

Stress Analysis Report

Analyzed File:	Belka gotowa.ipt
Autodesk Inventor Version:	2017 (Build 210142000, 142)
Creation Date:	02.07.2025, 06:45
Study Author:	High Flier

Project Info (iProperties)

Static Analysis:1

General objective and settings:

Design Objective	Parametric Dimension
Study Type	Static Analysis
Last Modification Date	02.07.2025, 06:44
Detect and Eliminate Rigid Body Modes	No

Mesh settings:

Avg. Element Size (fraction of model diameter)	0,1
Min. Element Size (fraction of avg. size)	0,2
Grading Factor	1,5
Max. Turn Angle	60 deg
Create Curved Mesh Elements	Yes

Material(s)

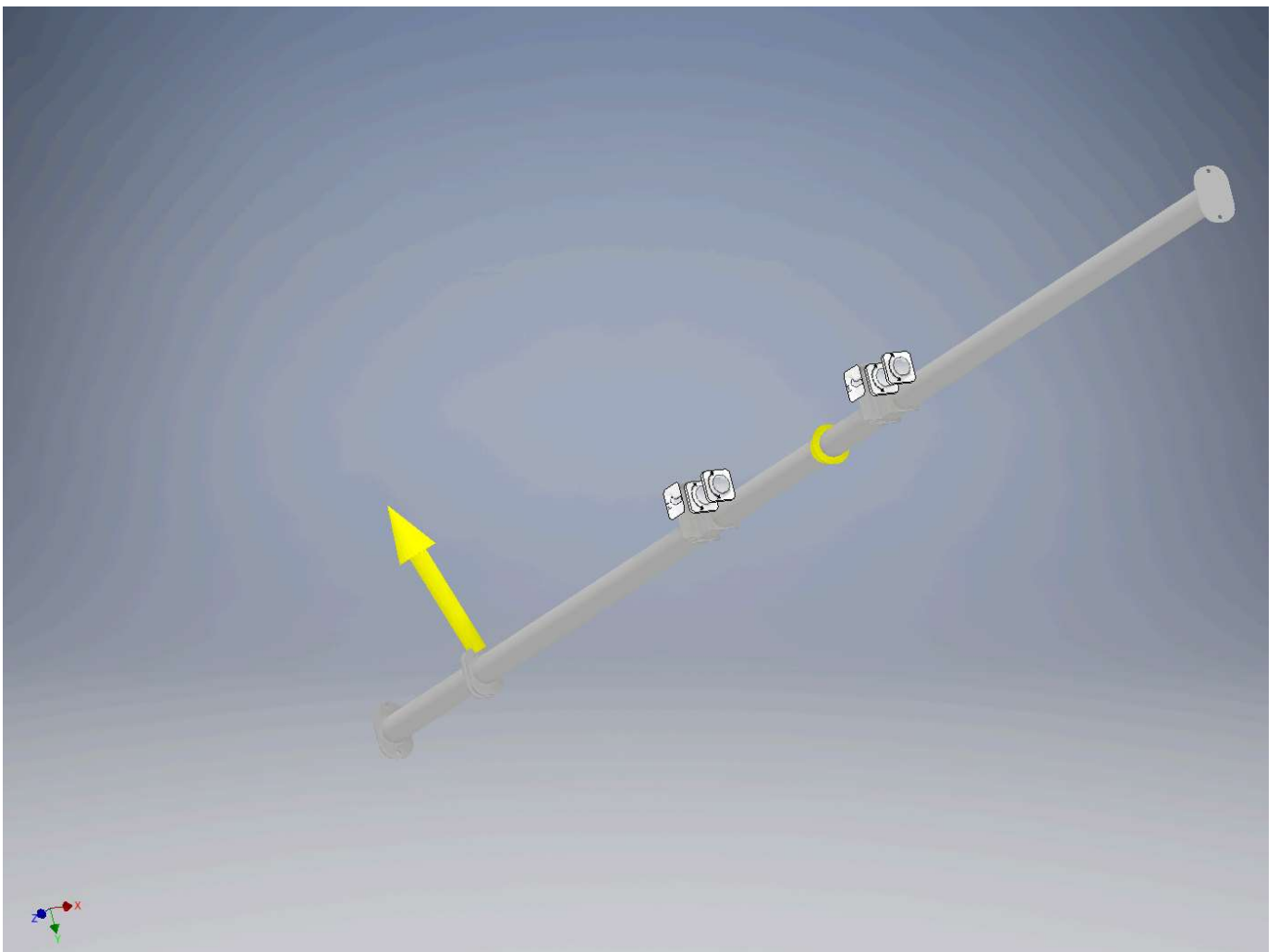
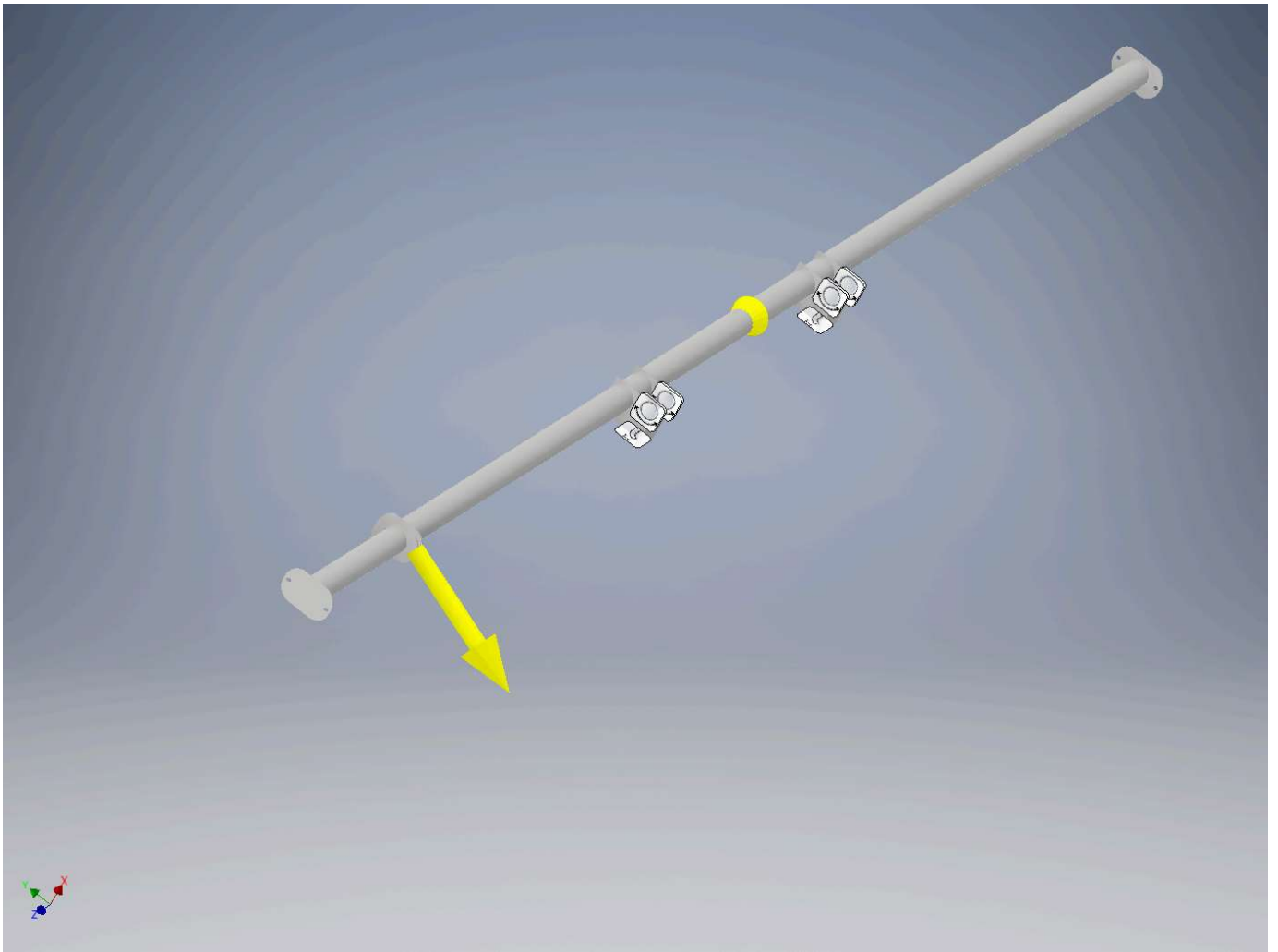
Name	Steel, Carbon	
General	Mass Density	7,85 g/cm^3
	Yield Strength	350 MPa
	Ultimate Tensile Strength	420 MPa
Stress	Young's Modulus	200 GPa
	Poisson's Ratio	0,29 ul
	Shear Modulus	77,5194 GPa
Part Name(s)	Belka gotowa.ipt	

Operating conditions

Gravity

Load Type	Gravity
Magnitude	9810,000 mm/s^2
Vector X	-0,000 mm/s^2
Vector Y	50,789 mm/s^2
Vector Z	9809,869 mm/s^2

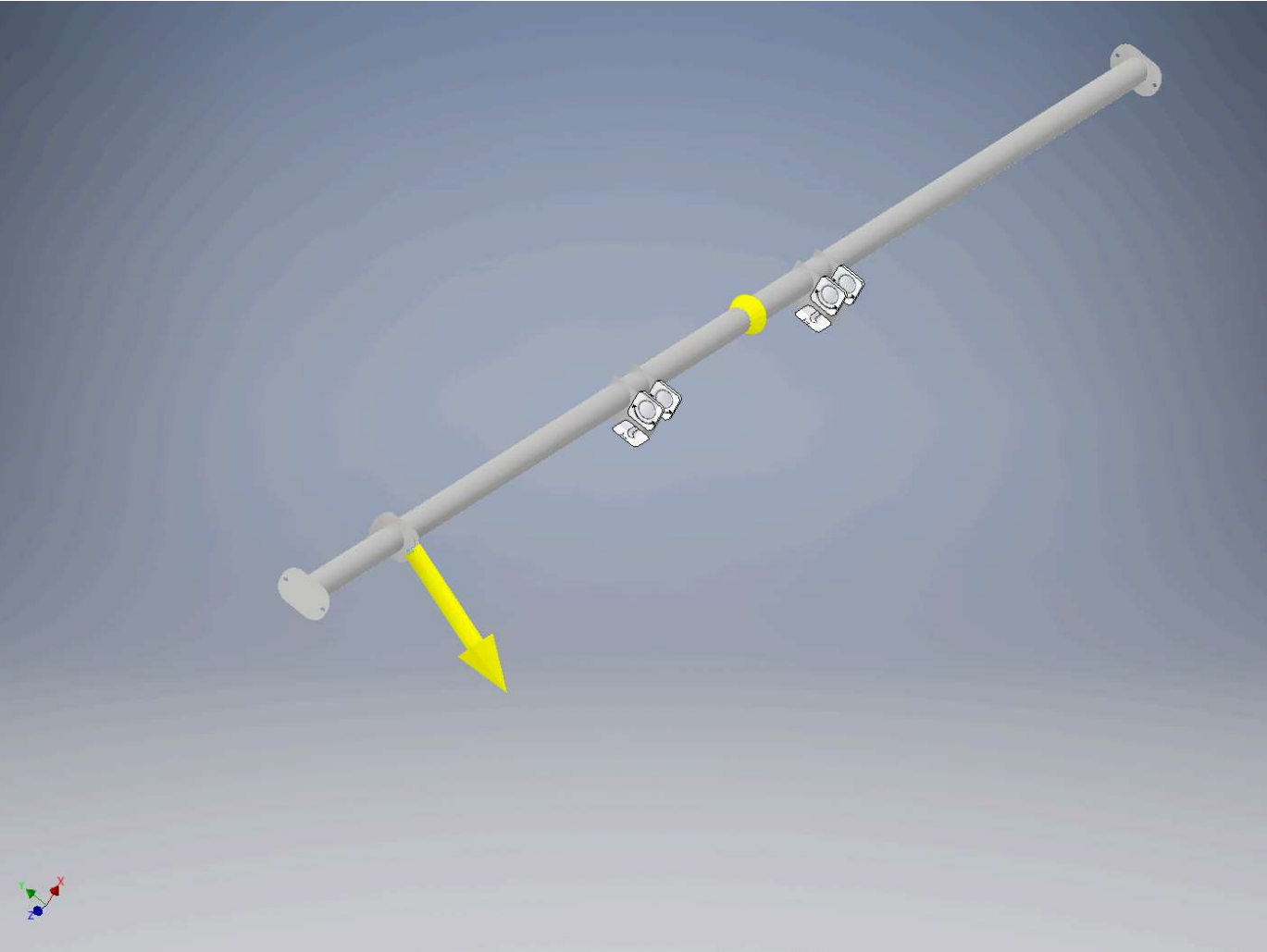
Selected Face(s)

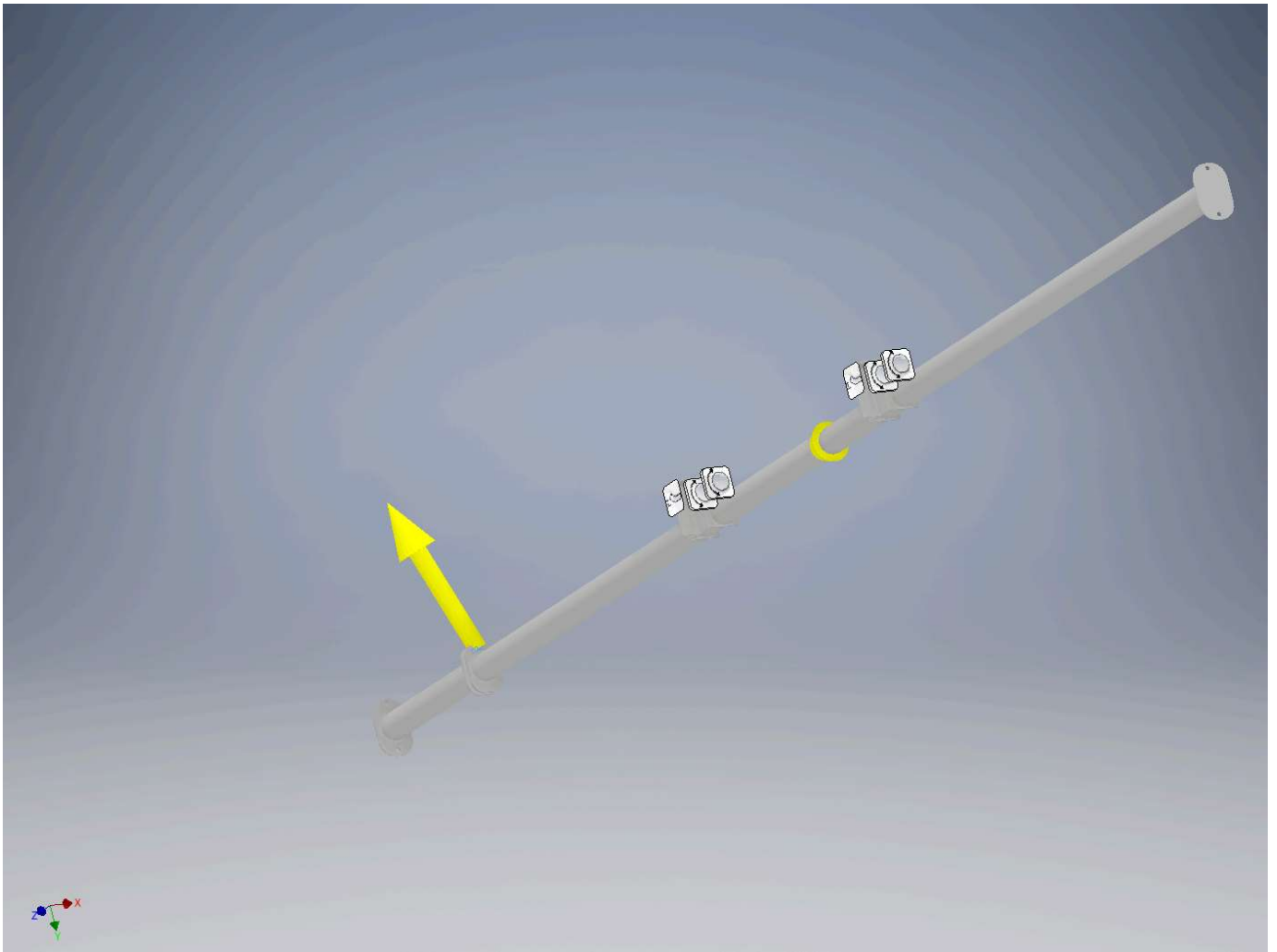


☐ **Force:1**

Load Type	Force
Magnitude	3500,000 N
Vector X	-1268,357 N
Vector Y	-3262,052 N
Vector Z	16,889 N

☐ **Selected Face(s)**

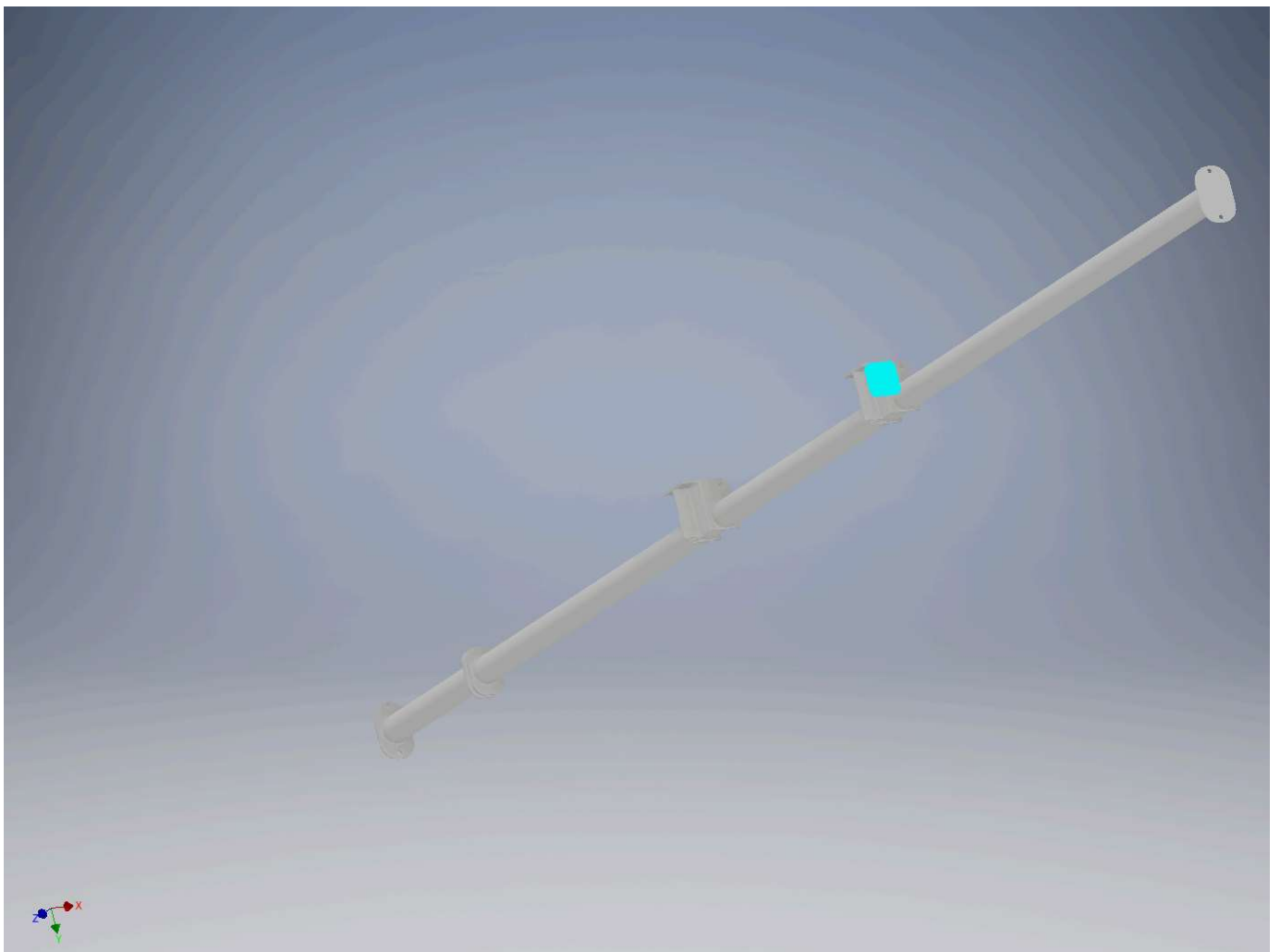
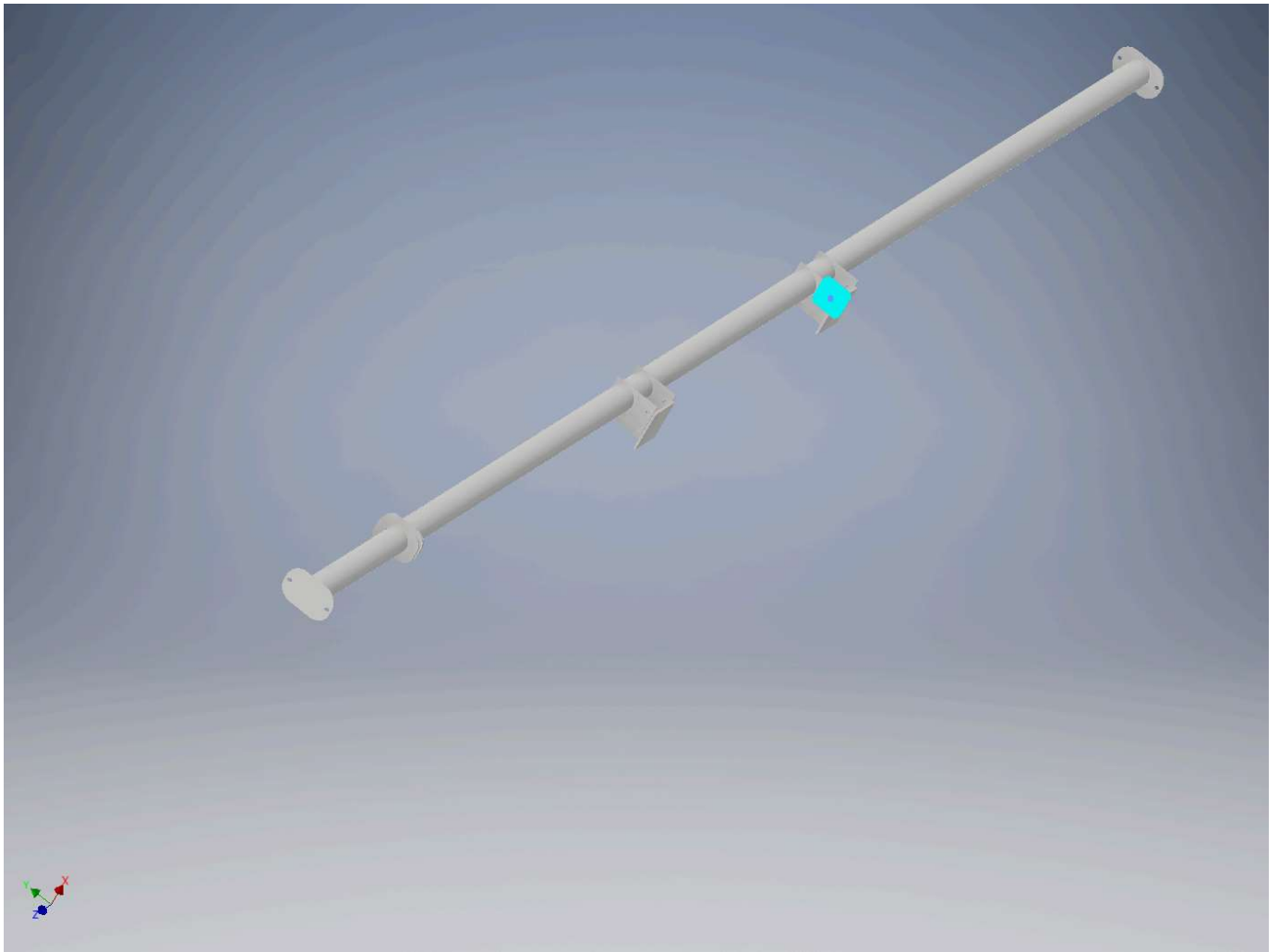




☐ **Pin Constraint:1**

Constraint Type	Pin Constraint
Fix Radial Direction	Yes
Fix Axial Direction	Yes
Fix Tangential Direction	No

☐ **Selected Face(s)**

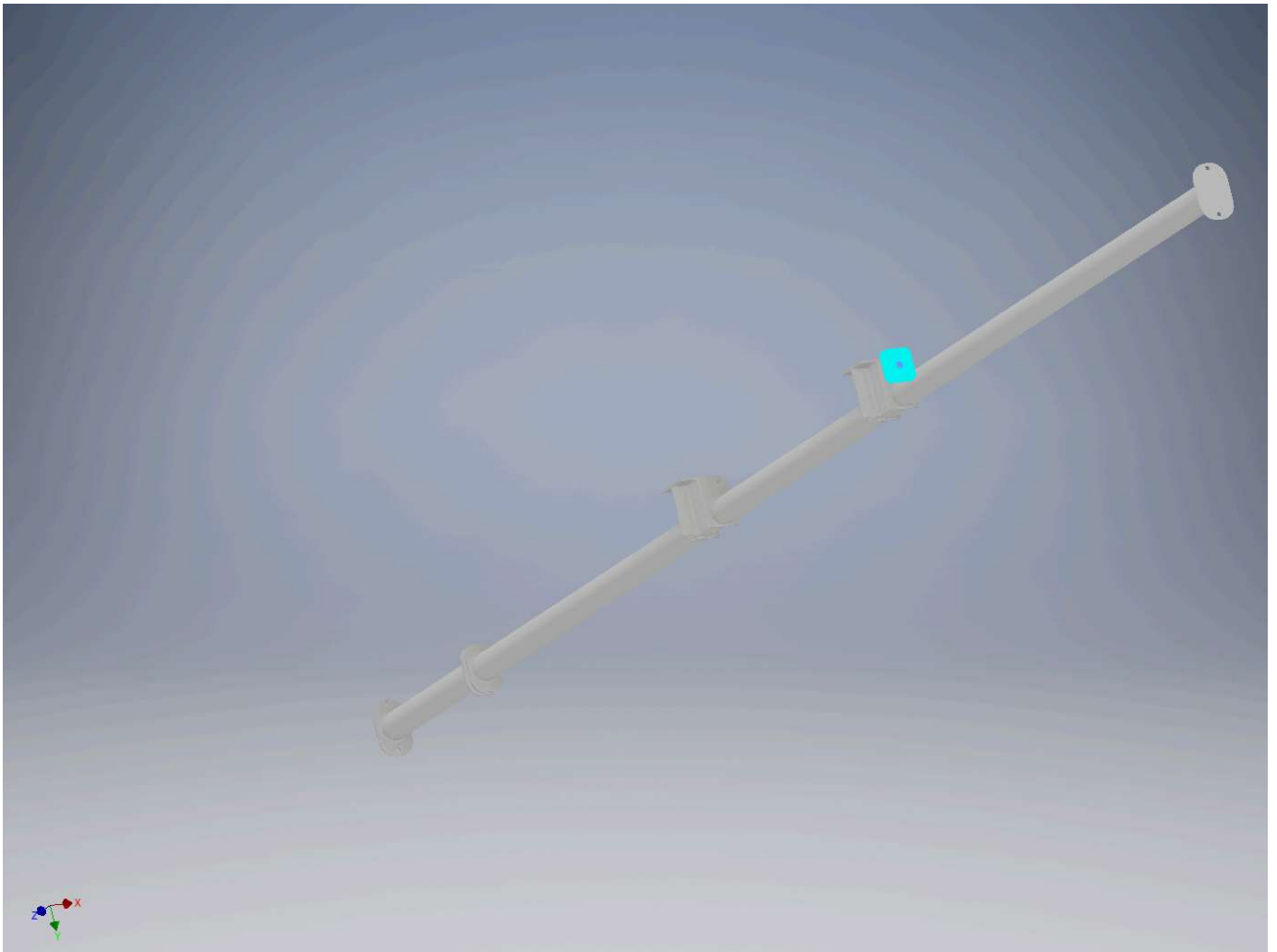


☐ **Pin Constraint:2**

Constraint Type	Pin Constraint
Fix Radial Direction	Yes
Fix Axial Direction	Yes
Fix Tangential Direction	No

☐ **Selected Face(s)**

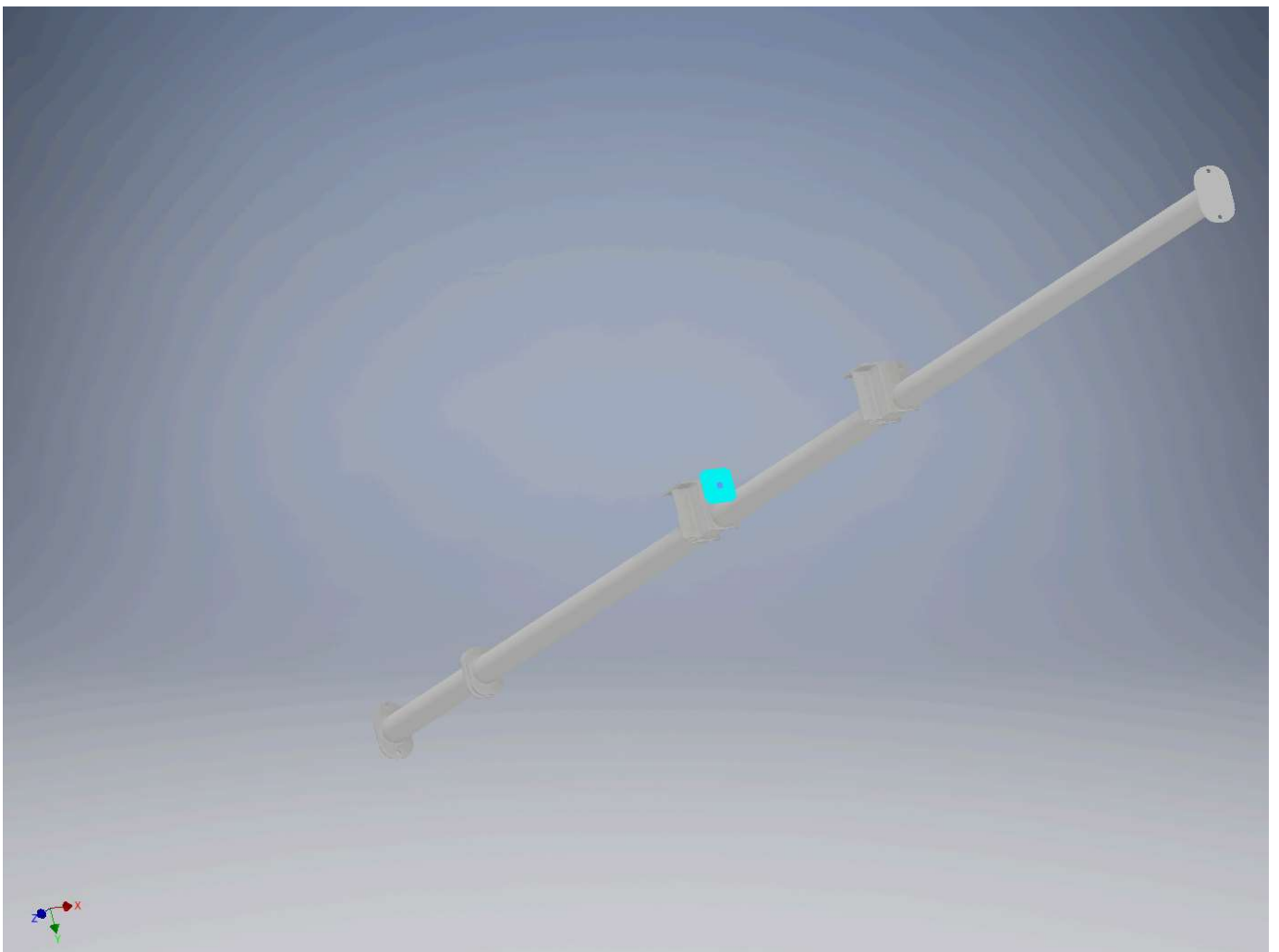
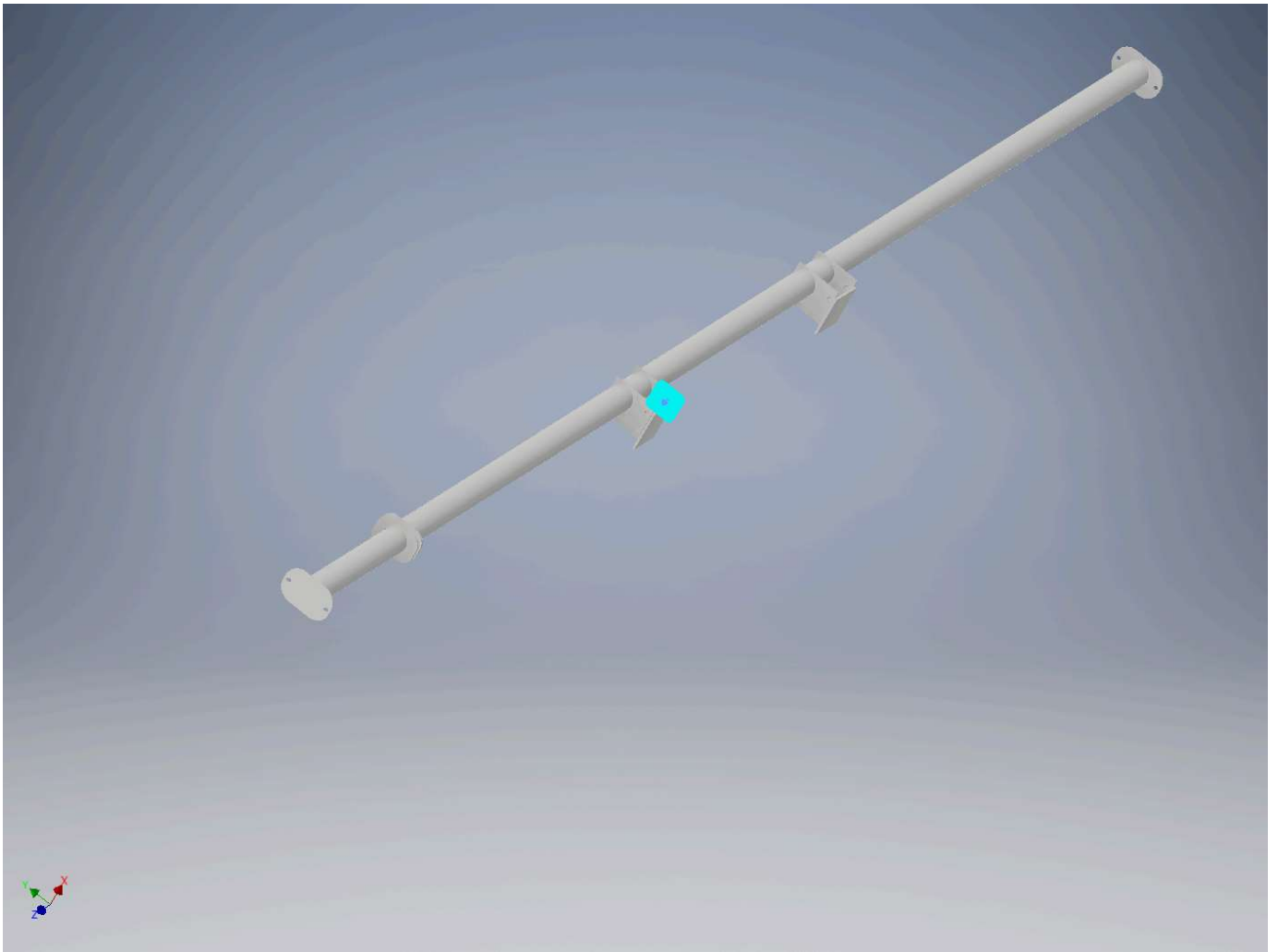




☐ **Pin Constraint:3**

Constraint Type	Pin Constraint
Fix Radial Direction	Yes
Fix Axial Direction	Yes
Fix Tangential Direction	No

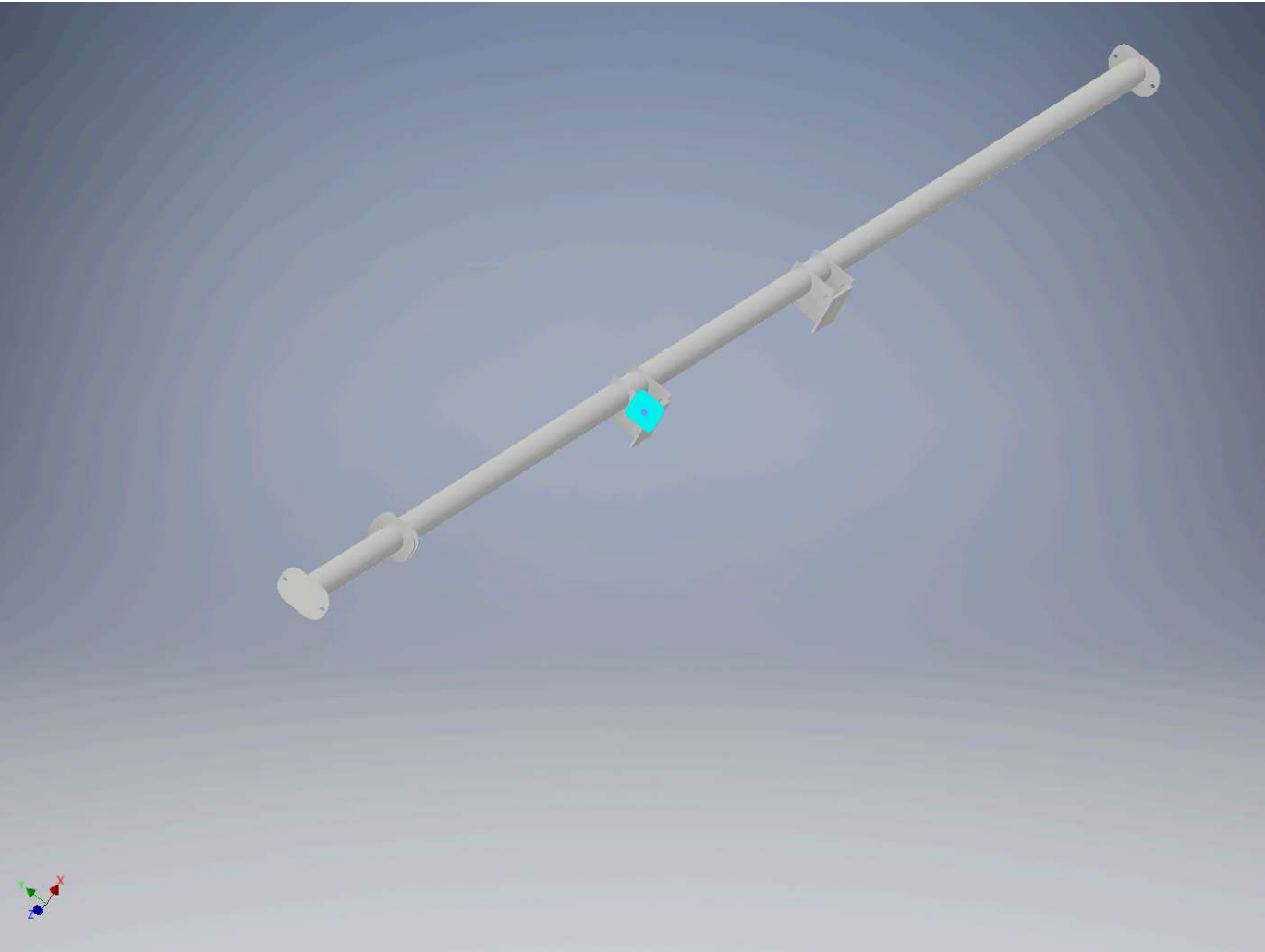
☐ **Selected Face(s)**

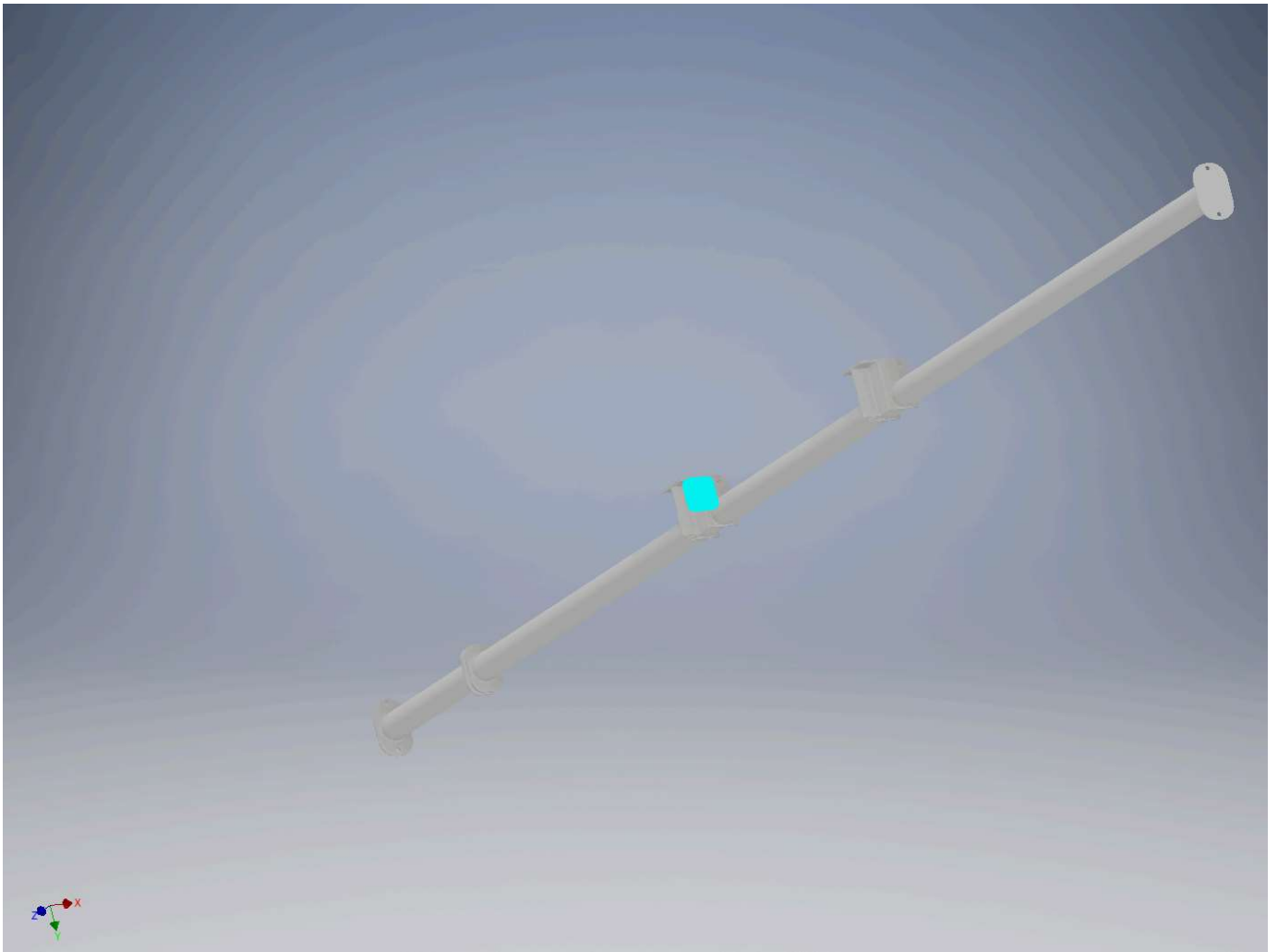


☐ **Pin Constraint:4**

Constraint Type	Pin Constraint
Fix Radial Direction	Yes
Fix Axial Direction	Yes
Fix Tangential Direction	No

☐ **Selected Face(s)**

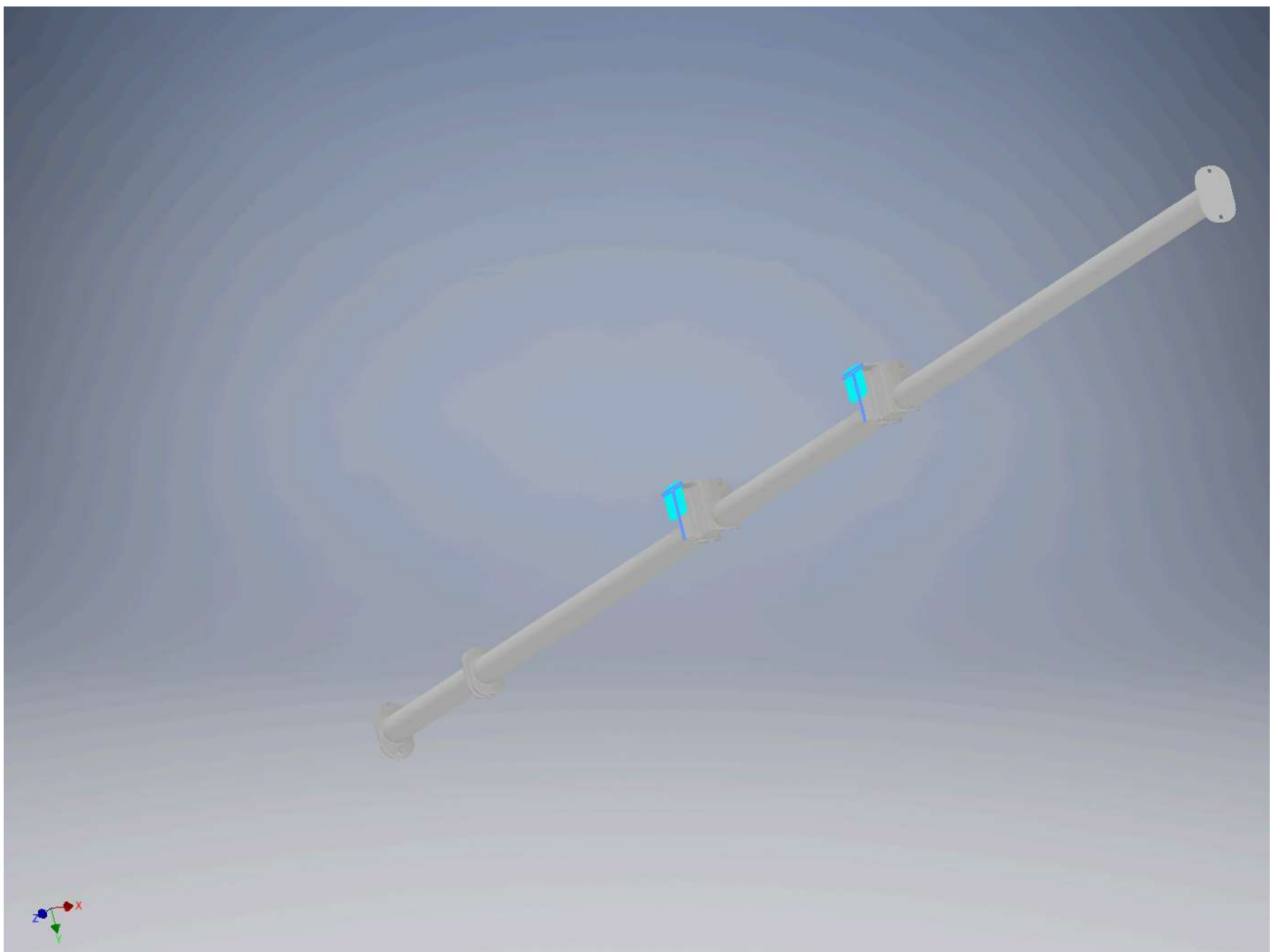
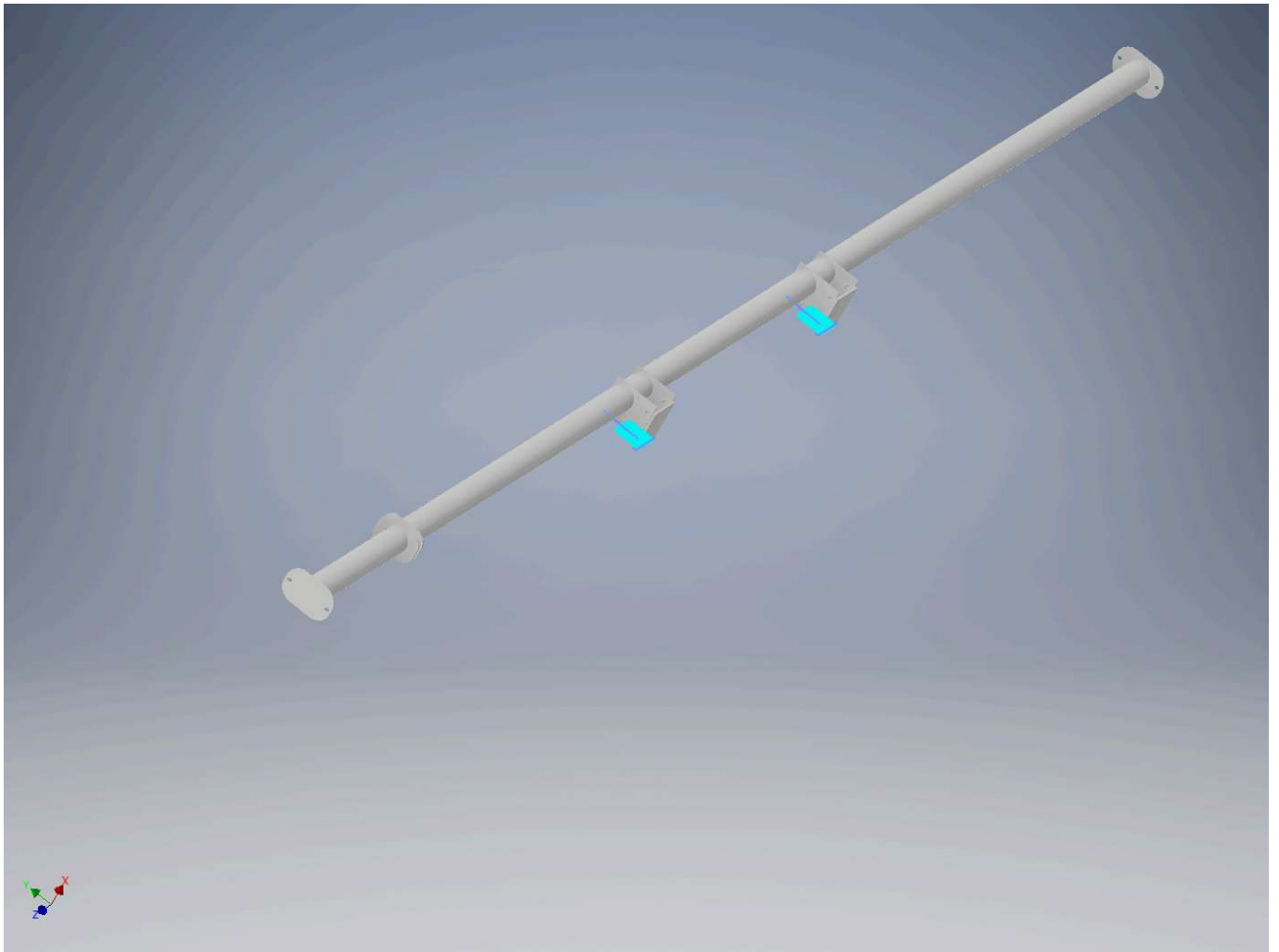




☐ **Fixed Constraint:1**

Constraint Type	Fixed Constraint
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☐ **Selected Face(s)**



☐ Results

☐ Parametric Configuration:1

☐ Reaction Force and Moment on Constraints

Constraint Name	Reaction Force		Reaction Moment	
	Magnitude	Component (X,Y,Z)	Magnitude	Component (X,Y,Z)
Pin Constraint:1	6593,71 N	-6302,53 N	22,99 N m	15,8495 N m
		-821,293 N		-16,6524 N m
		-1755,17 N		0,169741 N m
Pin Constraint:2	4070,79 N	1643,79 N	82,1522 N m	-8,89988 N m
		3392,99 N		-81,6687 N m
		-1535,24 N		0 N m
Pin Constraint:3	25928,7 N	5179,94 N	315,843 N m	-309,249 N m
		-25369,8 N		-64,2026 N m
		-1357,8 N		0 N m
Pin Constraint:4	26185,4 N	-580,409 N	360,881 N m	-360,872 N m
		26178,5 N		2,50272 N m
		-143,566 N		0 N m
Fixed Constraint:1	1382,86 N	1326,3 N	10968,2 N m	-10152,3 N m
		-142,102 N		-4150,54 N m
		364,732 N		74,7962 N m

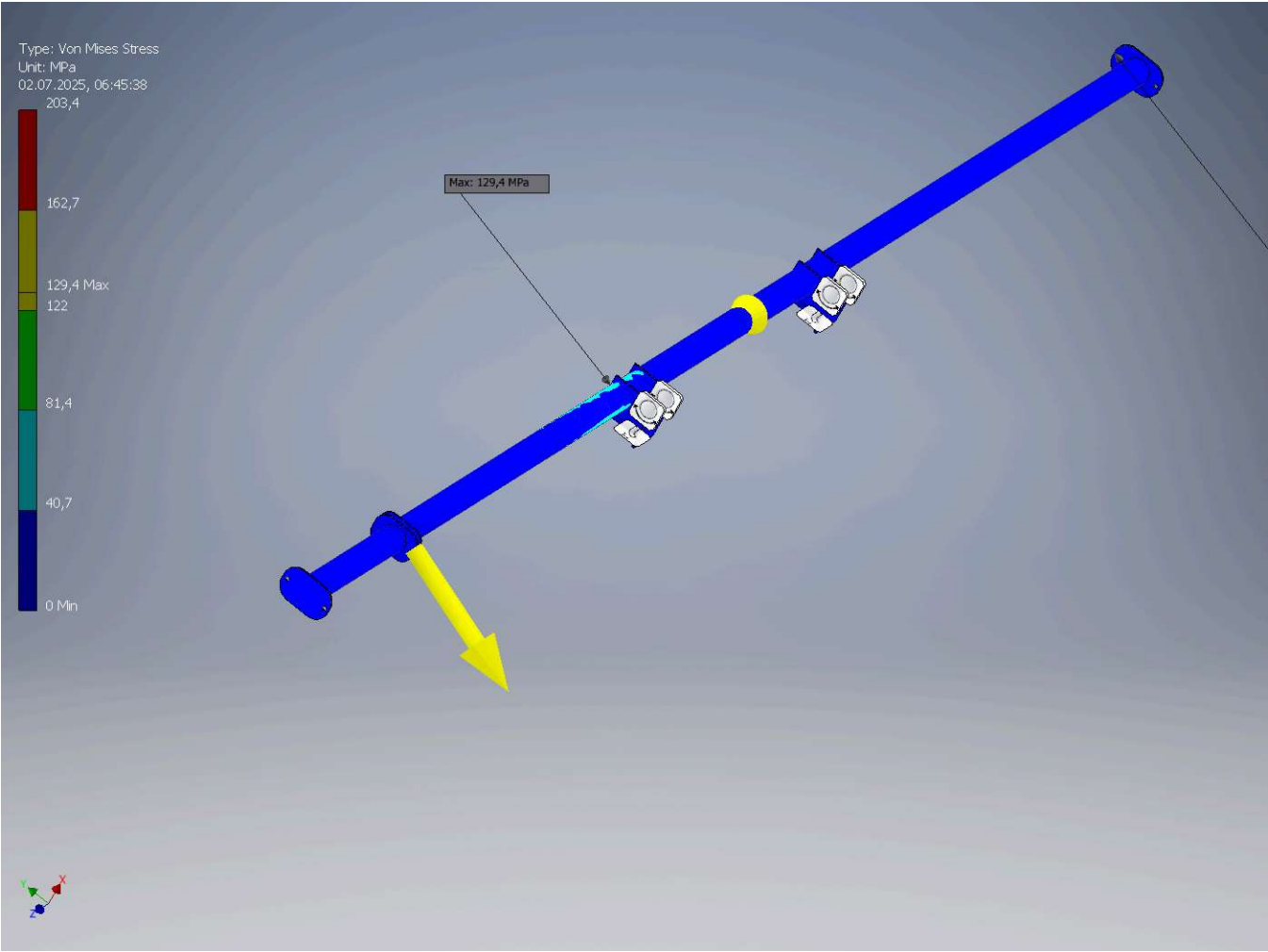
☐ Result Summary

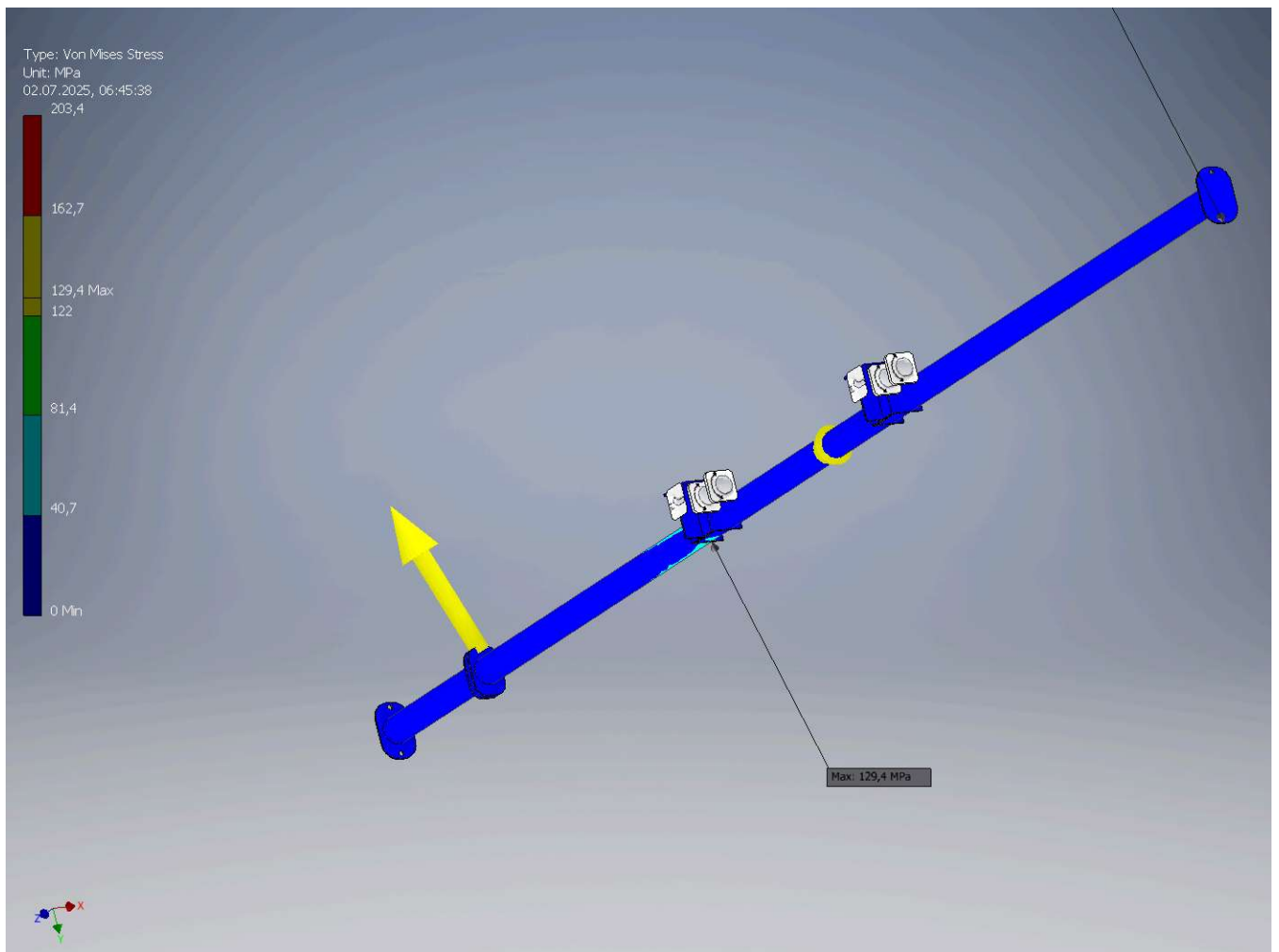
Name	Minimum	Maximum
Volume	52538900 mm ³	
Mass	412,43 kg	
Von Mises Stress	0,00254065 MPa	129,365 MPa
1st Principal Stress	-20,2786 MPa	137,178 MPa
3rd Principal Stress	-98,423 MPa	36,327 MPa
Displacement	0 mm	20,285 mm
Safety Factor	2,70552 ul	15 ul
Stress XX	-88,1387 MPa	111,9 MPa
Stress XY	-40,6724 MPa	36,84 MPa
Stress XZ	-36,958 MPa	24,1593 MPa
Stress YY	-96,6894 MPa	84,5961 MPa
Stress YZ	-16,1549 MPa	30,1216 MPa
Stress ZZ	-57,6947 MPa	136,318 MPa
X Displacement	-10,1147 mm	0,35349 mm
Y Displacement	-17,5701 mm	0,295512 mm
Z Displacement	-0,888507 mm	1,28919 mm
Equivalent Strain	0,0000000109372 ul	0,000604166 ul
1st Principal Strain	-0,00000178532 ul	0,000539482 ul
3rd Principal Strain	-0,000478147 ul	0,0000156794 ul
Strain XX	-0,00036795 ul	0,000381298 ul
Strain XY	-0,000262337 ul	0,000237618 ul
Strain XZ	-0,000238379 ul	0,000155827 ul
Strain YY	-0,000466966 ul	0,000403966 ul
Strain YZ	-0,000104199 ul	0,000194285 ul
Strain ZZ	-0,000280981 ul	0,000533932 ul
Contact Pressure	0 MPa	326,87 MPa
Contact Pressure X	-208,344 MPa	120,982 MPa
Contact Pressure Y	-150,12 MPa	116,148 MPa

Contact Pressure Z	-103,511 MPa	202,238 MPa
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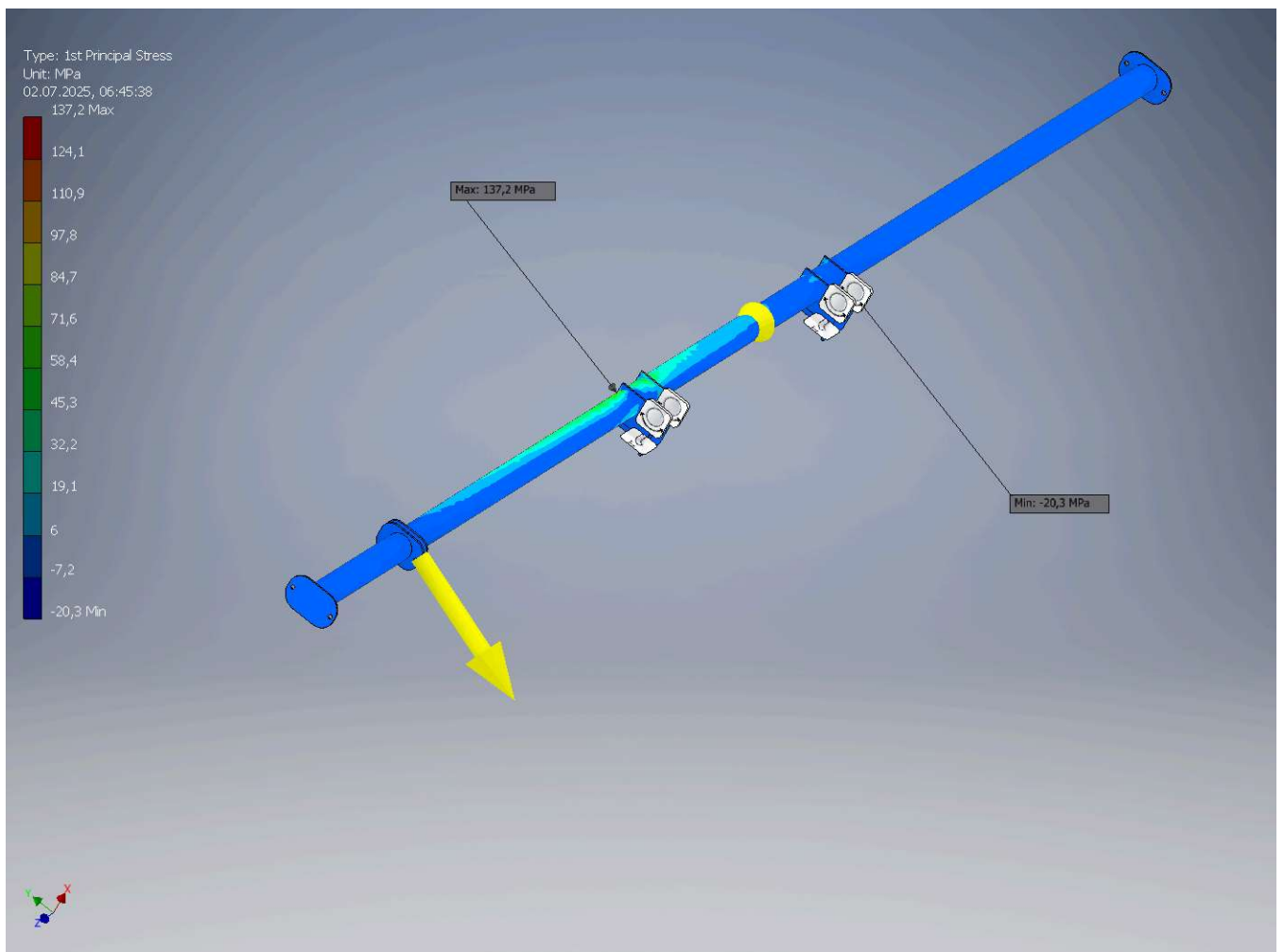
Figures

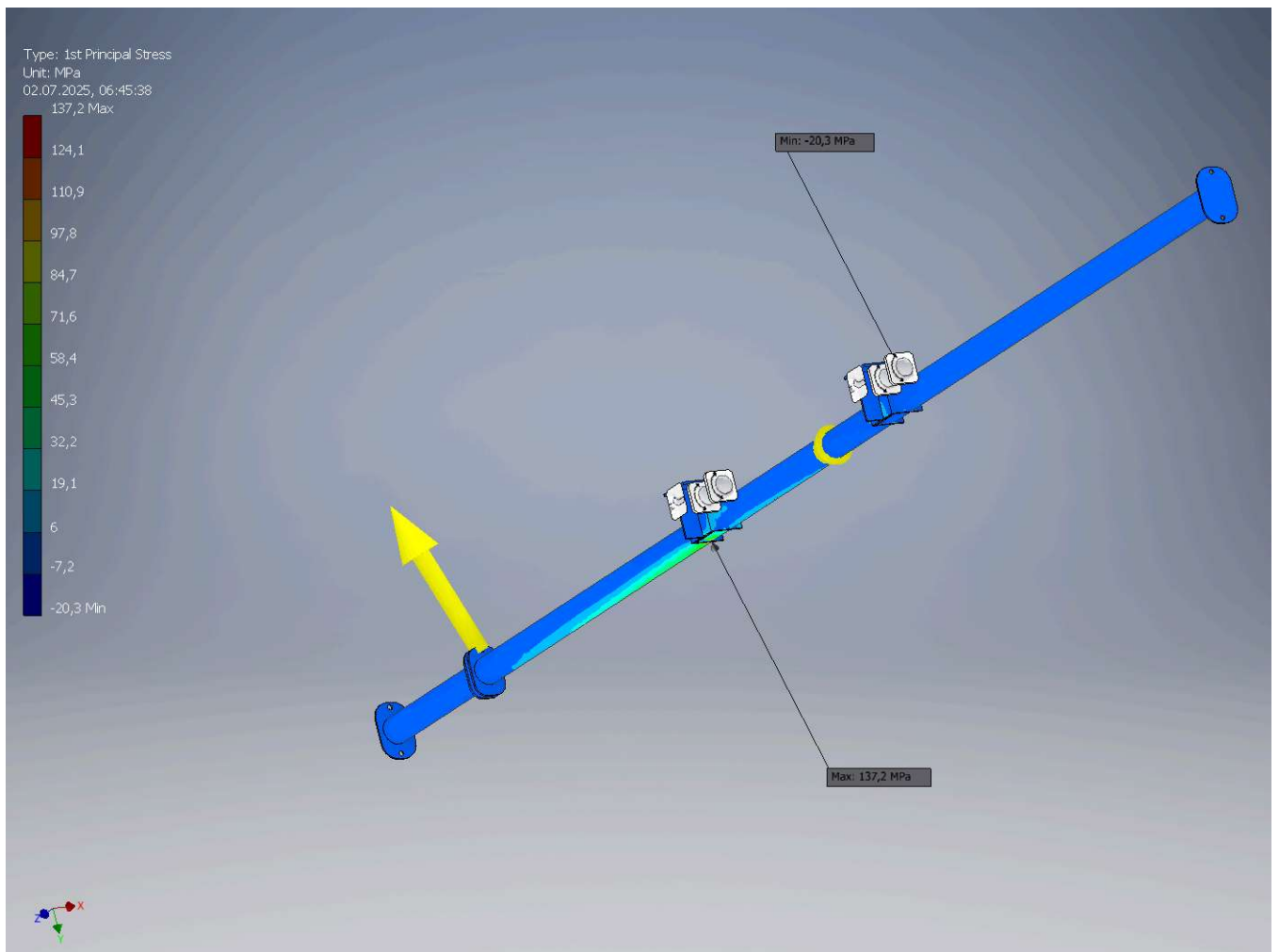
Von Mises Stress



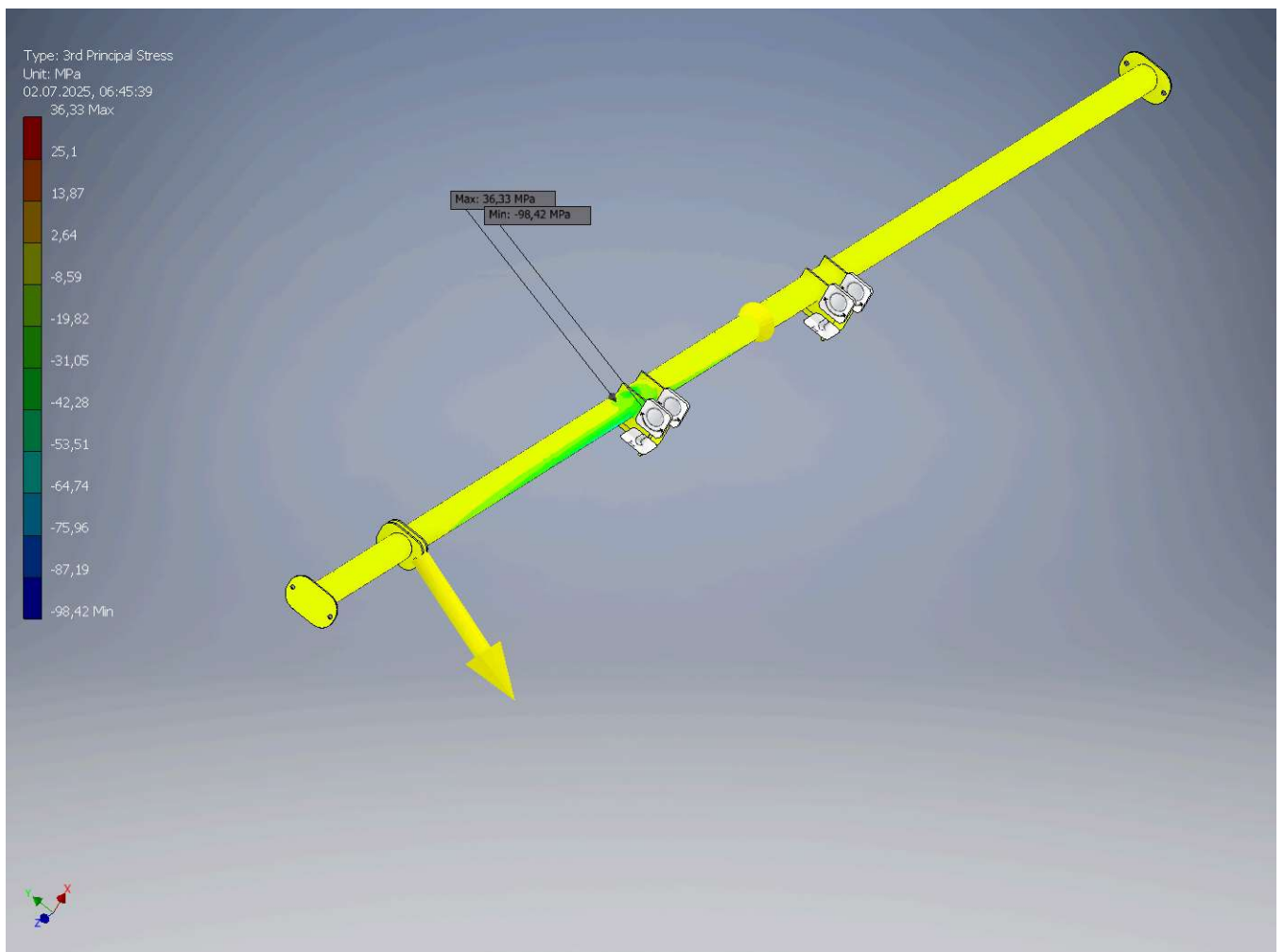


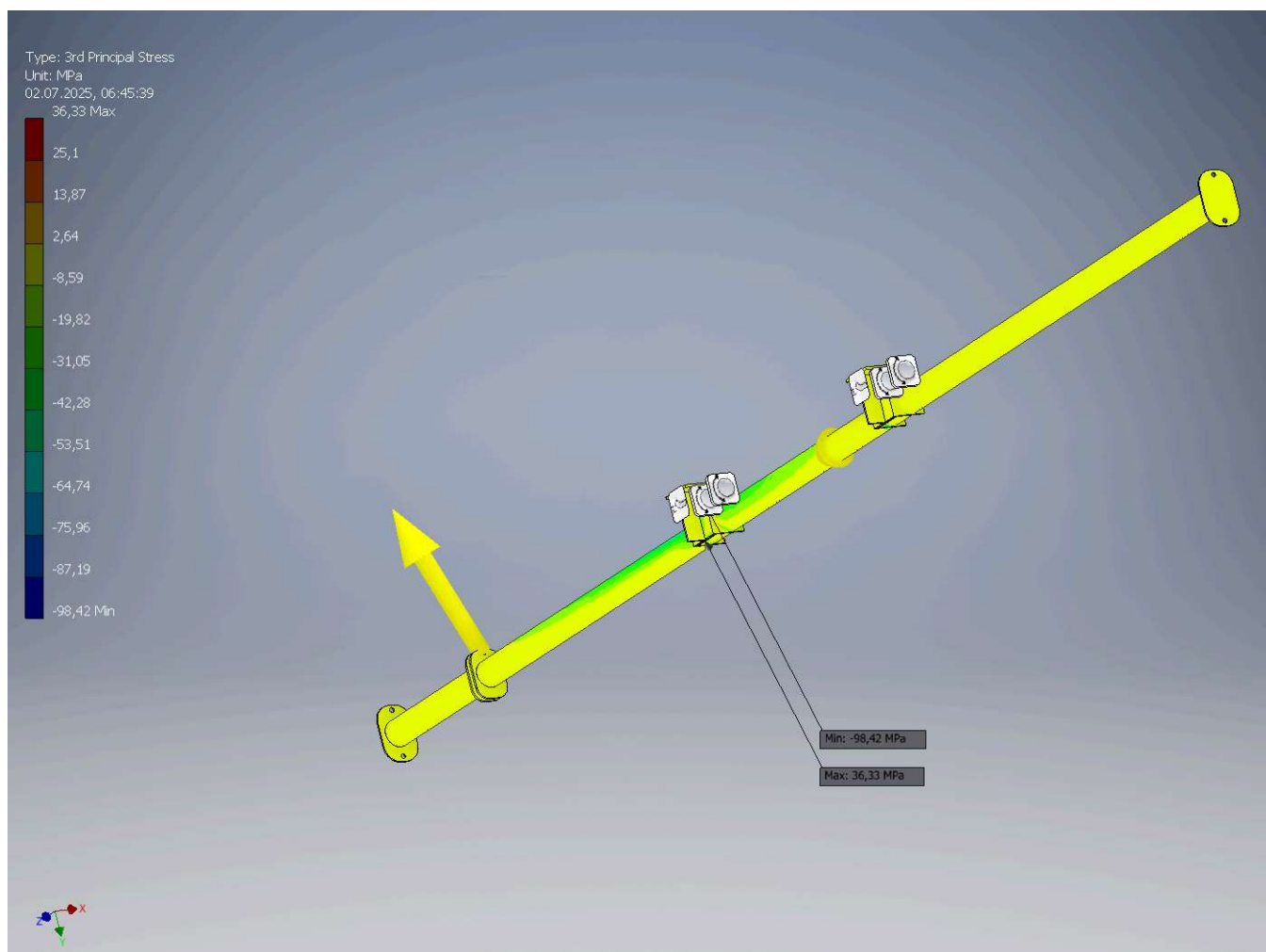
1st Principal Stress



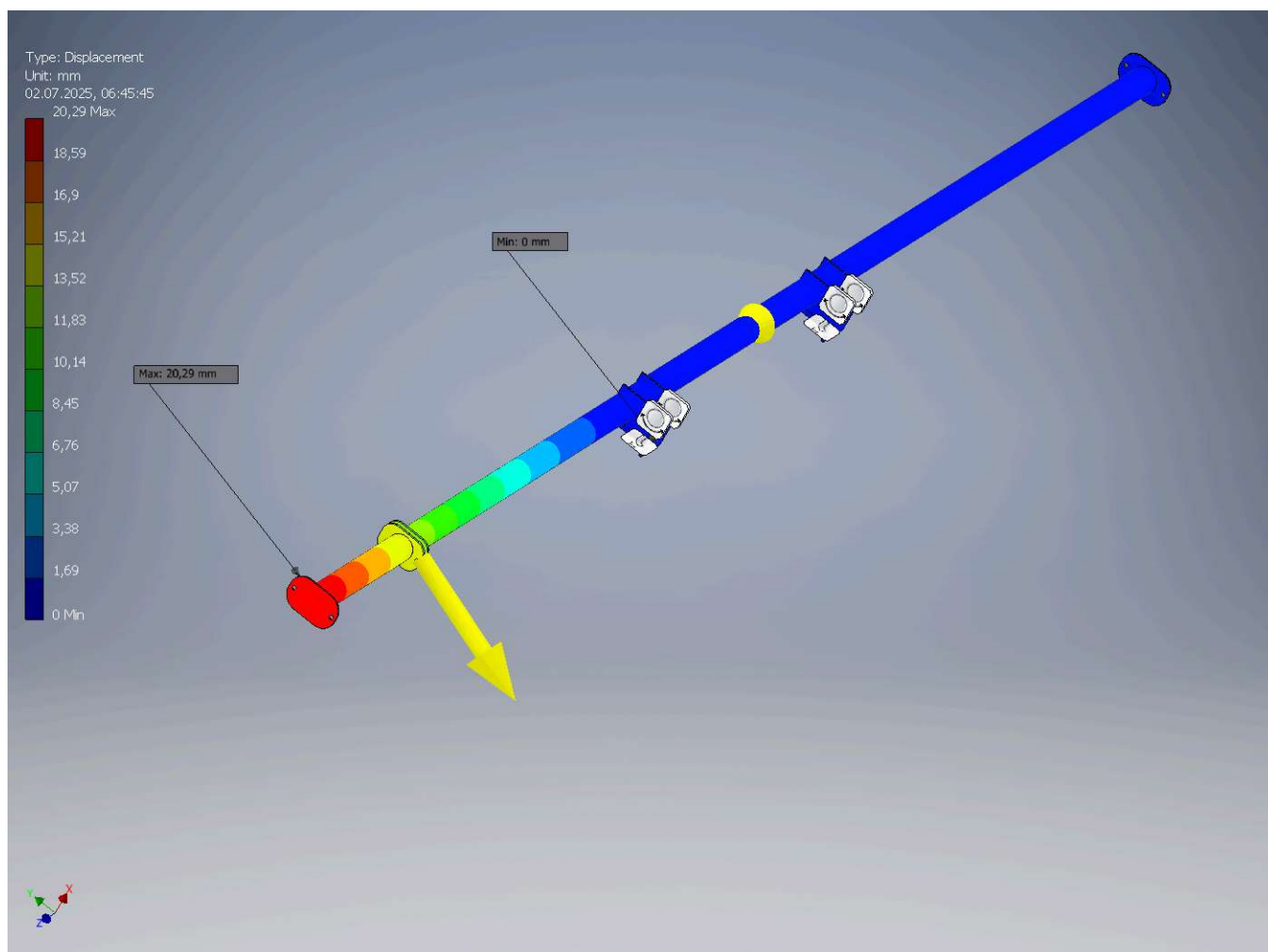


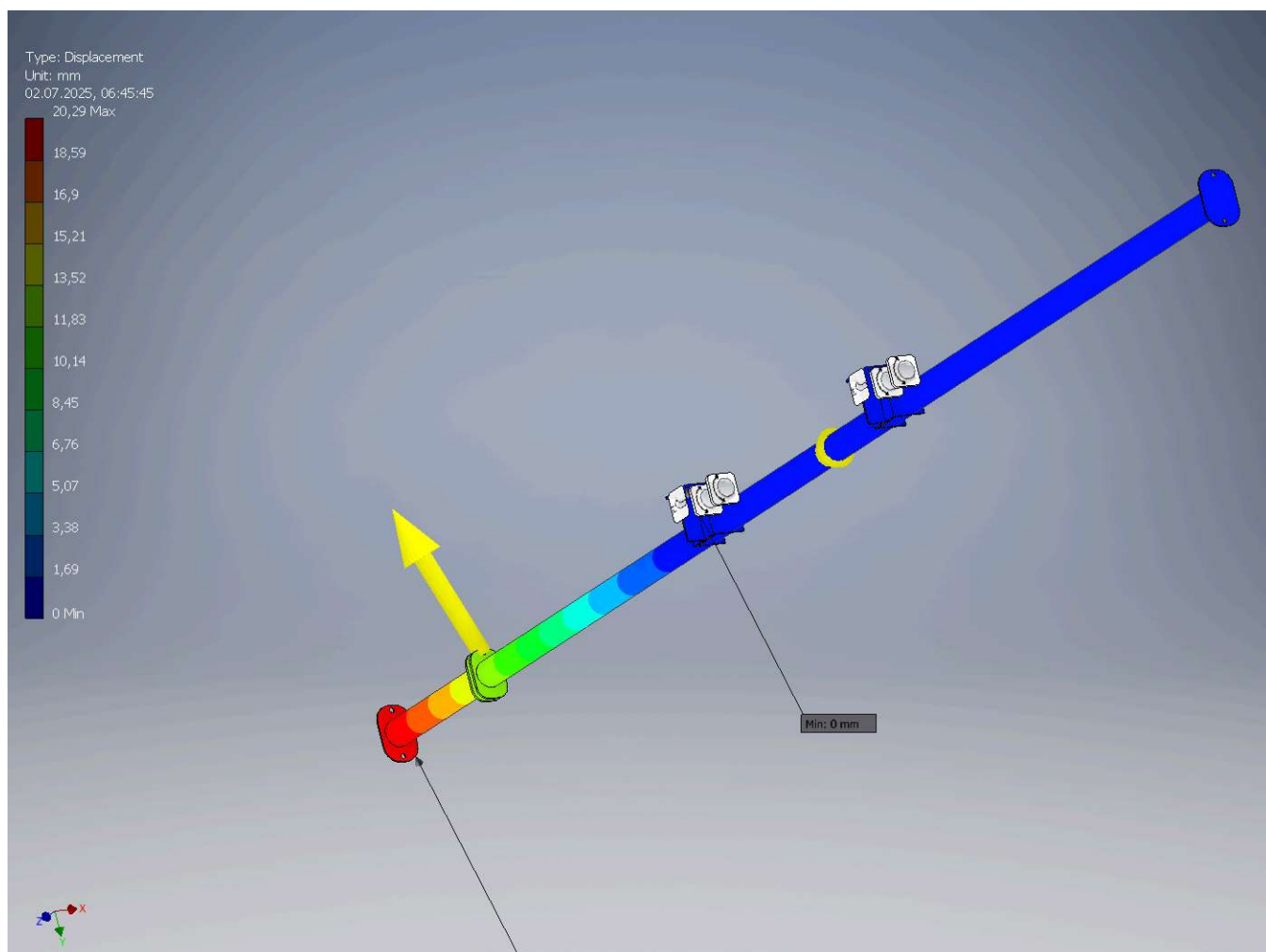
3rd Principal Stress



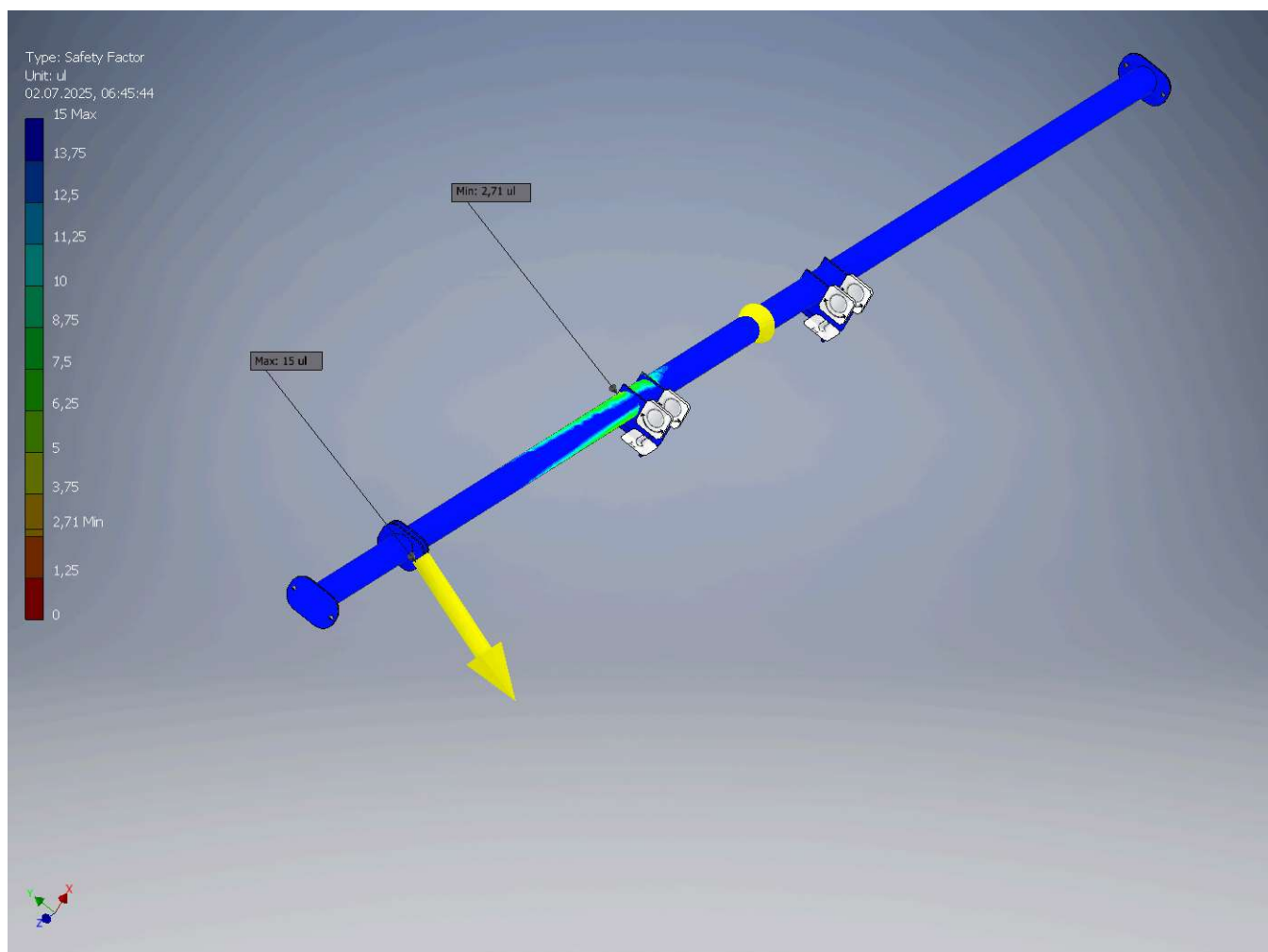


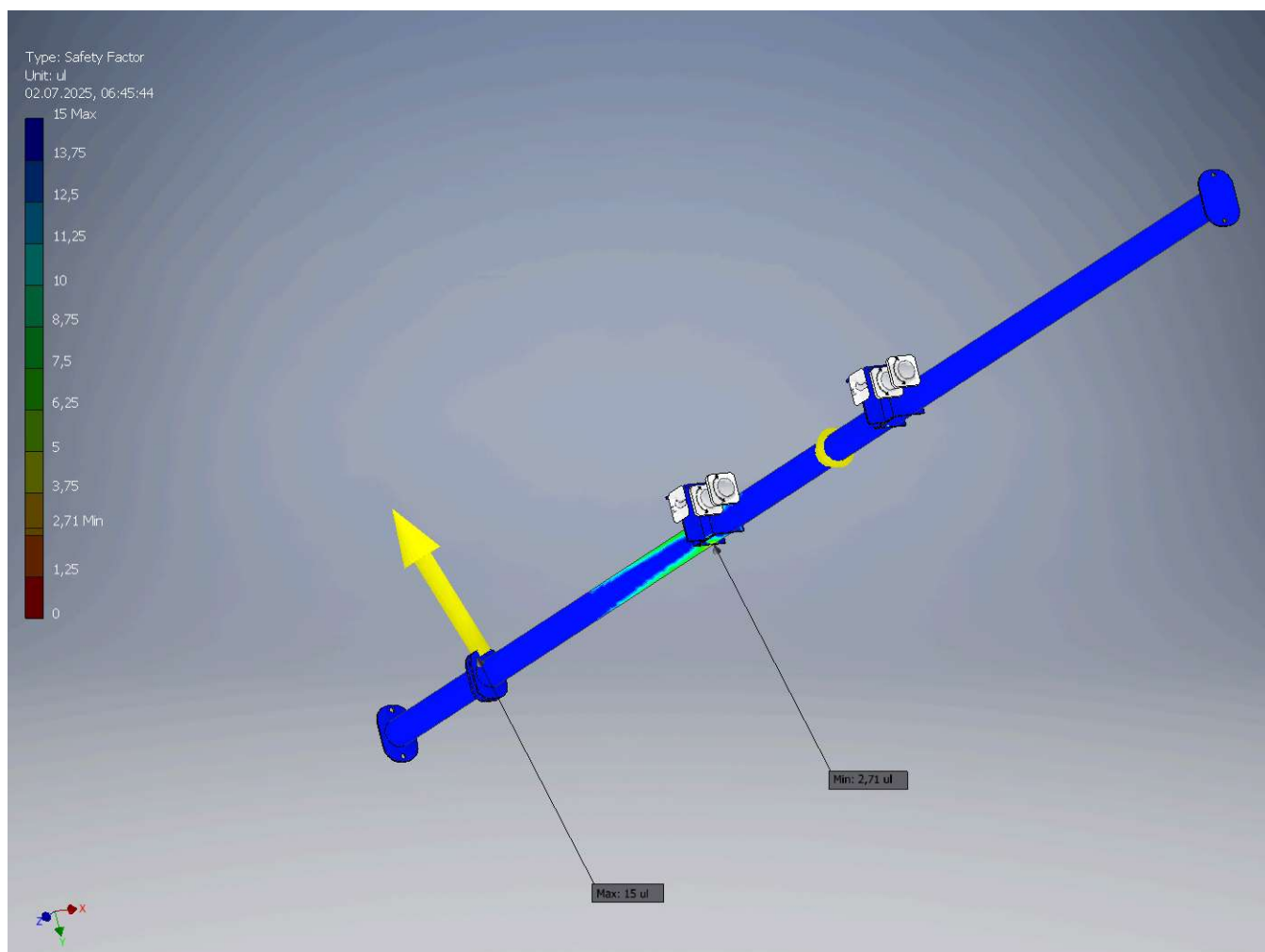
Displacement



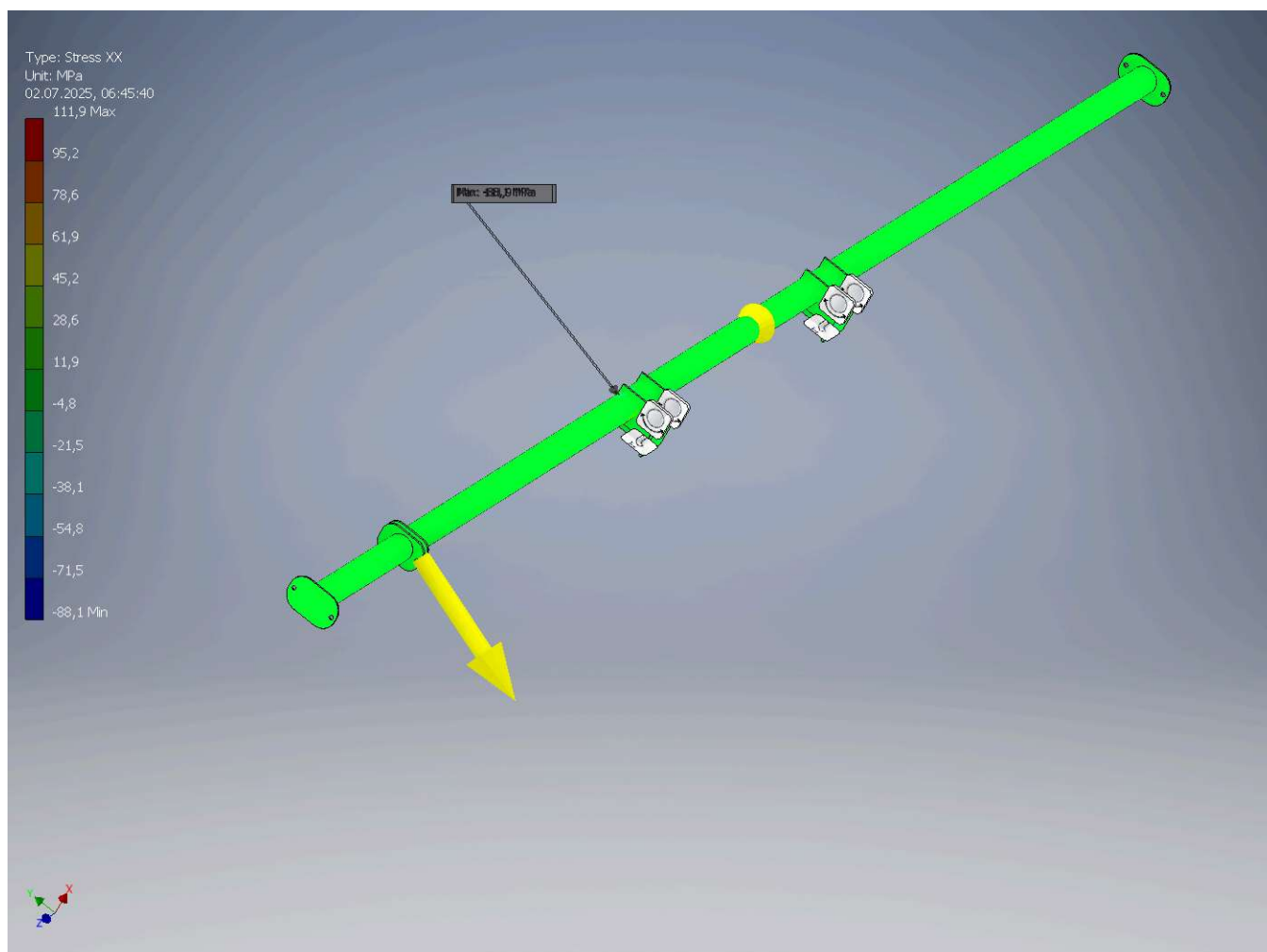


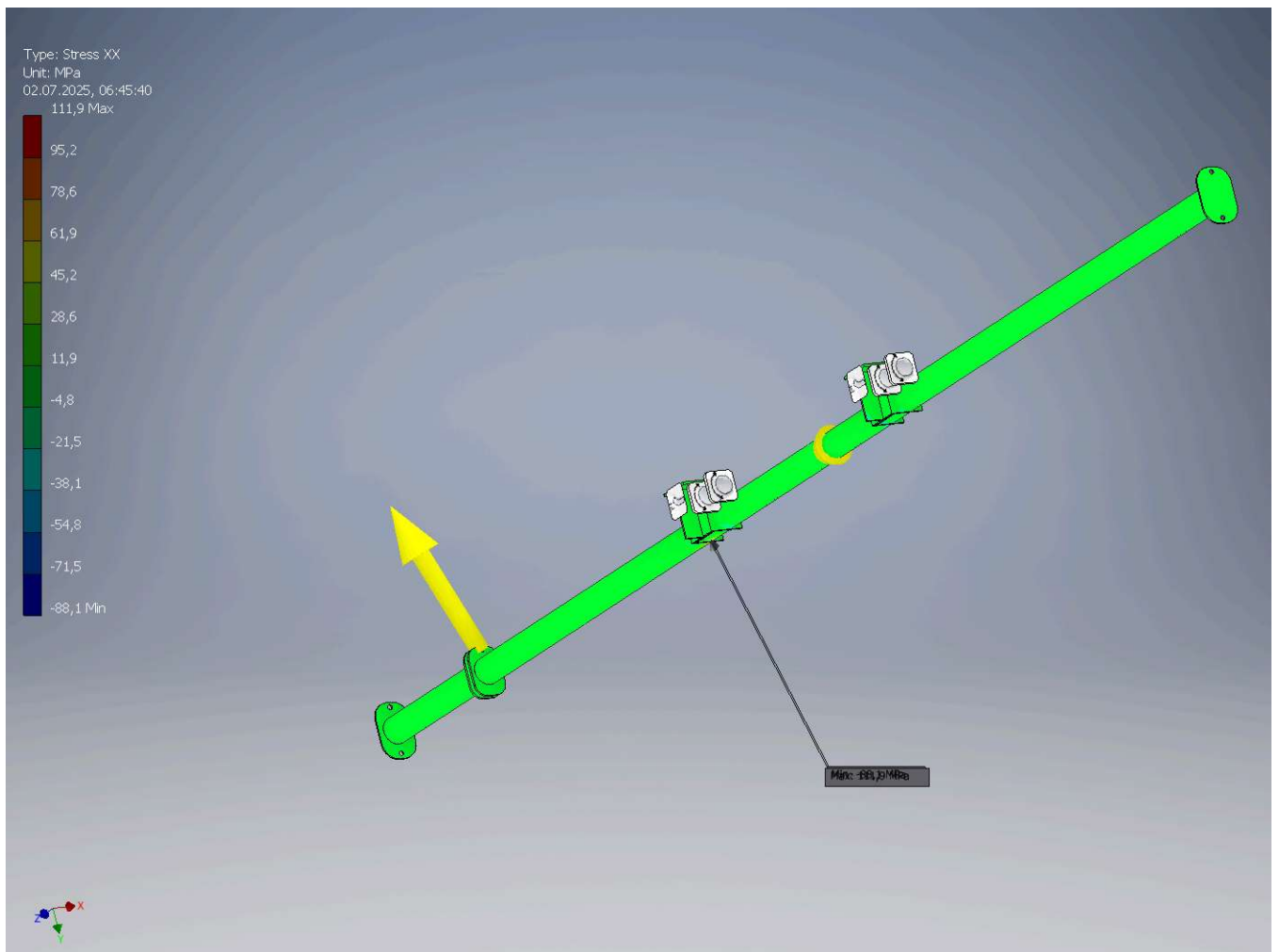
☐ Safety Factor



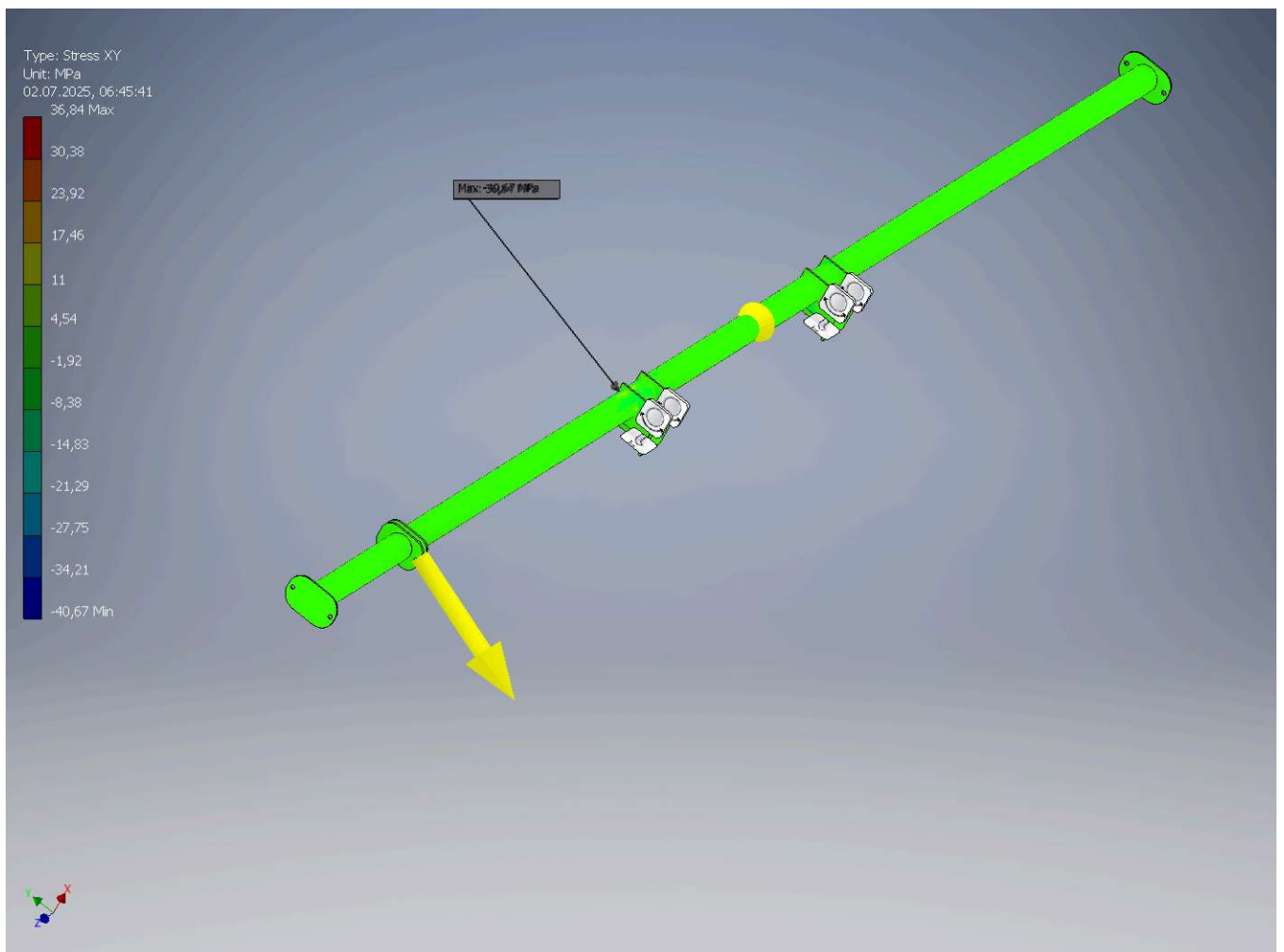


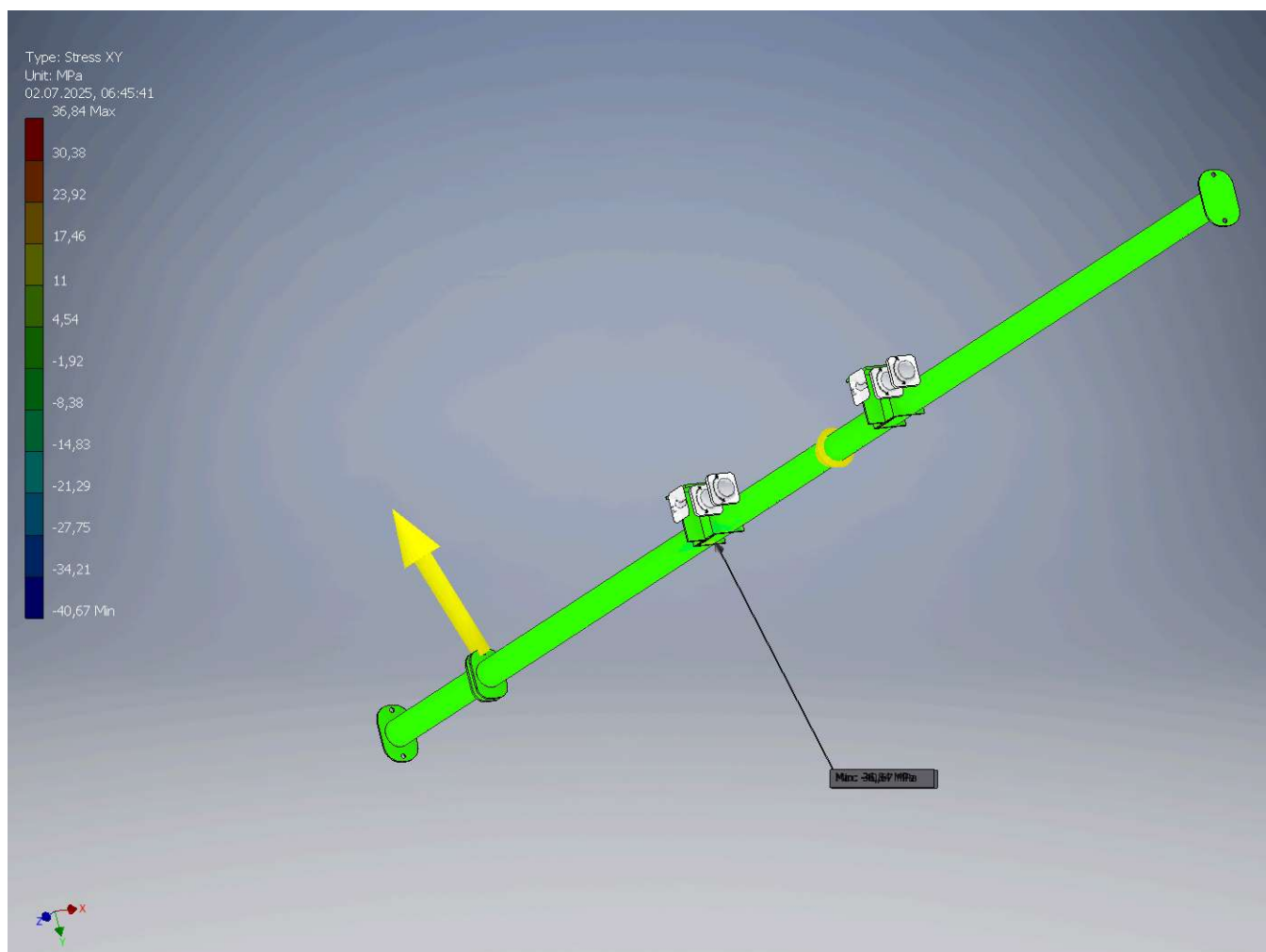
☐ Stress XX



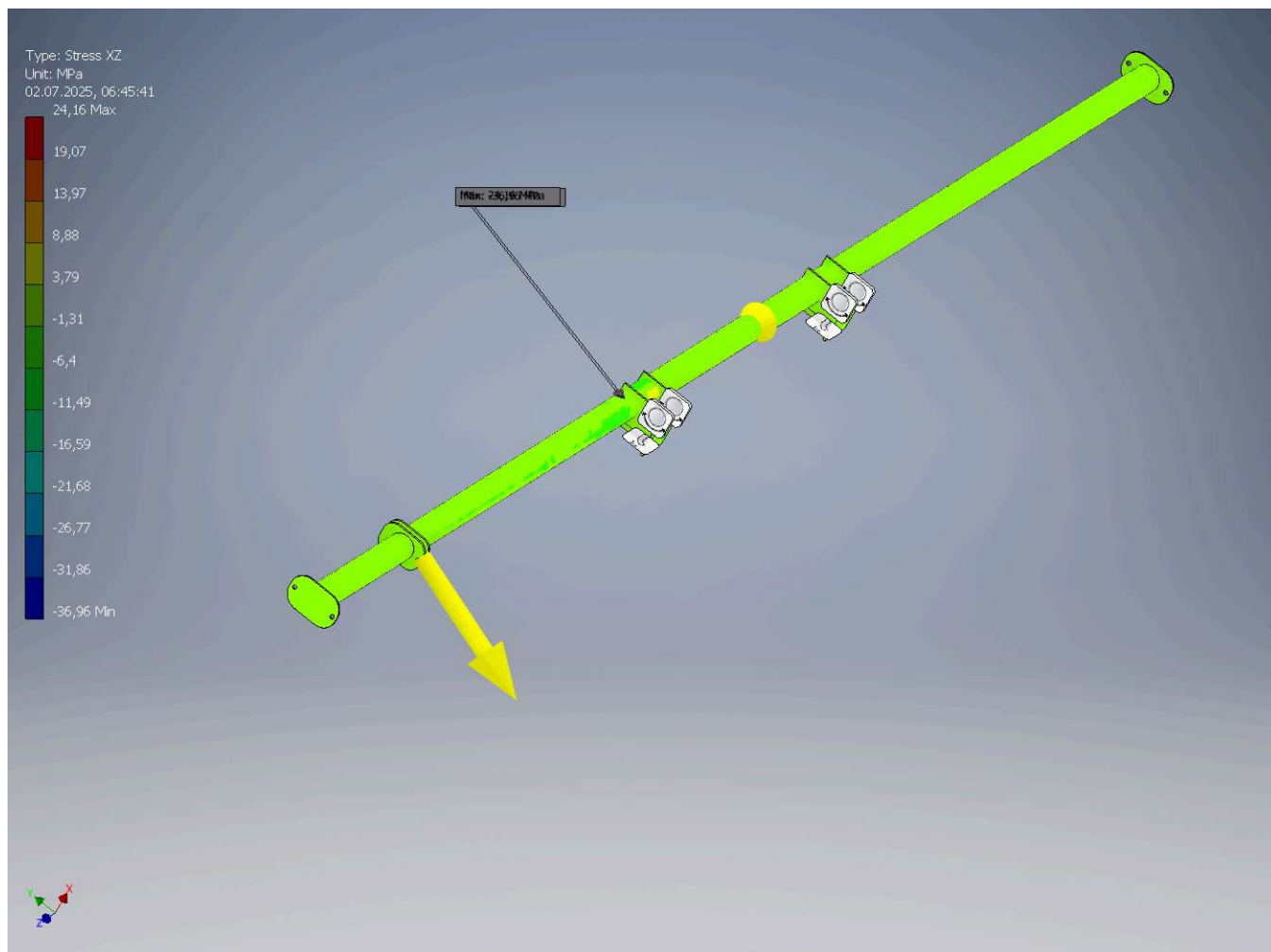


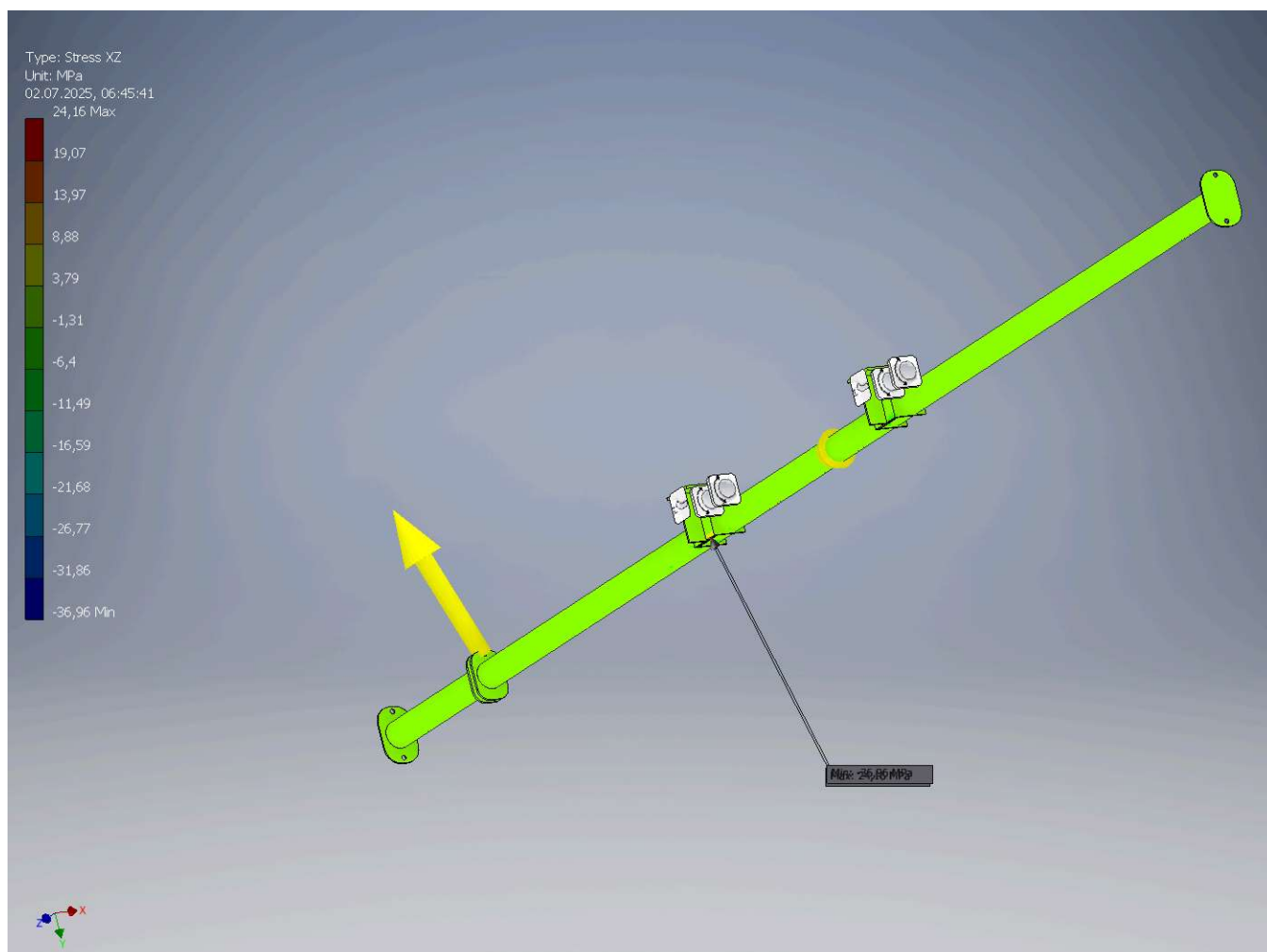
Stress XY



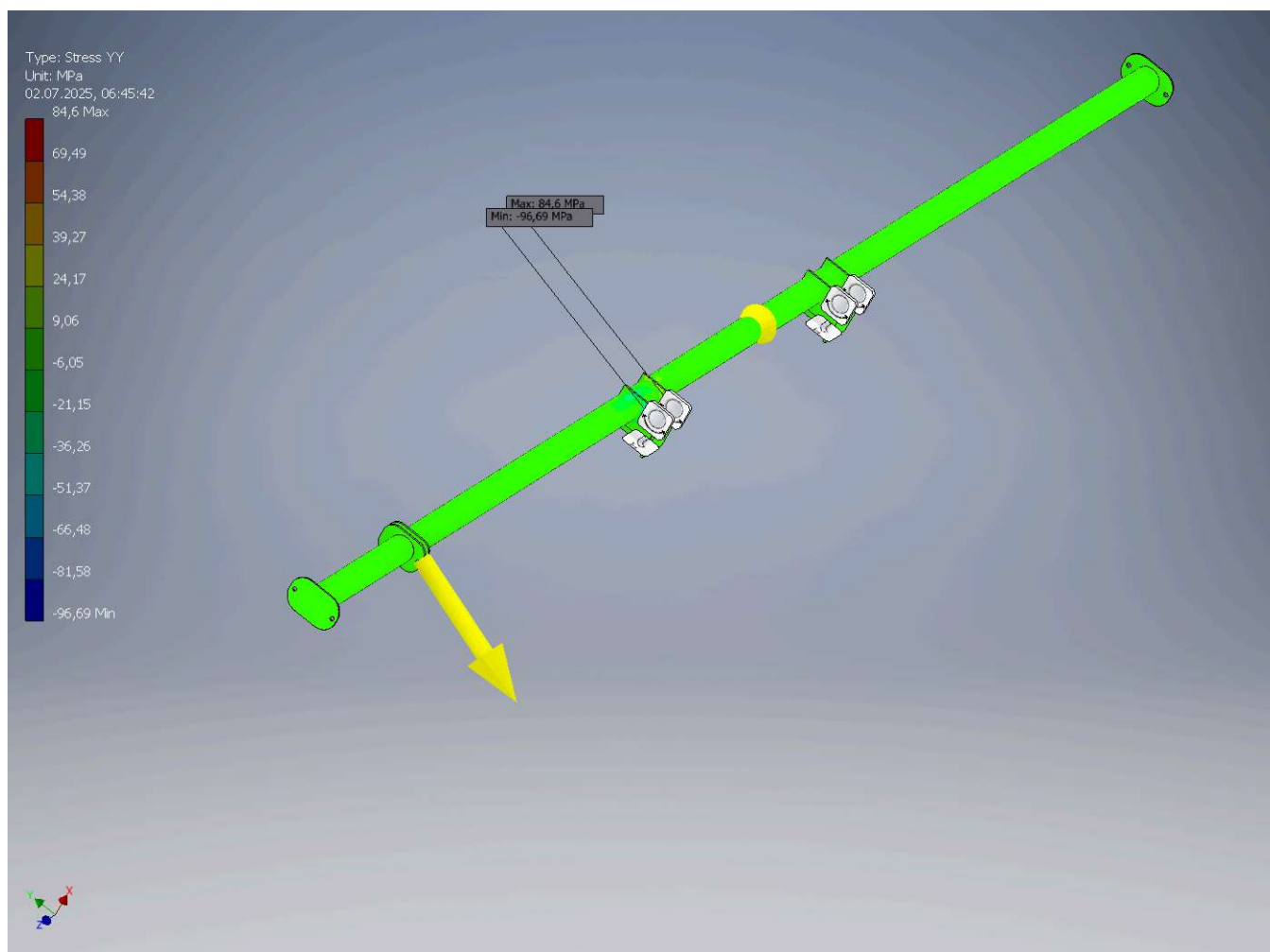


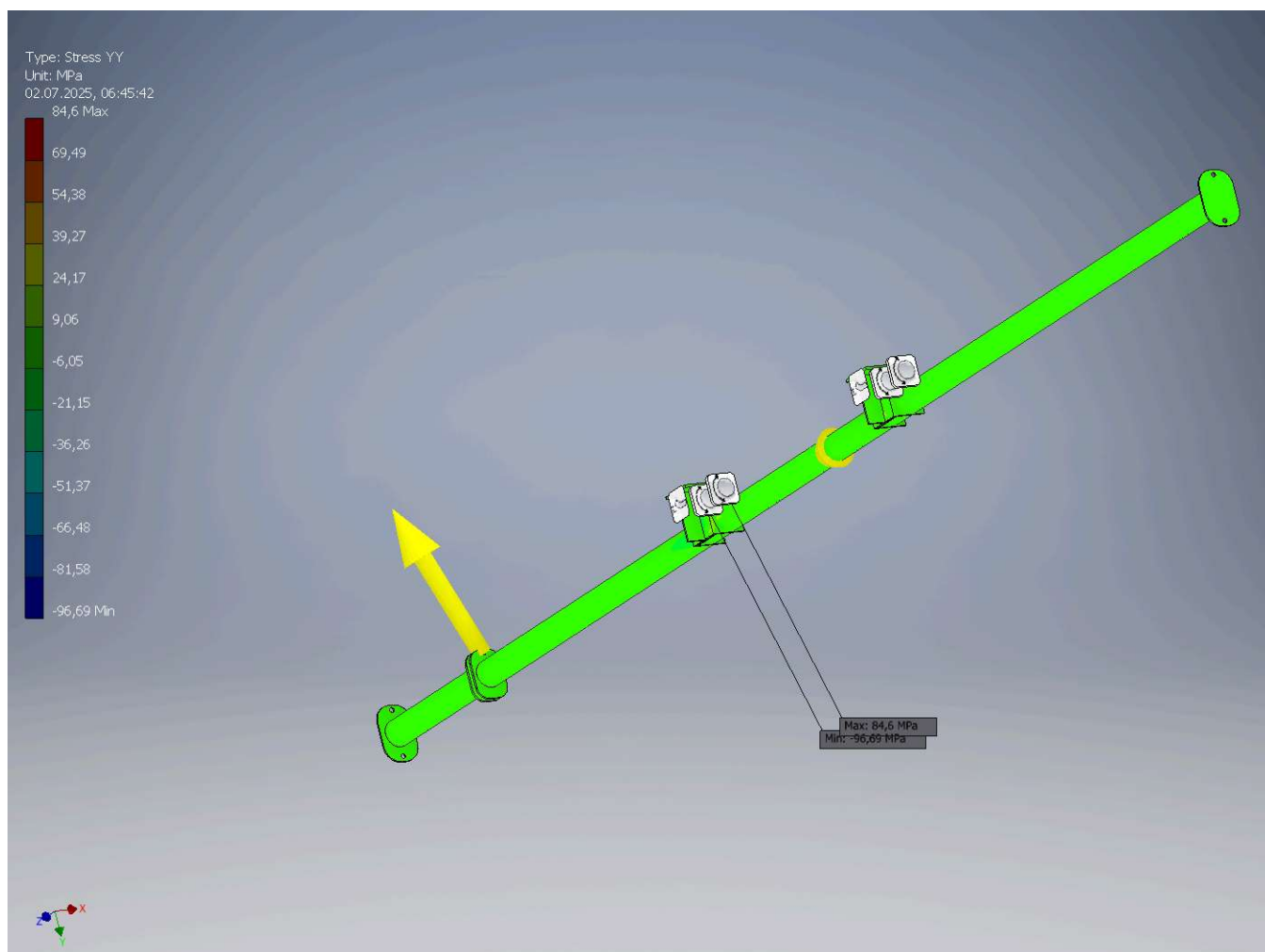
Stress XZ



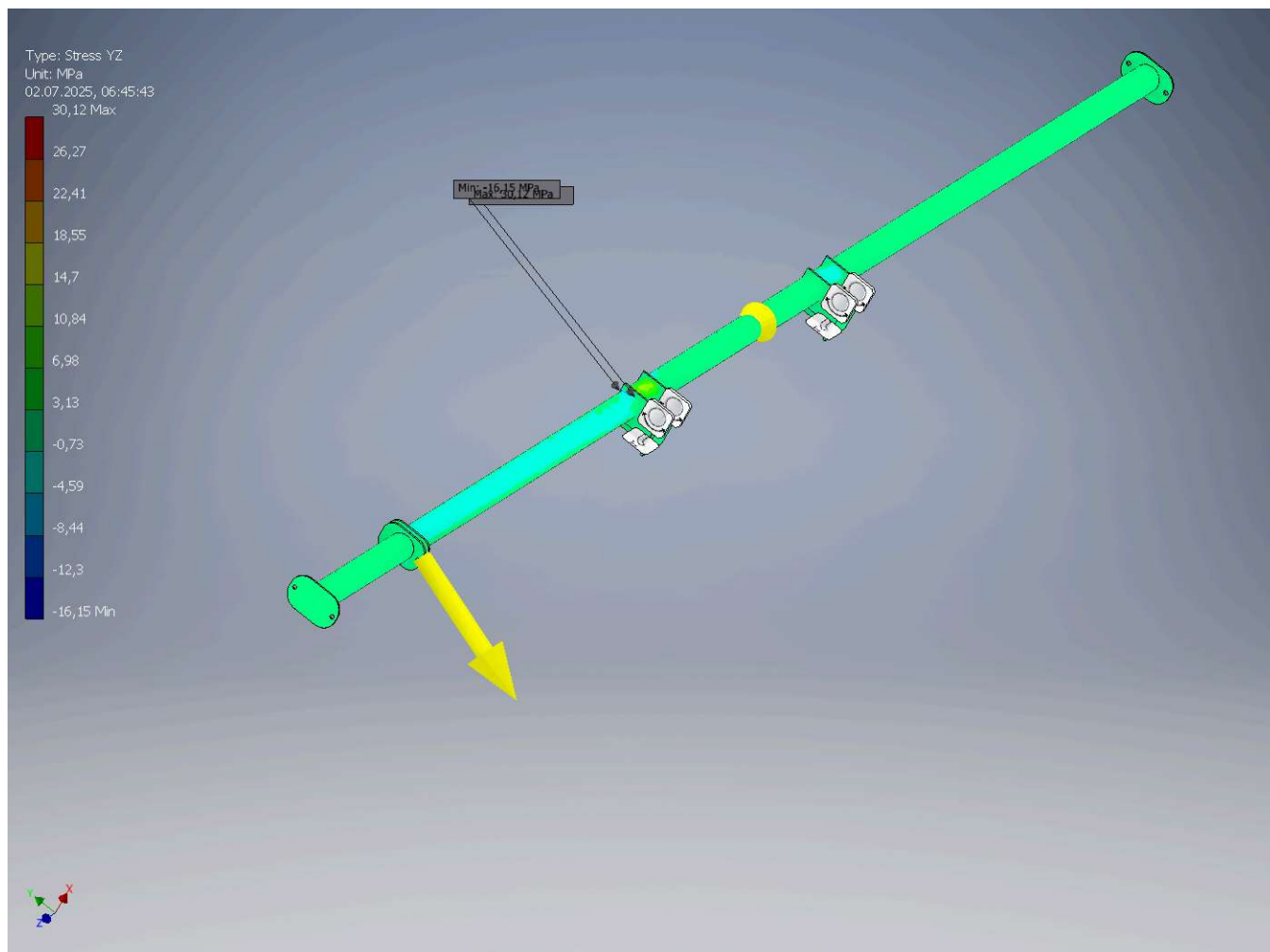


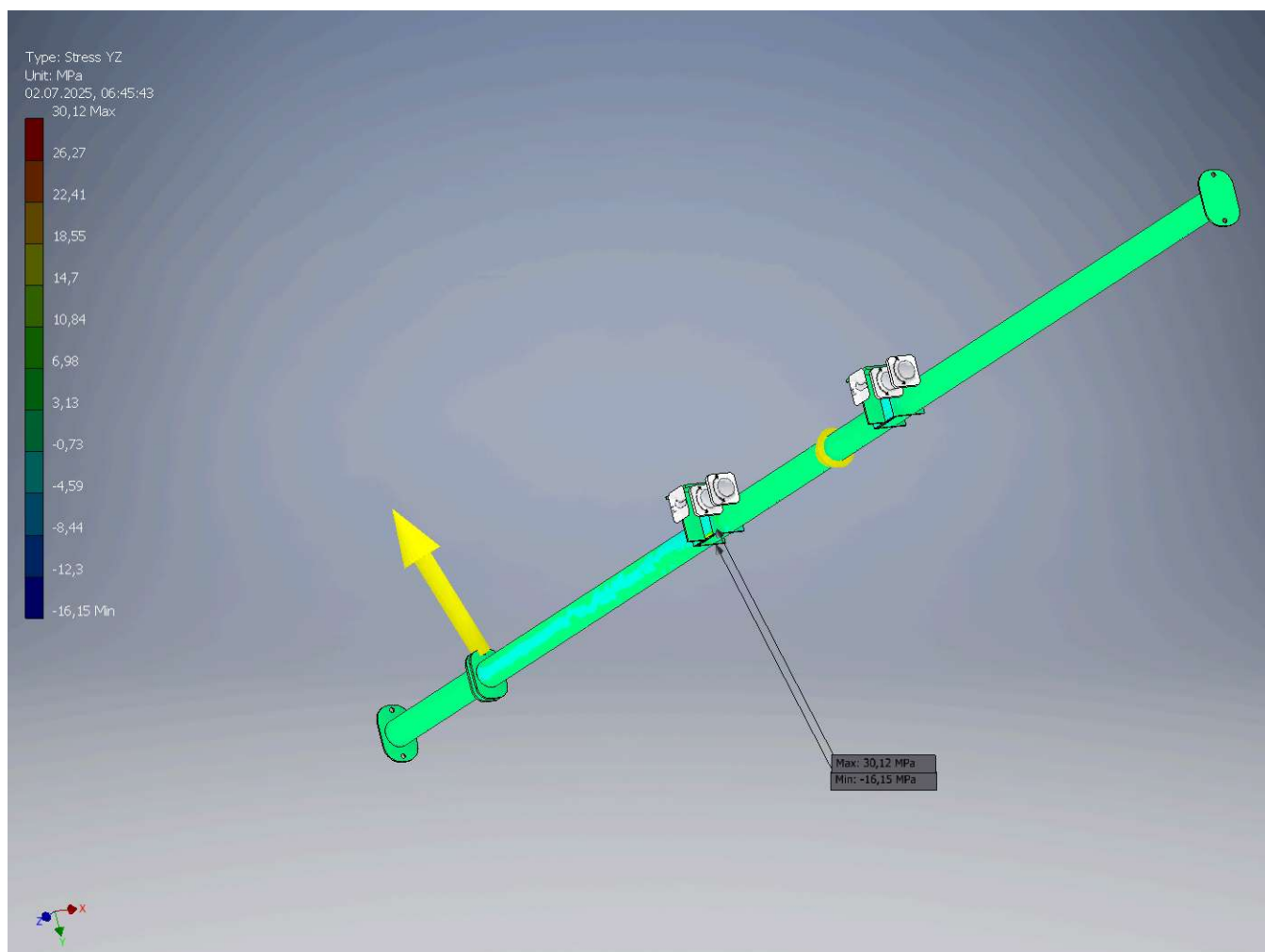
Stress YY



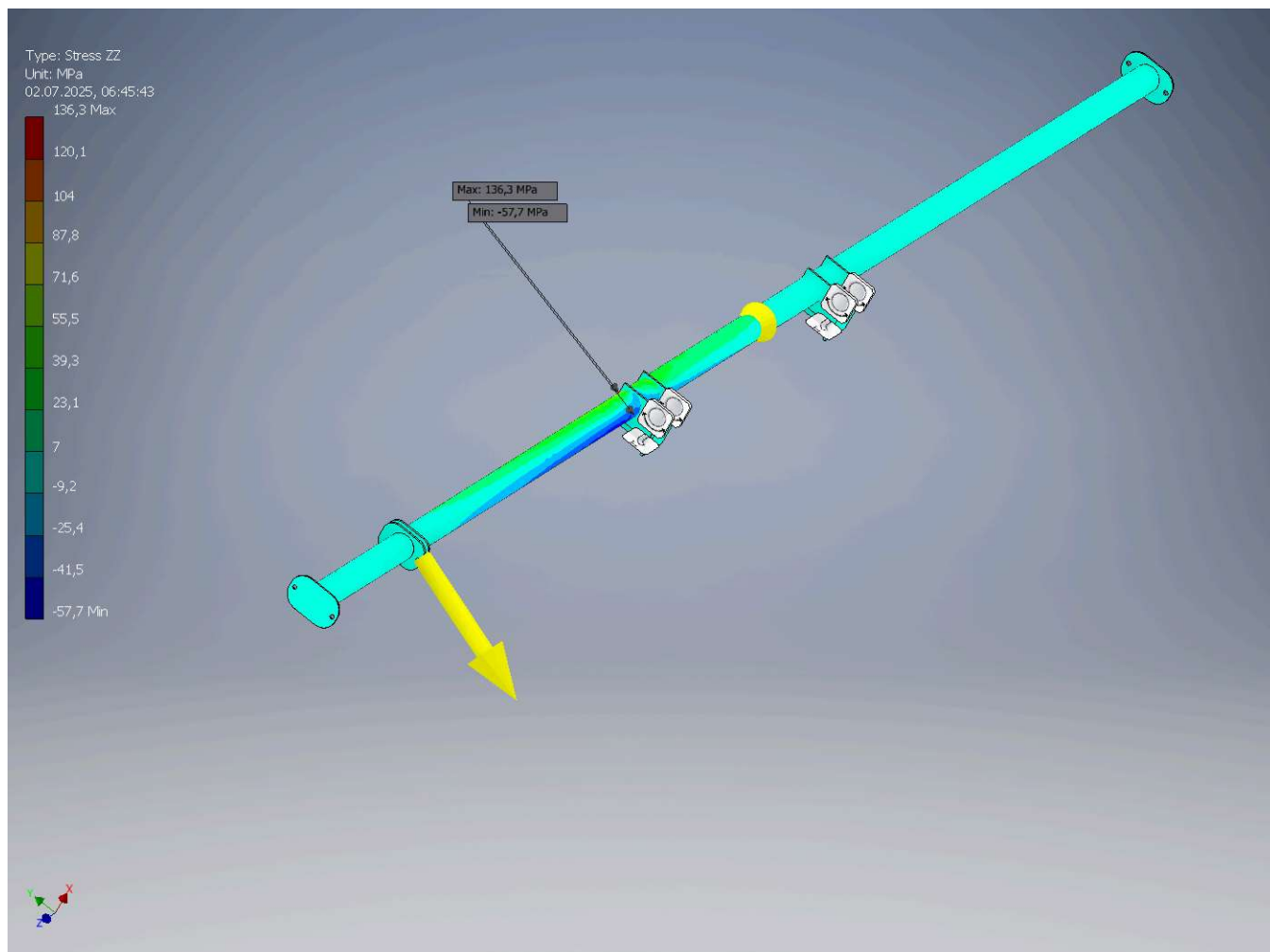


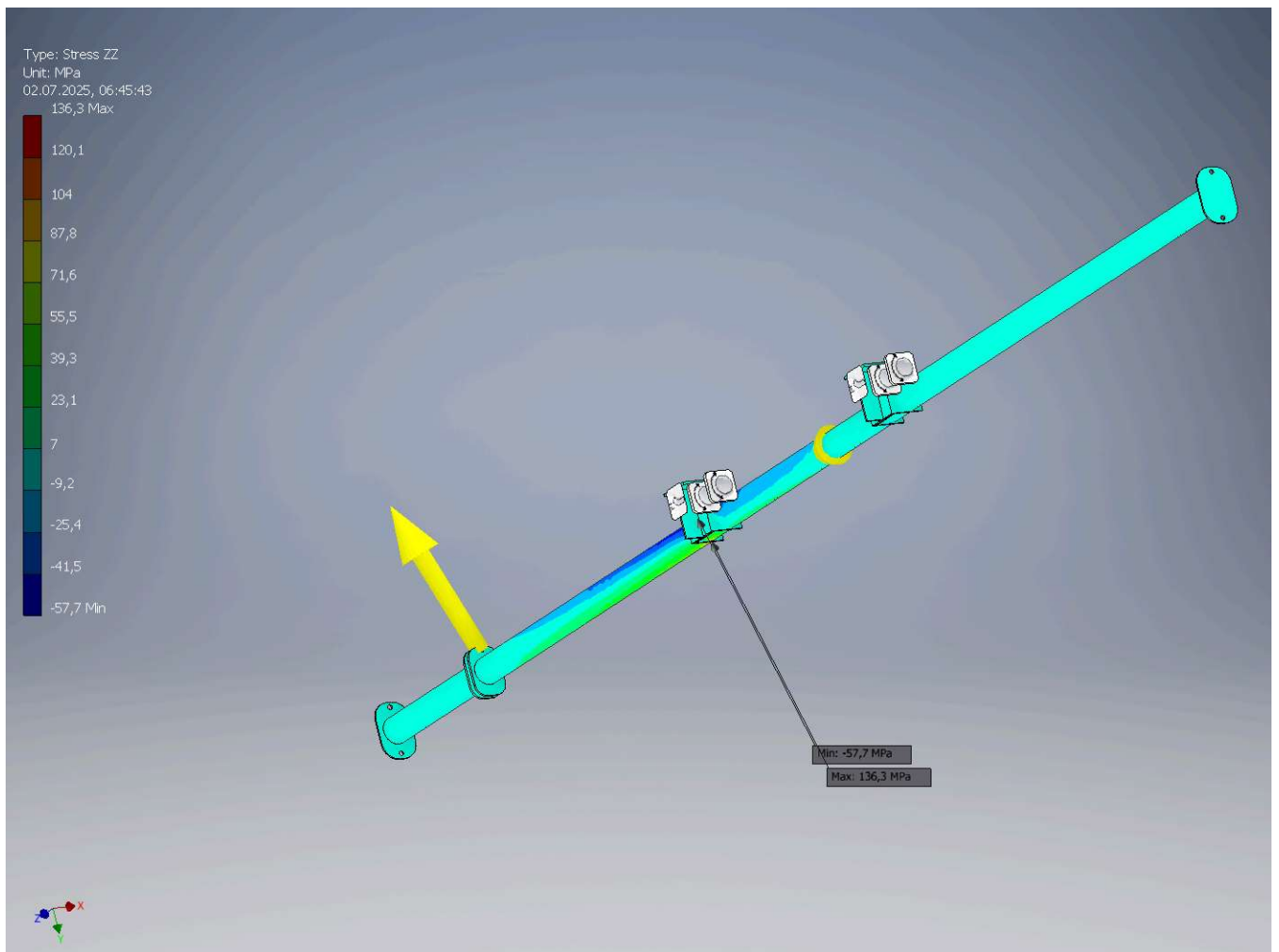
Stress YZ



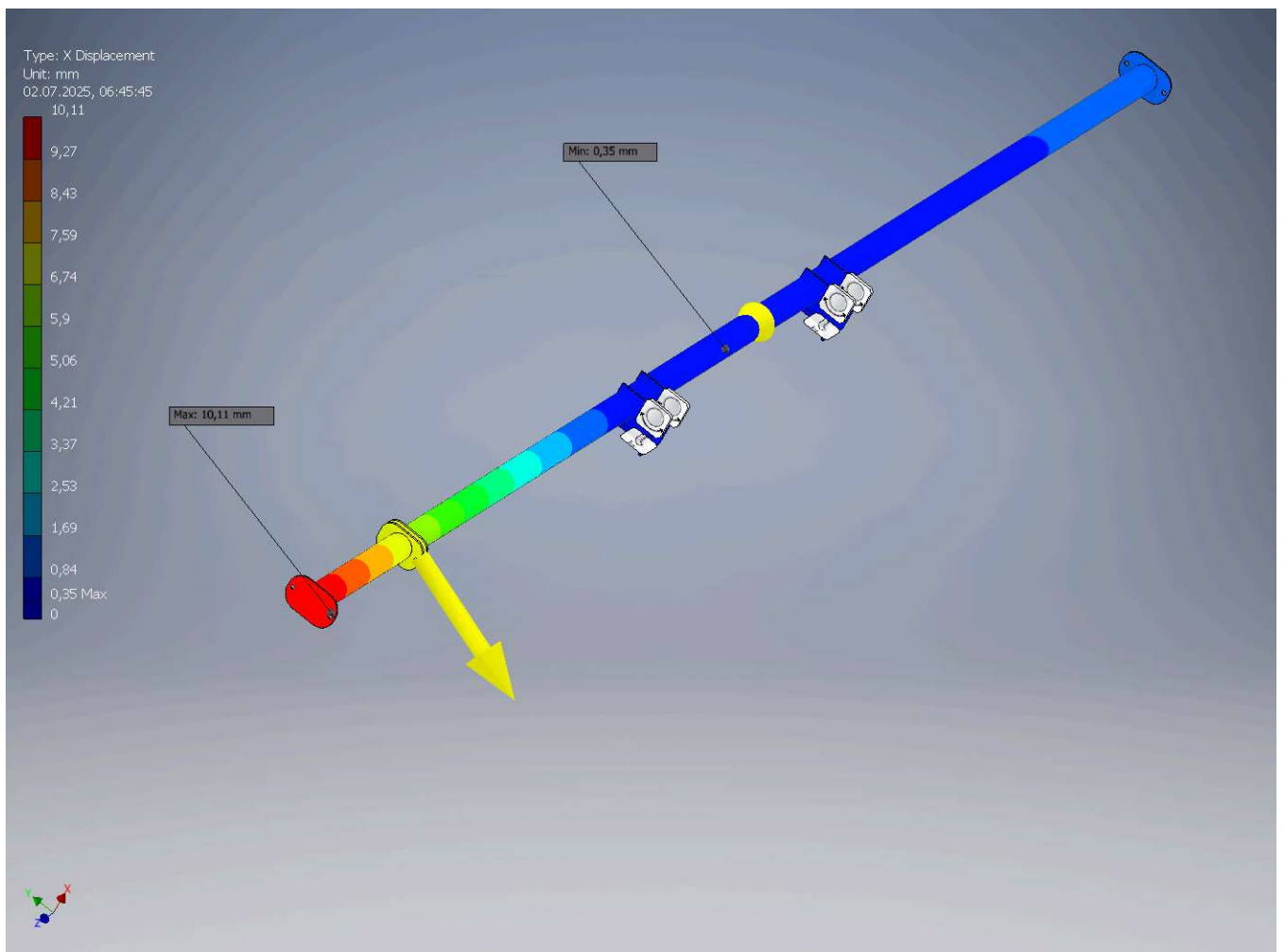


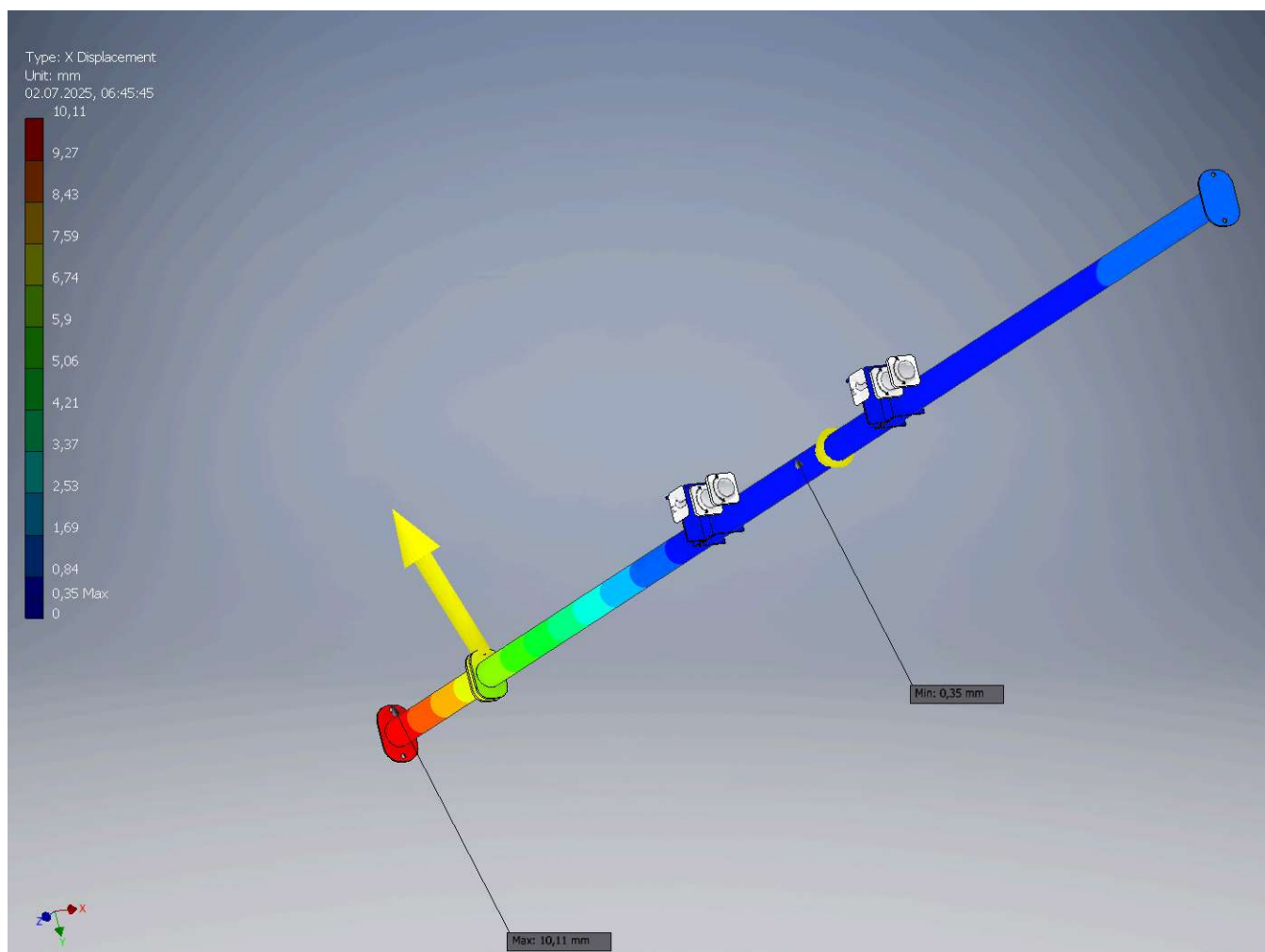
Stress ZZ



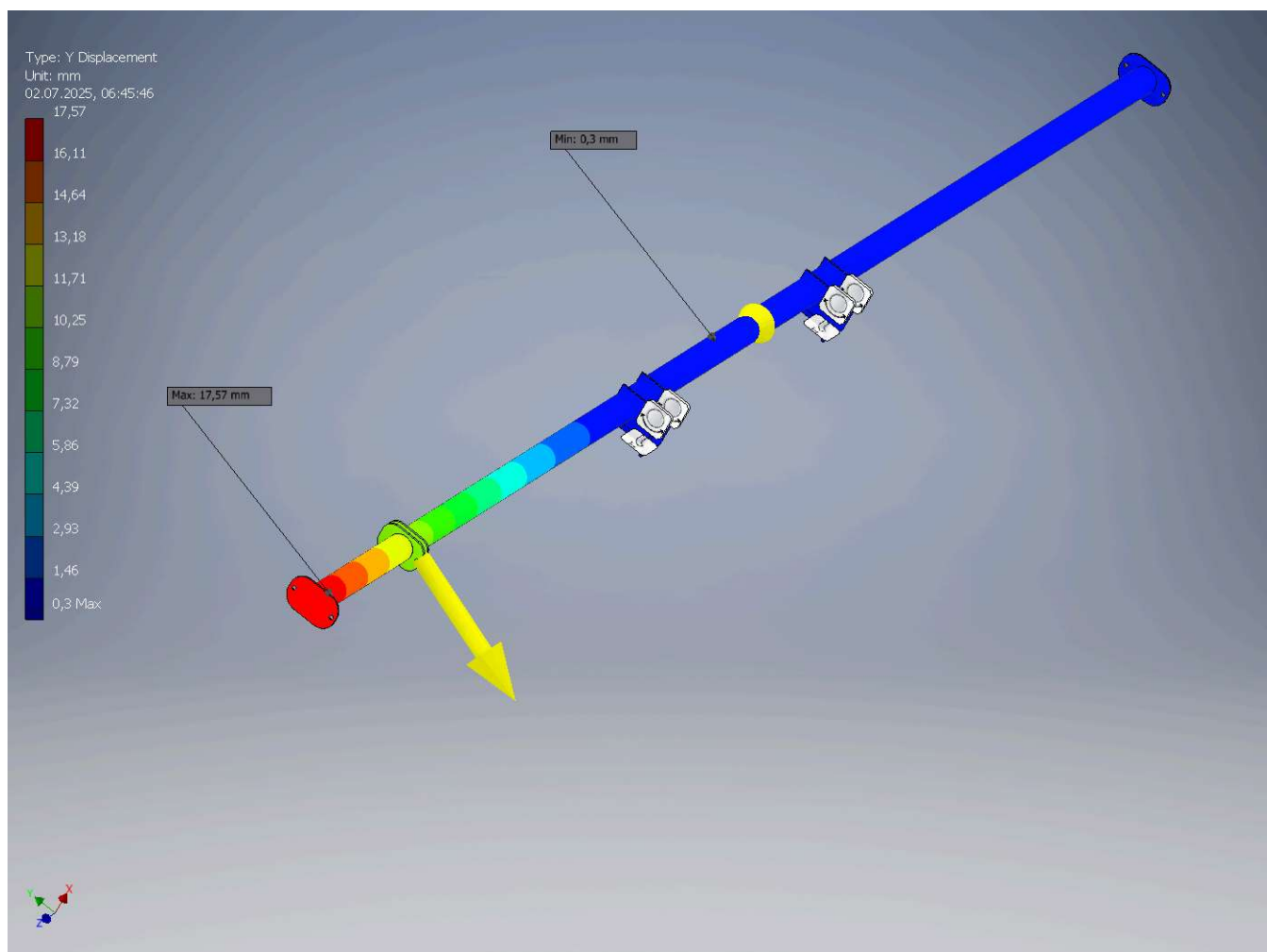


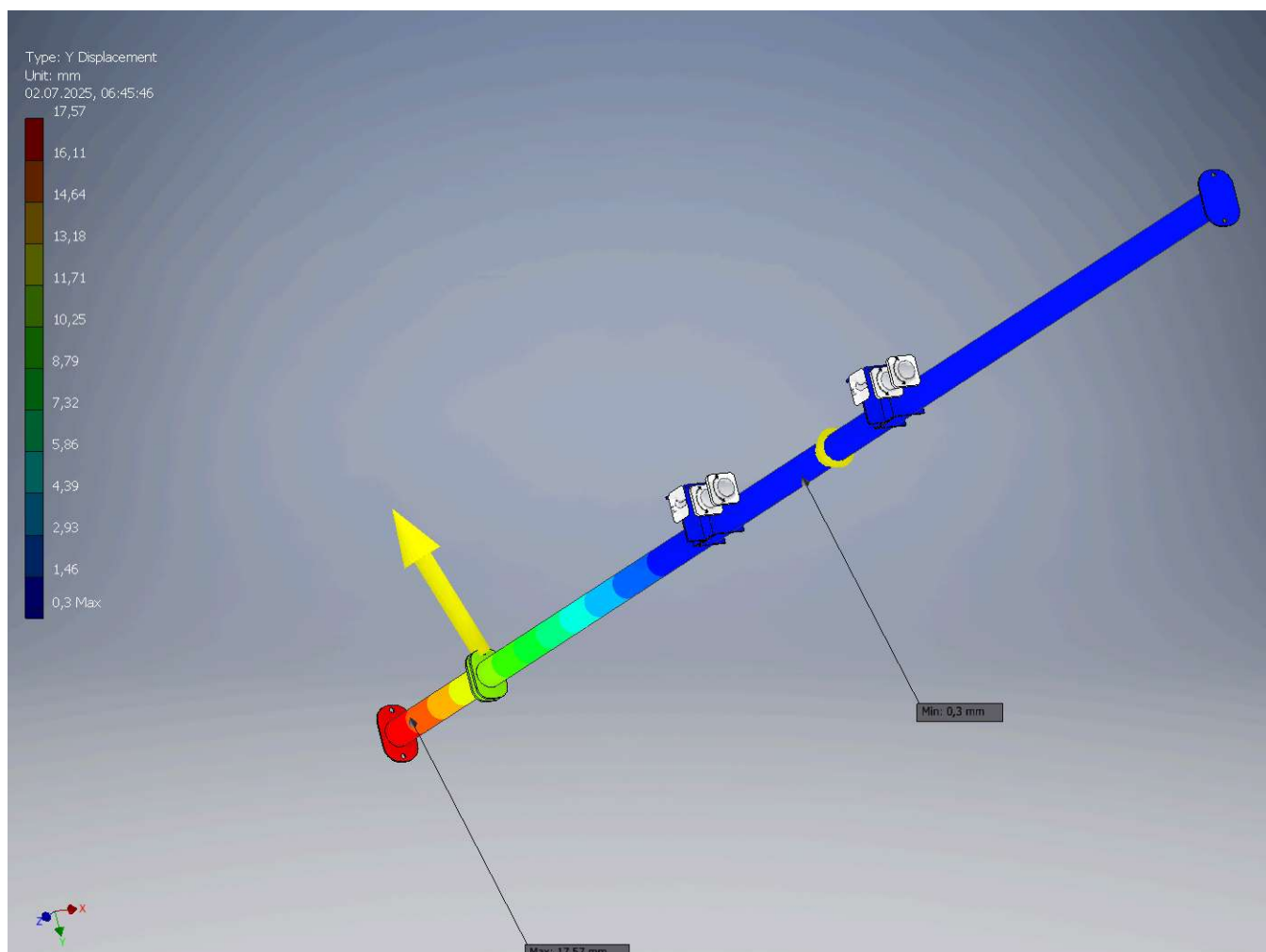
☐ X Displacement



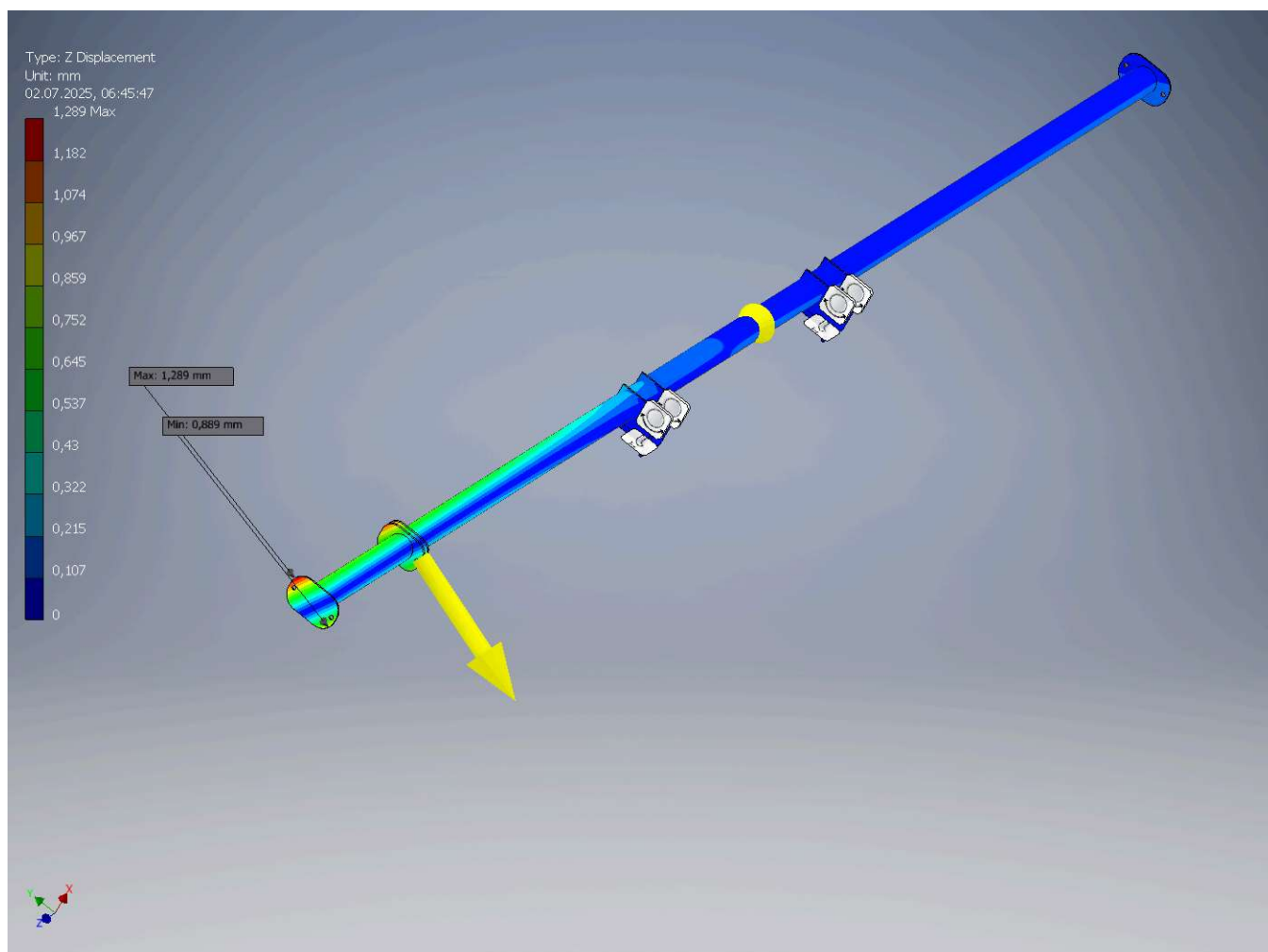


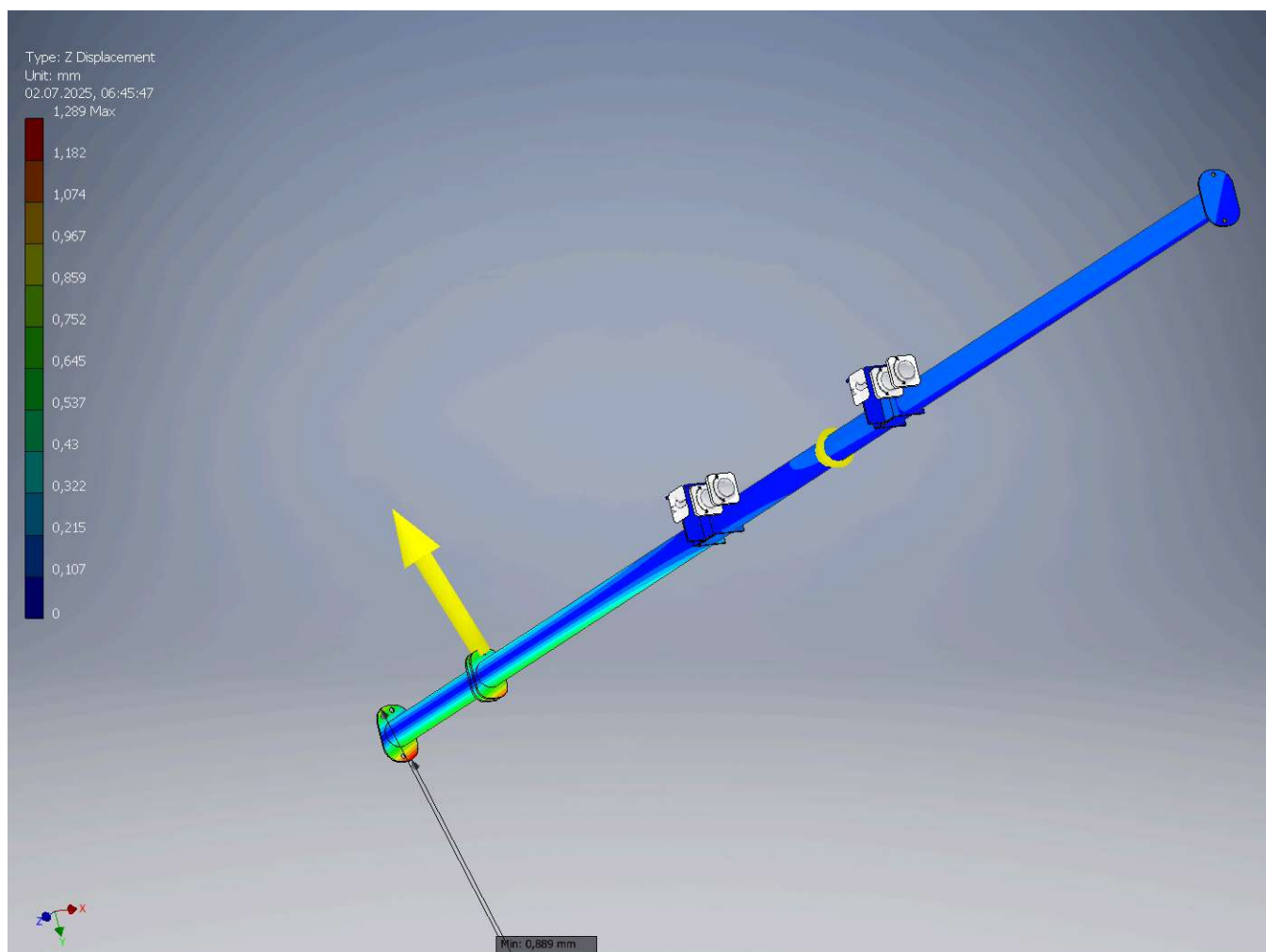
Y Displacement



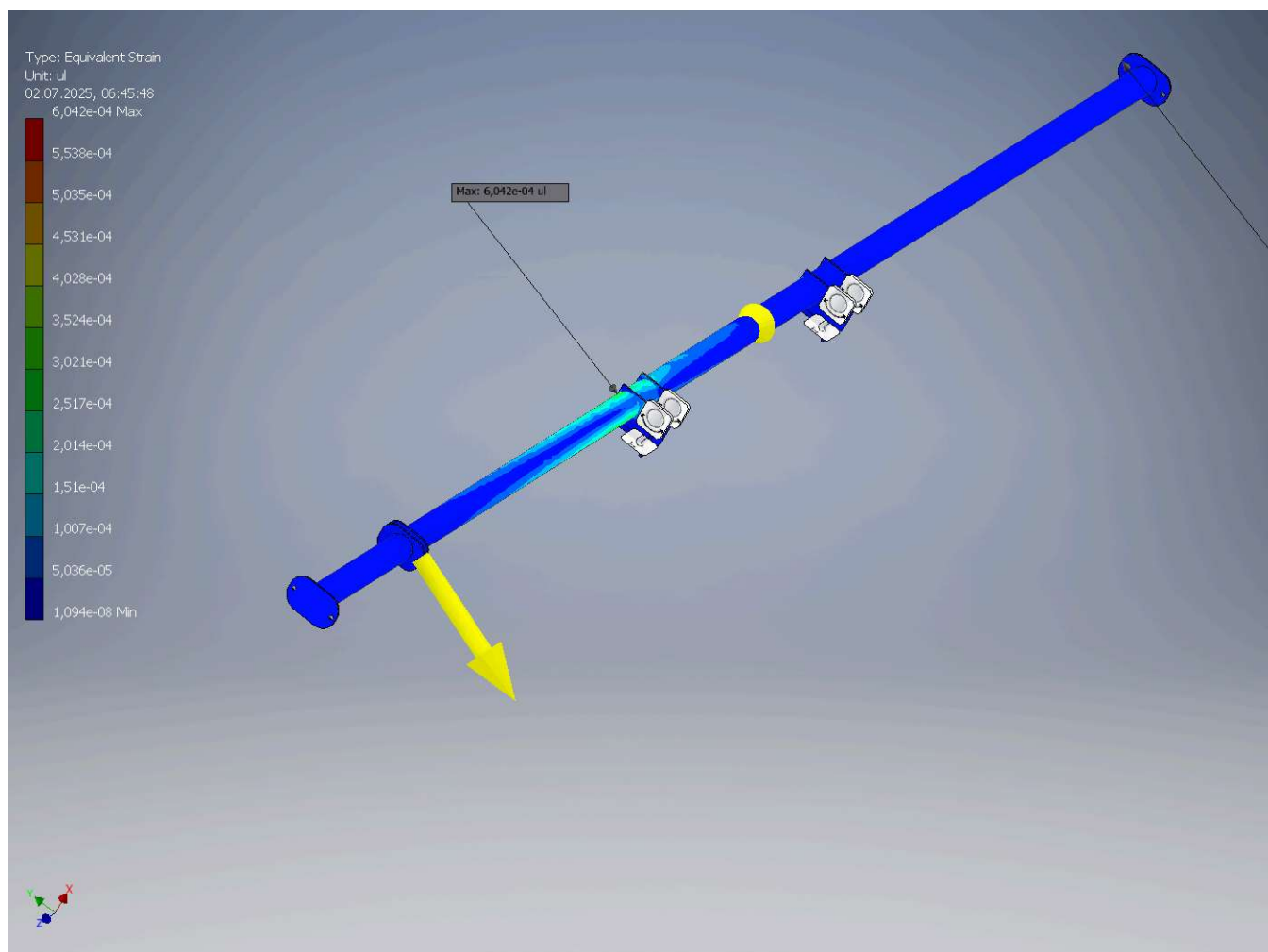


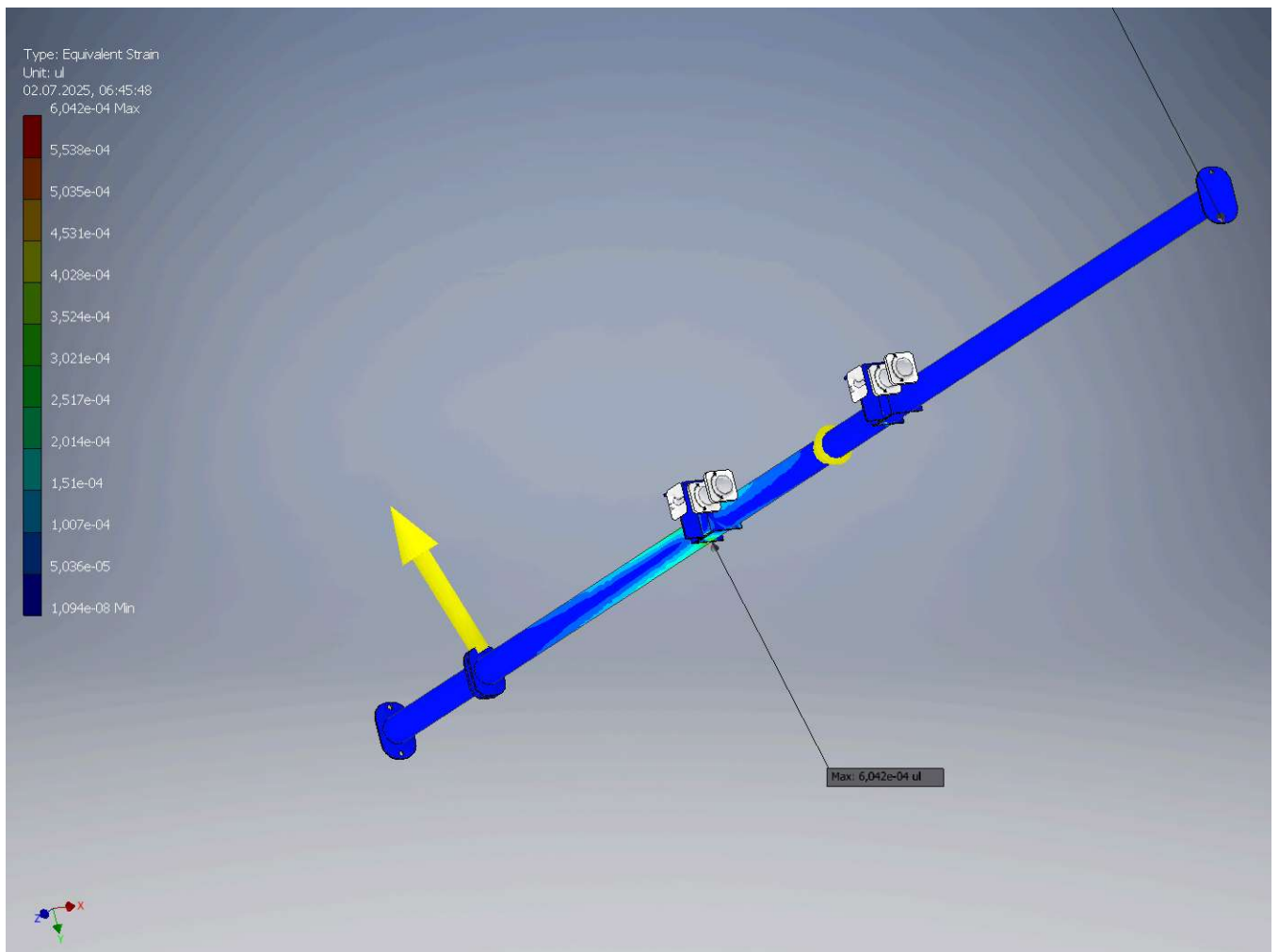
☐ Z Displacement



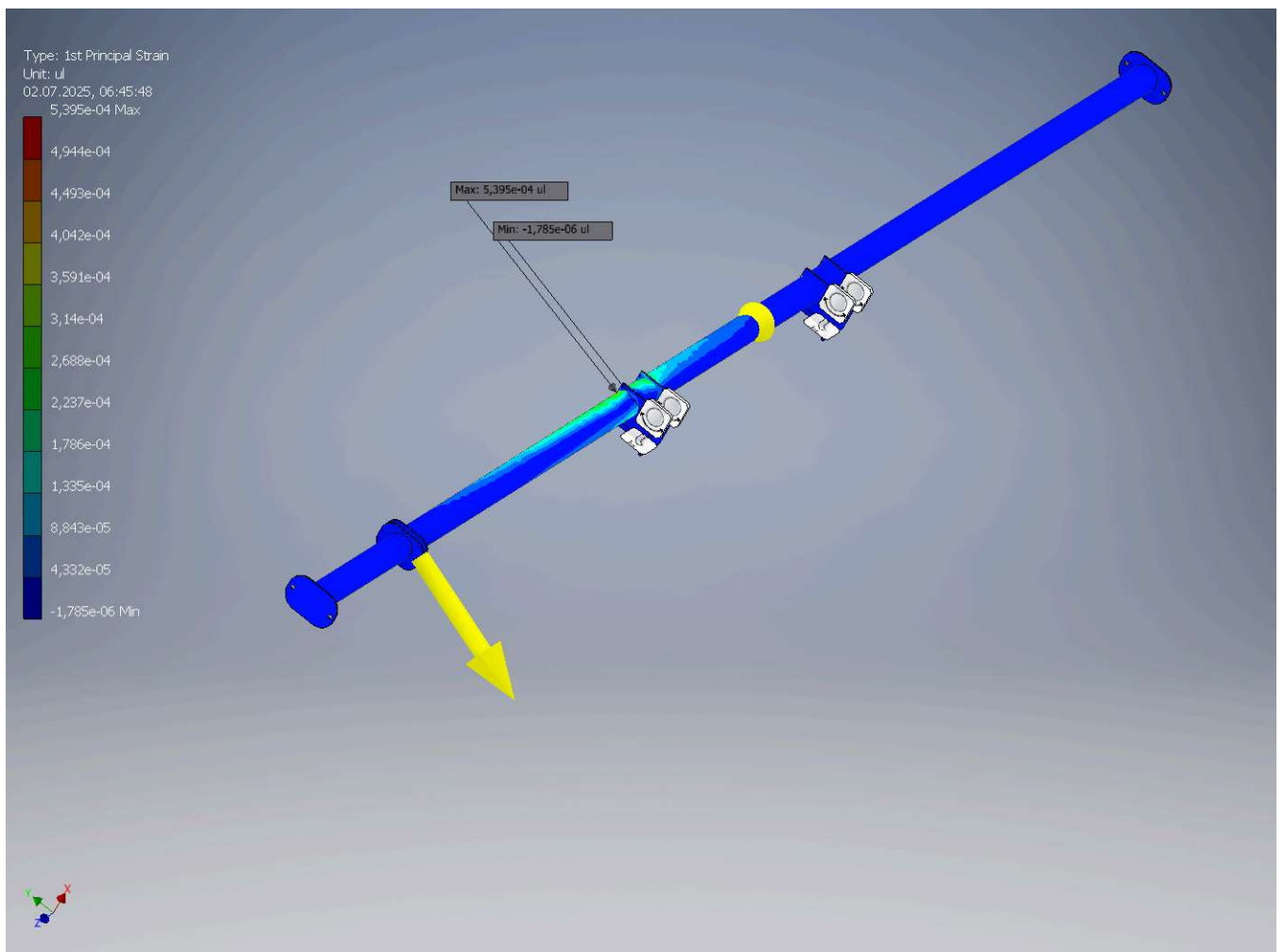


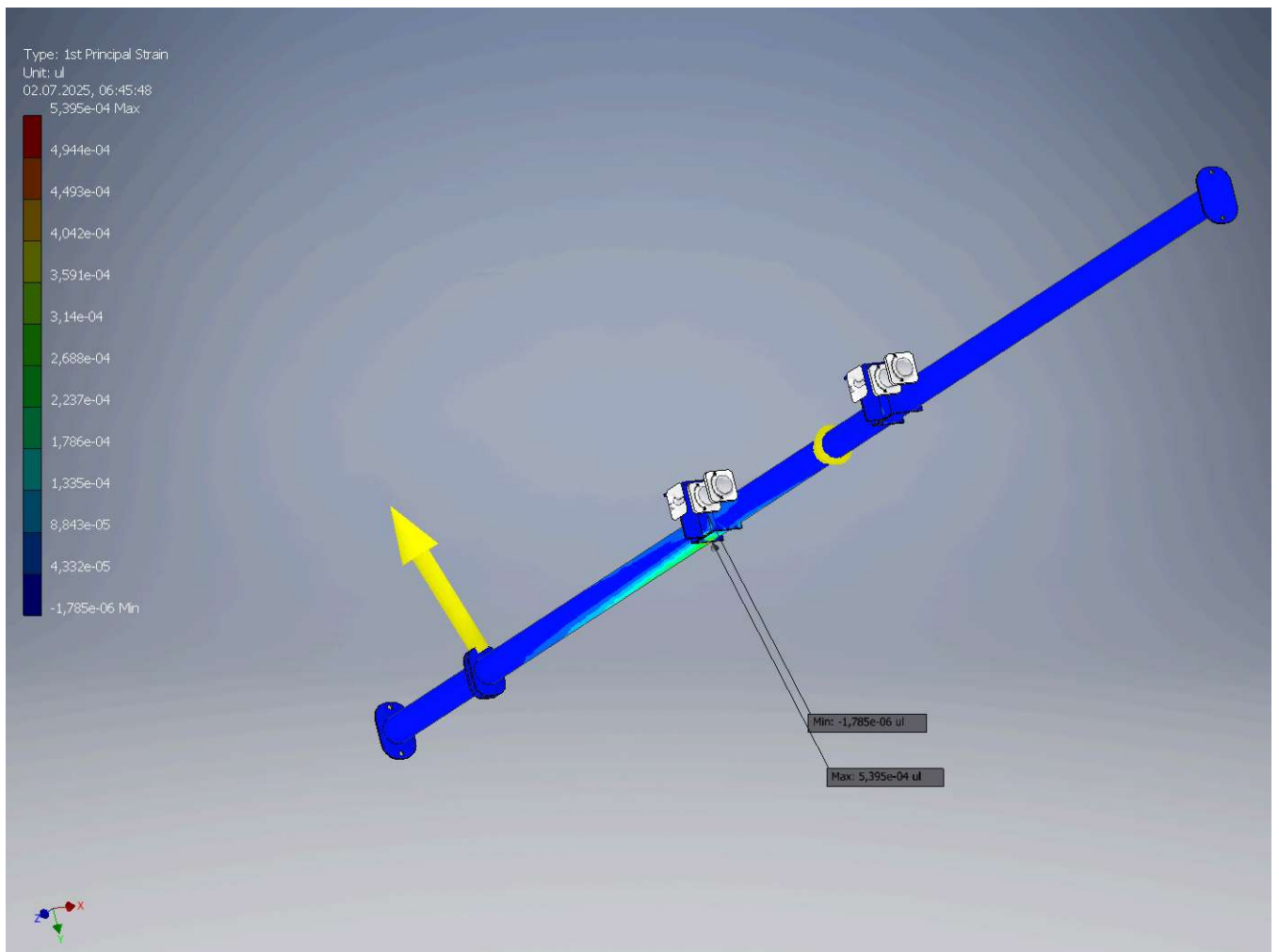
☐ Equivalent Strain



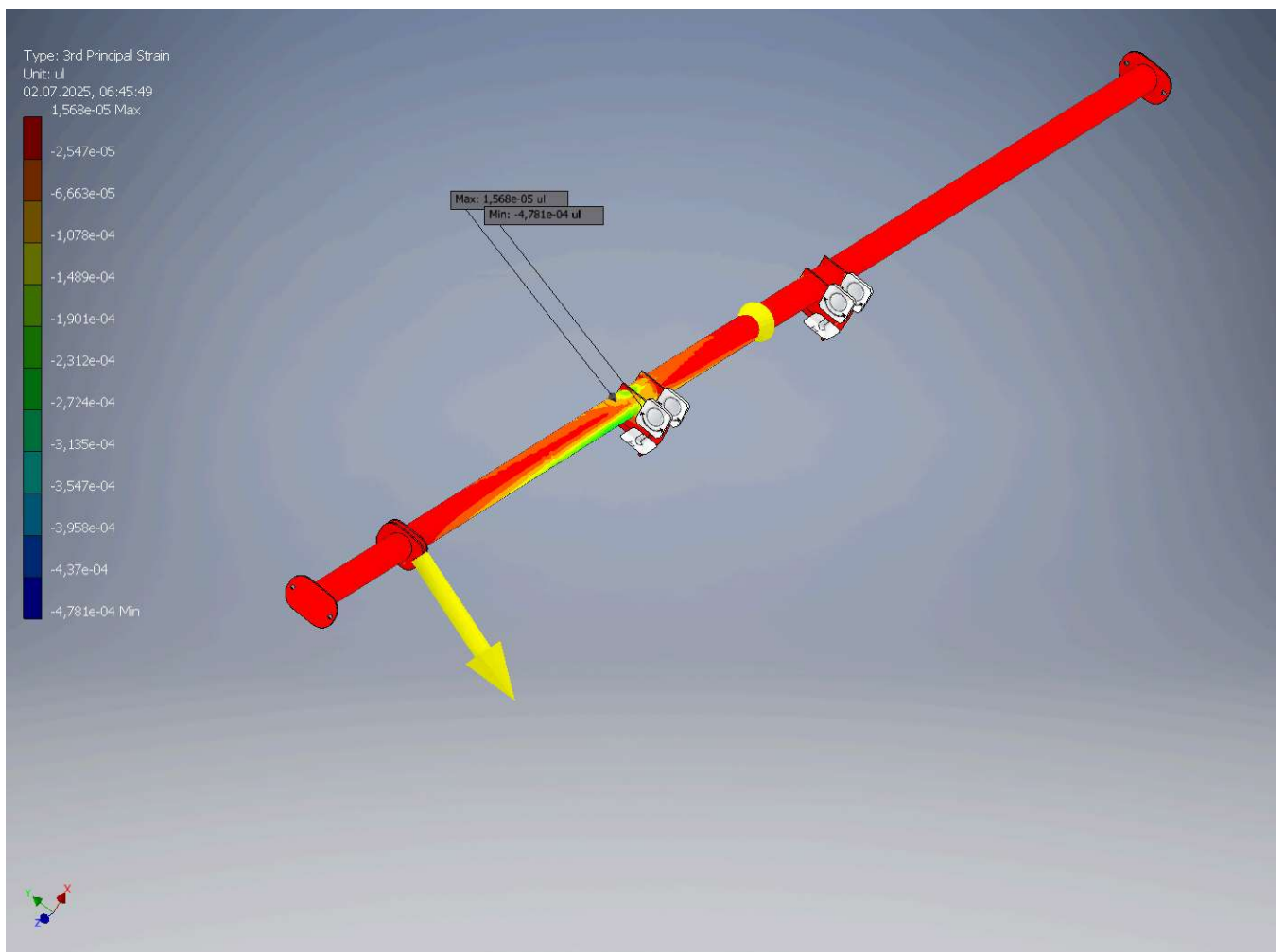


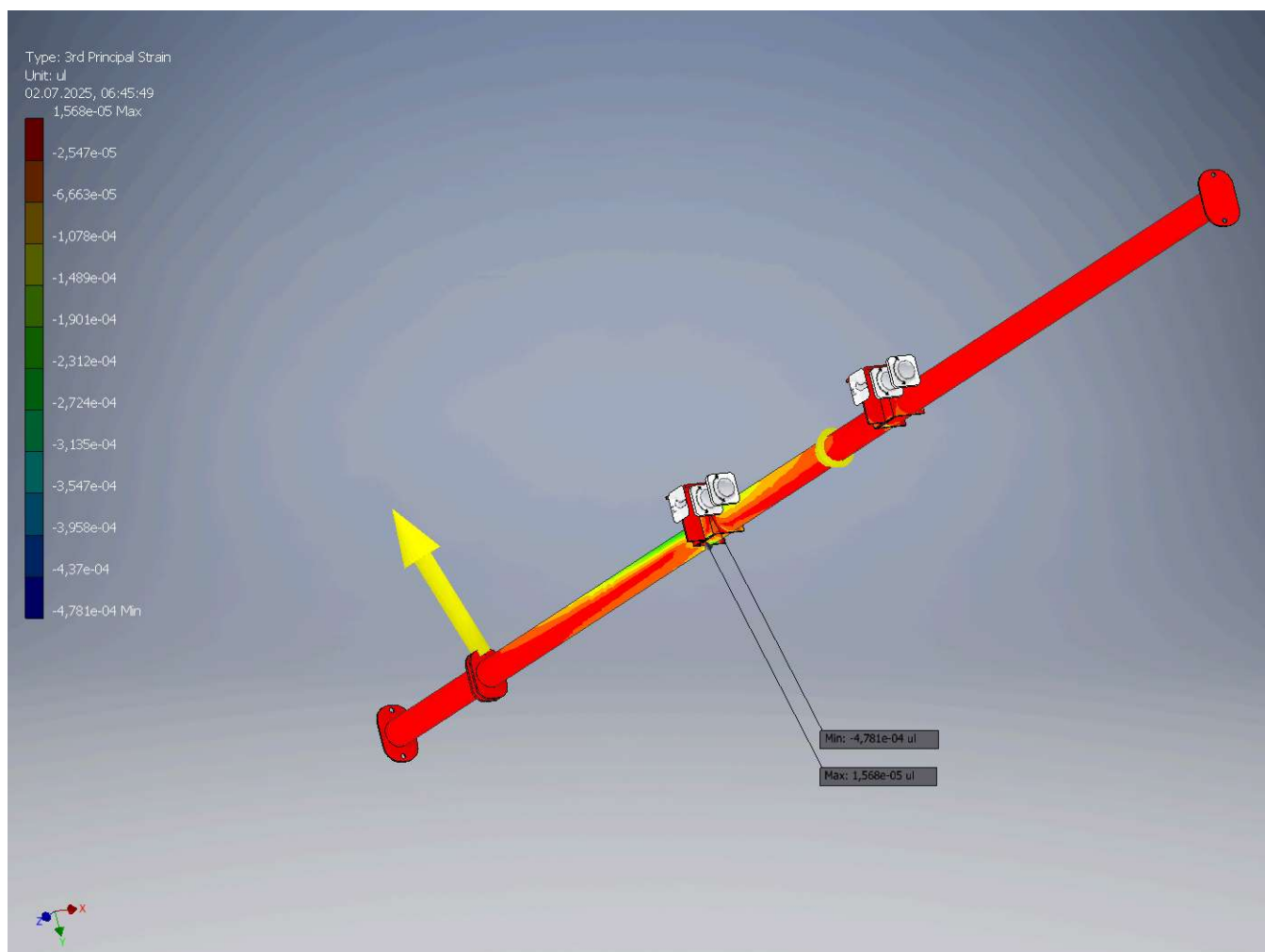
1st Principal Strain



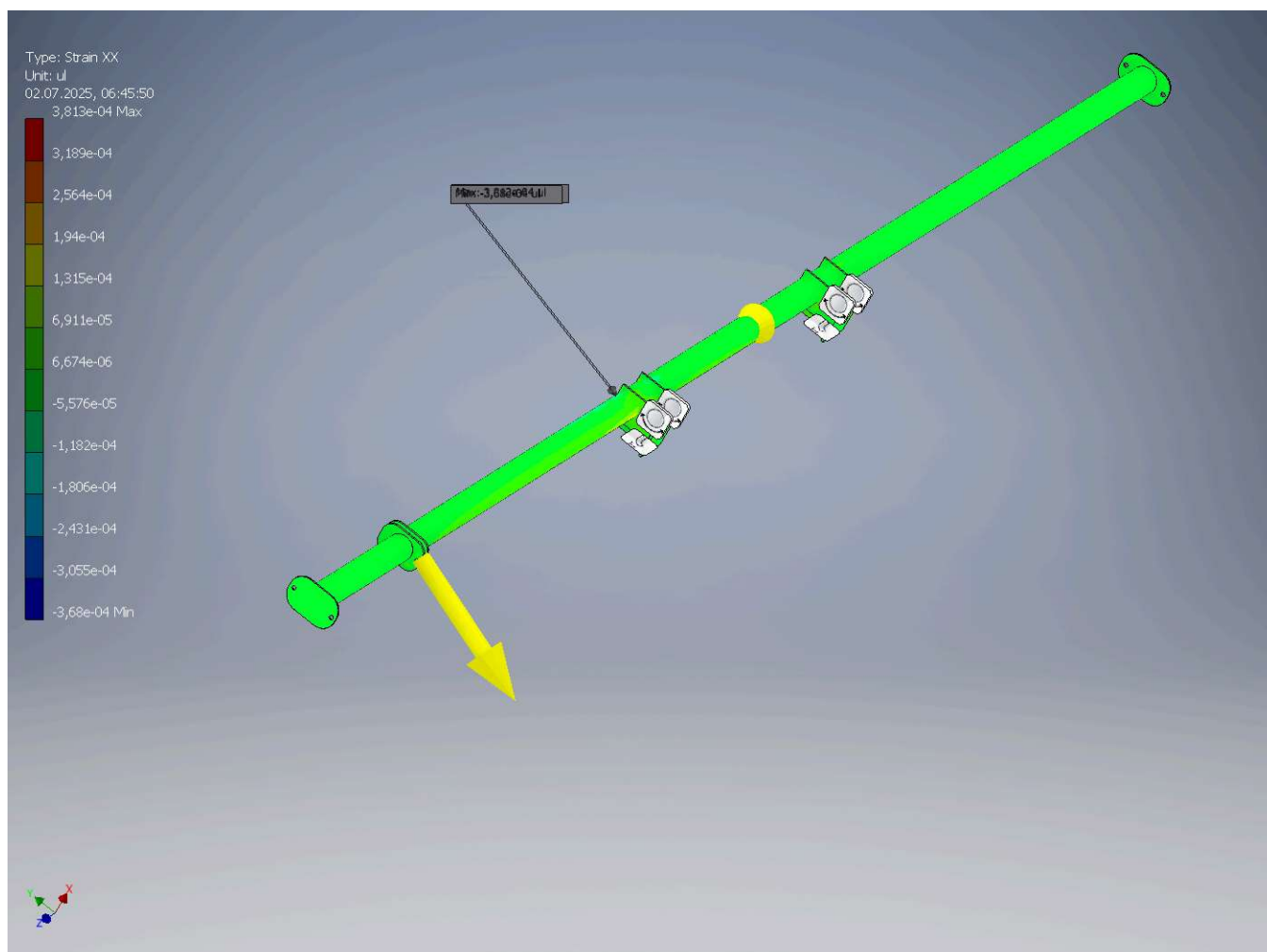


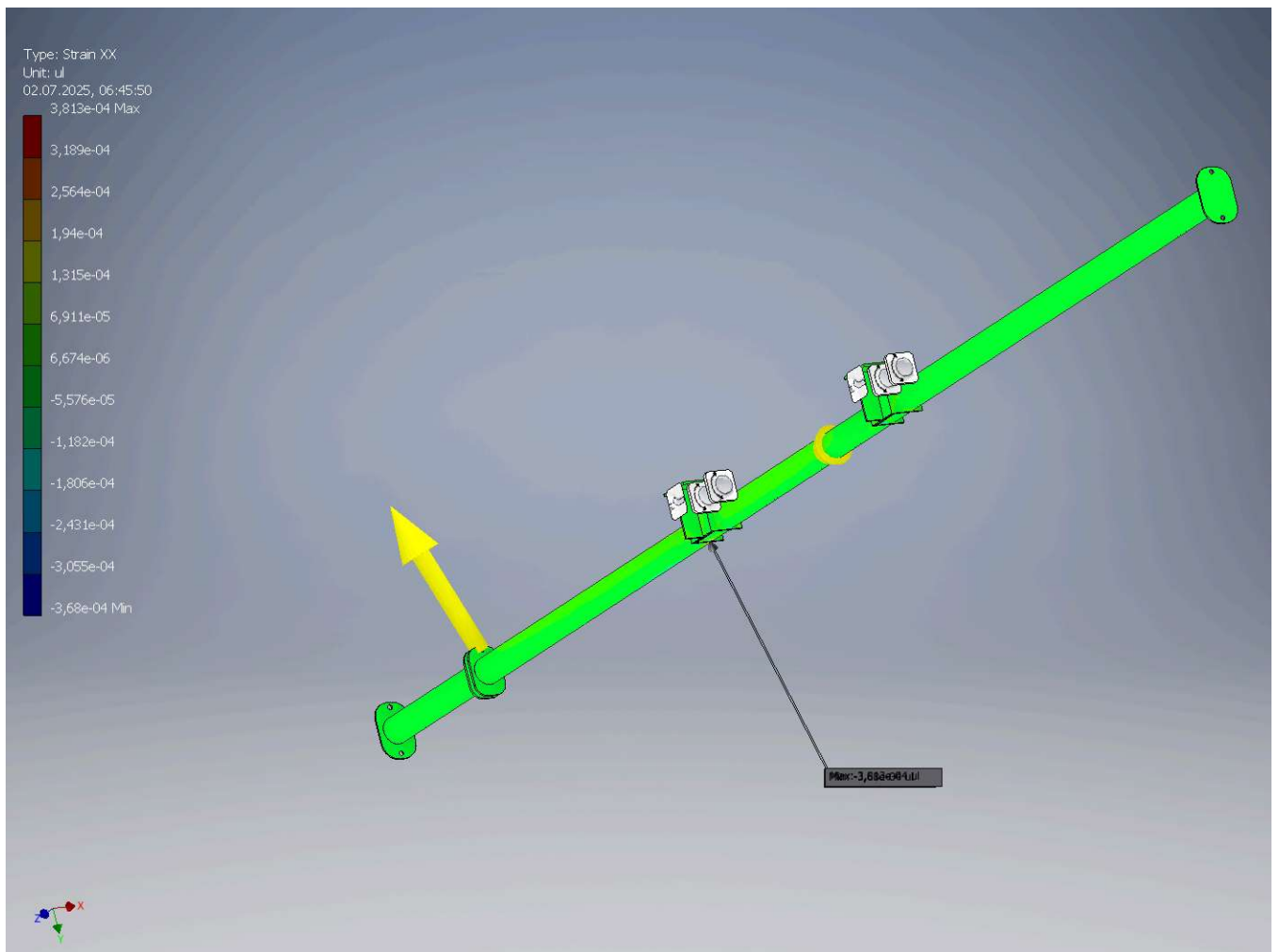
3rd Principal Strain



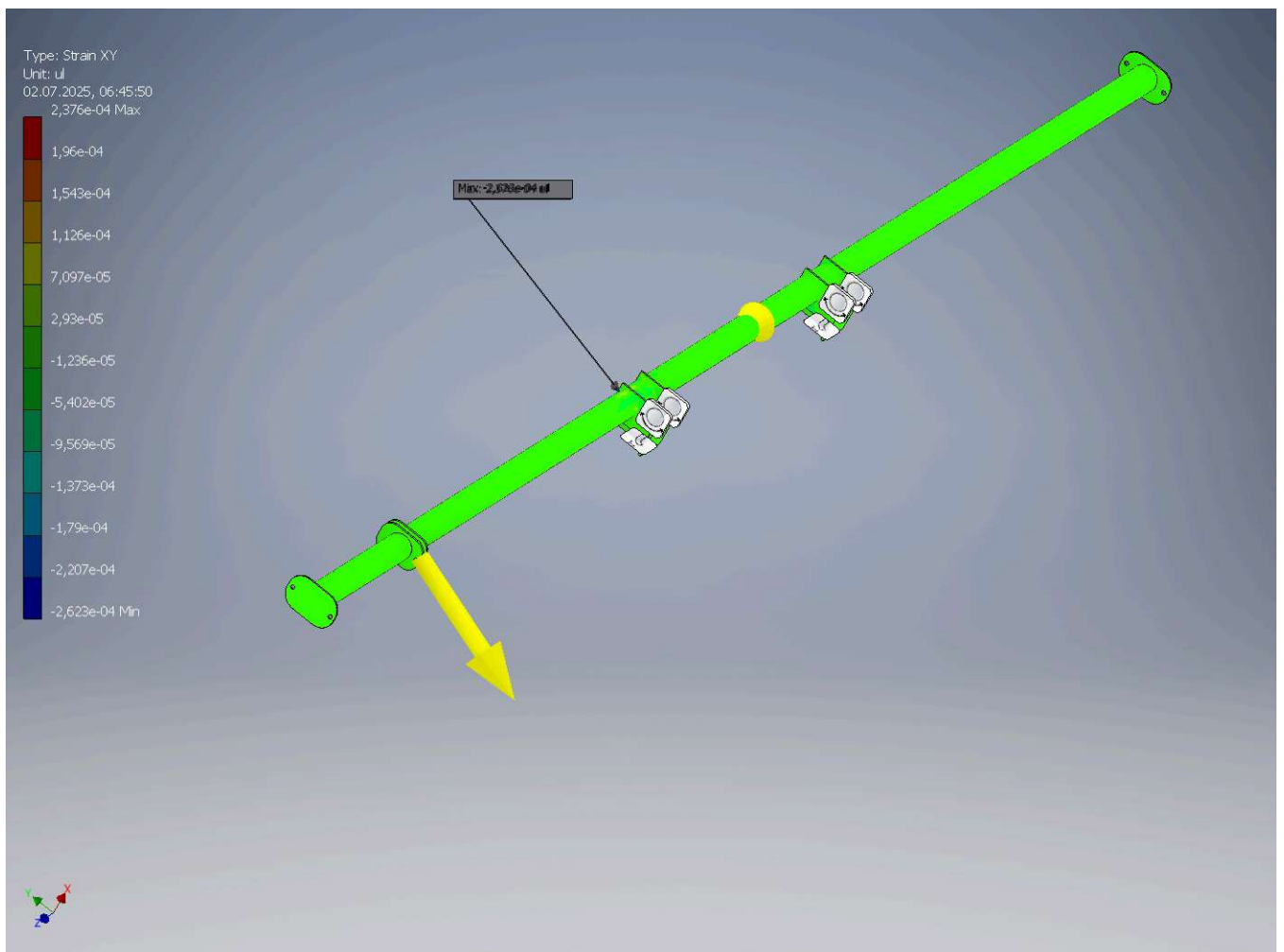


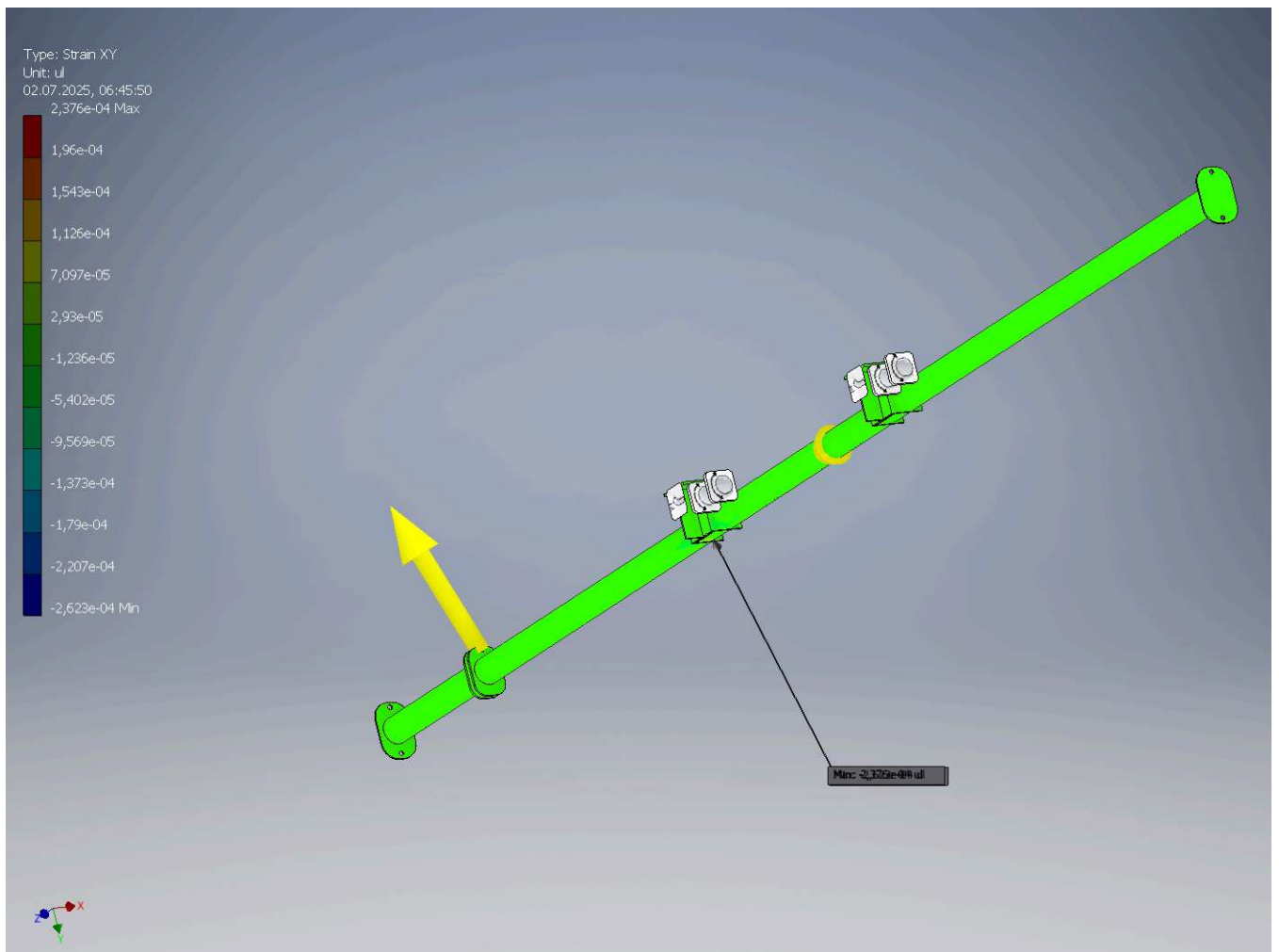
Strain XX



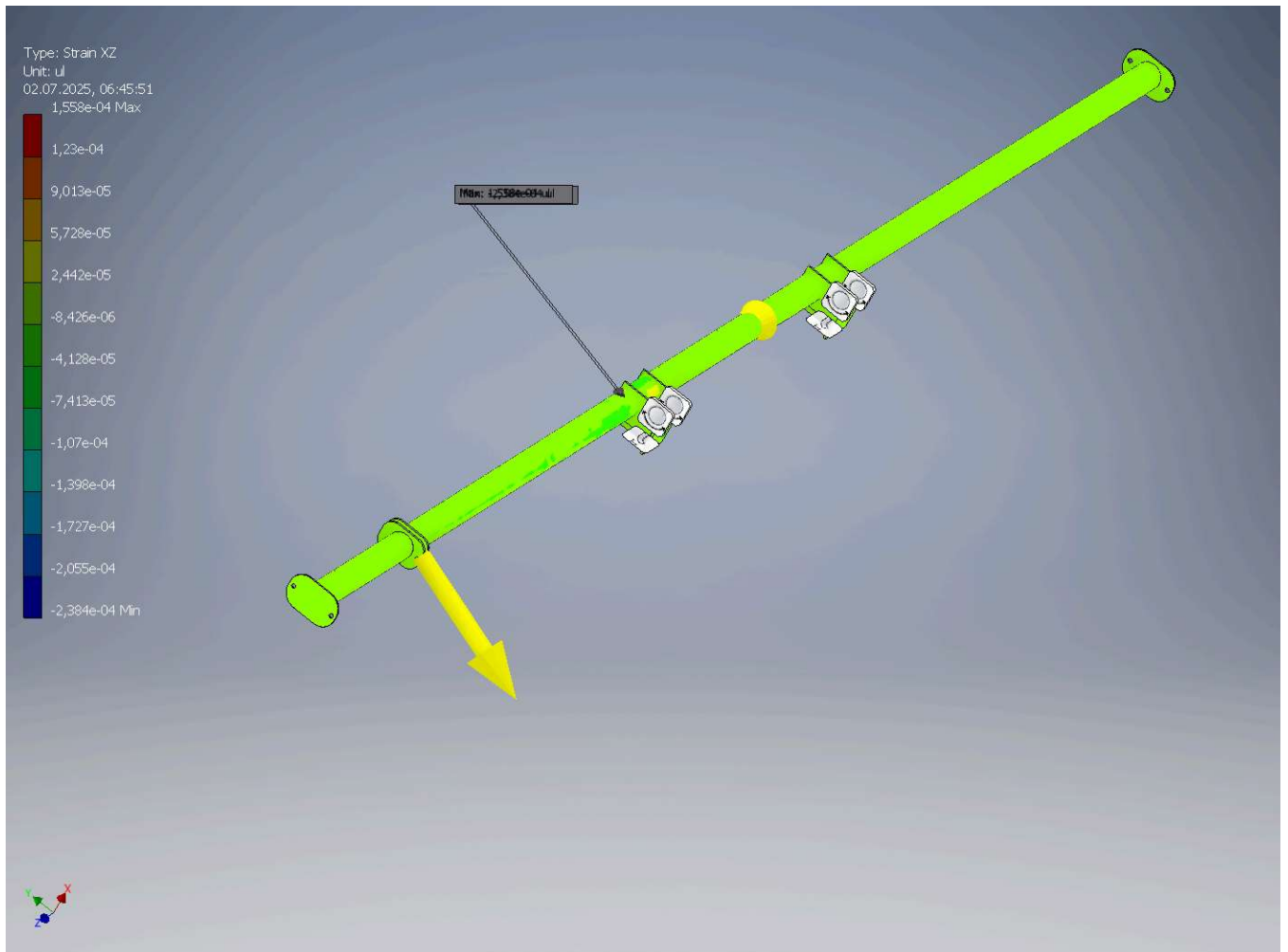


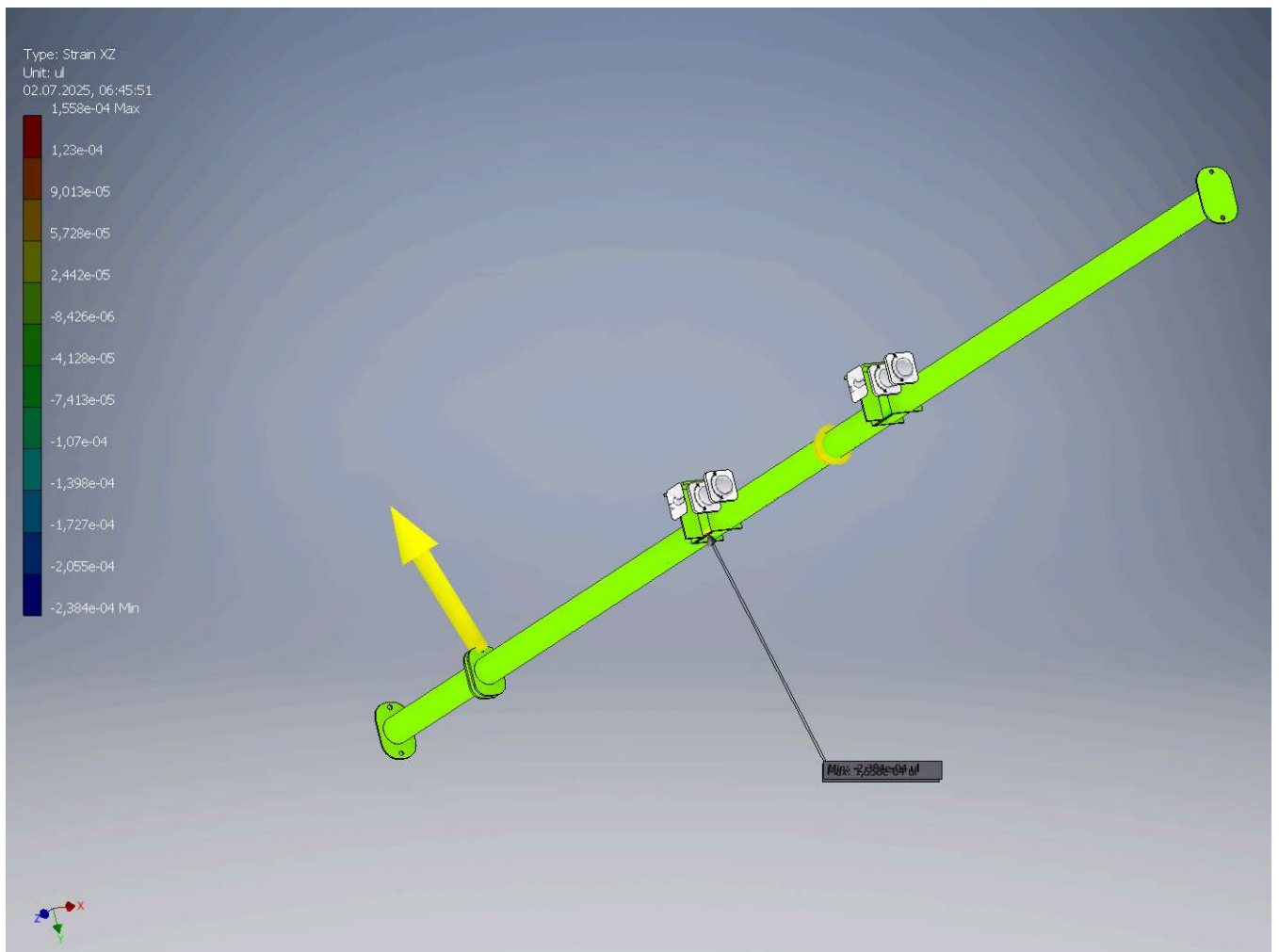
Strain XY



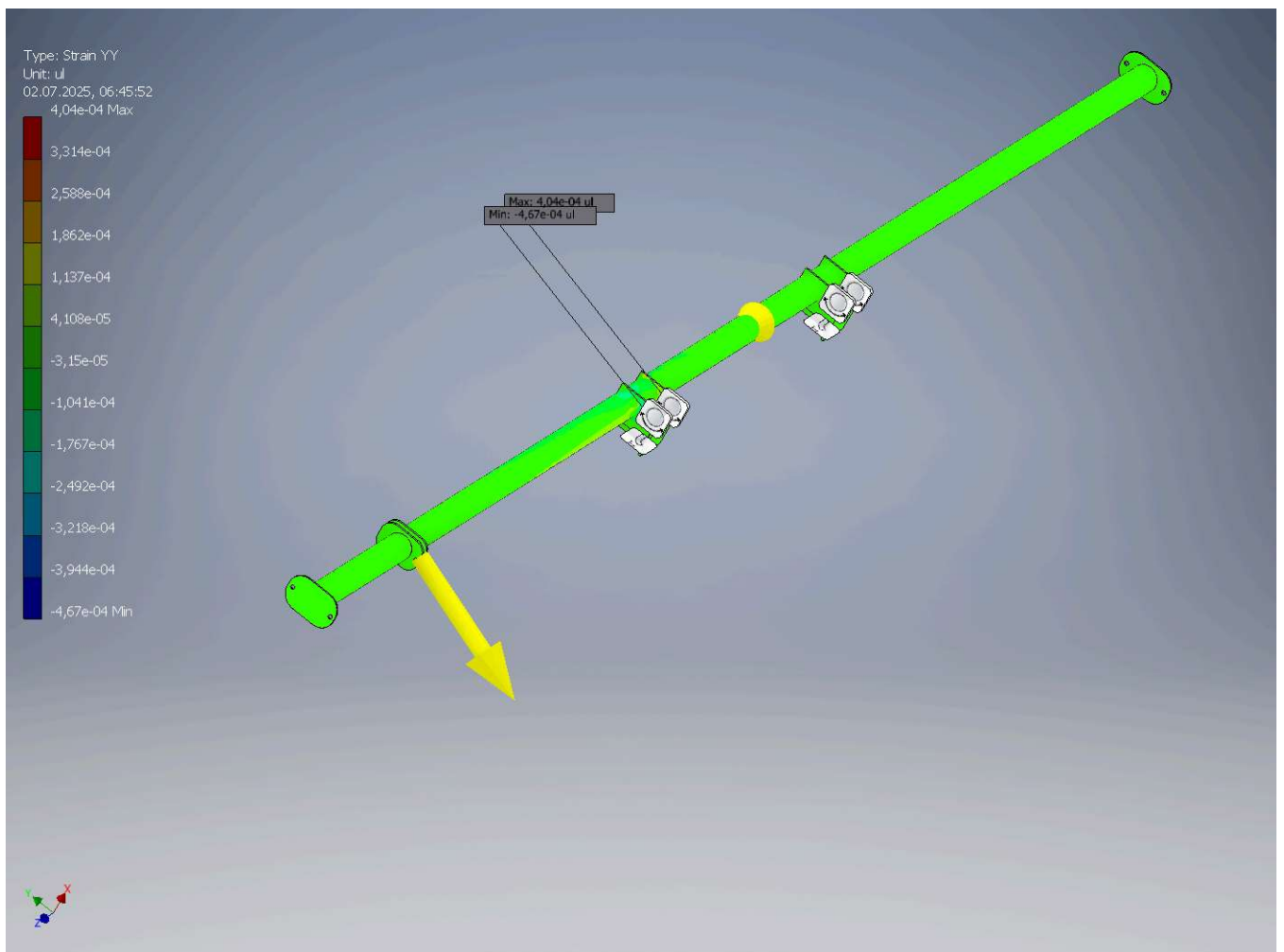


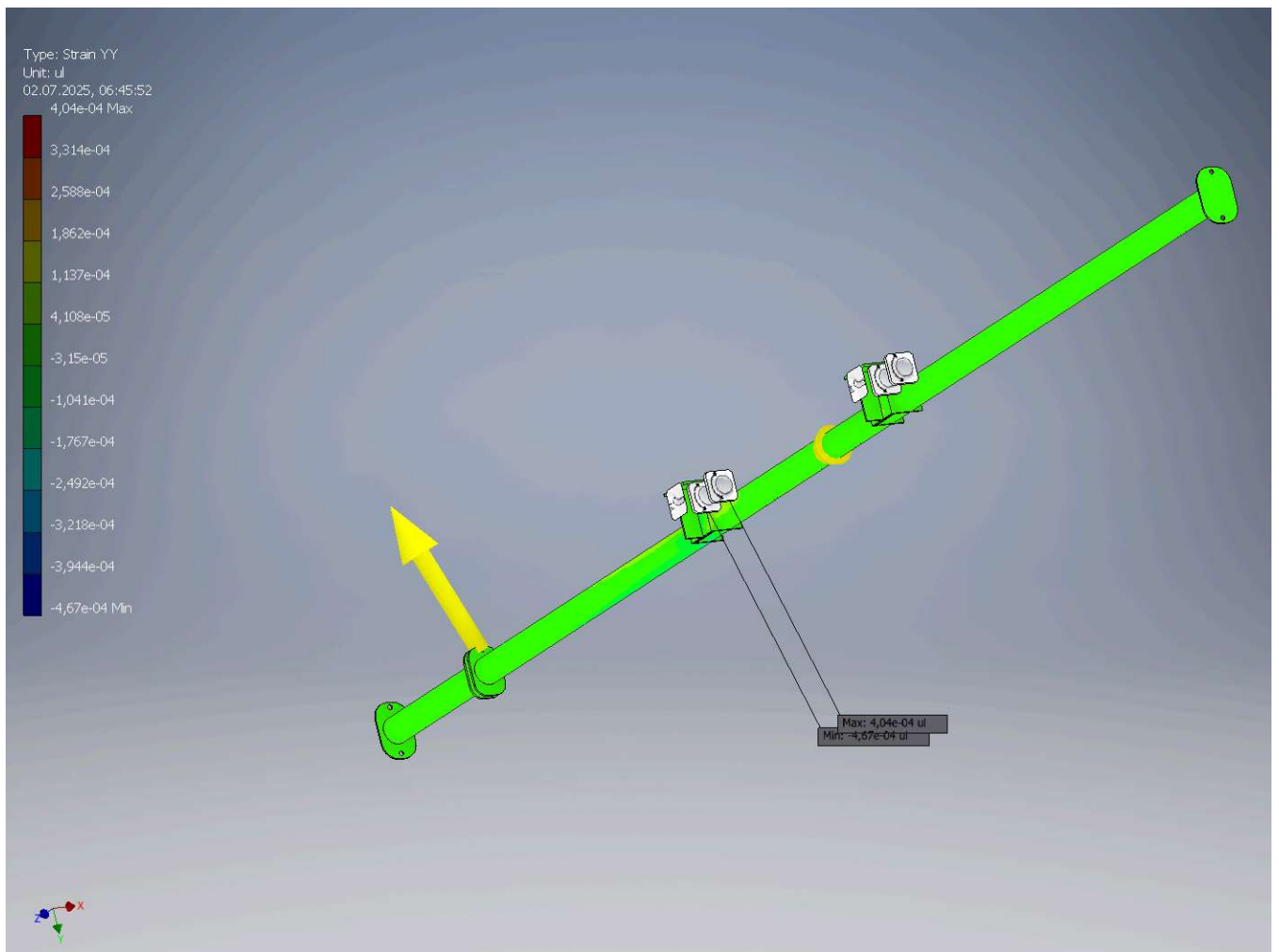
Strain XZ



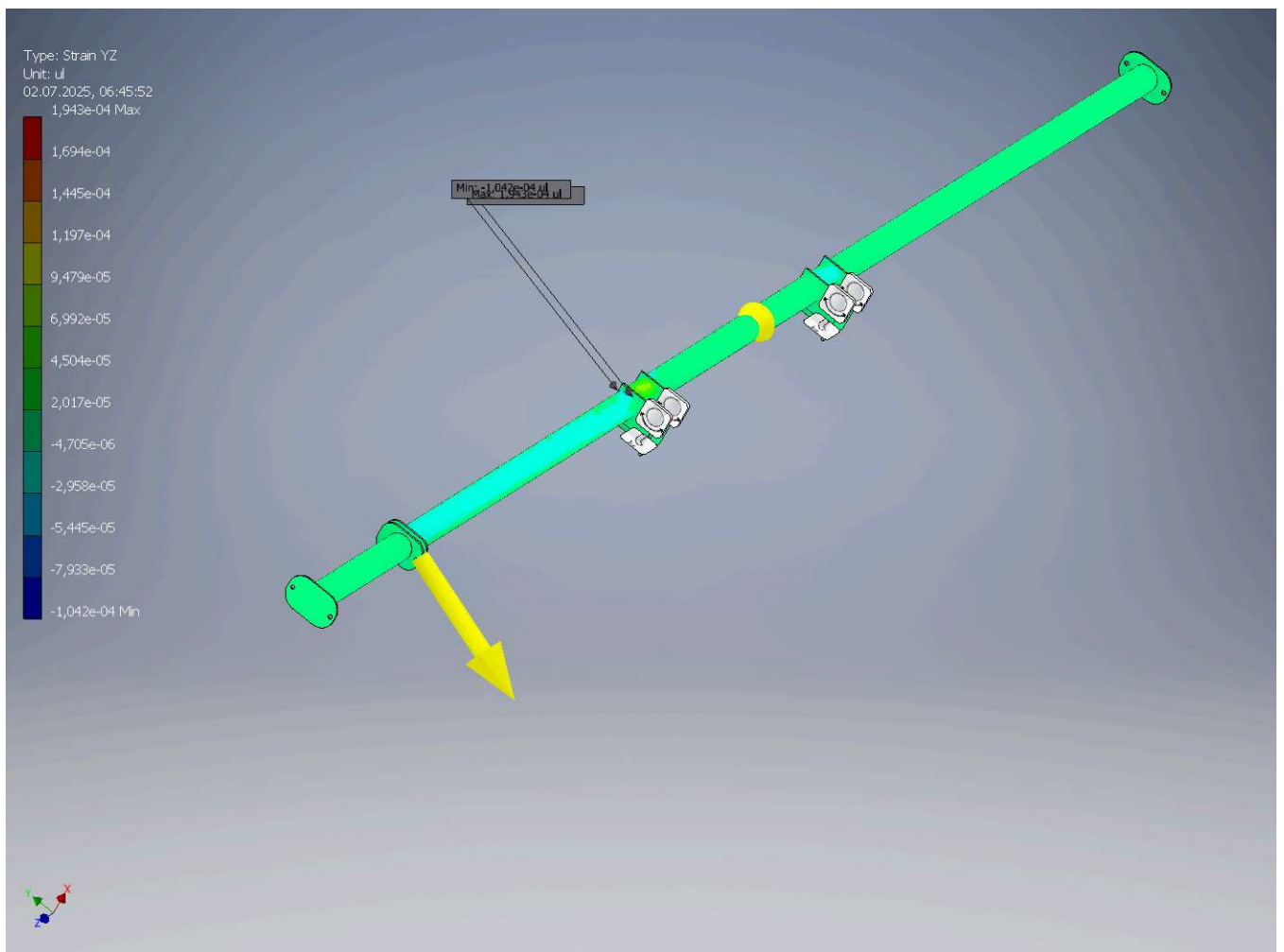


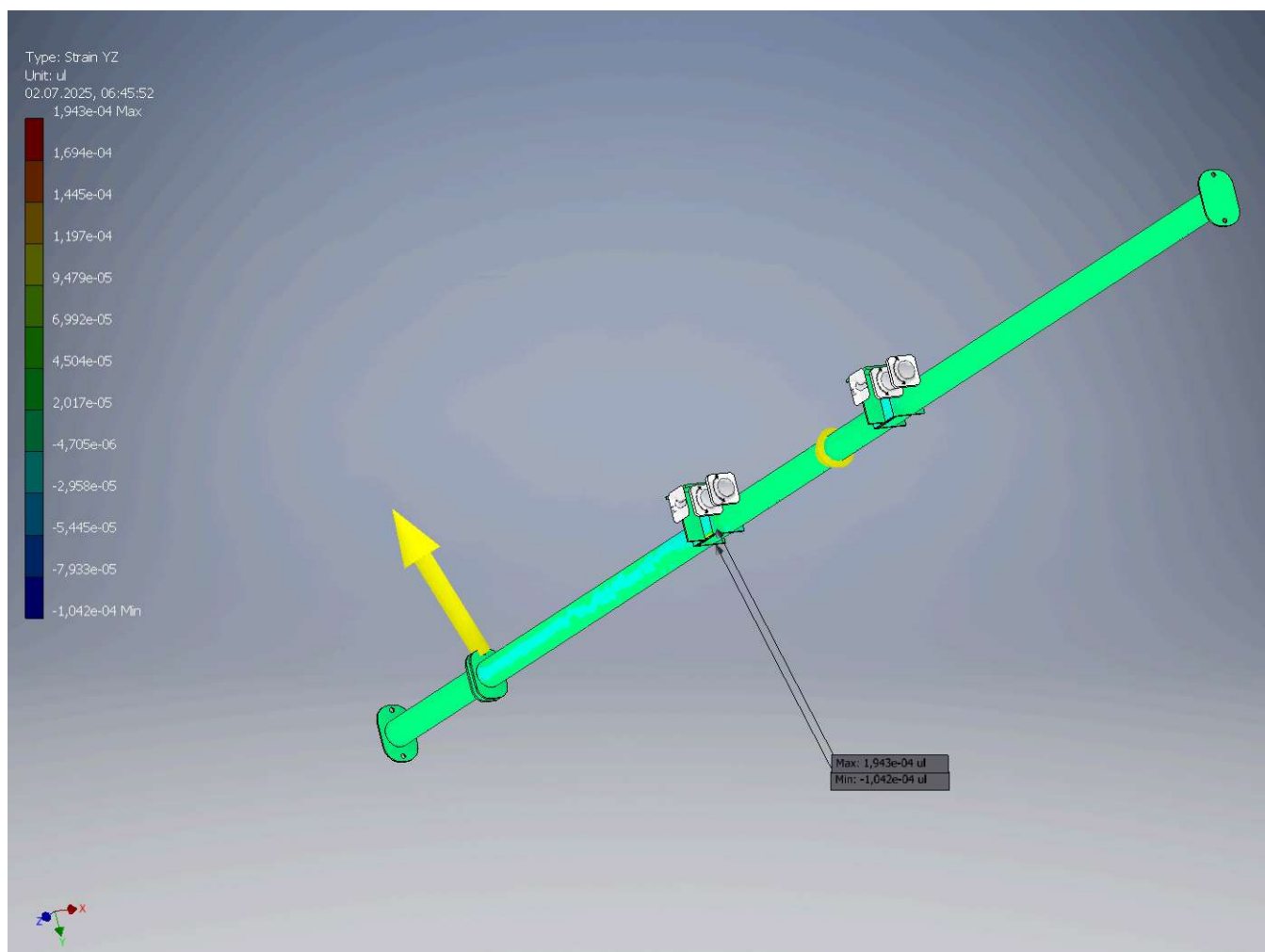
Strain YY



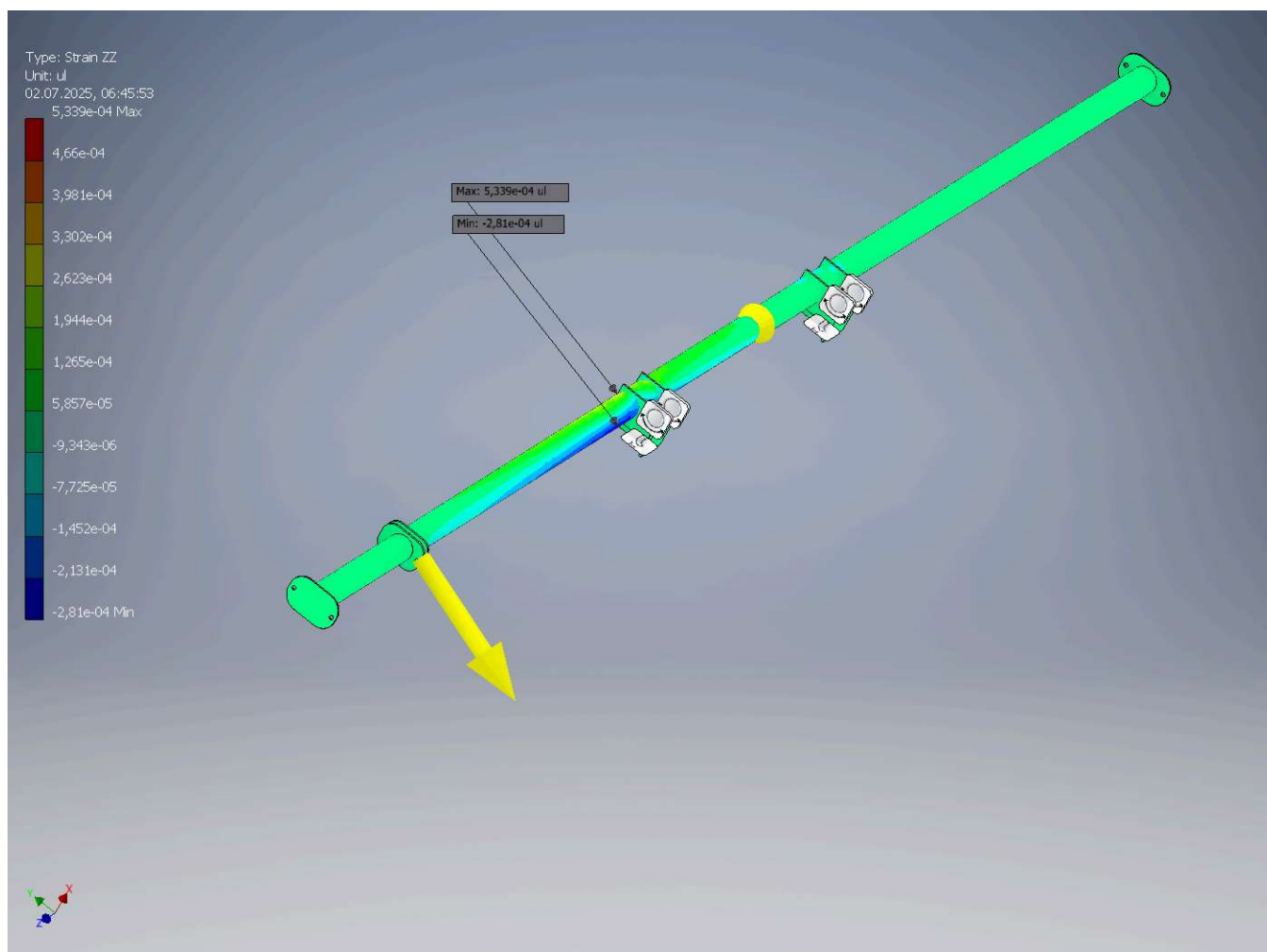


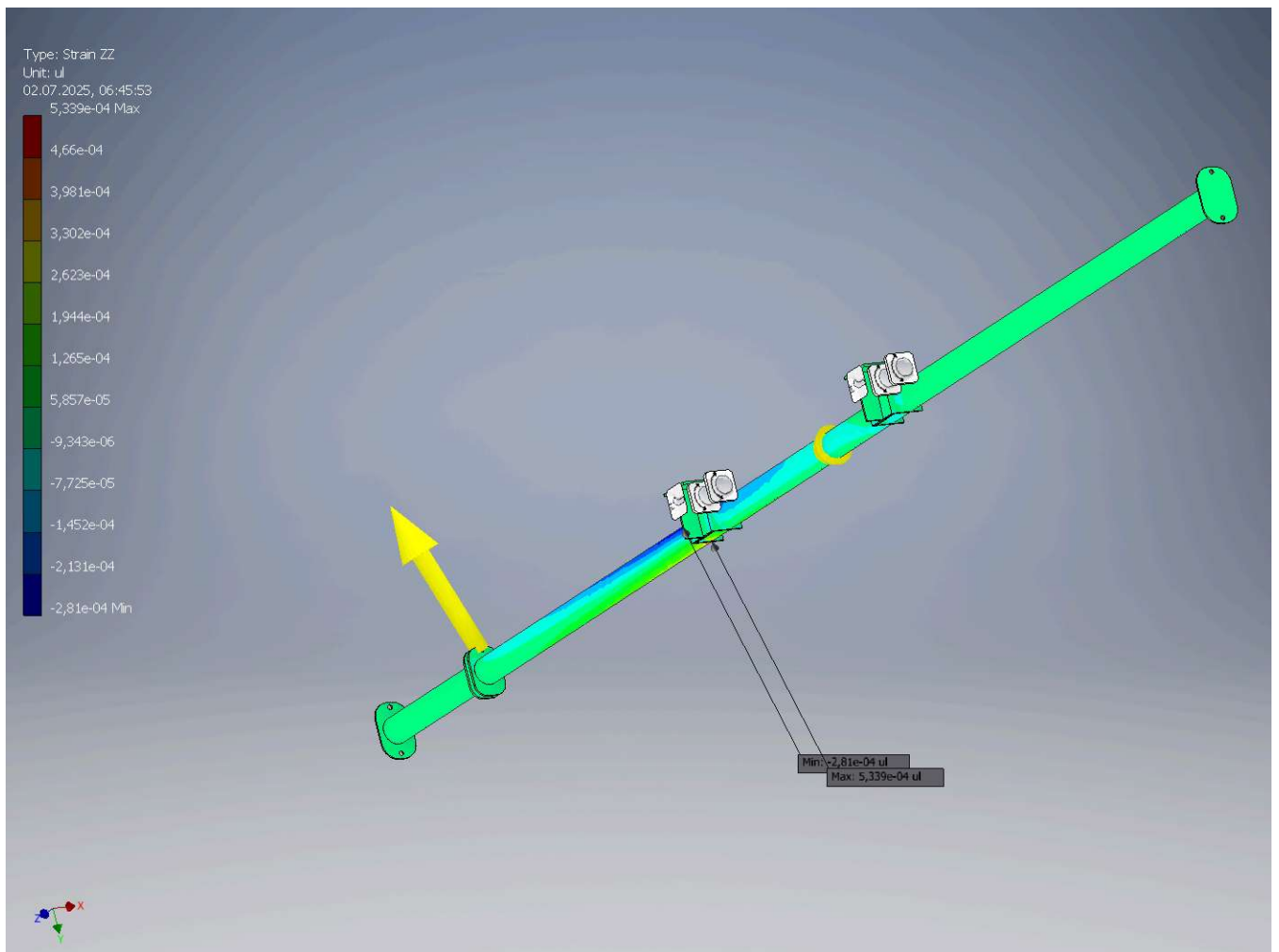
Strain YZ



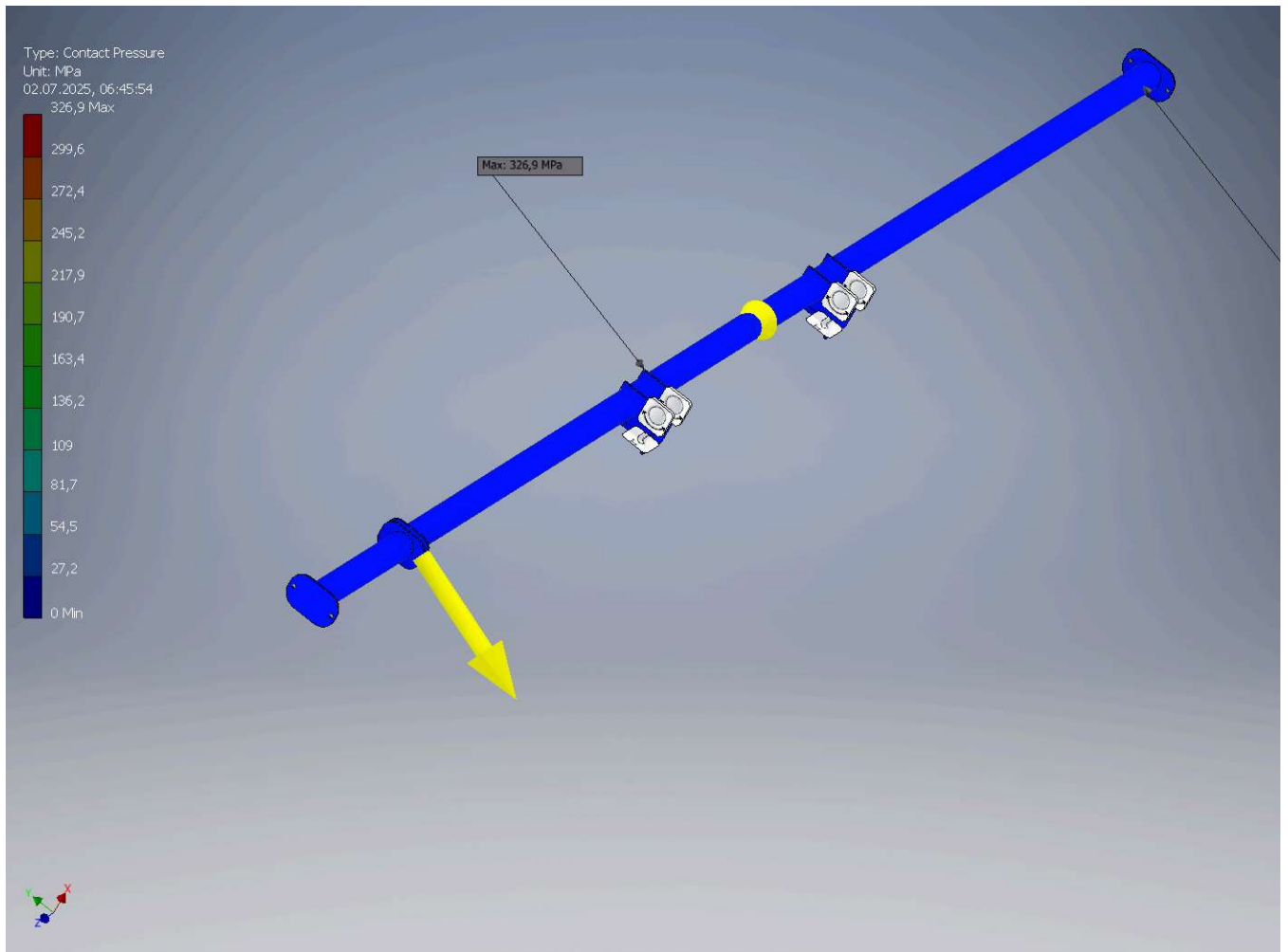


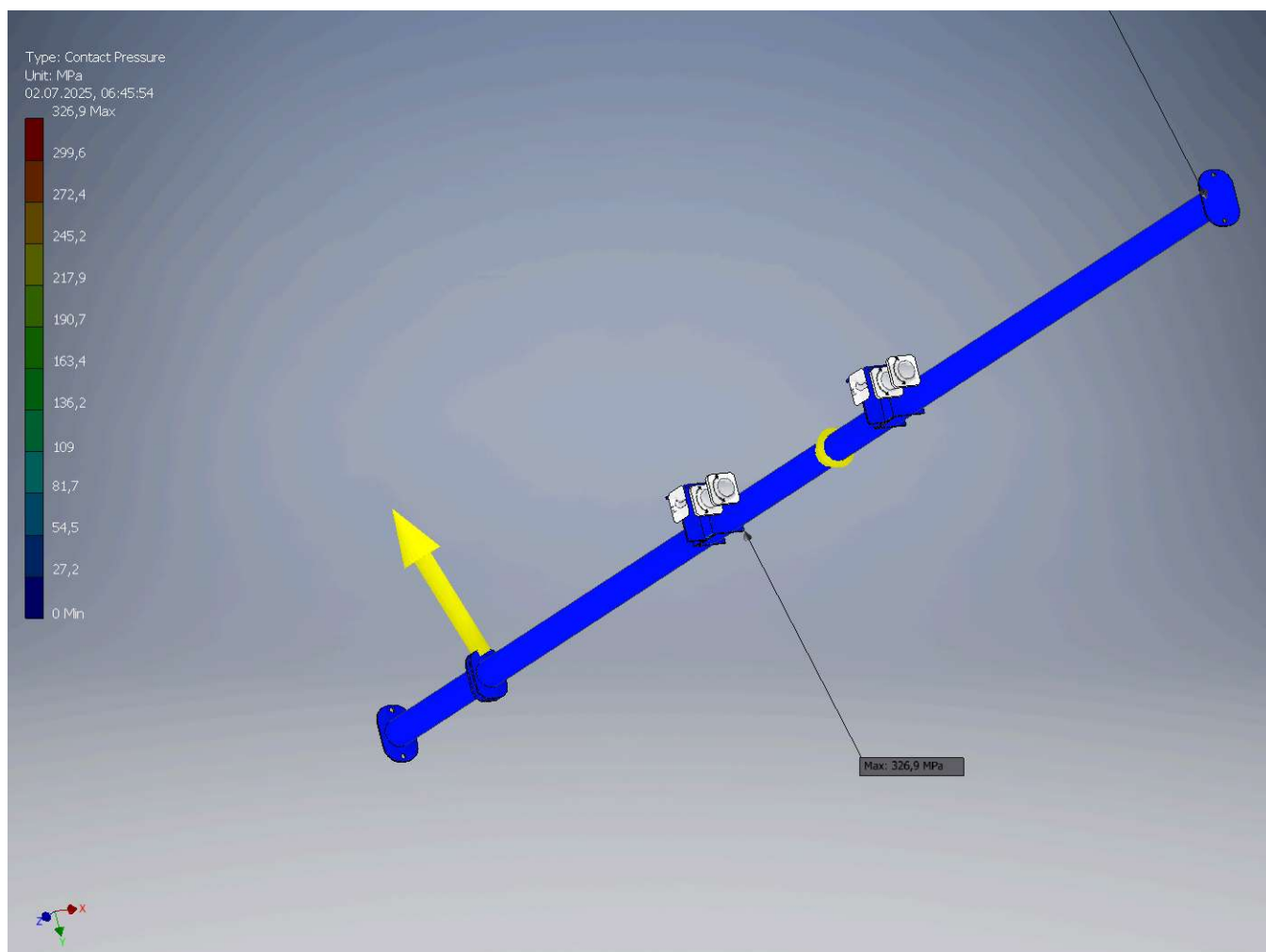
Strain ZZ



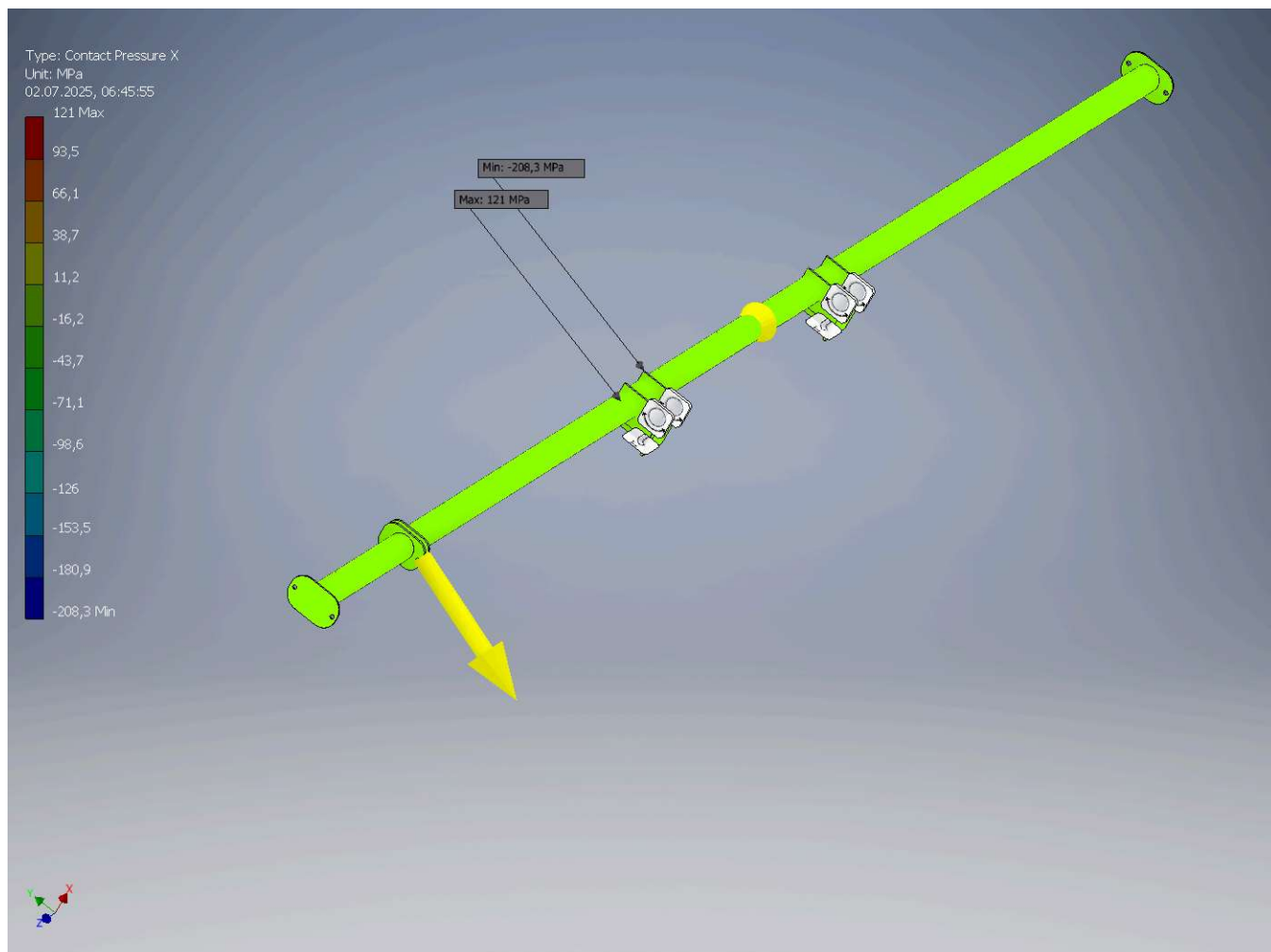


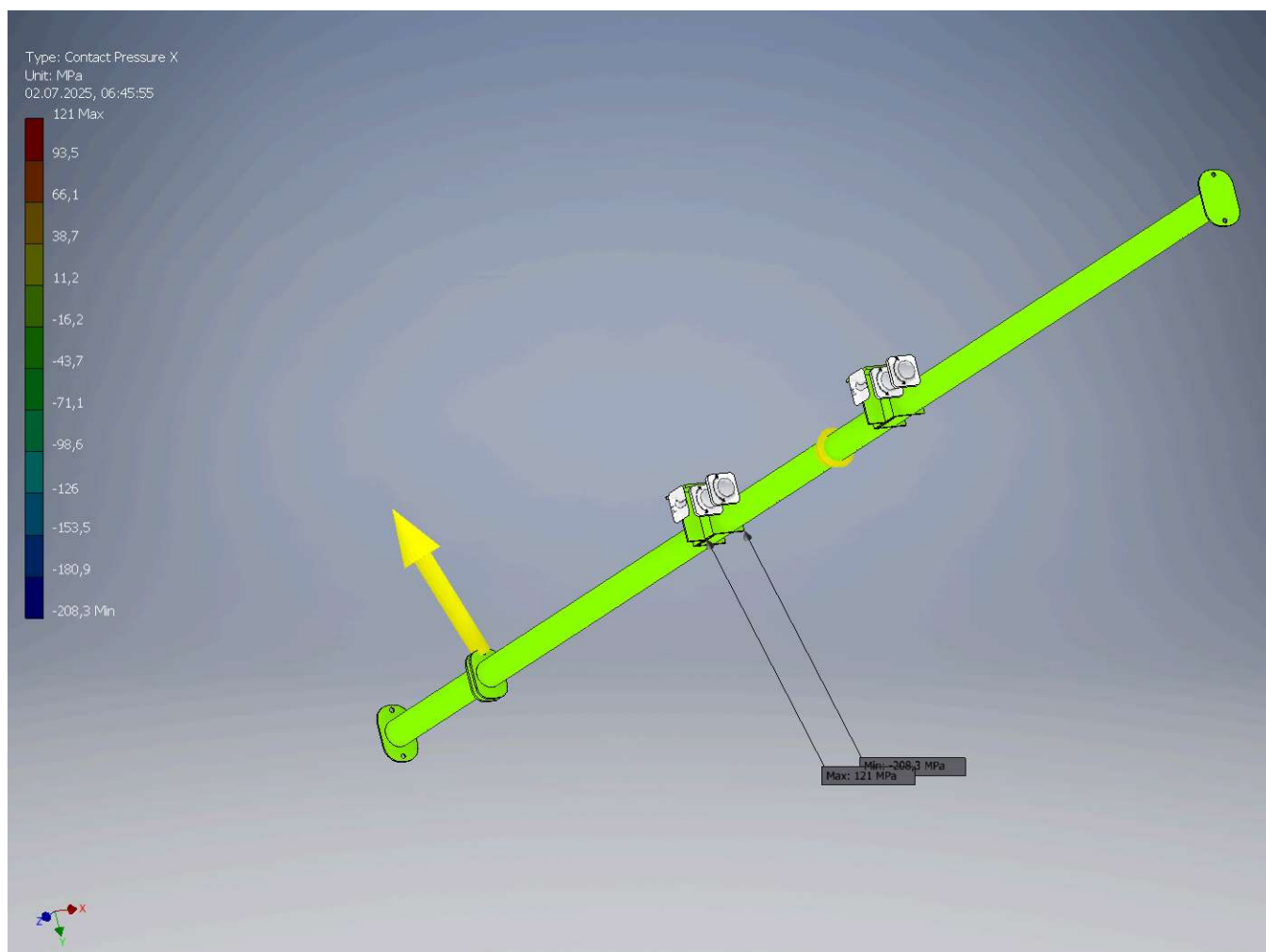
☐ Contact Pressure



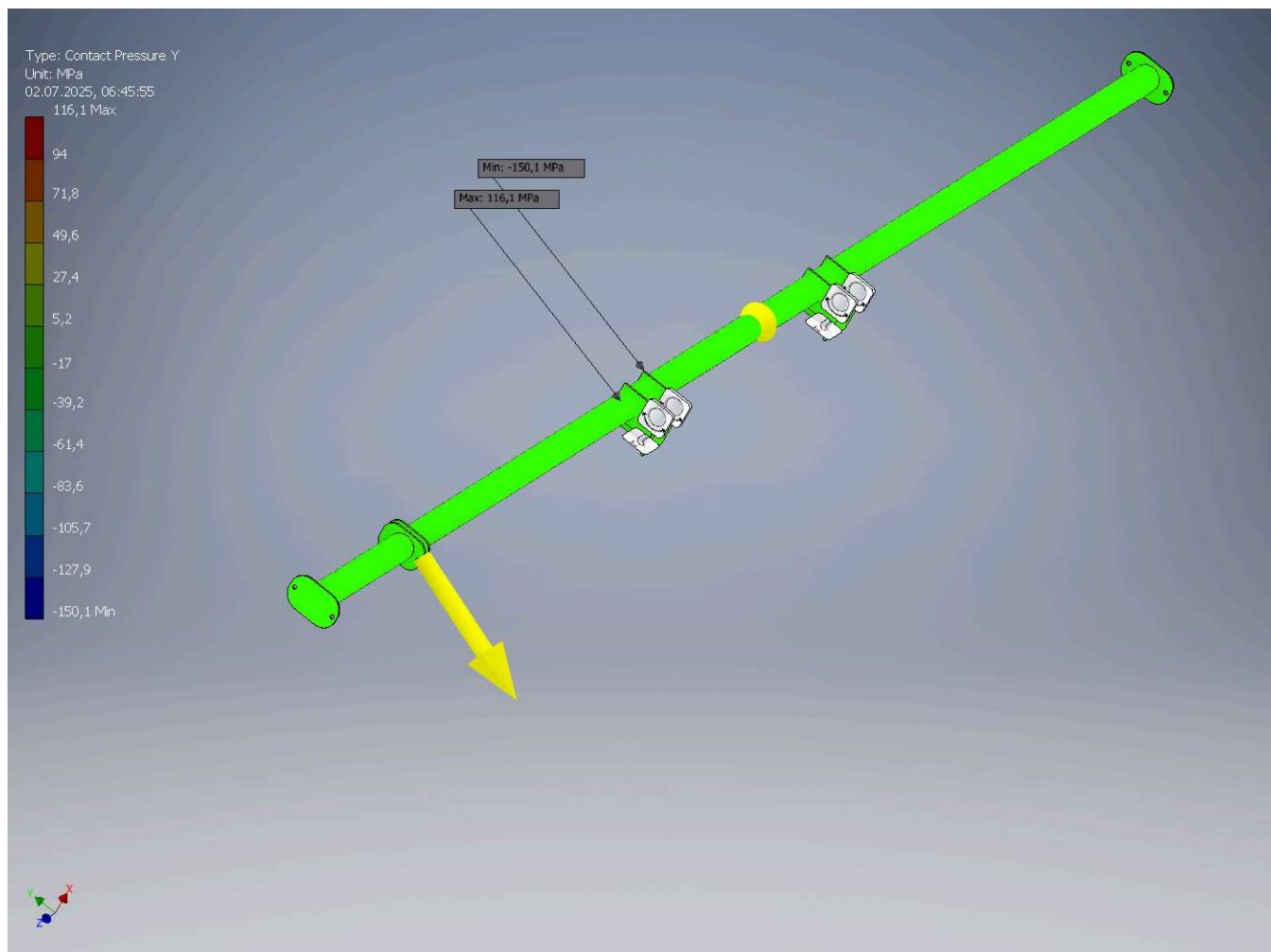


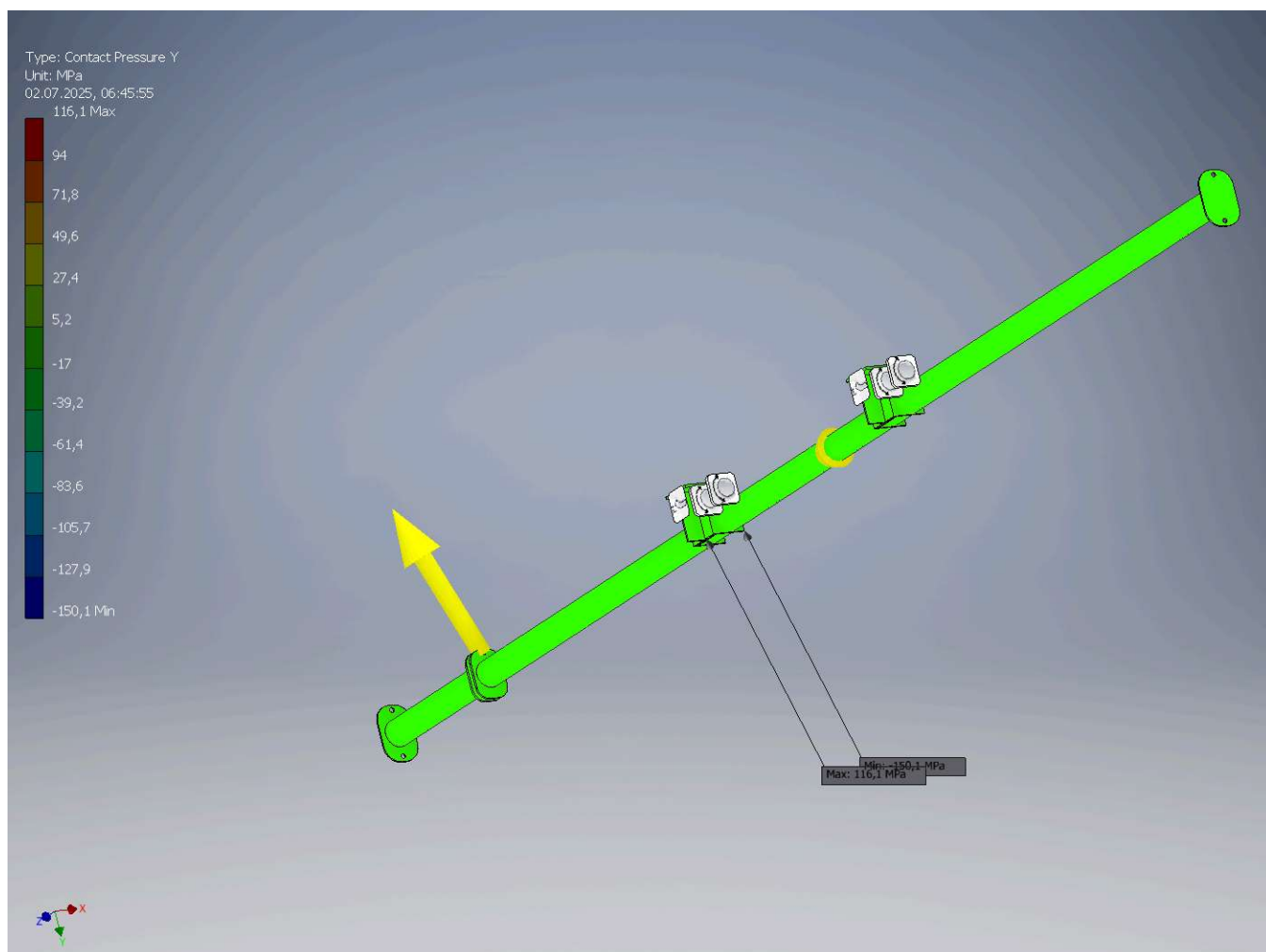
☐ Contact Pressure X



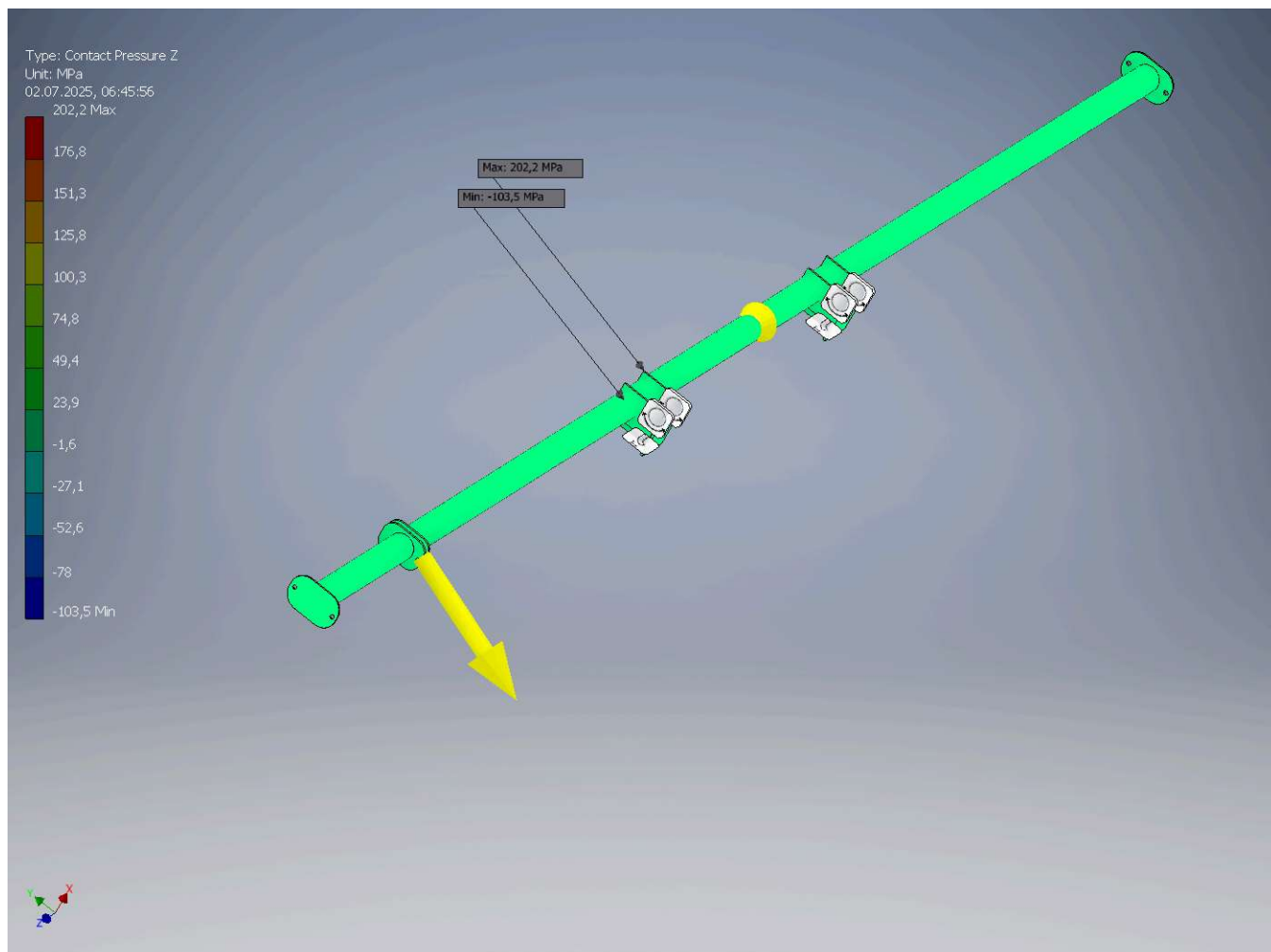


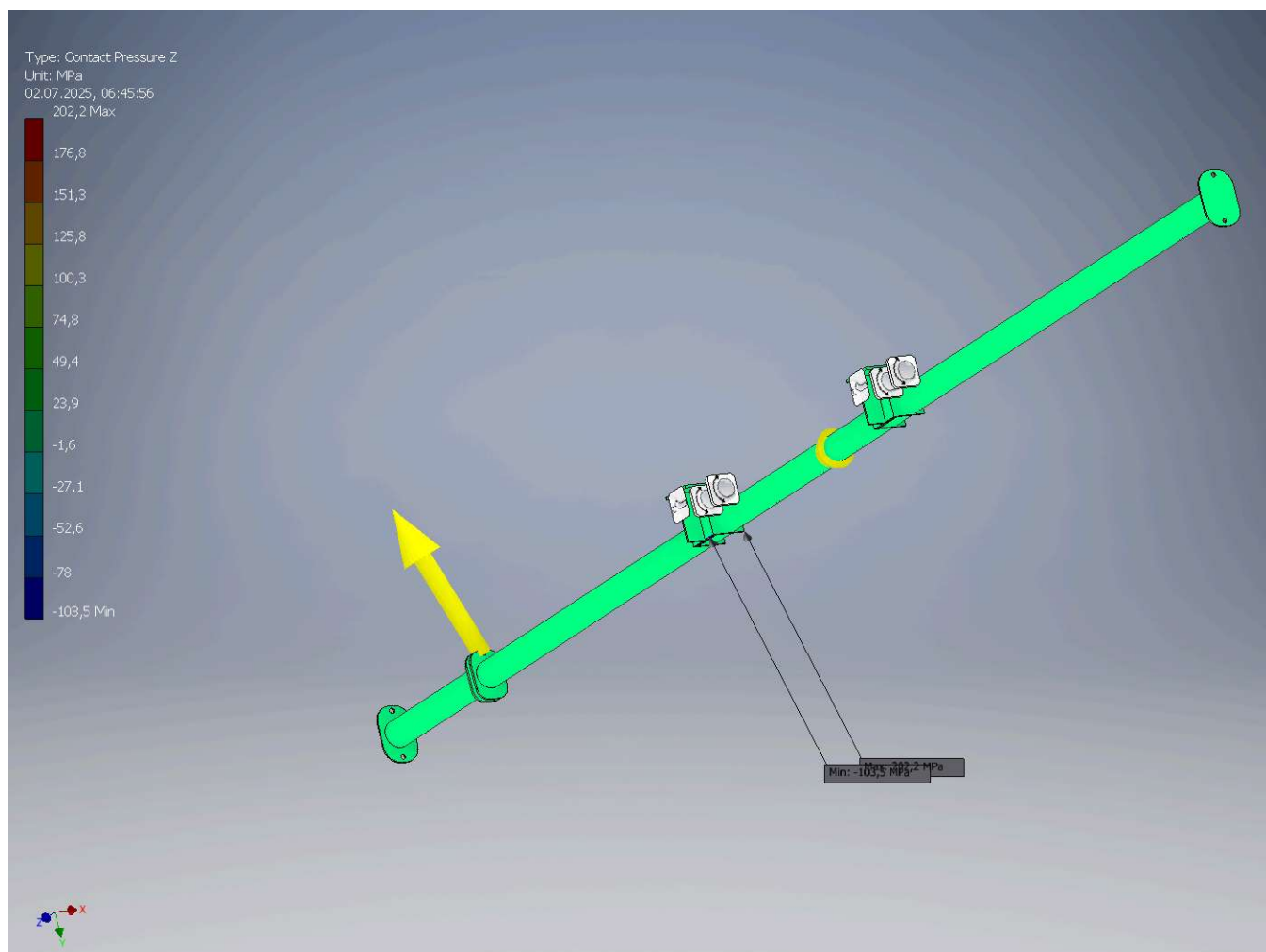
☐ Contact Pressure Y





☐ Contact Pressure Z





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