Four horns support system – update

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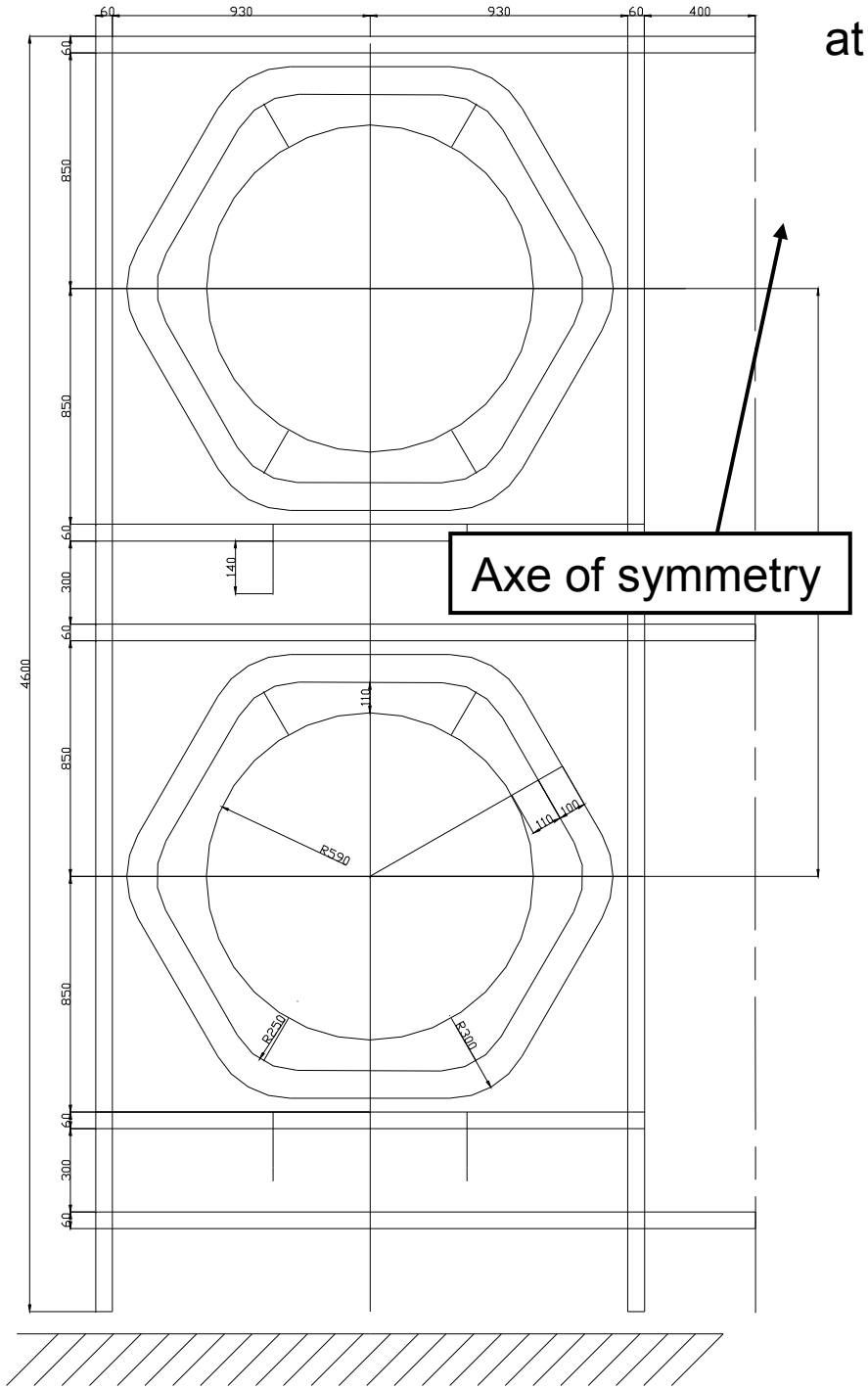


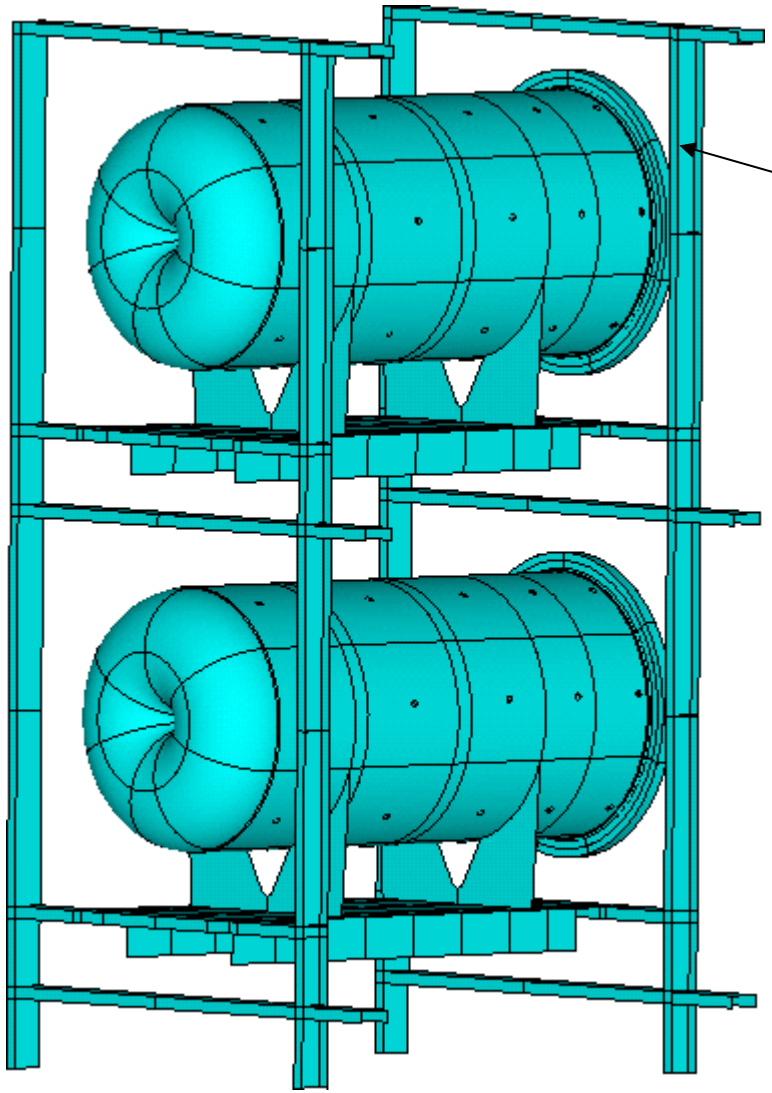
at present

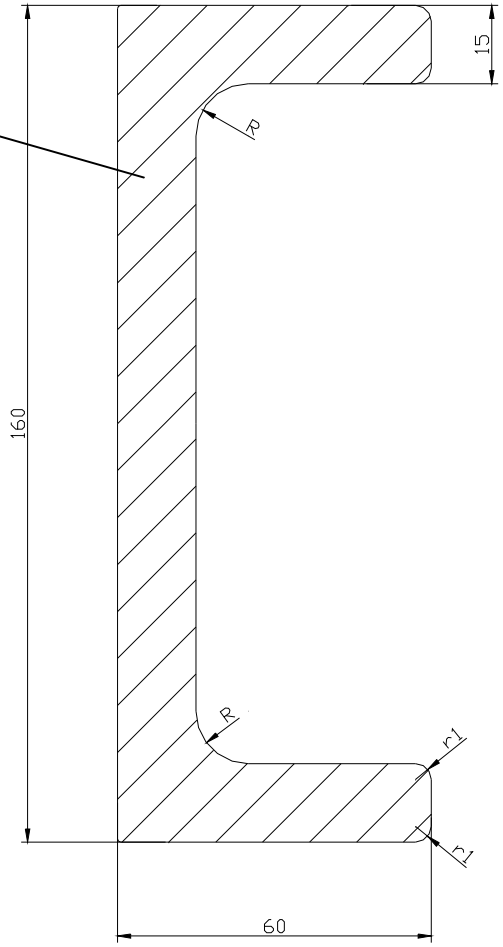
1. Total height: H = 4300 [*mm*]
2. Distance between horn centres (horiz. and vert.): L = 2000 [*mm*]
3. Distance between frames: B = 235 [*mm*]
4. Width of the cell for single horn: C = 2 x 830 [*mm*]
5. Height of the cell for single horn: J = 2 x 830 [*mm*]

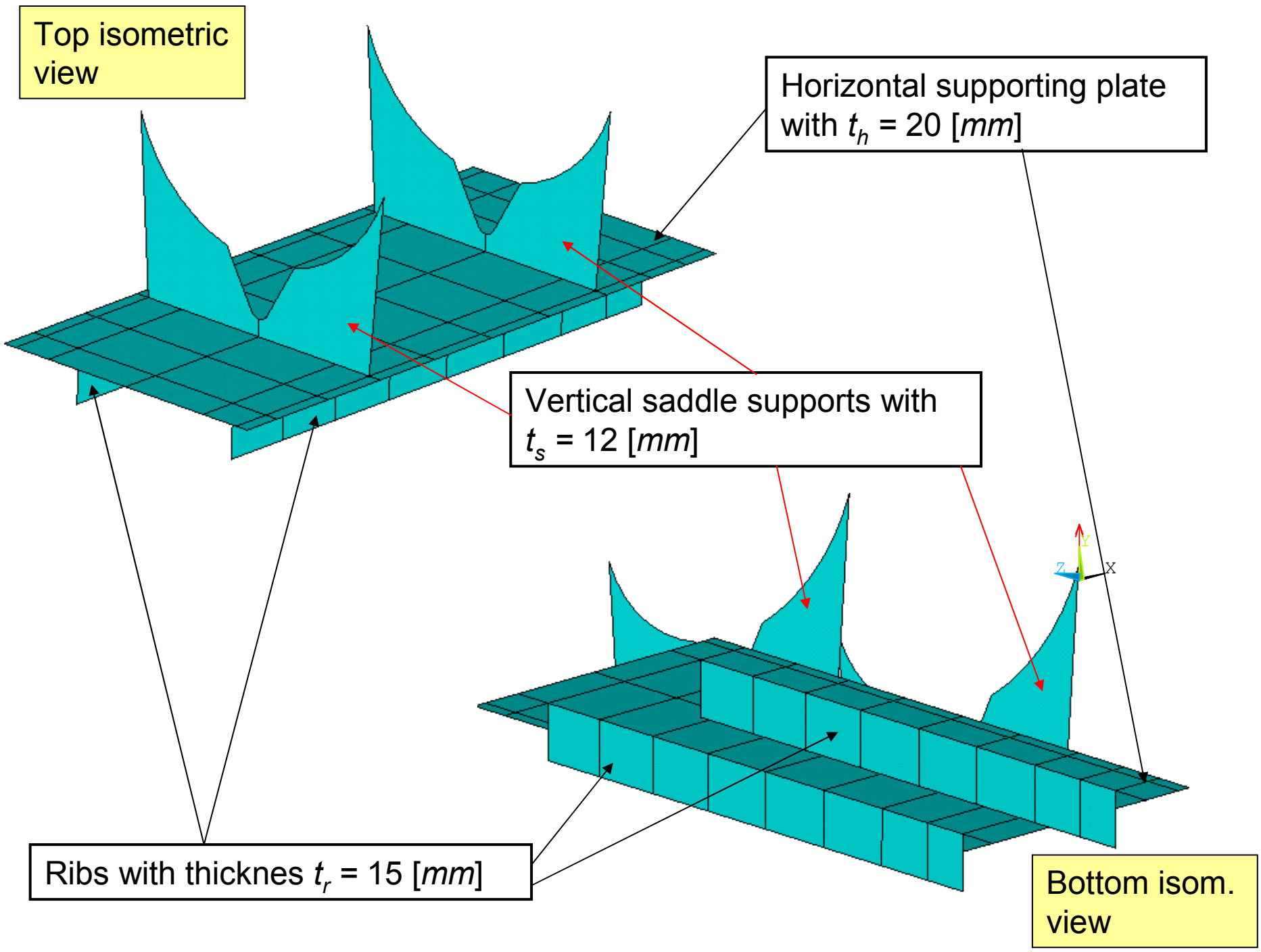
previously

1. Total height: H = 4600 [*mm*]
2. Distance between horn centres: L = 2120
3. Distance between frames: B = 2 x 400 [*mm*]
4. Width of the cell for single horn: C = 2 x 930 [*mm*]
5. Height of the cell for single horn: J = 2 x 850 [*mm*]

Standard aluminium channel section for frame structure



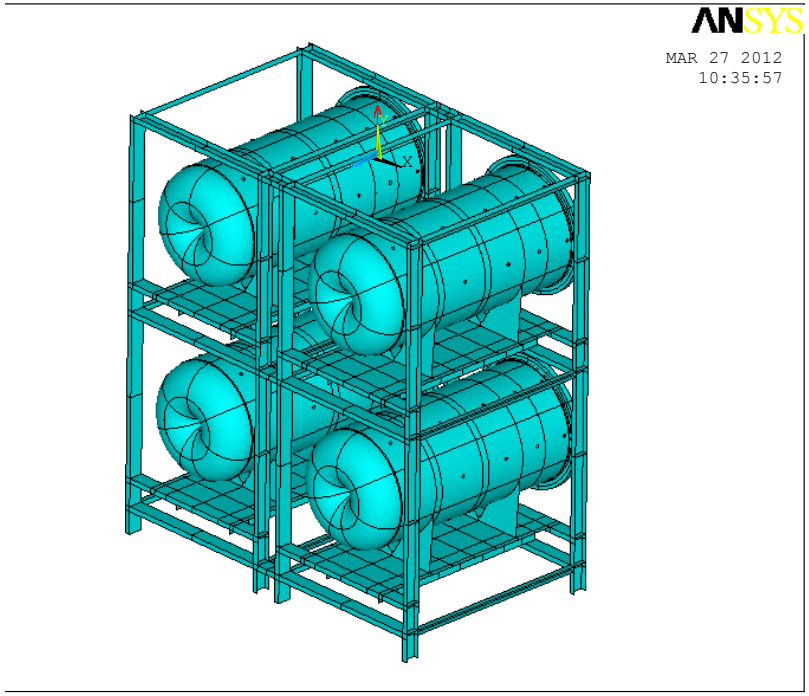


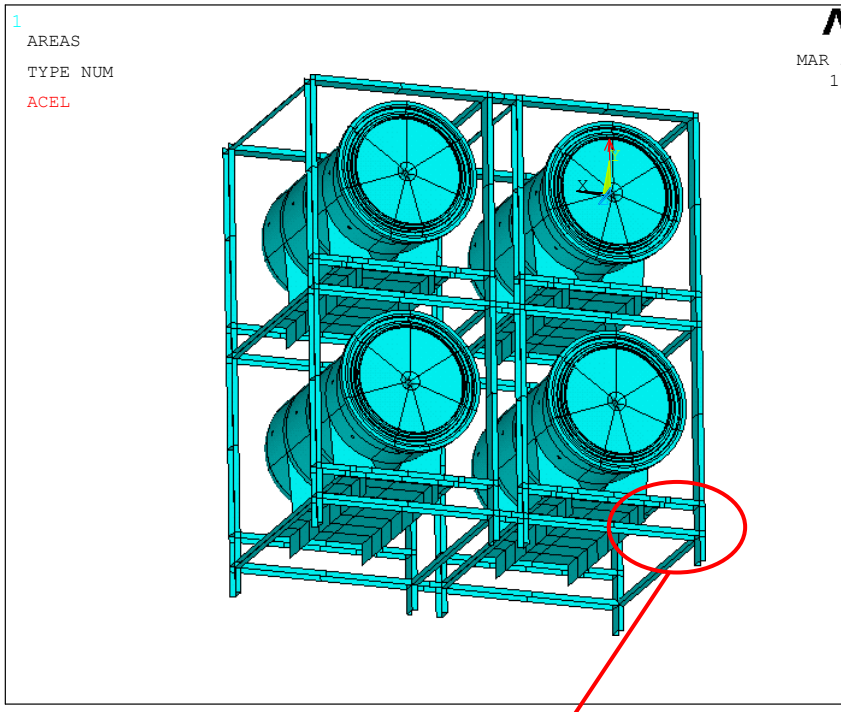

Top isometric view
Horizontal supporting plate with t_h = 20 [mm]
Vertical saddle supports with t_s = 12 [mm]
Ribs with thicknes t_r = 15 [mm]
Bottom isom. view
Y
Z
X

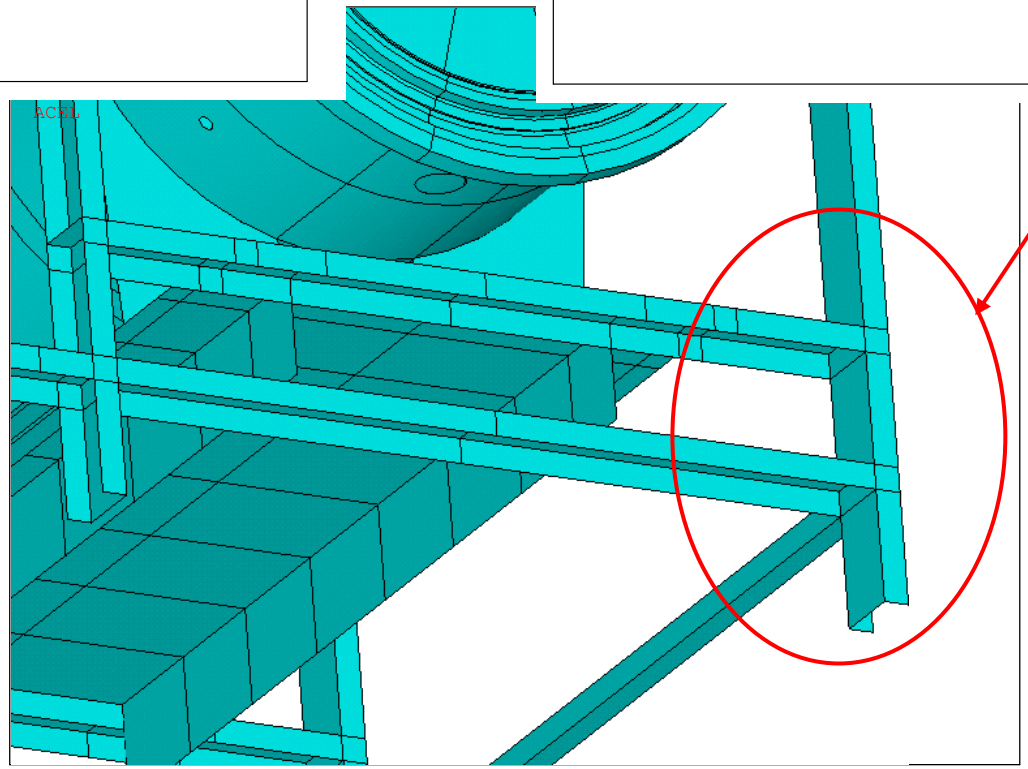
Full structure with longitudinal spans, supported on the top,

Results in slides: 8 – 17 (load: deadweight)

Results in slides: 19 – 27 (load: deadweight + hydrostatic pressure)





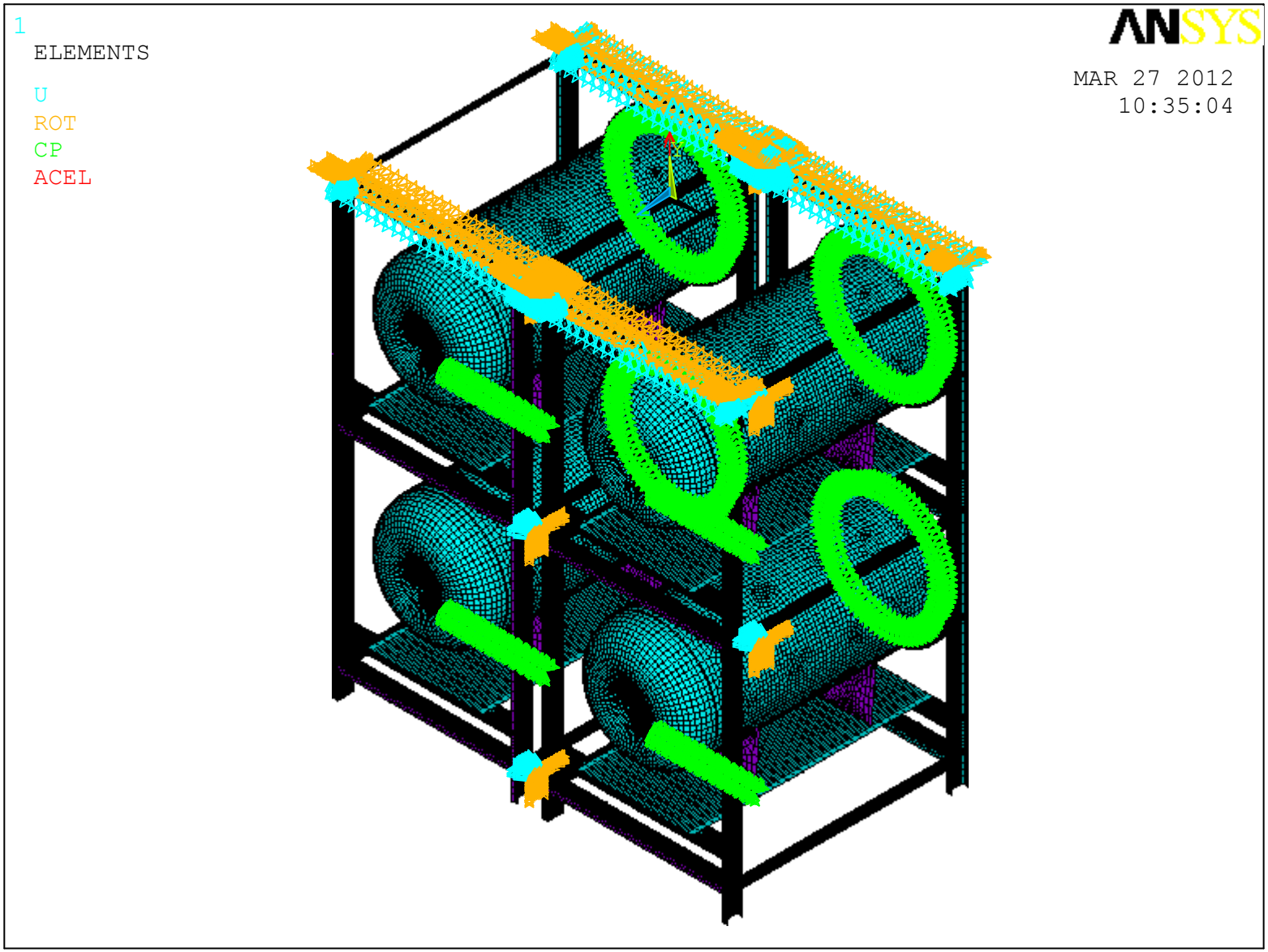


Total mass:

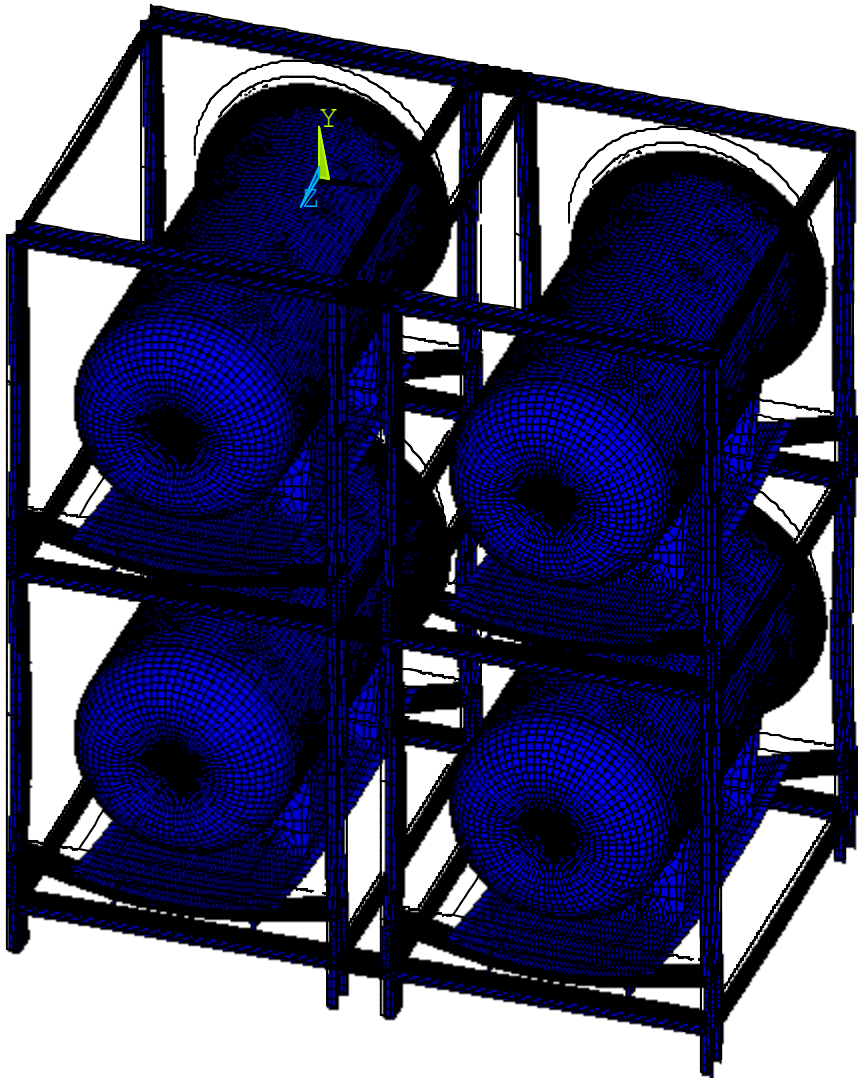
2850 [*kg*]

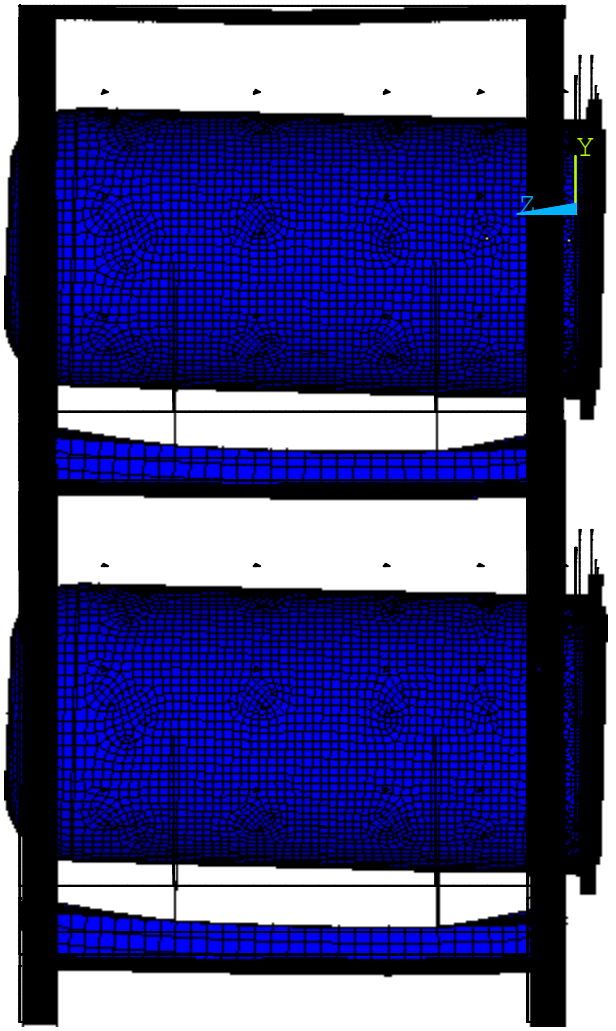
Mass of support system:

1560 [*kg*]

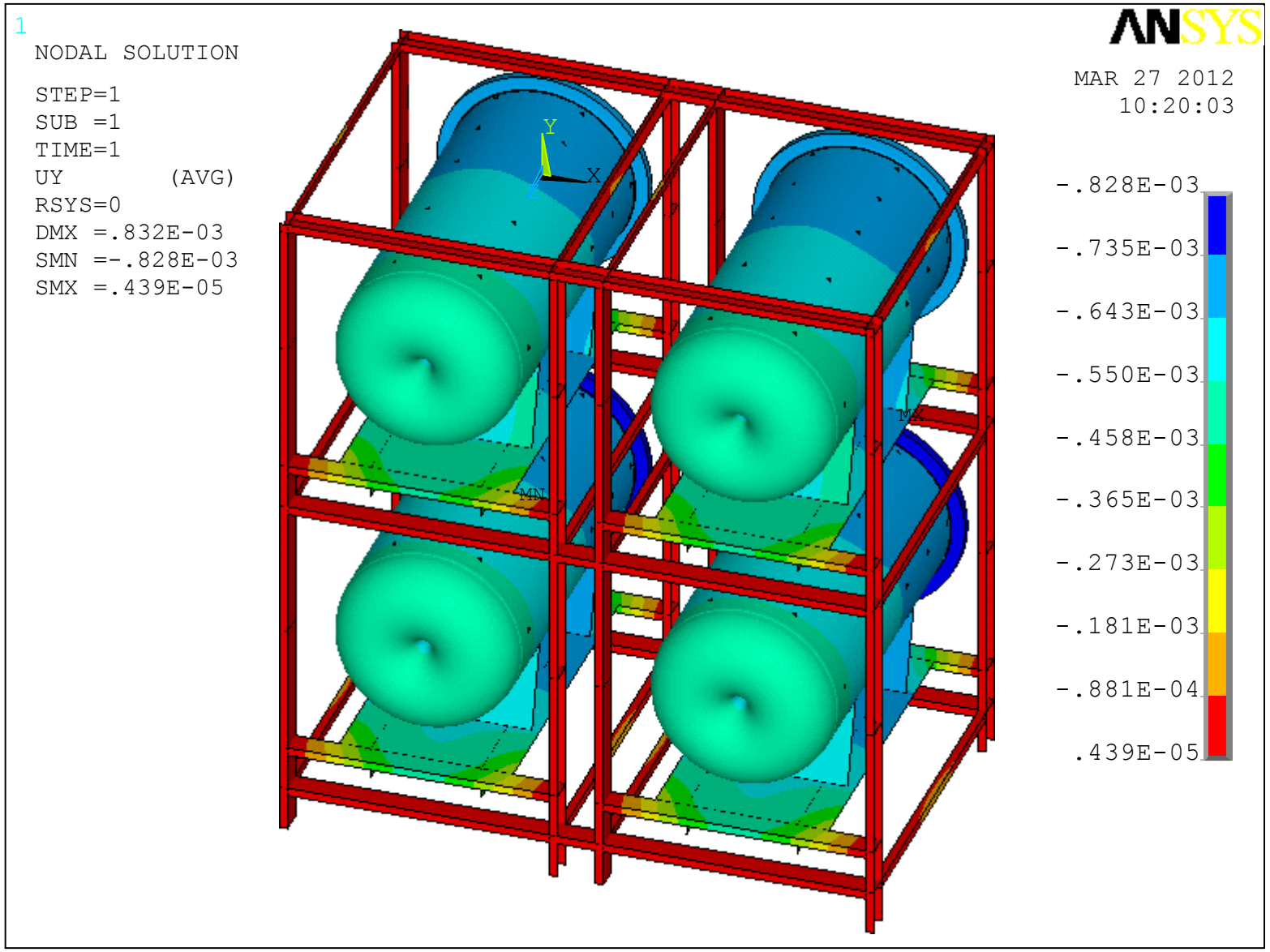


Isometric view of mesh with boundary conditions introduced

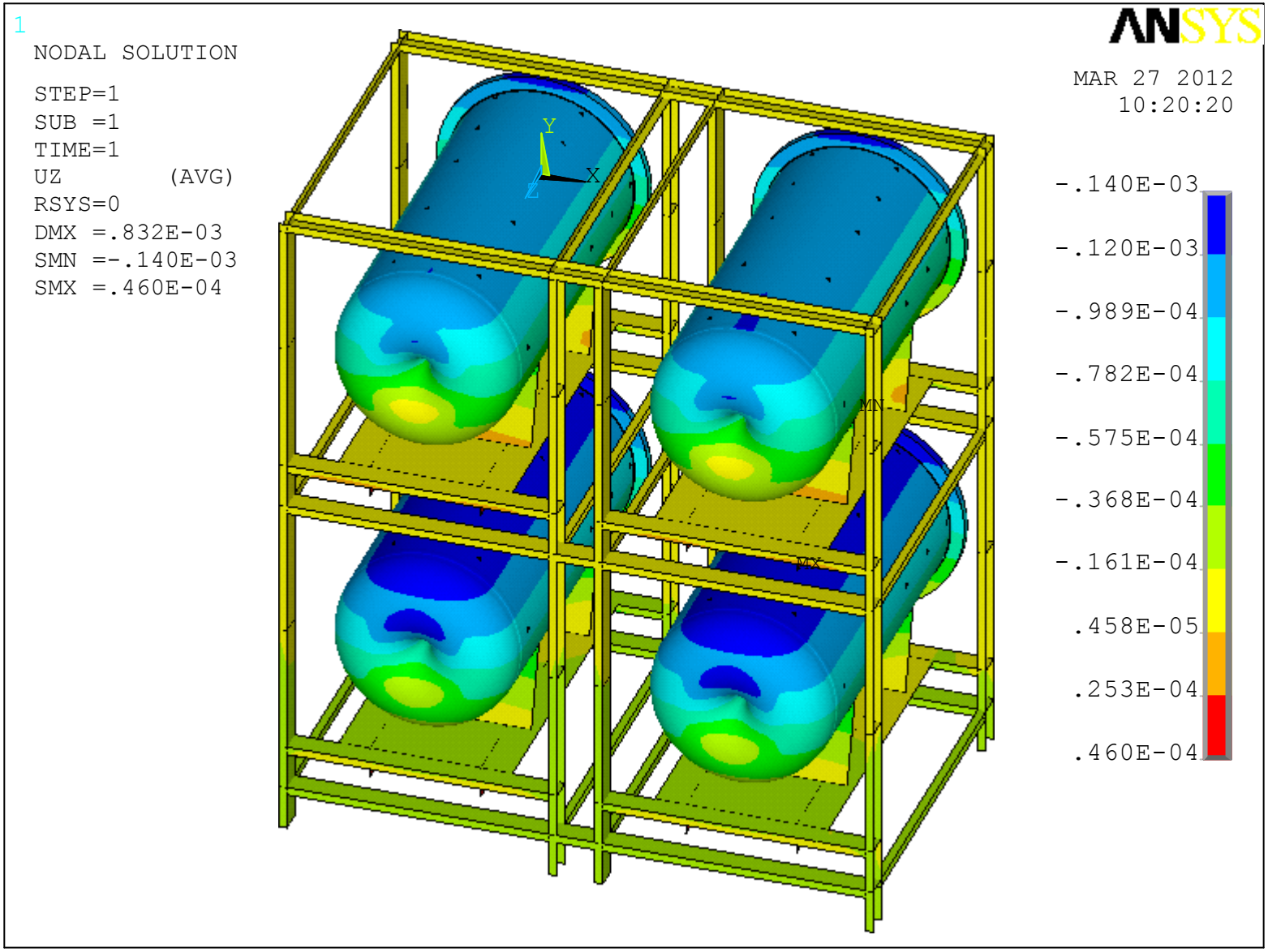




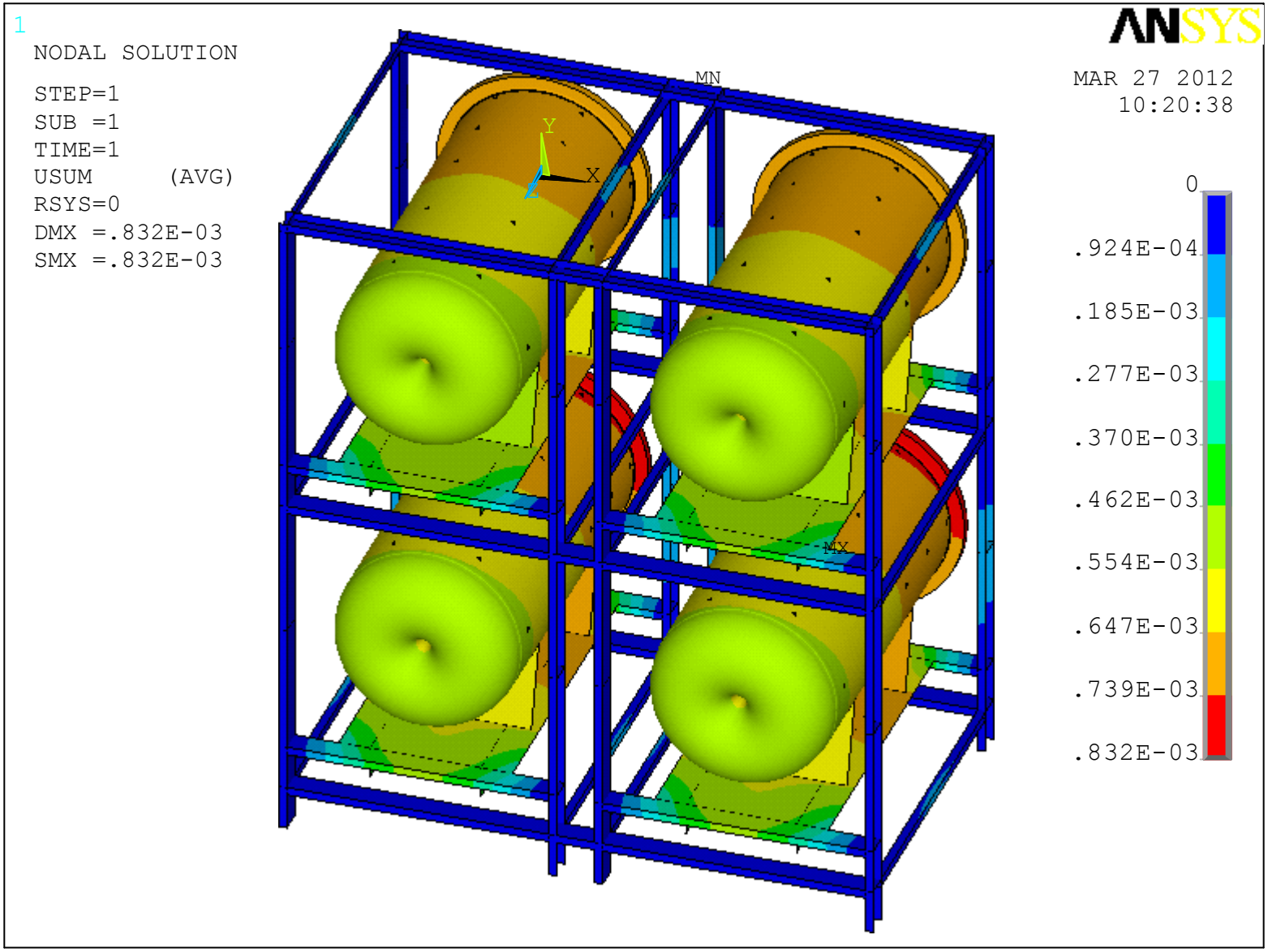
Deformation of structure under deadweight – not to scale drawing



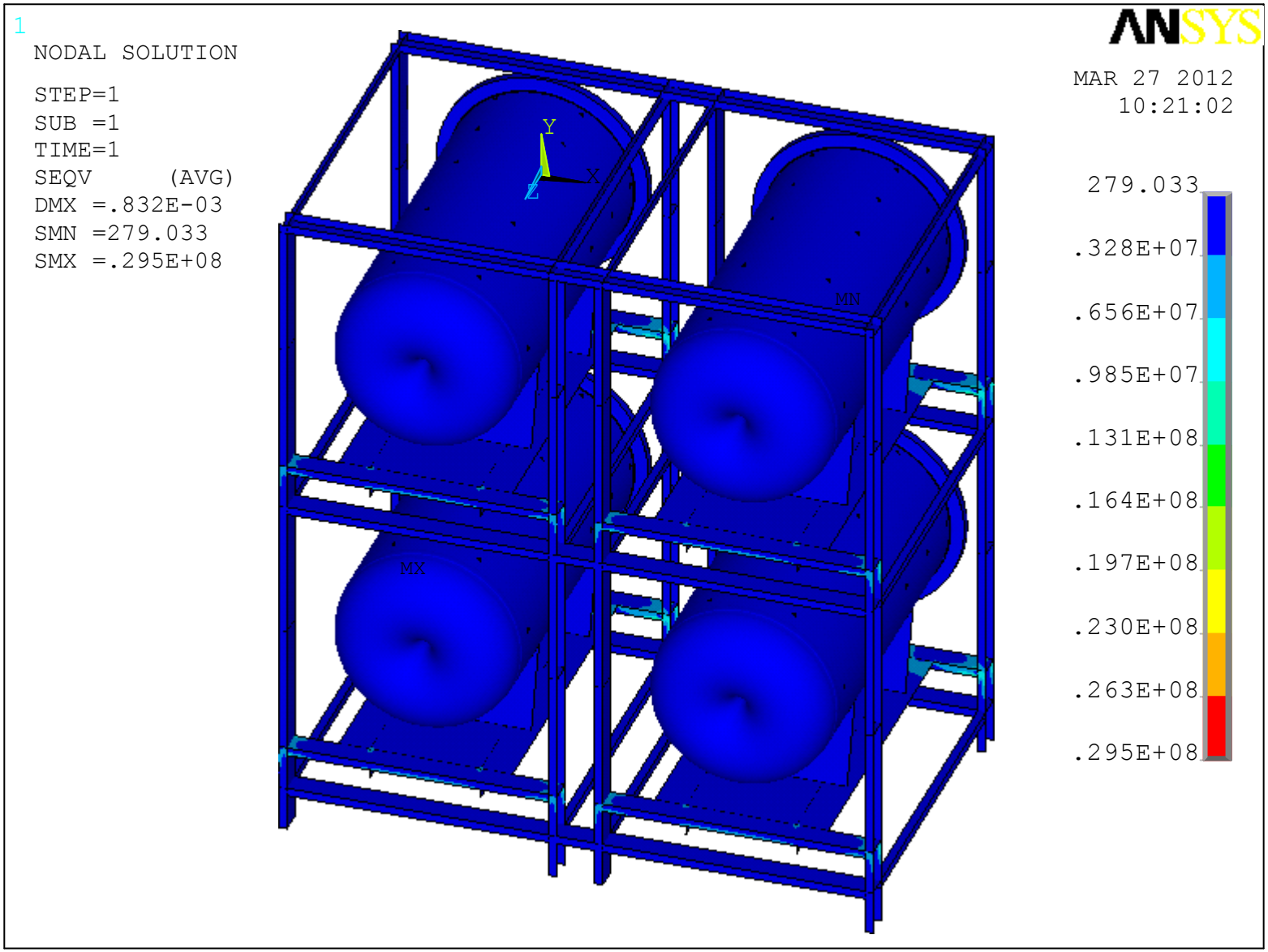
Uy displacement in [*m*]



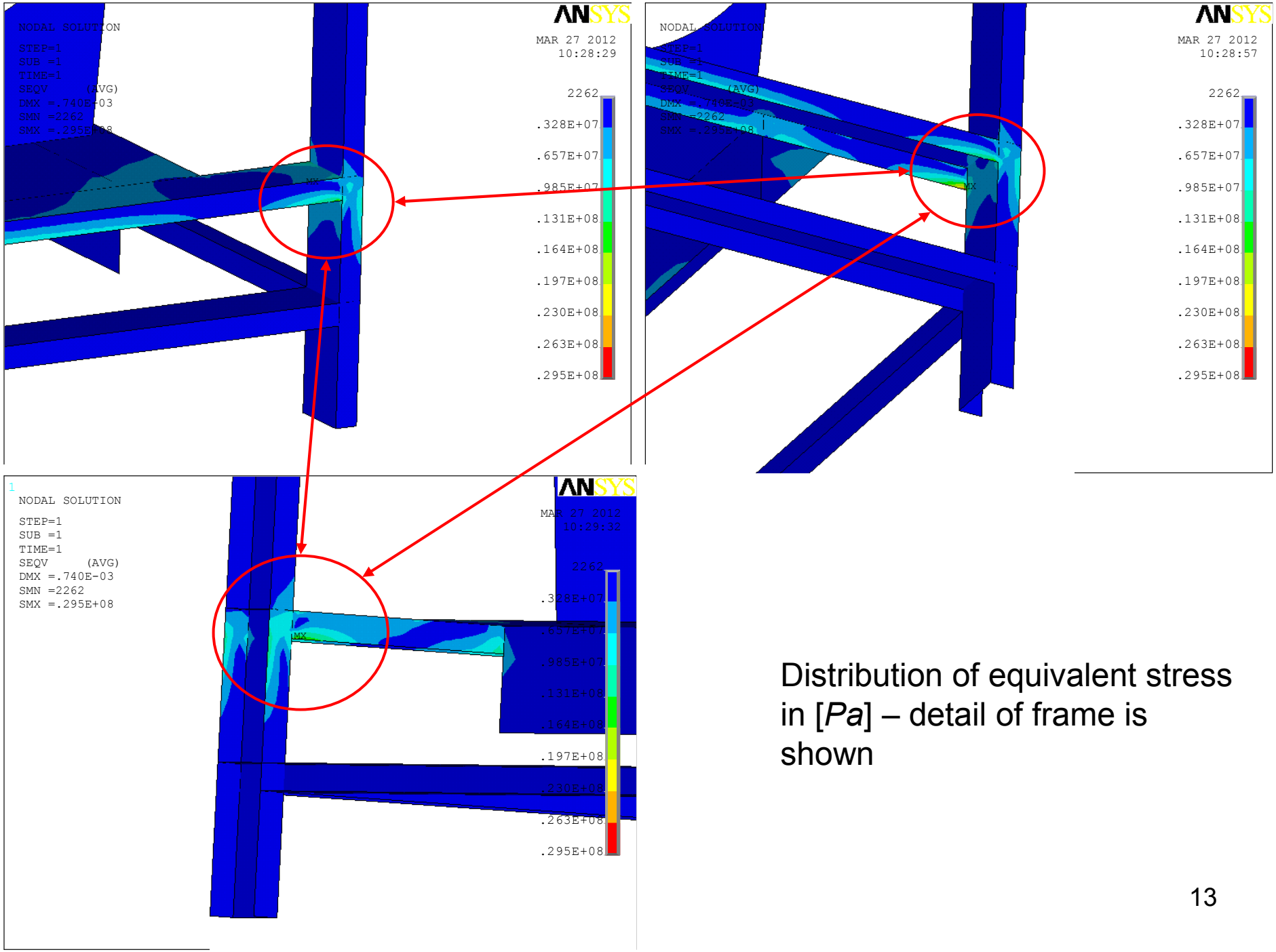
Uz displacement in [*m*]



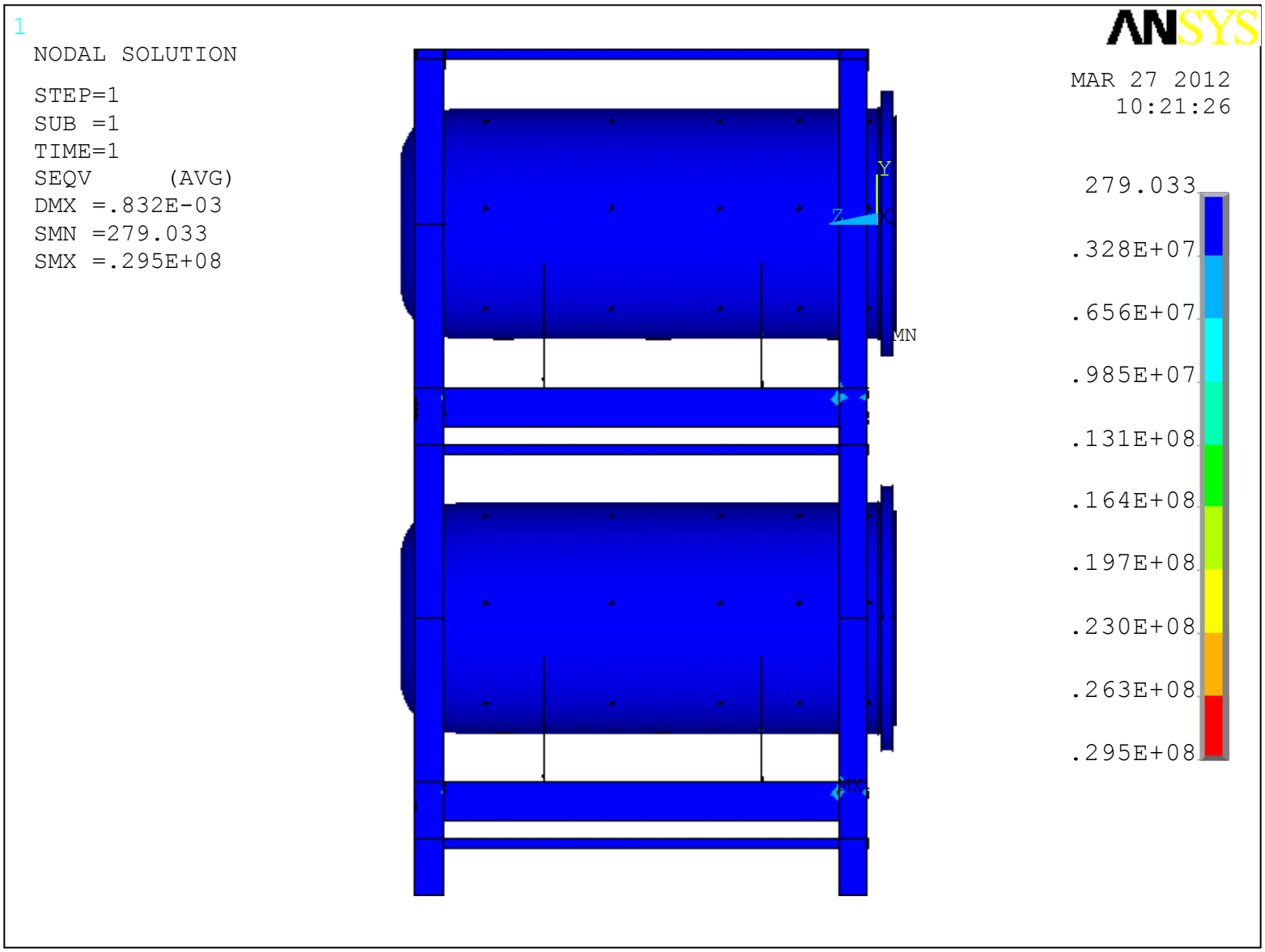
Us vector of displacements in [*m*]



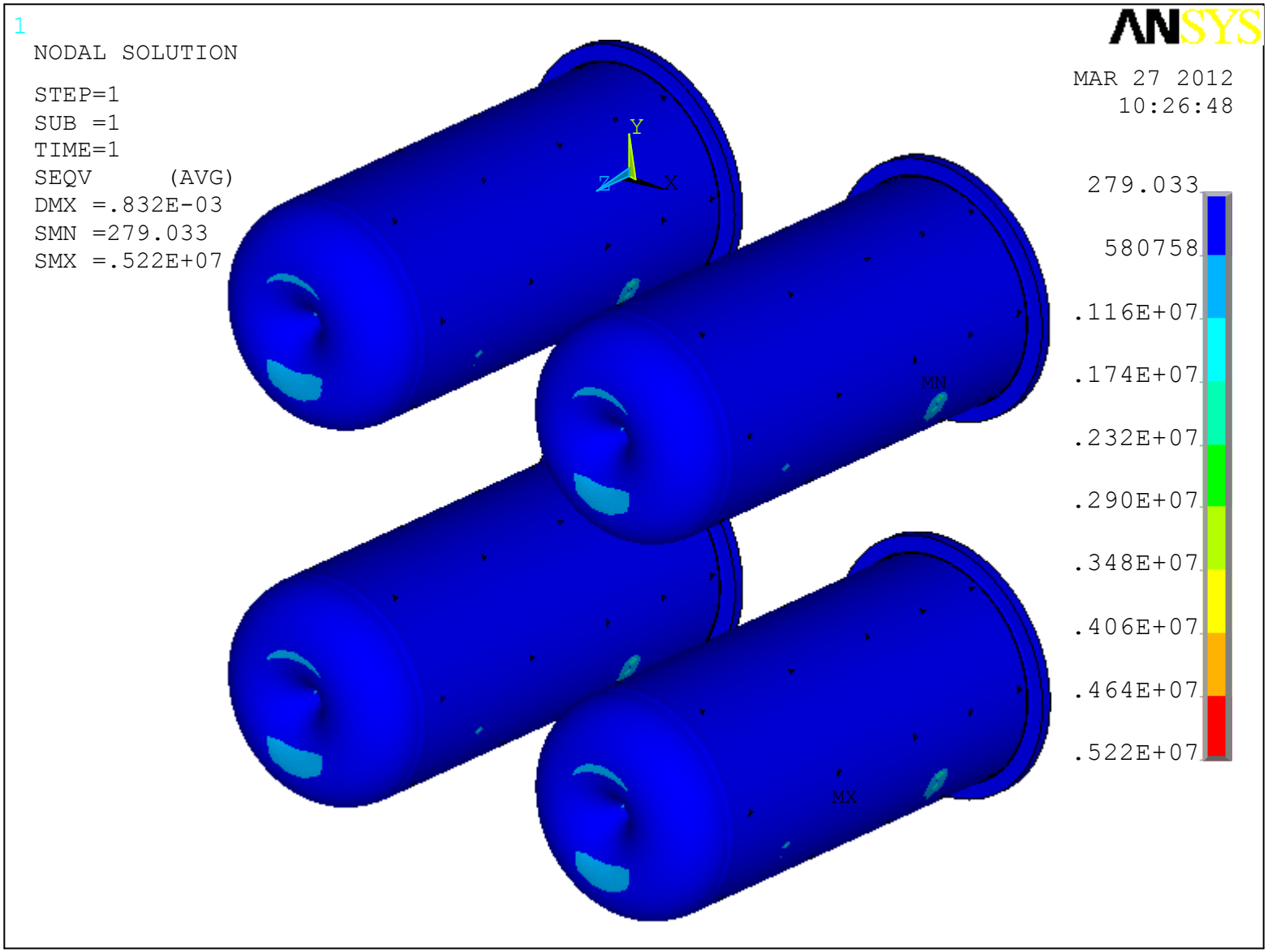
Distribution of equivalent stress in [*Pa*]



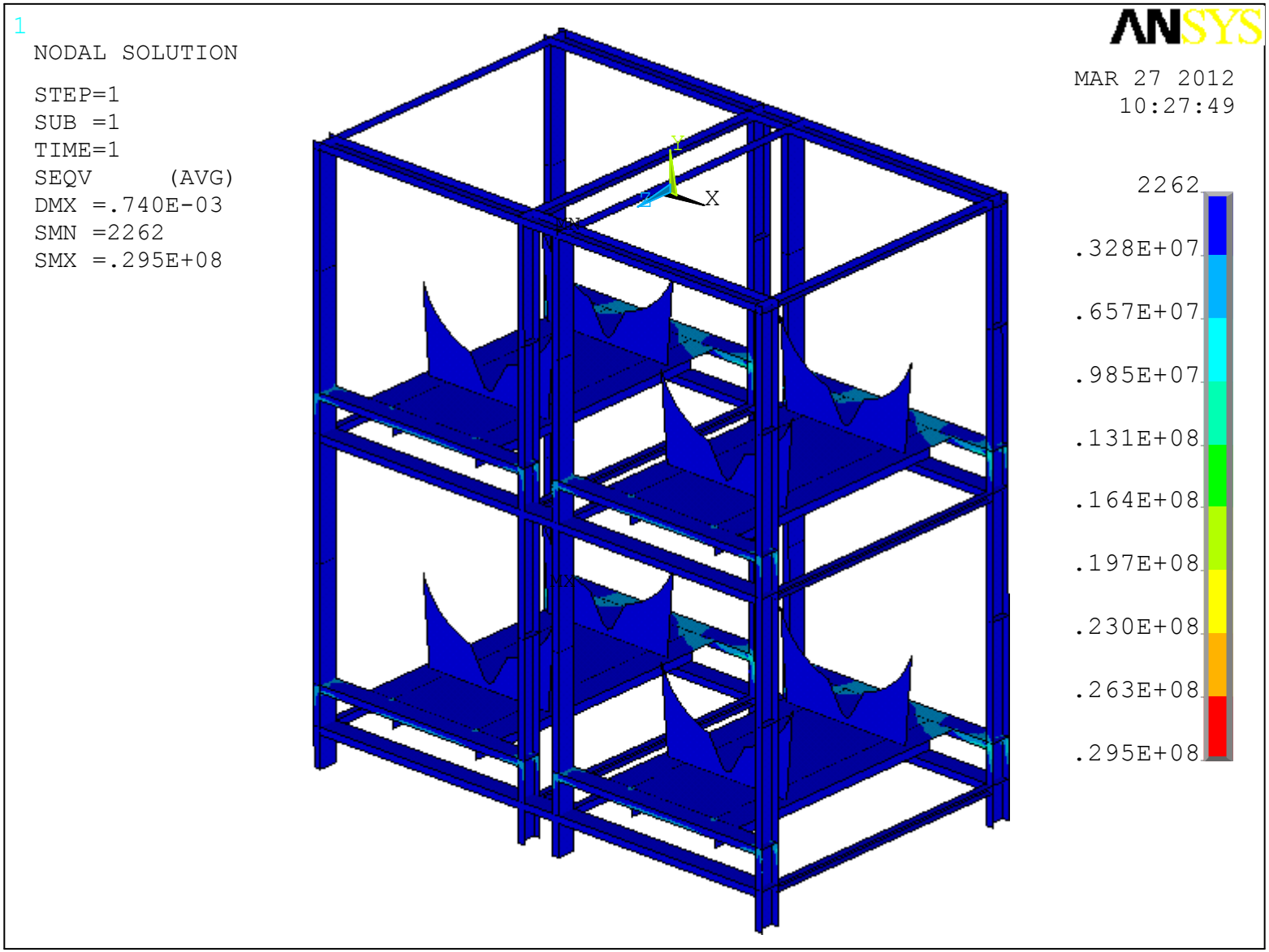
Distribution of equivalent stress in [*Pa*] – detail of frame is shown



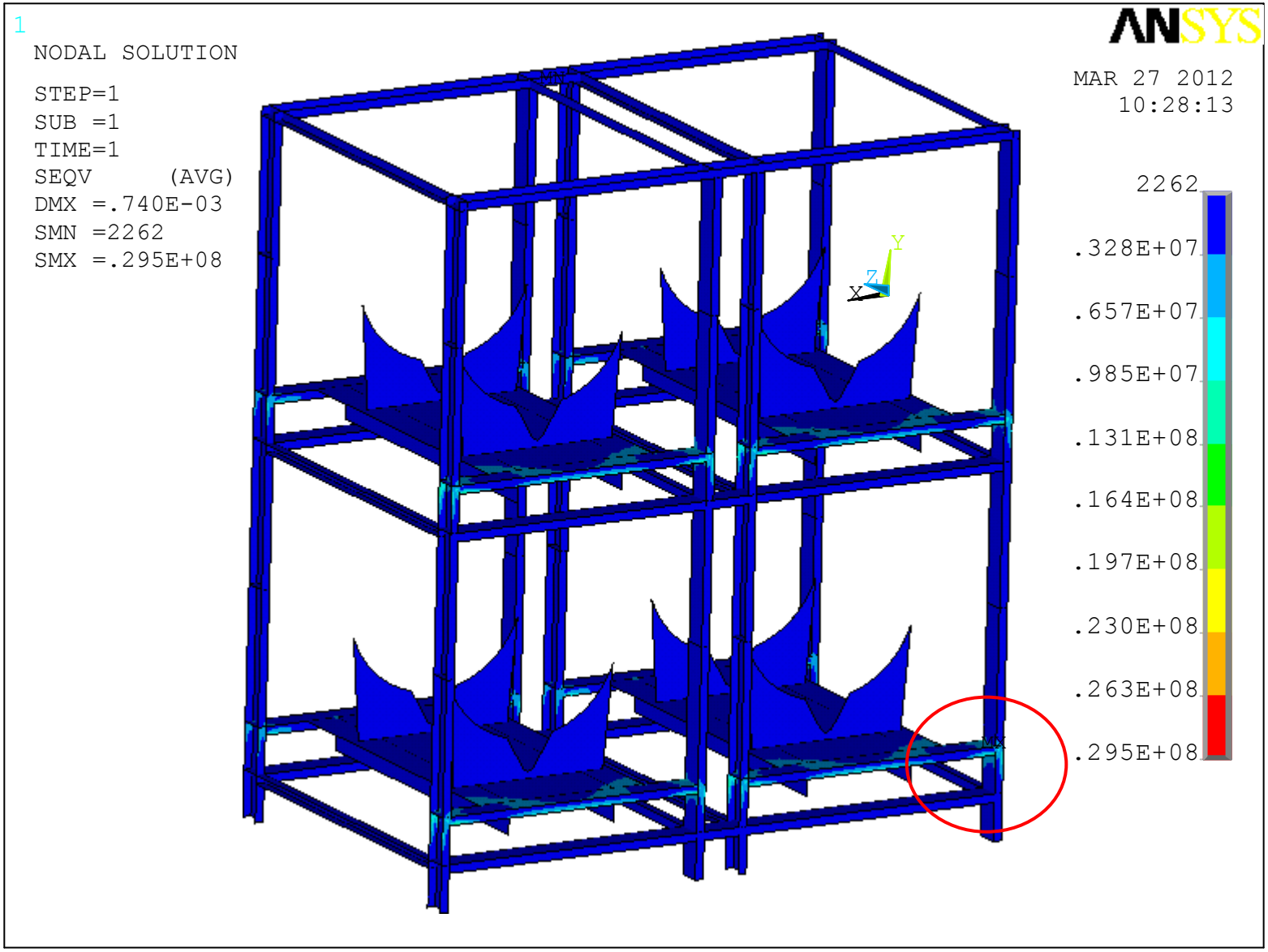
Distribution of equivalent stress in [*Pa*]



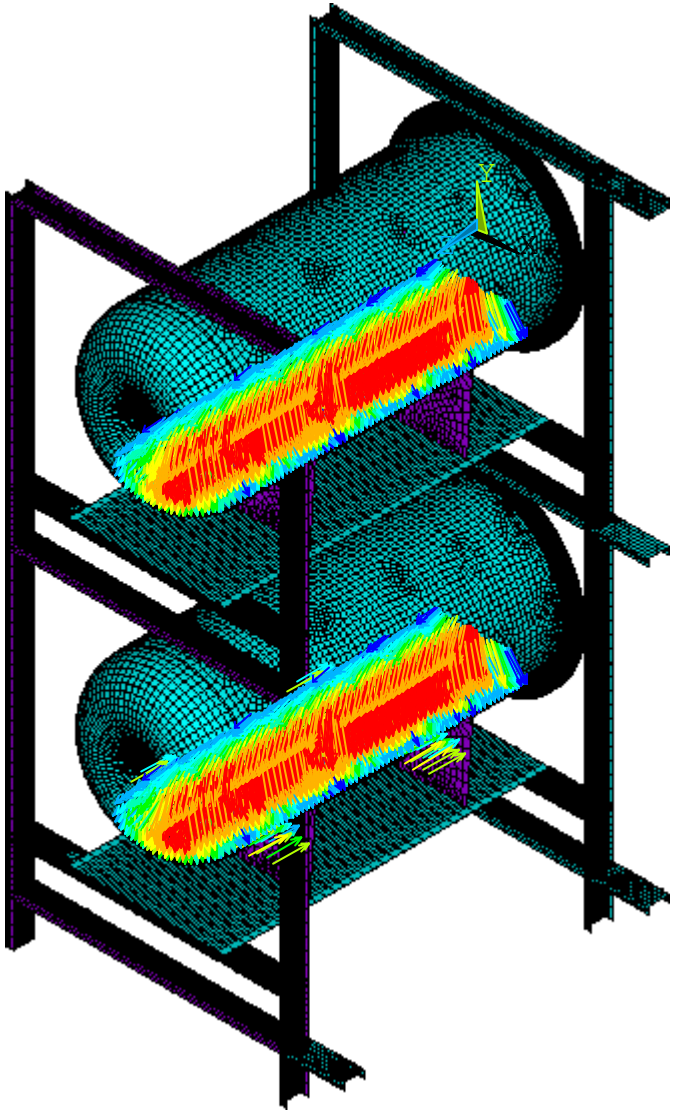
Distribution of equivalent stress in [*Pa*] – only horns are shown



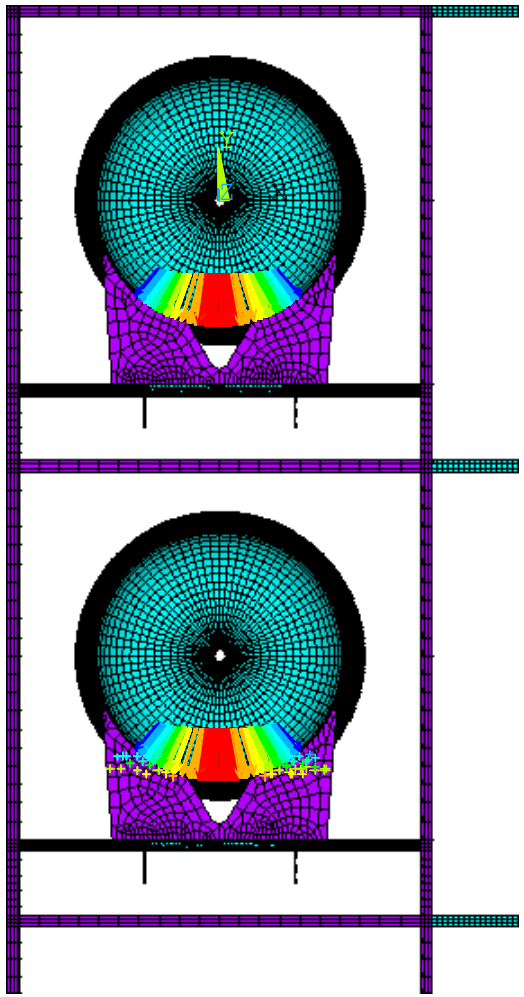
Distribution of equivalent stress in [*Pa*] – only frames are shown

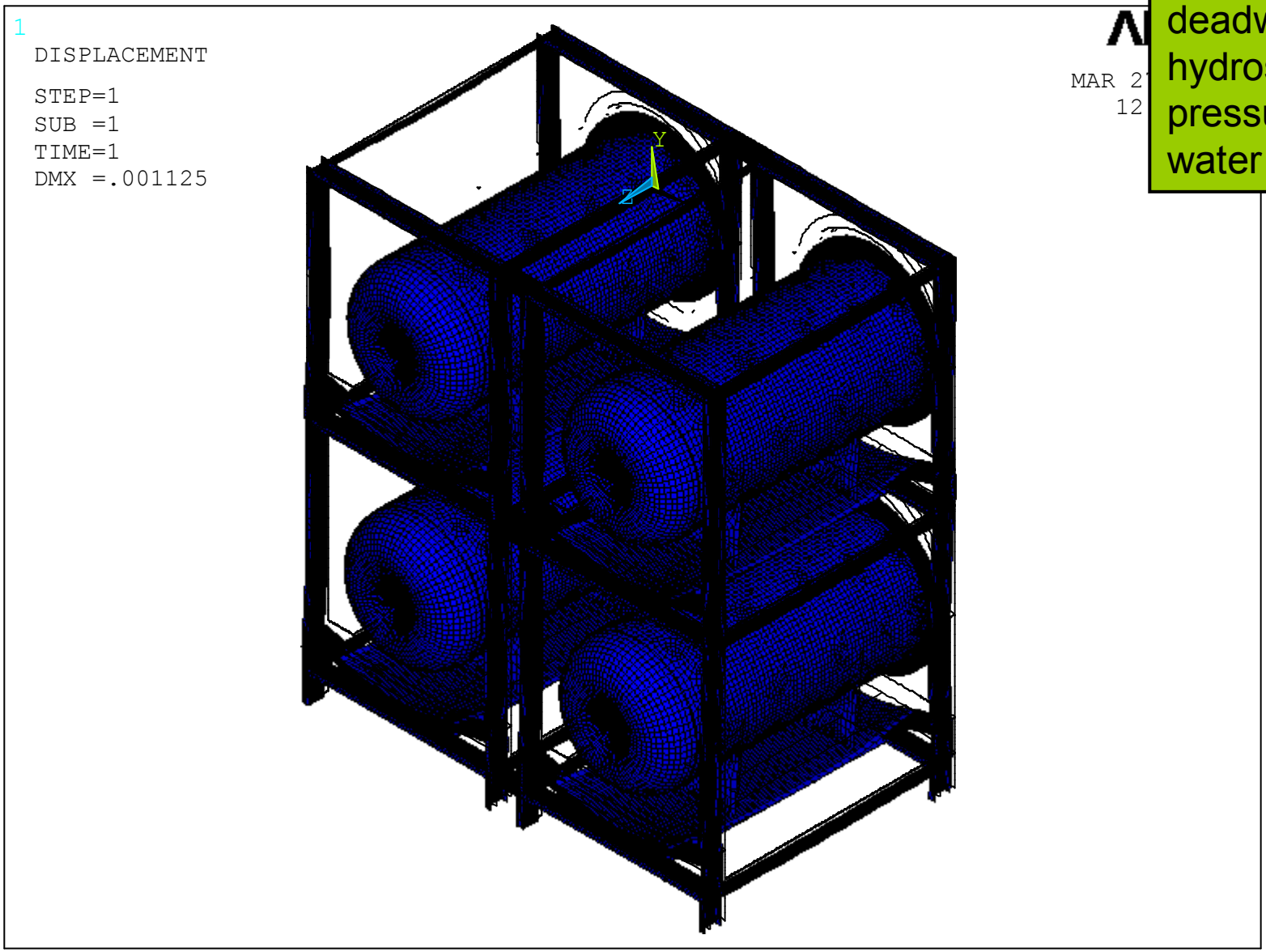


Distribution of equivalent stress in [*Pa*] – only frames are shown (opposite view)



Pressure of water inside horns added (only symmetric half shown)





Loads: deadweight + hydrostatic pressure of water

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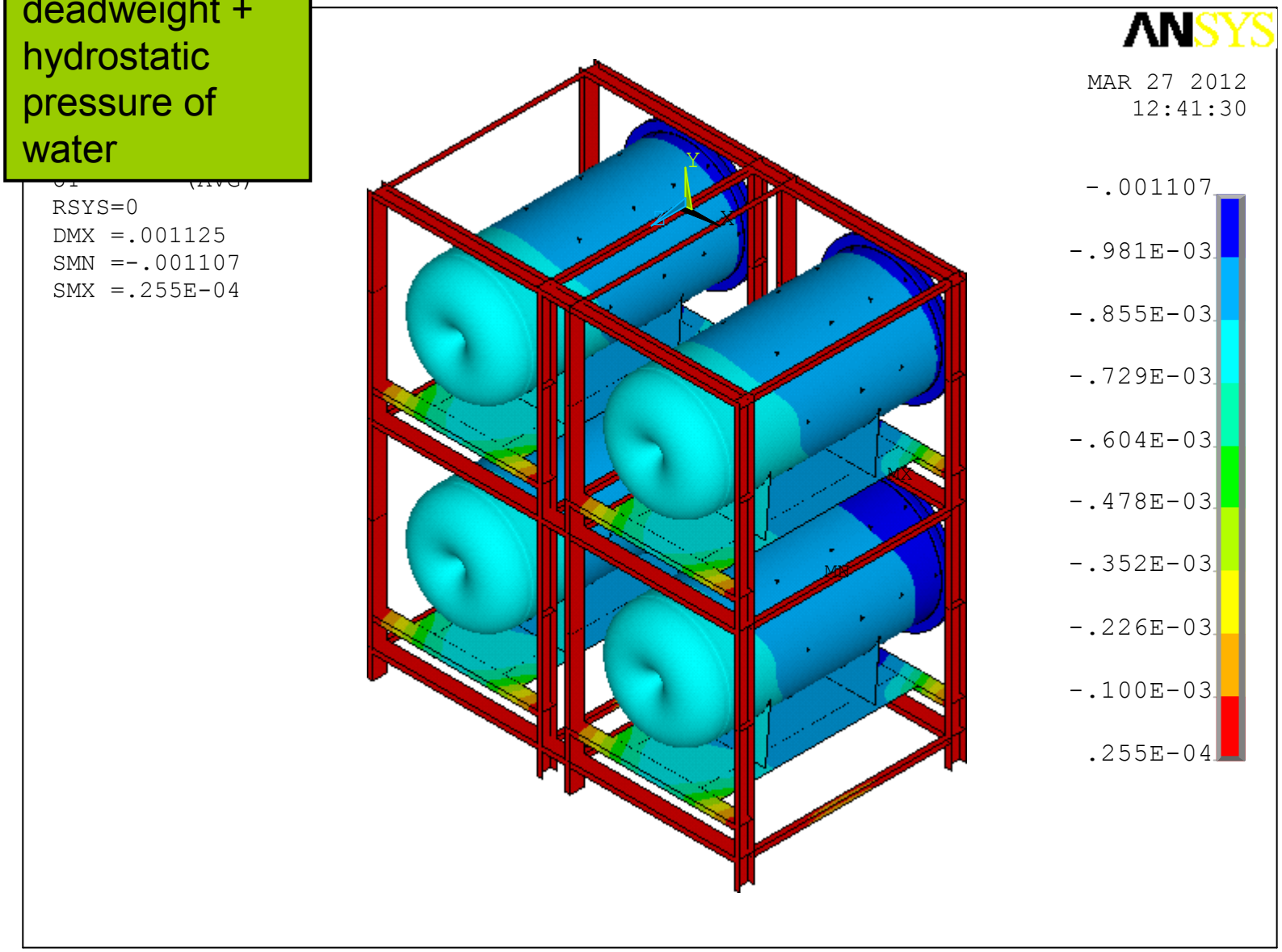
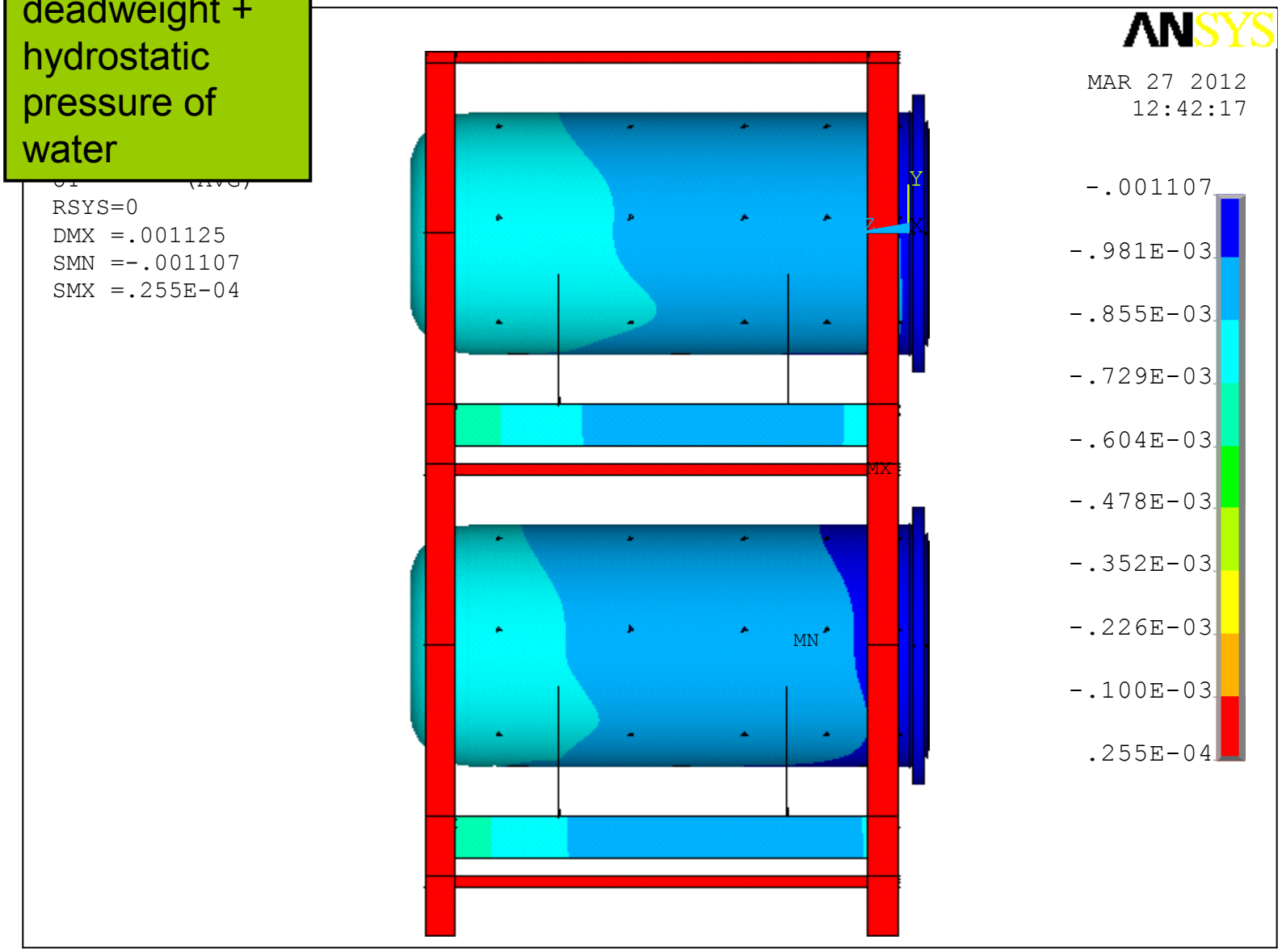


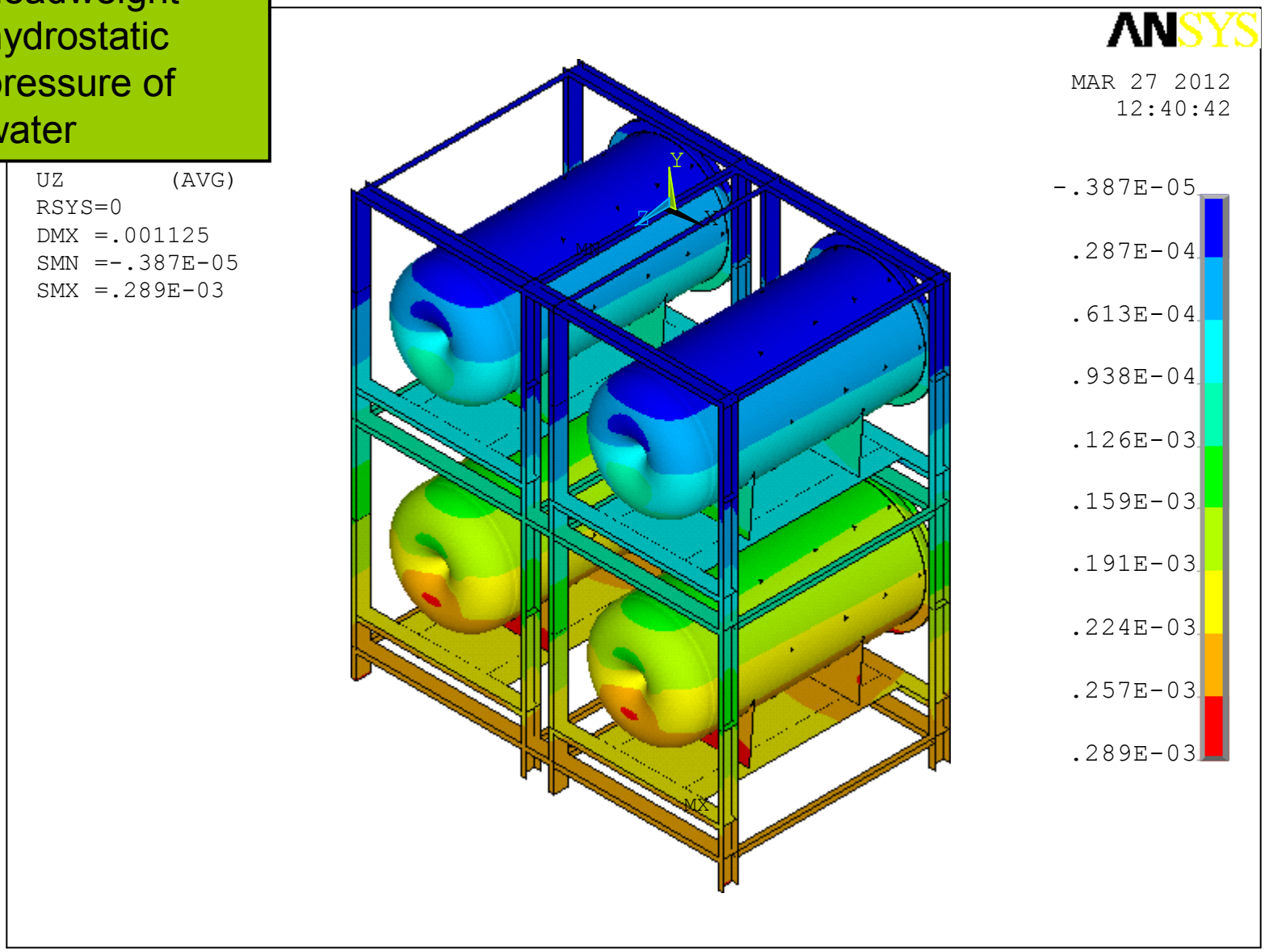
Uy displacement in [*m*]

Loads: deadweight + hydrostatic pressure of water



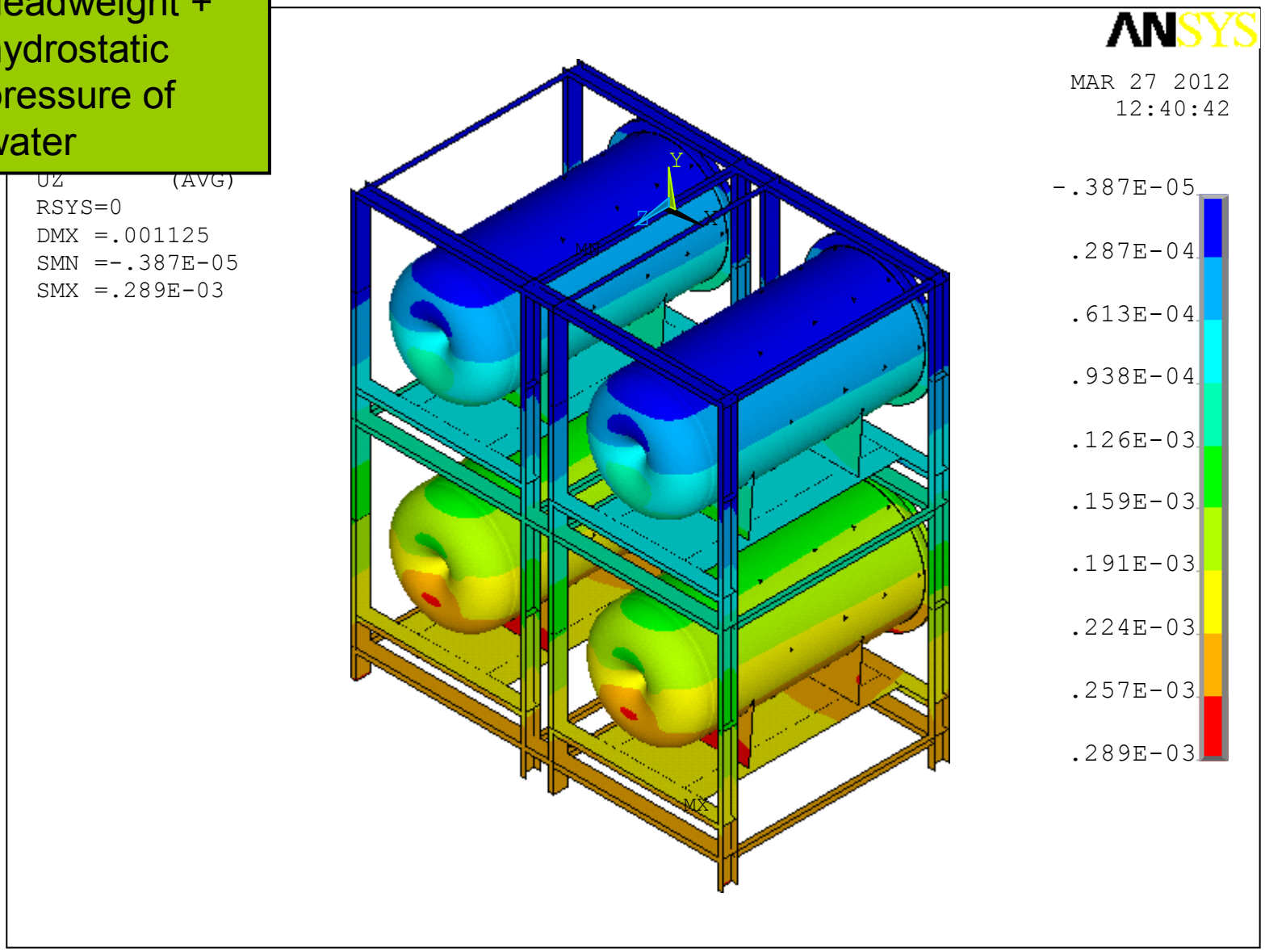
Uy displacement in [*m*]

Loads: deadweight + hydrostatic pressure of water



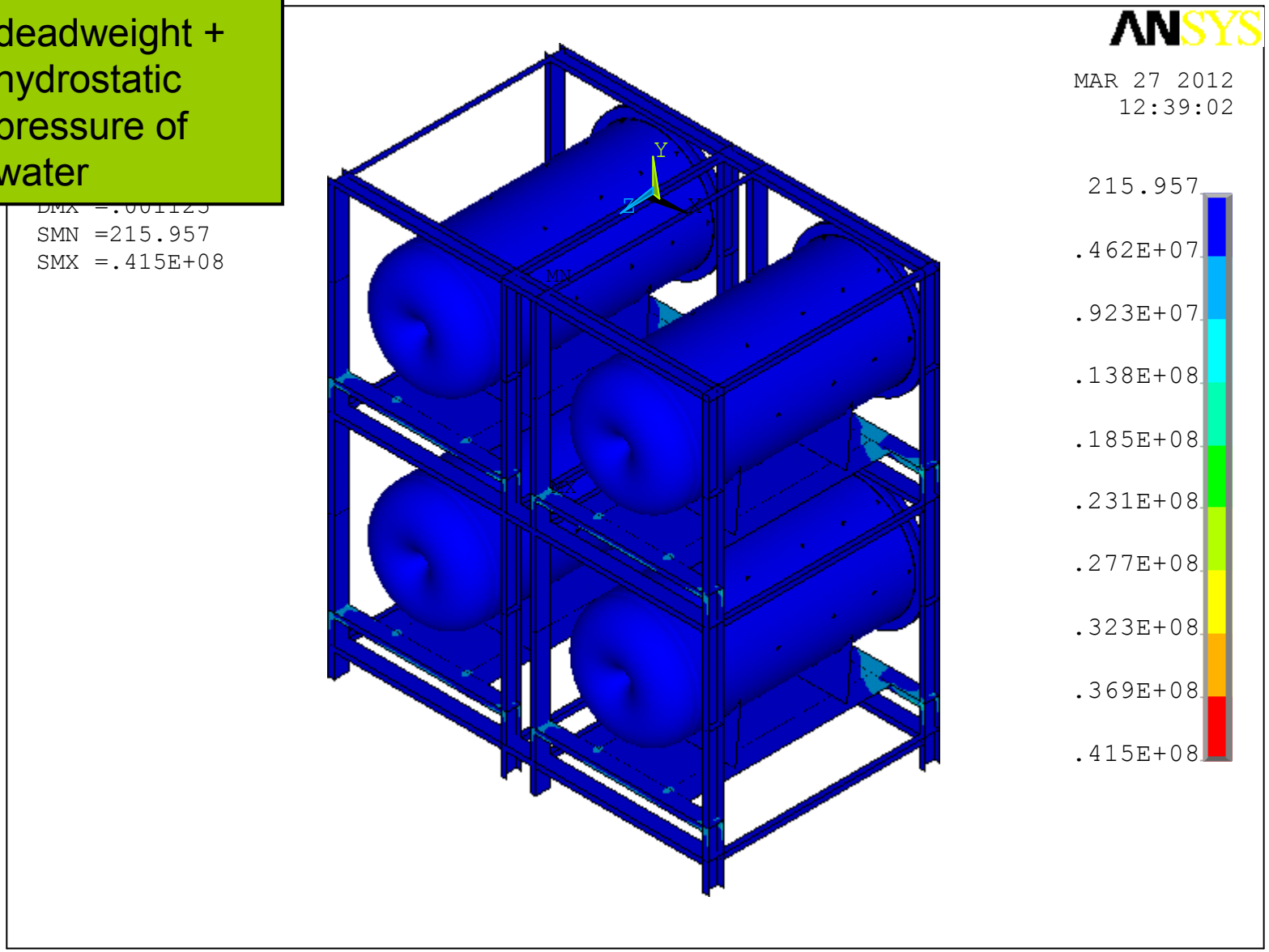
Uz displacement in [*m*]

Loads: deadweight + hydrostatic pressure of water



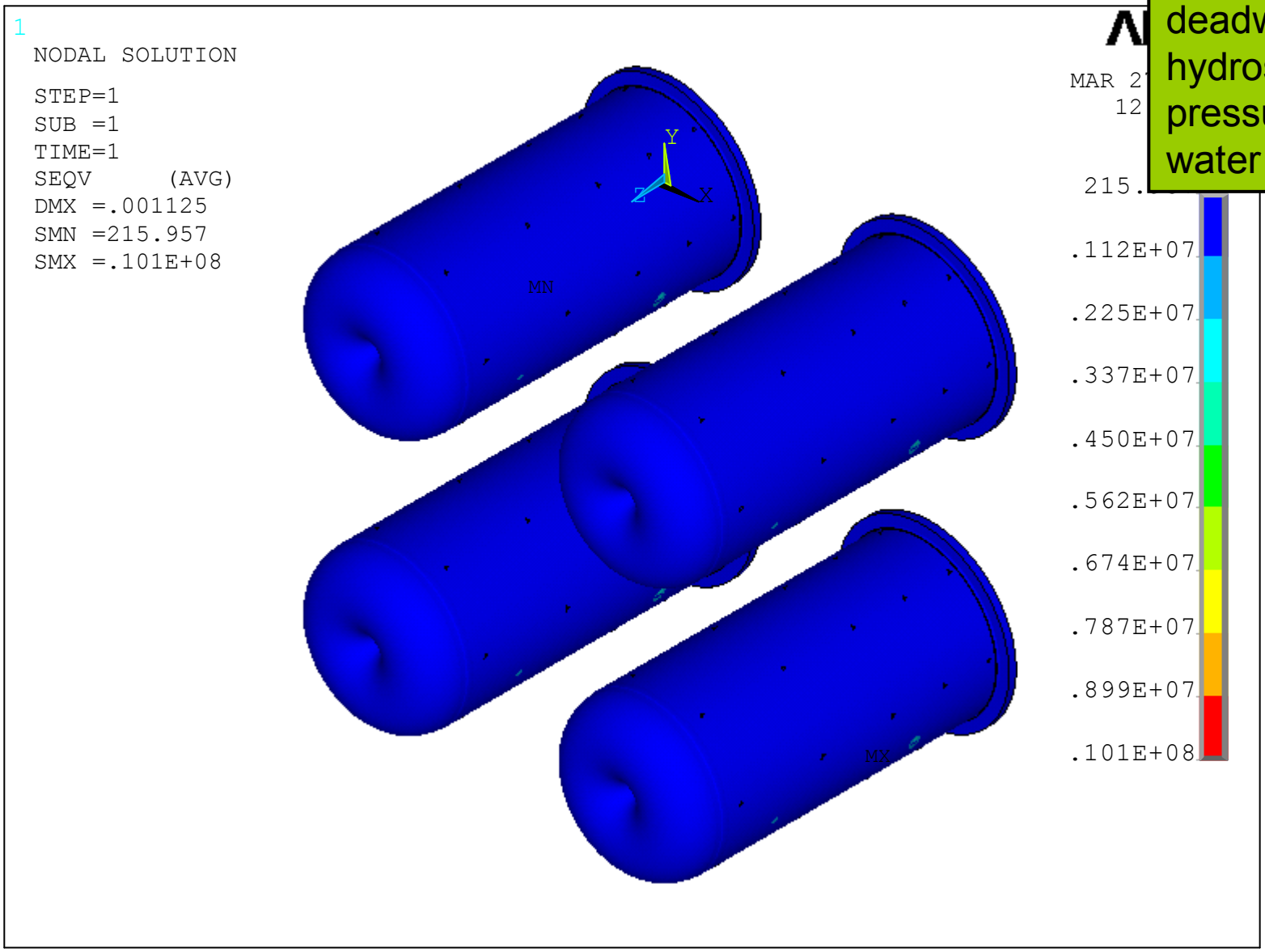
Distribution of displacements vector in [*m*]

Loads: deadweight + hydrostatic pressure of water



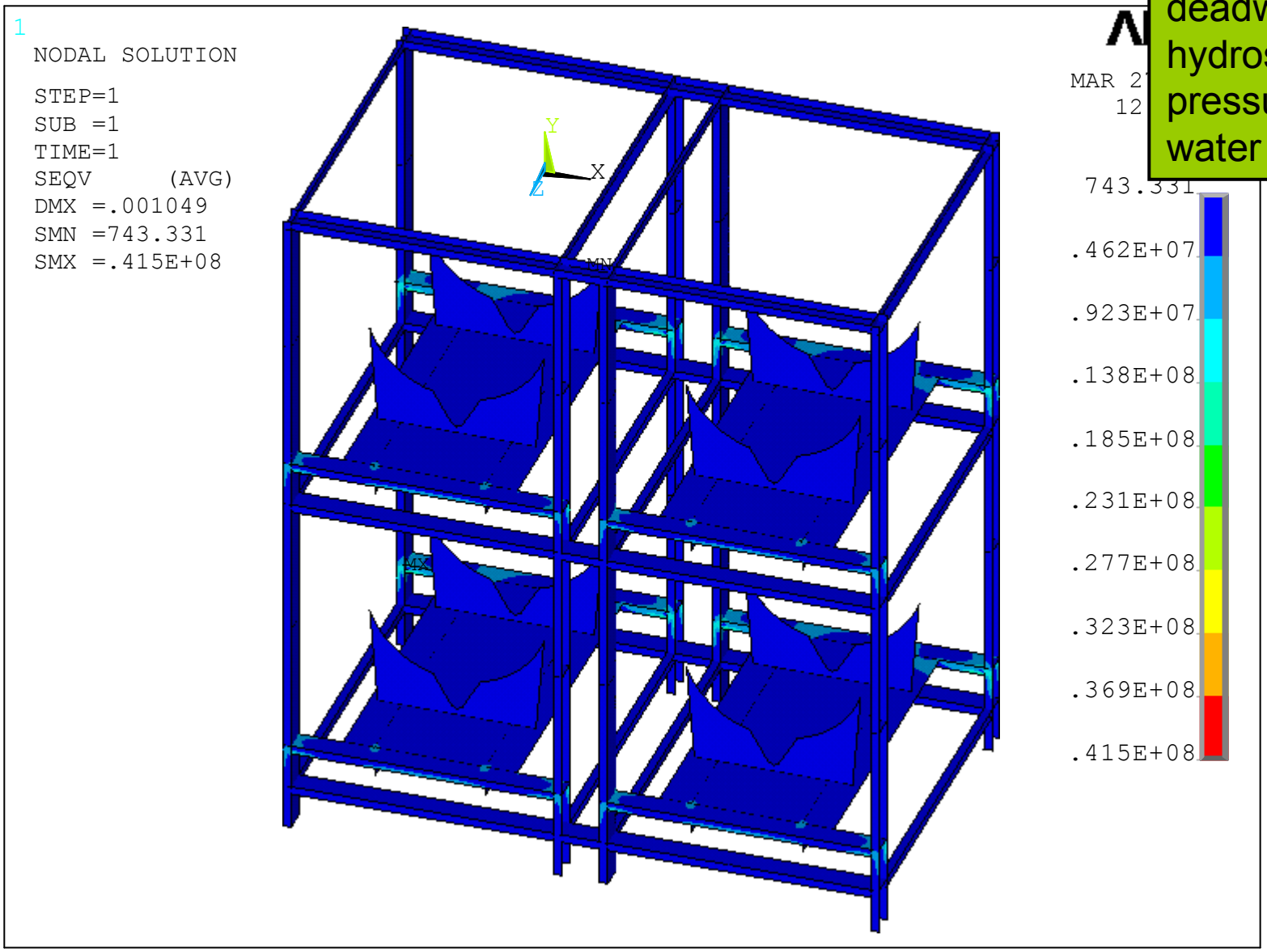
Distribution of equivalent stress in [*Pa*]

Loads: deadweight + hydrostatic pressure of water

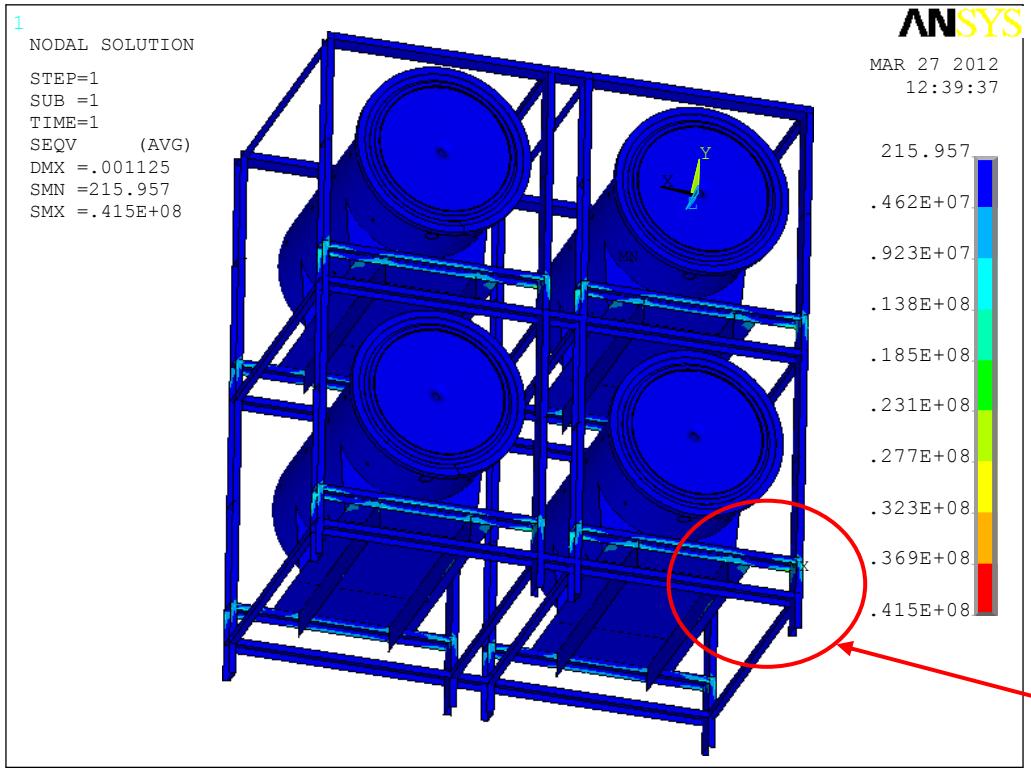


Distribution of equivalent stress in [*Pa*] – only horns are shown

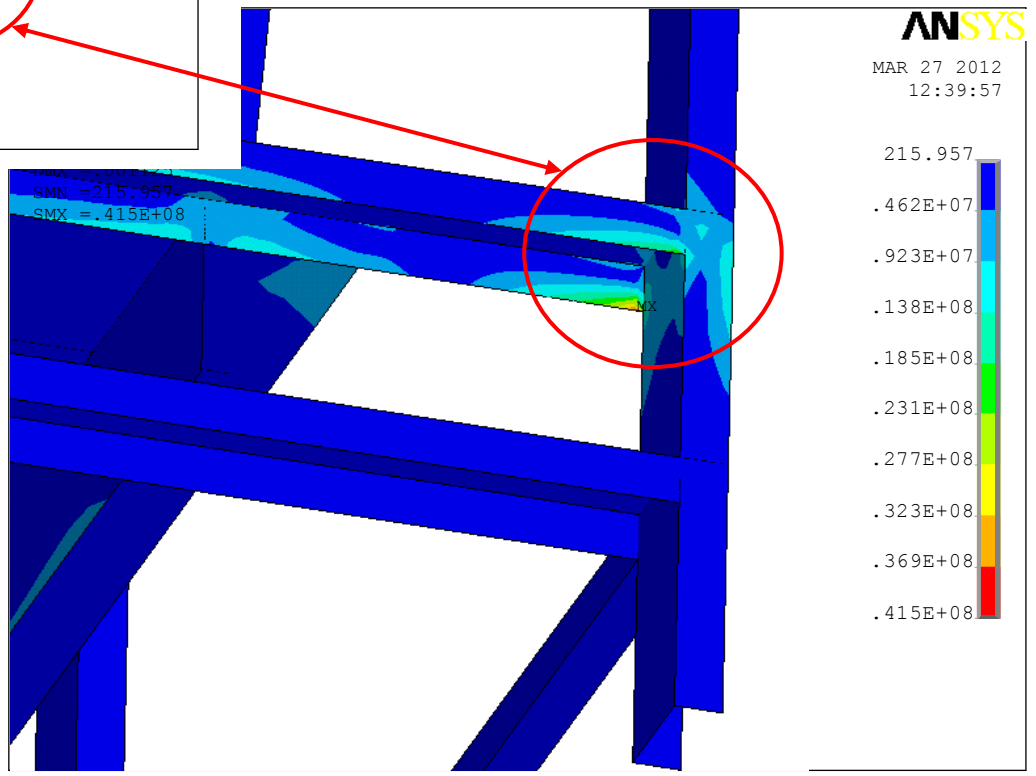
Loads: deadweight + hydrostatic pressure of water



Distribution of equivalent stress in [*Pa*] – only frames are shown



Loads: deadweight + hydrostatic pressure of water



Distribution of equivalent stress in [*Pa*] – opposite view with maximum area magnified

Summary of results for structure with longitudinal spans

Strucutre, loads	$\|u_y\|_{max}$ *mm*	$\sigma_{eqv,\ max}$ *MPa* (horn)	$\sigma_{eqv,\ max}$ *MPa* (frame)
(plate with ribs), deadweight	0.83	5.2	29.5
(plate with ribs), deadweight + hydrostatic pressure	1.11	10.1	41.5

Further steps to make:

1. Calculations of natural frequencies for the whole structure (not only symmetric half)

2. Introduction of water frame

3. Introduction of strip line plates

Thank you for your attention