NA magnets & Cryo facility

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Accomplished tasks:
• 2D documentation for support frame- modifications
• Bending test with Michela + geometric considerations
• New cross-section of Magnadon
• 3D model of the vacuum vessel for Magnadon
• Initial buckling analysis of vacuum vessel

Future tasks:
• Making the order for the support frame
• Small modifications in python code
To be ordered ASAP:

Square tube 50x50x3.2
Stainless steel
Possible suppliers?
Magnadon cross-section

Wall thickness (VV) – 10 mm
Wall thickness (TSH) - 3 mm

- Not enough space for the outer thermal shield.
- Split thermal shield?
Split thermal shield 3D model
Magnadon cross-section

Outer diameter of supporting ring can be reduced by 40 mm (20 mm per side), then:

- [Diagram with labels: Vacuum vessel, Thermal shield, Tube (support) for thermosyphon, Magnet + support structure]
Vacuum vessel 3D

Wall thickness: 10 mm
Ring thickness: 10 mm
Material: Stainless steel

FEA Buckling Loads (working conditions):

1) Atmospheric pressure (103 kPa) acting on external surfaces

2) Mass of everything that will be attached to vacuum vessel (cold mass etc)

3) Forces caused by support structure
 Equivalent Stress < 168 MPa (CMS technical report )
FEA Vacuum vessel, first case

Load Multiplier > 1
FEA Vacuum vessel, second case

Equivalent Stress < 168 MPa
Load Multiplier > 1, but why lower than in previous case?
FEA Vacuum vessel, third case

Error 😞 😞 😞