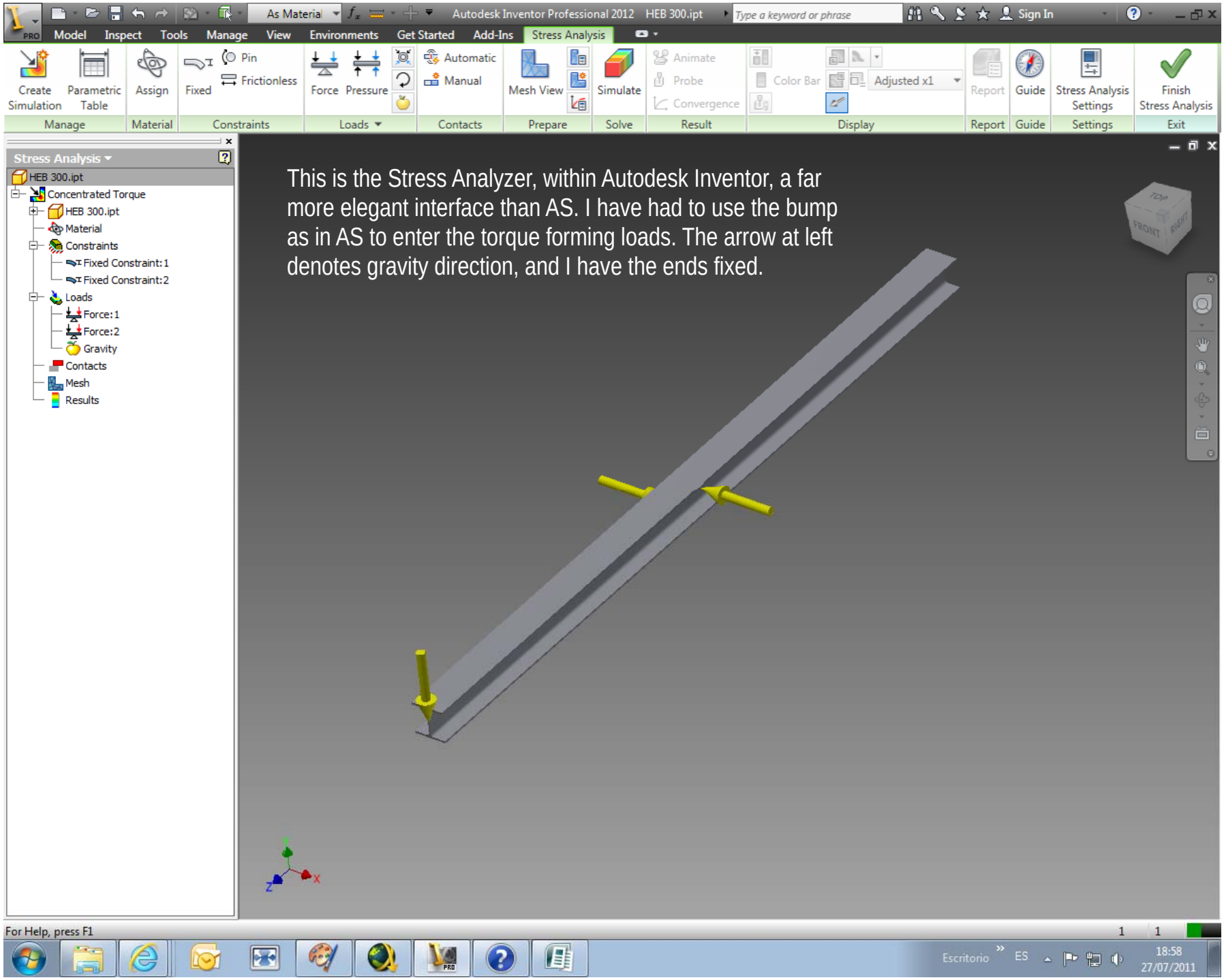
Autodesk Inventor Professional 2012 HEB 300.ipt
Model Inspect Tools Manage View Environments Get Started Add-Ins Stress Analysis
Create Simulation
Parametric Table
Assign
Fixed
Pin
Frictionless
Force
Pressure
Automatic
Manual
Mesh View
Simulate
Animate
Probe
Convergence
Color Bar
Adjusted x1
Report
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Finish Stress Analysis
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Loads
Contacts
Prepare
Solve
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Exit
Stress Analysis
HEB 300.ipt
Concentrated Torque
HEB 300.ipt
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Fixed Constraint:2
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Force:1
Force:2
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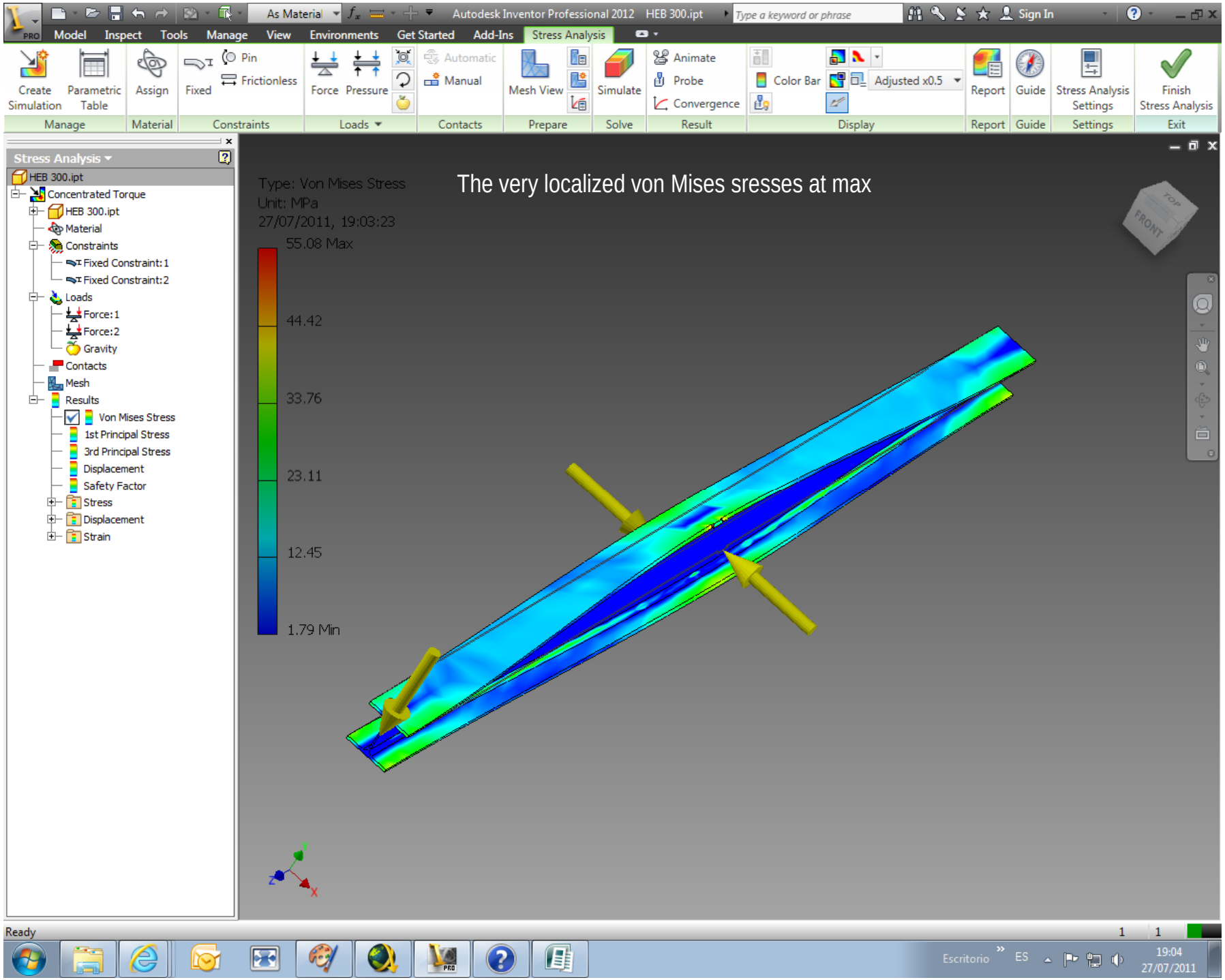
Mesh
Results
This is the Stress Analyzer, within Autodesk Inventor, a far more elegant interface than AS. I have had to use the bump as in AS to enter the torque forming loads. The arrow at left denotes gravity direction, and I have the ends fixed.
For Help, press F1
Escritorio
ES
18:58
27/07/2011


Autodesk Inventor Professional 2012 HEB 300.ipt
Model Inspect Tools Manage View Environments Get Started Add-Ins Stress Analysis
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Parametric Table
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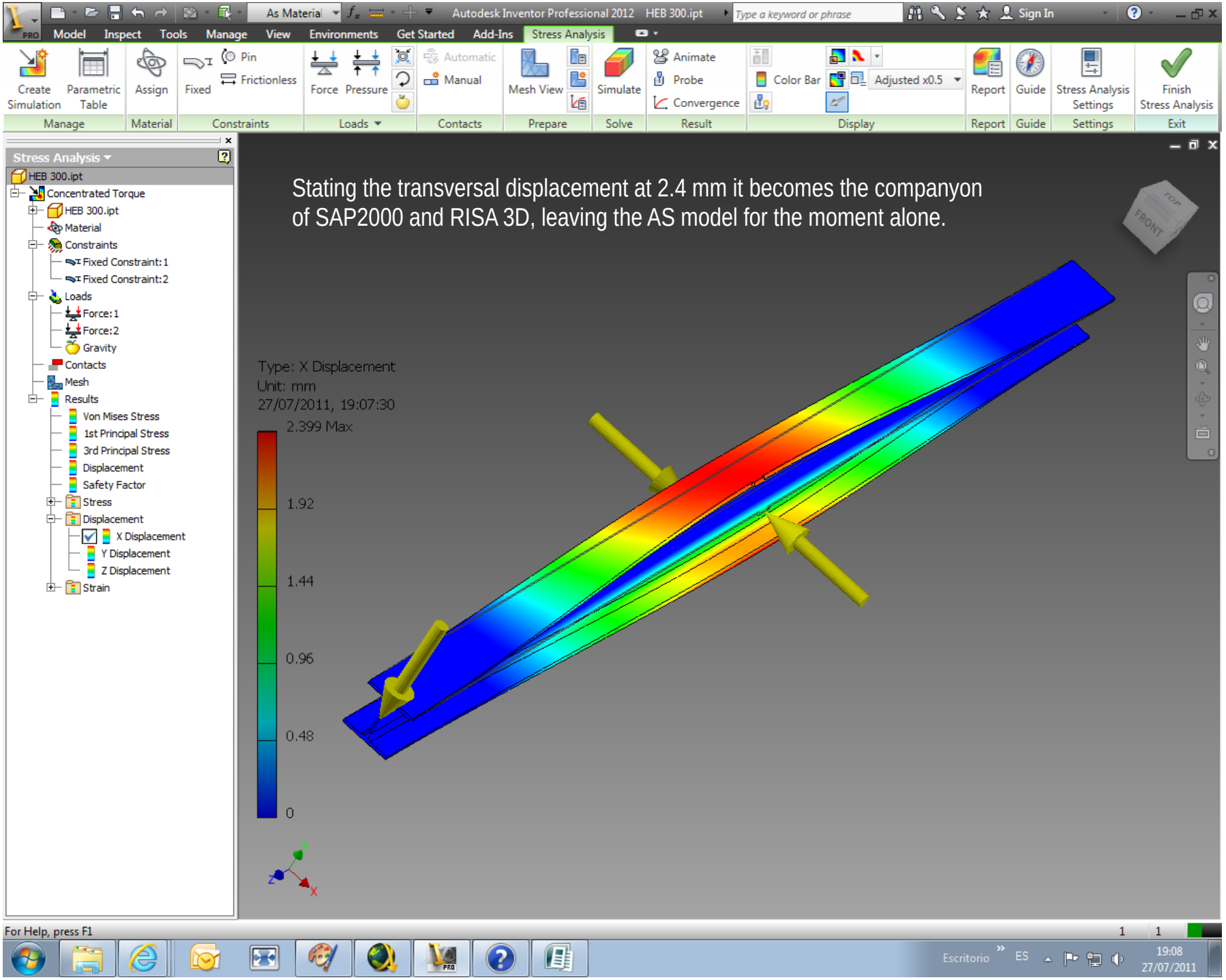
Mesh
Results
Von Mises Stress
1st Principal Stress
3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
Strain
Type: Von Mises Stress
Unit: MPa
27/07/2011, 19:03:23
55.08 Max
44.42
33.76
23.11
12.45
1.79 Min
The very localized von Mises sresses at max
TOP
FRONT
Ready
Escritorio
ES
19:04
27/07/2011


Autodesk Inventor Professional 2012 HEB 300.ipt
Model Inspect Tools Manage View Environments Get Started Add-Ins Stress Analysis
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Adjusted x0.5
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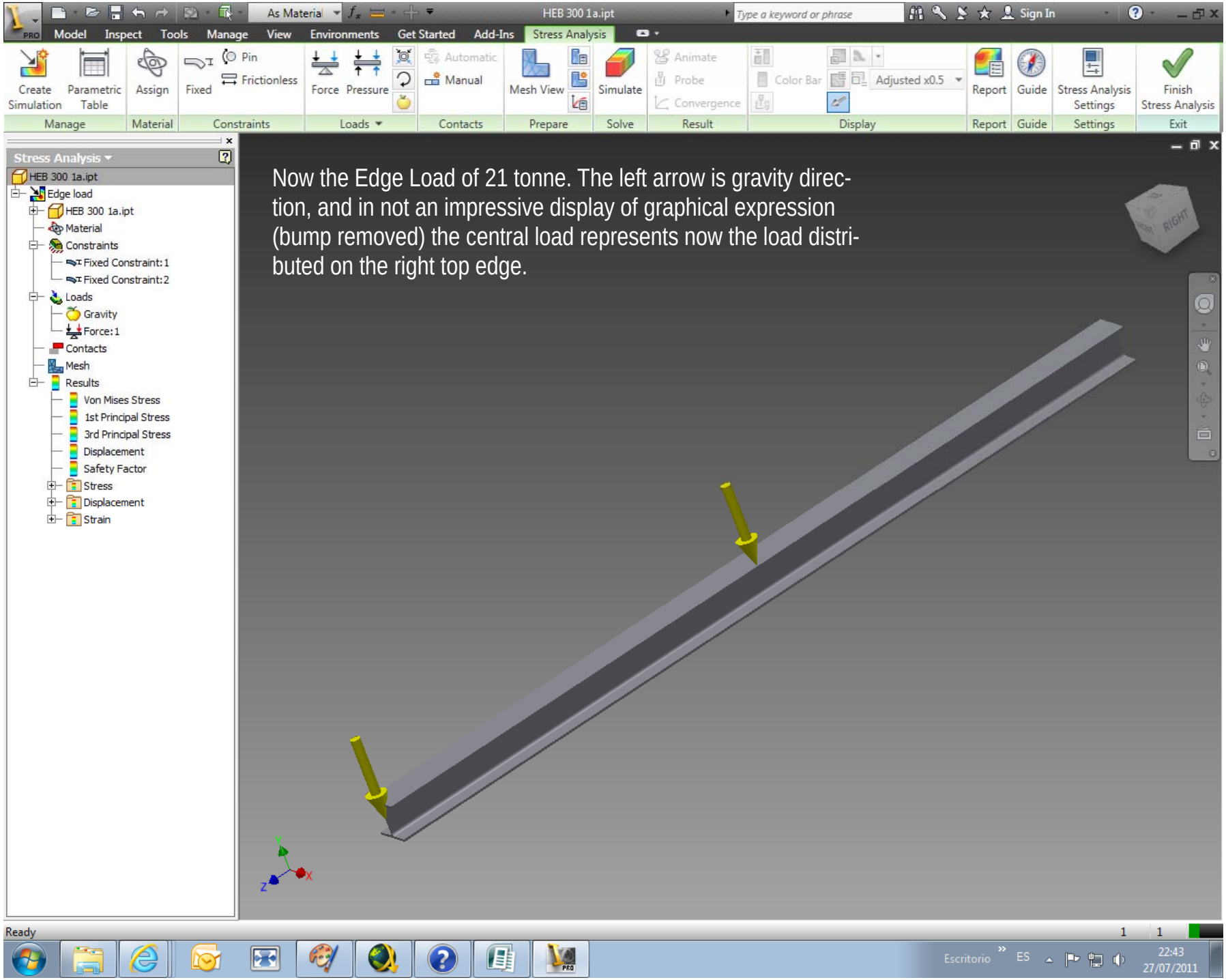
1st Principal Stress
3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
X Displacement
Y Displacement
Z Displacement
Strain
Stating the transversal displacement at 2.4 mm it becomes the companyon
of SAP2000 and RISA 3D, leaving the AS model for the moment alone.
Type: X Displacement
Unit: mm
27/07/2011, 19:07:30
2.399 Max
1.92
1.44
0.96
0.48
0
FRONT
For Help, press F1
Escritorio
ES
19:08
27/07/2011


As Material
HEB 300 1a.ipt
Type a keyword or phrase
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Stress Analysis
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Stress Analysis
HEB 300 1a.ipt
Edge load
HEB 300 1a.ipt
Material
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Fixed Constraint:2
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Force:1
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Von Mises Stress
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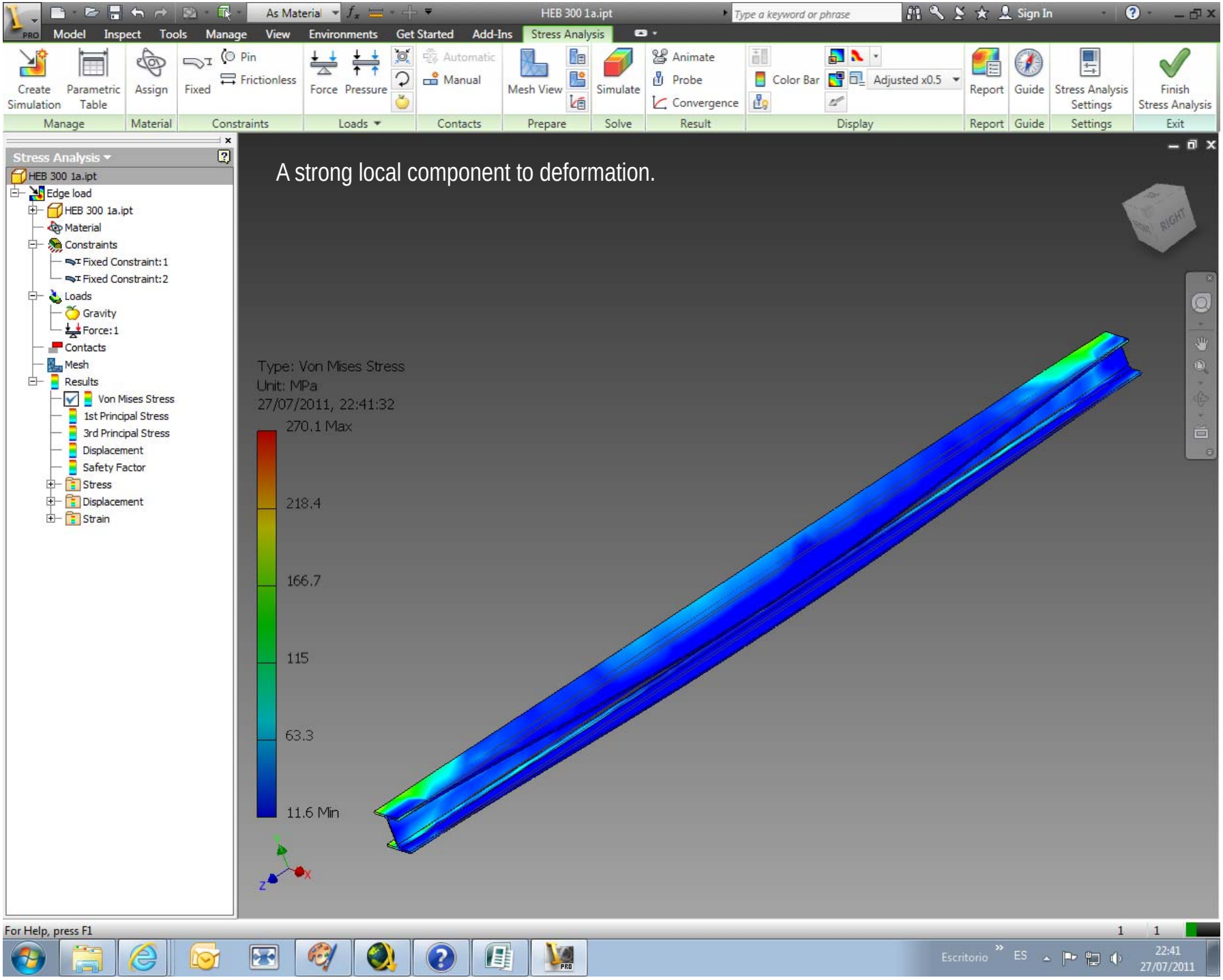
3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
Strain
Now the Edge Load of 21 tonne. The left arrow is gravity direction, and in not an impressive display of graphical expression (bump removed) the central load represents now the load distributed on the right top edge.
RIGHT
Ready
Escritorio
ES
22:43
27/07/2011


HEB 300 1a.ipt
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Stress Analysis
HEB 300 1a.ipt
Edge load
HEB 300 1a.ipt
Material
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Fixed Constraint:1
Fixed Constraint:2
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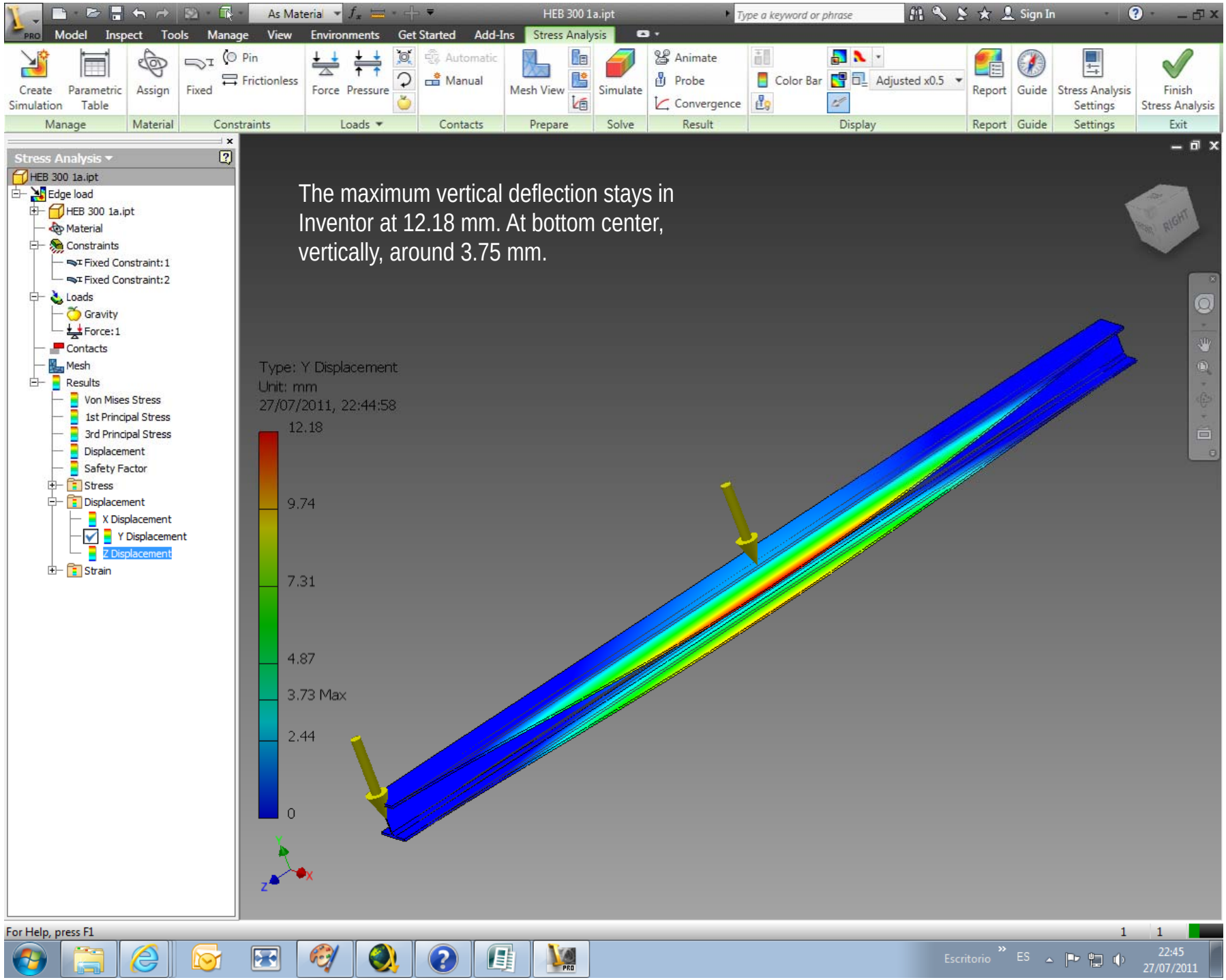
Force:1
Contacts
Mesh
Results
Von Mises Stress
1st Principal Stress
3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
Strain
A strong local component to deformation.
Type: Von Mises Stress
Unit: MPa
27/07/2011, 22:41:32
270.1 Max
218.4
166.7
115
63.3
11.6 Min
For Help, press F1
Escritorio
ES
22:41
27/07/2011


The maximum vertical deflection stays in Inventor at 12.18 mm. At bottom center, vertically, around 3.75 mm.
Type: Y Displacement
Unit: mm
27/07/2011, 22:44:58
12.18
9.74
7.31
4.87
3.73 Max
2.44
0
HEB 300 1a.ipt
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Stress Analysis
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Edge load
HEB 300 1a.ipt
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Fixed Constraint:2
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Gravity
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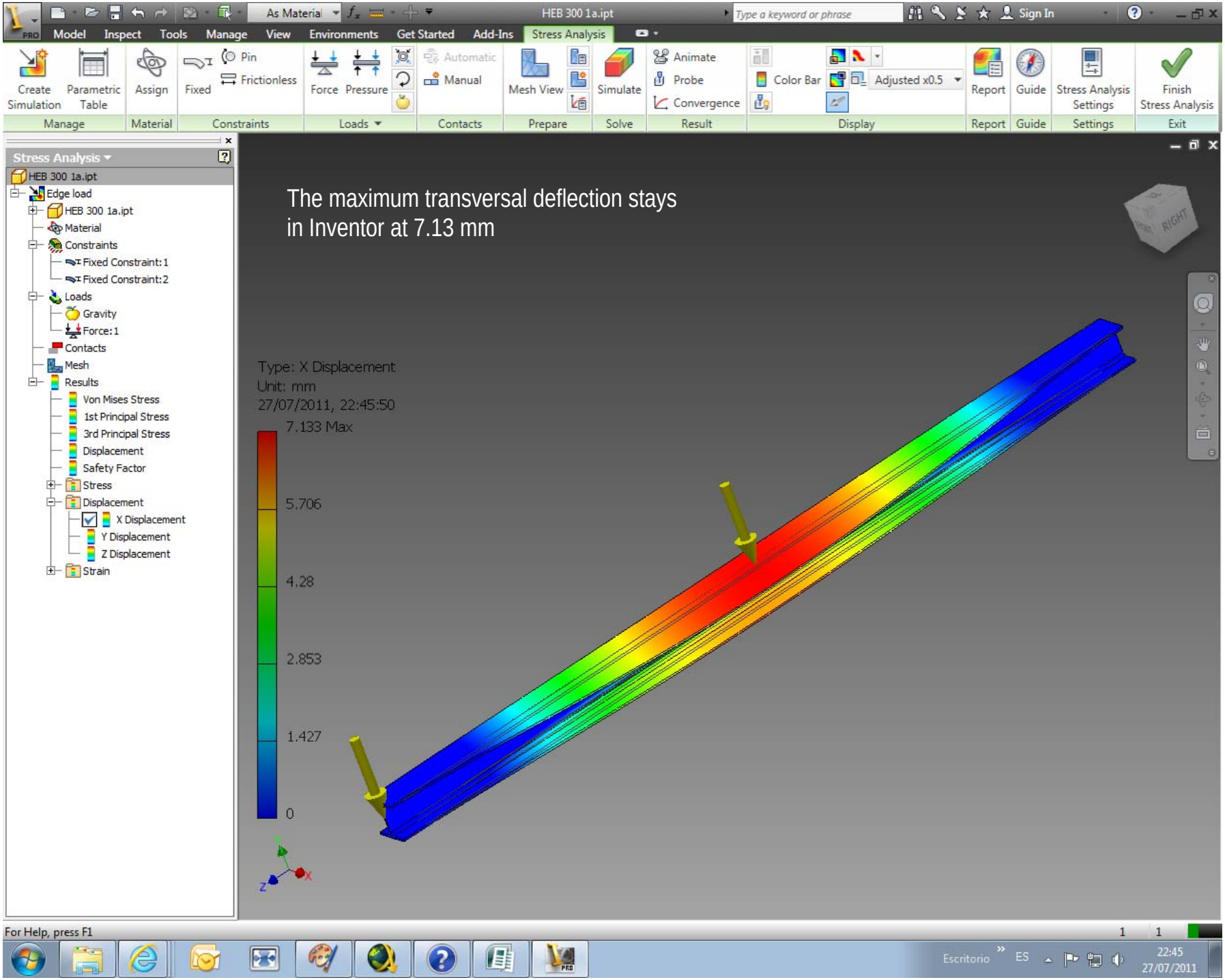
Results
Von Mises Stress
1st Principal Stress
3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
X Displacement
Y Displacement
Z Displacement
Strain
For Help, press F1
Escritorio
ES
22:45
27/07/2011


HEB 300 1a.ipt
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Parametric Table
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Automatic
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Mesh View
Simulate
Animate
Probe
Convergence
Color Bar
Adjusted x0.5
Report
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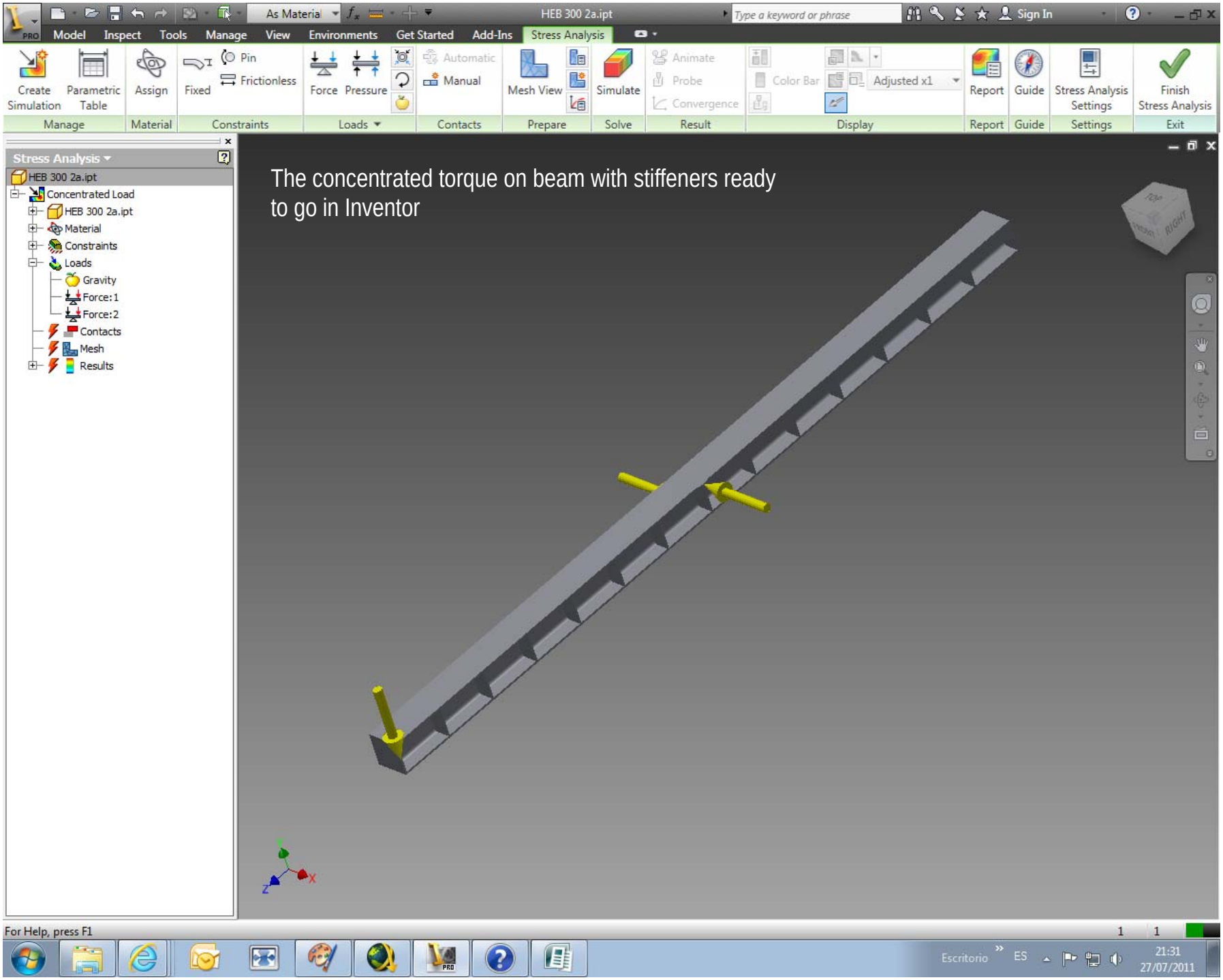
Stress Analysis
HEB 300 1a.ipt
Edge load
HEB 300 1a.ipt
Material
Constraints
Fixed Constraint:1
Fixed Constraint:2
Loads
Gravity
Force:1
Contacts
Mesh
Results
Von Mises Stress
1st Principal Stress
3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
X Displacement
Y Displacement
Z Displacement
Strain
The maximum transversal deflection stays in Inventor at 7.13 mm
Type: X Displacement
Unit: mm
27/07/2011, 22:45:50
7.133 Max
5.706
4.28
2.853
1.427
0
RIGHT
For Help, press F1
Escritorio
ES
22:45
27/07/2011


As Material
HEB 300 2a.ipt
Type a keyword or phrase
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Stress Analysis
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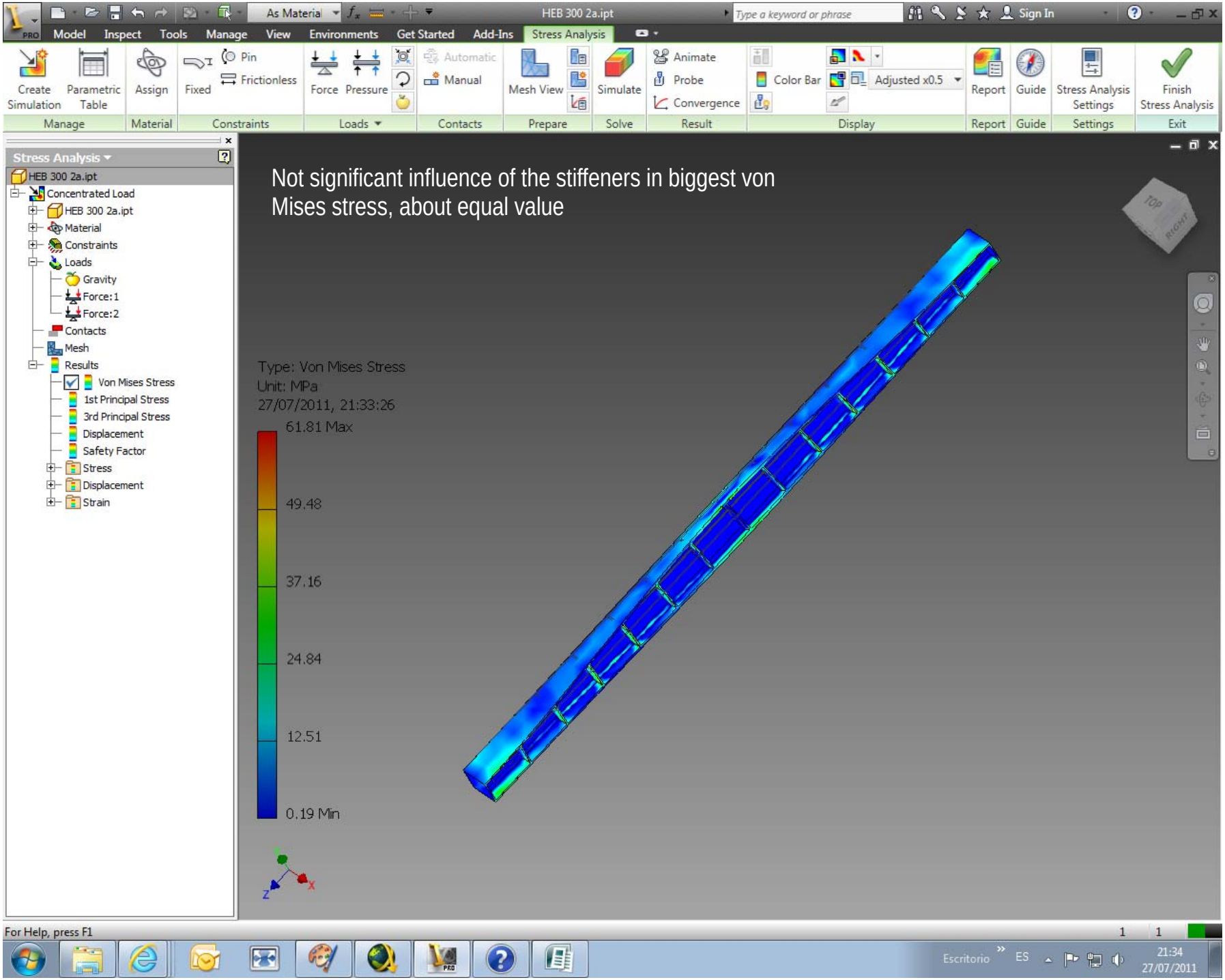
Stress Analysis
HEB 300 2a.ipt
Concentrated Load
HEB 300 2a.ipt
Material
Constraints
Loads
Gravity
Force:1
Force:2
Contacts
Mesh
Results
The concentrated torque on beam with stiffeners ready to go in Inventor
For Help, press F1
Escritorio
ES
21:31
27/07/2011


Not significant influence of the stiffeners in biggest von Mises stress, about equal value
Type: Von Mises Stress
Unit: MPa
27/07/2011, 21:33:26
61.81 Max
49.48
37.16
24.84
12.51
0.19 Min
HEB 300 2a.ipt
Concentrated Load
Material
Constraints
Loads
Gravity
Force:1
Force:2
Contacts
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Von Mises Stress
1st Principal Stress
3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
Strain
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Parametric Table
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Automatic
Manual
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Adjusted x0.5
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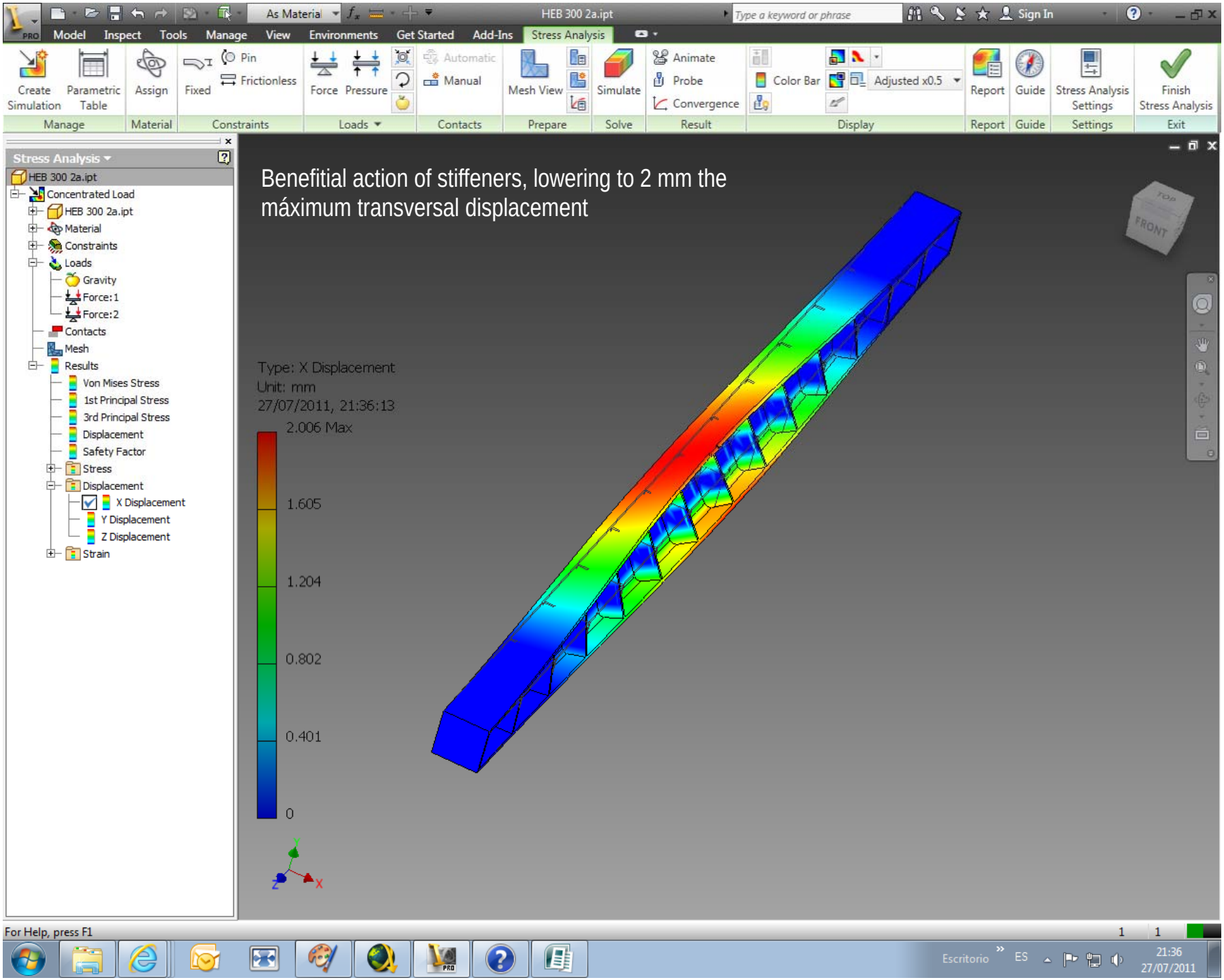
Exit
For Help, press F1


HEB 300 2a.ipt
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Stress Analysis
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Concentrated Load
HEB 300 2a.ipt
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Gravity
Force:1
Force:2
Contacts
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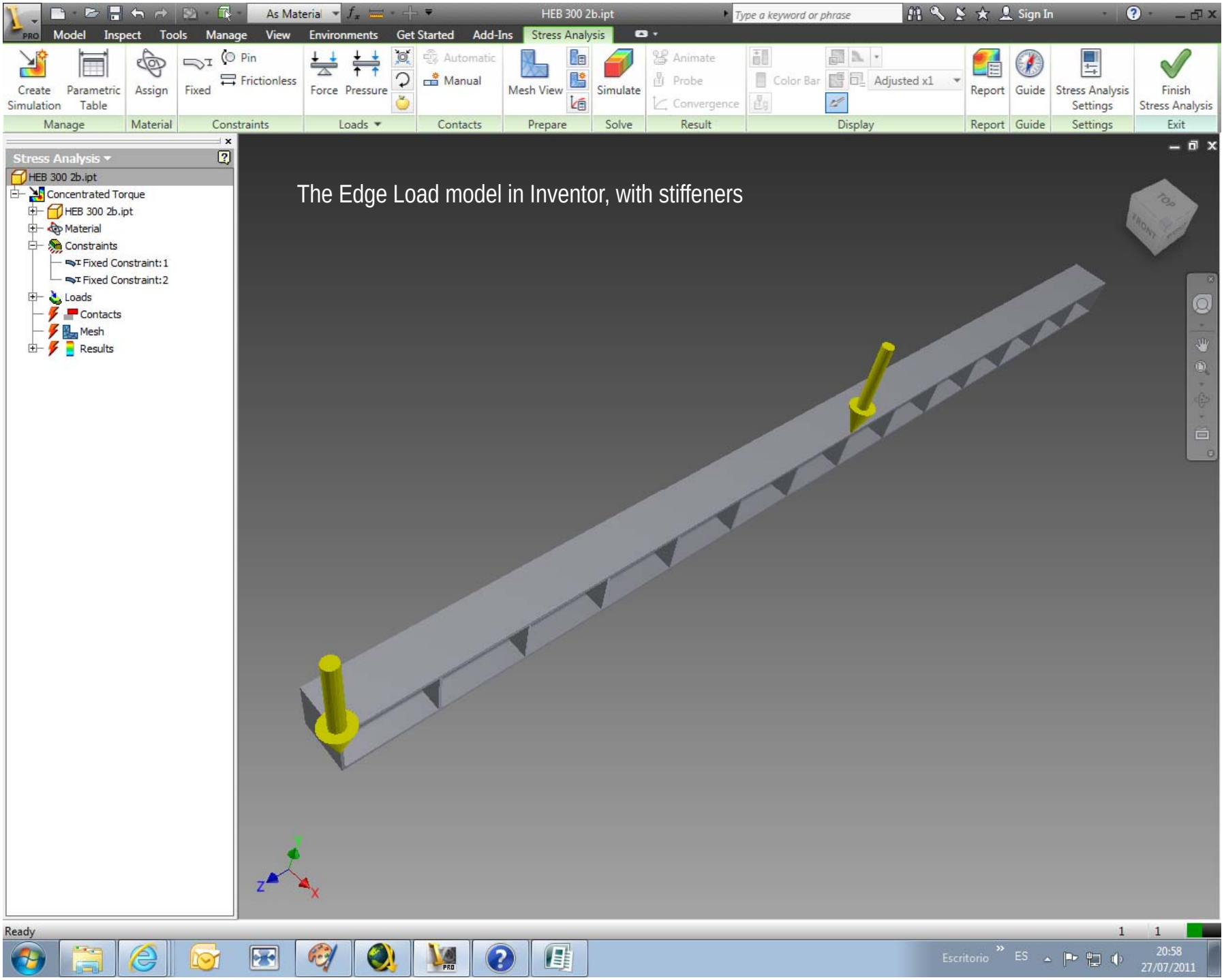
Von Mises Stress
1st Principal Stress
3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
X Displacement
Y Displacement
Z Displacement
Strain
Benefitial action of stiffeners, lowering to 2 mm the máximum transversal displacement
Type: X Displacement
Unit: mm
27/07/2011, 21:36:13
2.006 Max
1.605
1.204
0.802
0.401
0
FRONT
For Help, press F1
Escritorio
ES
21:36
27/07/2011


HEB 300 2b.ipt
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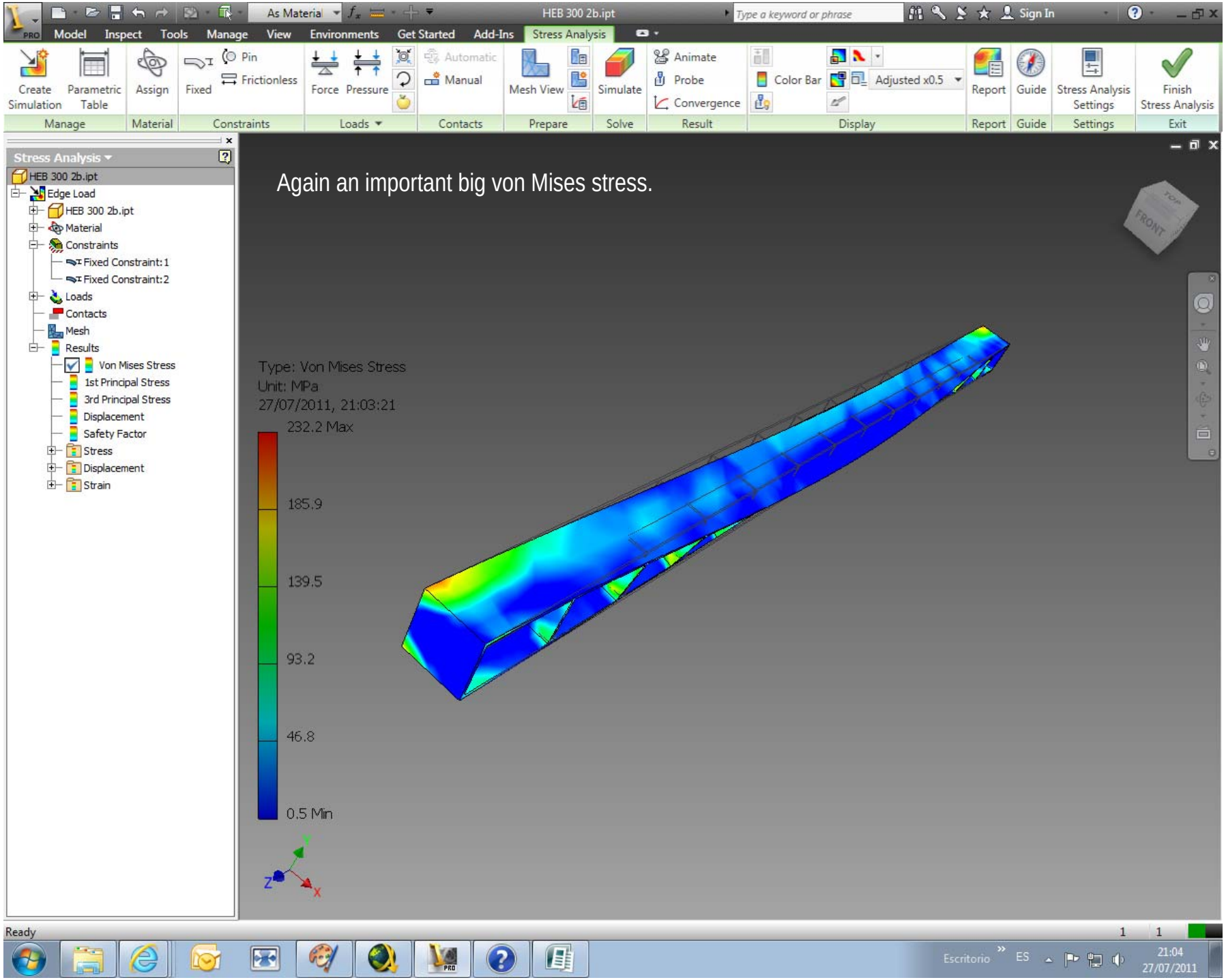
Stress Analysis
HEB 300 2b.ipt
Concentrated Torque
HEB 300 2b.ipt
Material
Constraints
Fixed Constraint:1
Fixed Constraint:2
Loads
Contacts
Mesh
Results
The Edge Load model in Inventor, with stiffeners
Ready
Escritorio
ES
20:58
27/07/2011


HEB 300 2b.ipt
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Adjusted x0.5
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Fixed Constraint:2
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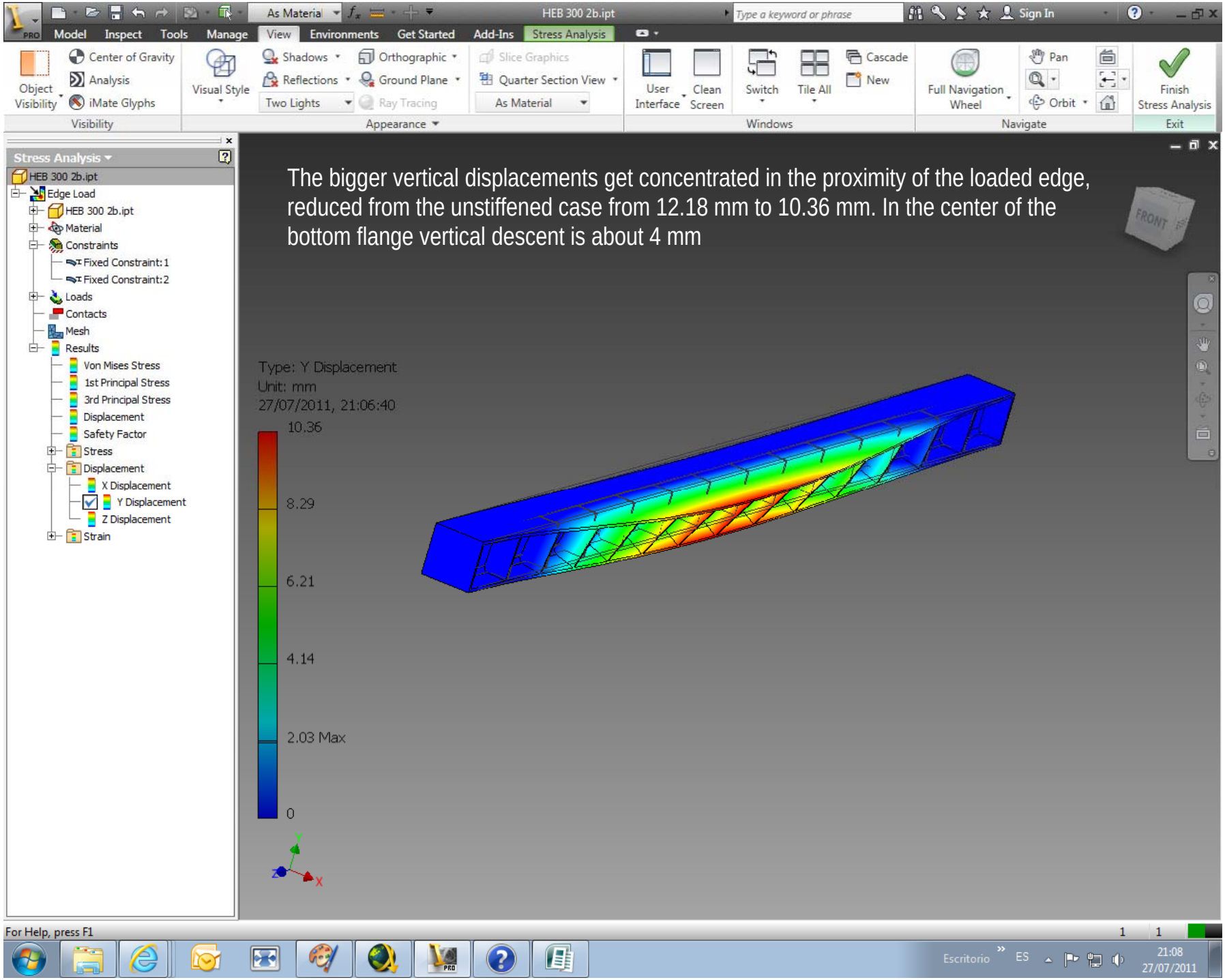
Results
Von Mises Stress
1st Principal Stress
3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
Strain
Again an important big von Mises stress.
Type: Von Mises Stress
Unit: MPa
27/07/2011, 21:03:21
232.2 Max
185.9
139.5
93.2
46.8
0.5 Min
Ready
Escritorio
ES
21:04
27/07/2011


HEB 300 2b.ipt
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iMate Glyphs
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Ground Plane
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Displacement
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Displacement
X Displacement
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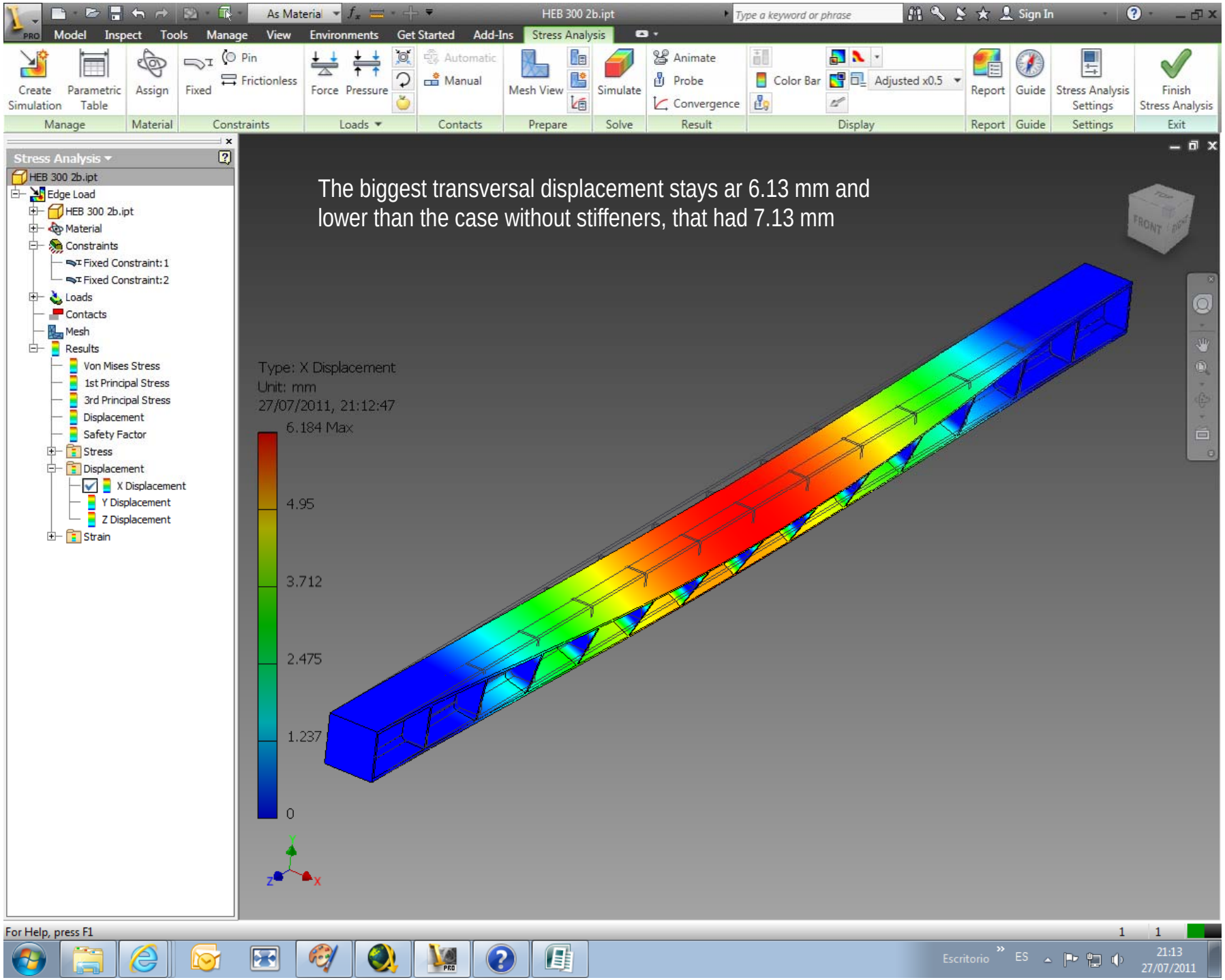
Z Displacement
Strain
The bigger vertical displacements get concentrated in the proximity of the loaded edge, reduced from the unstiffened case from 12.18 mm to 10.36 mm. In the center of the bottom flange vertical descent is about 4 mm
FRONT
Type: Y Displacement
Unit: mm
27/07/2011, 21:06:40
10.36
8.29
6.21
4.14
2.03 Max
0
Y
Z
X
For Help, press F1
Escritorio
ES
21:08
27/07/2011


HEB 300 2b.ipt
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HEB 300 2b.ipt
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Von Mises Stress
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3rd Principal Stress
Displacement
Safety Factor
Stress
Displacement
X Displacement
Y Displacement
Z Displacement
Strain
The biggest transversal displacement stays ar 6.13 mm and
lower than the case without stiffeners, that had 7.13 mm
Type: X Displacement
Unit: mm
27/07/2011, 21:12:47
6.184 Max
4.95
3.712
2.475
1.237
0
FRONT
For Help, press F1
Escritorio
ES
21:13
27/07/2011

CONCENTRATED TORQUE MODEL		AS	RISA 3D	SAP2000	INVENTOR
MAXIMUM DETECTED VON MISES STRESS Mpa	WITHOUT STIFFENERS	14	44	46	55
MAXIMUM DETECTED VON MISES STRESS Mpa	WITH STIFFENERS	46	39.9	46	61
MAXIMUM TRANSVERSAL DEFLECTION mm	WITHOUT STIFFENERS	0.32	2.78	2.3	2.4
MAXIMUM TRANSVERSAL DEFLECTION mm	WITH STIFFENERS	2.08	2.19	2.2	2

EDGE LOAD MODEL		AS MODEL	RISA 3D MODEL	SAP2000	INVENTOR
MAXIMUM DETECTED VON MISES STRESS Mpa	WITHOUT STIFFENERS	79	257		270
MAXIMUM DETECTED VON MISES STRESS Mpa	WITH STIFFENERS	202	196		232
MAXIMUM VERTICAL DEFLECTION mm	WITHOUT STIFFENERS	4	16		12.18
MAXIMUM VERTICAL DEFLECTION mm	WITH STIFFENERS	9	12		10.36
MAXIMUM TRANSVERSAL DEFLECTION mm	WITHOUT STIFFENERS	0.13	8.12		7.13
MAXIMUM TRANSVERSAL DEFLECTION mm	WITH STIFFENERS	4.55	6.41		6.13