1.axis-1	Displacement

Y Axis

Axis Id	Title
Chart-1.axis-1	Force

Scale Tick Marks Title Axes

☒ Linear ☐ 10 dB ☐ 20 dB

Max: ☐ Auto-compute ☒ []

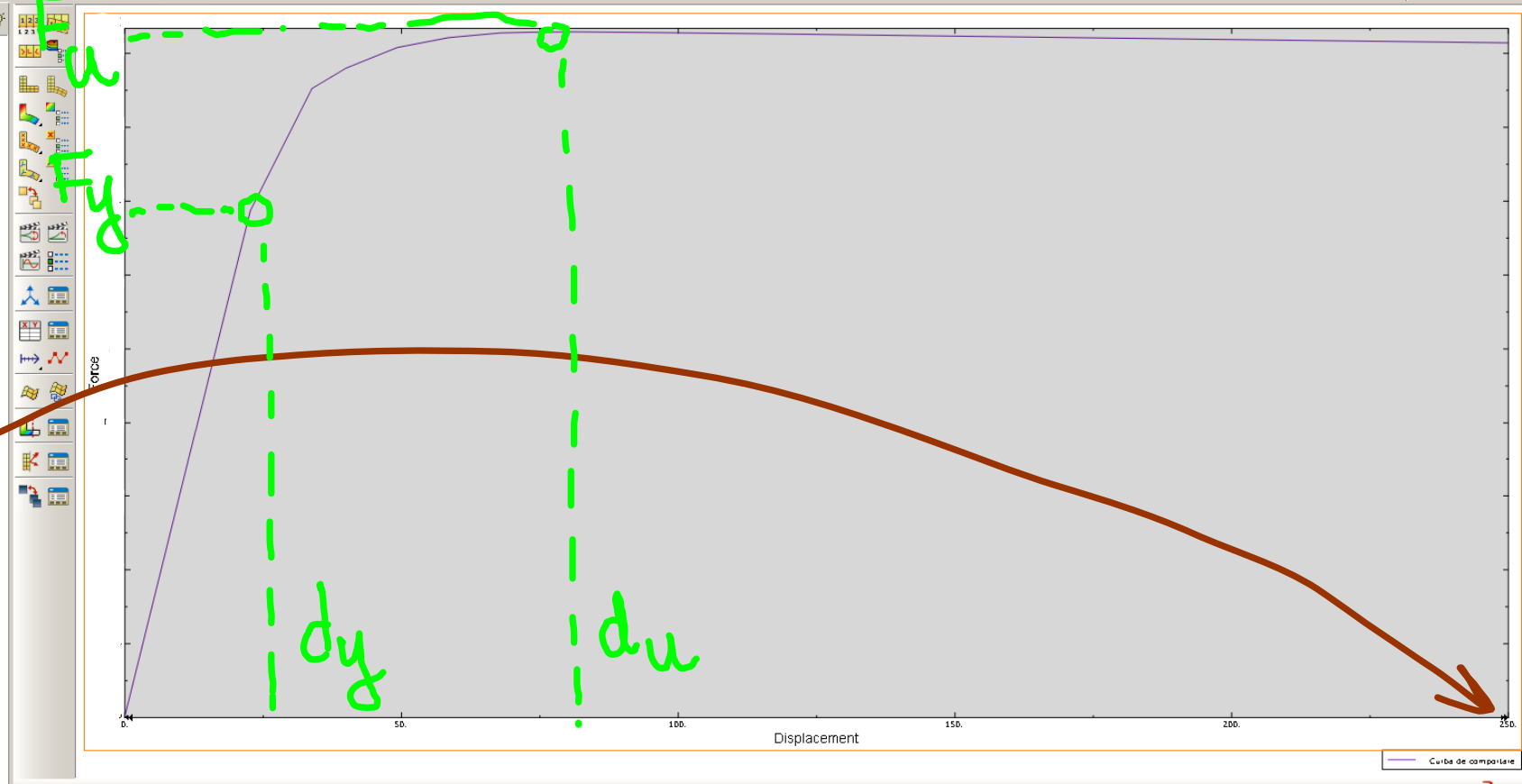
Min: ☐ Auto-compute ☒ []

Tick Mode

Major: ☒ Automatic ☐ By increment ☐ By count

Minor: Ticks per increment:

Dismiss



Scale: 1.00000e+000, 1.00000e+000, 1.00000e+000, -

Deformed coordinates (unscaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -

Deformed coordinates (scaled): 5.00000e+003, -1.25000e-031, 0.00000e+000, -

Displacement (unscaled): 1.13304e-032, -1.25000e-031, 0.00000e+000, 1.25512e-031

The XY data "Curba de comportare" has been created.

XY data has been created from an operation.

The XY data "Curba de comportare" has been created.

Rezultatele

- $F_y, F_u = ?$ 343.59kN; 464.56kN
 - $d_y, d_u = ?$ 22.68 mm; 81.16 mm
-
- SAP $d_y = 24.55$ mm $F_y = 358.58$ kN
 - SAP $d_u = 85.73$ mm $F_u = 451.25$ kN