MVD update

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MVD routing: disks

- Problems so far ... ☹
  - Not sufficient space, even with thinner global support
  - Required routing inside global MVD support

- Solution ... ☺ ... (!?)
  - Decrease outer radius of barrel layer 4 and strip disks
  - Global MVD support shifted inside
    - ✓ Smallest impact of overall concepts in strip part
    - ✓ Sufficient space created in between global MVD support and maximum outer radius of 150 mm

MVD routing: disks

- Solution ... ☺ ... (!?)
  - Decrease of outer radius barrel layer 4:
    r_{max} = 140 mm **– 5 mm** → r_{max} = 135 mm
  - Global MVD support:
    r = 137 mm ... 141 mm → **Space: 8,228 mm²**
    Remark:
    Additional space at radii > 150 mm along CF
    for cooling pipes : 20 mm (width) up to min. r = 175 mm
    → **Additional space outside r = 150 mm: > 1,400 mm²**
  - Check:
    - Effects for strip disks
    - Coverage tests

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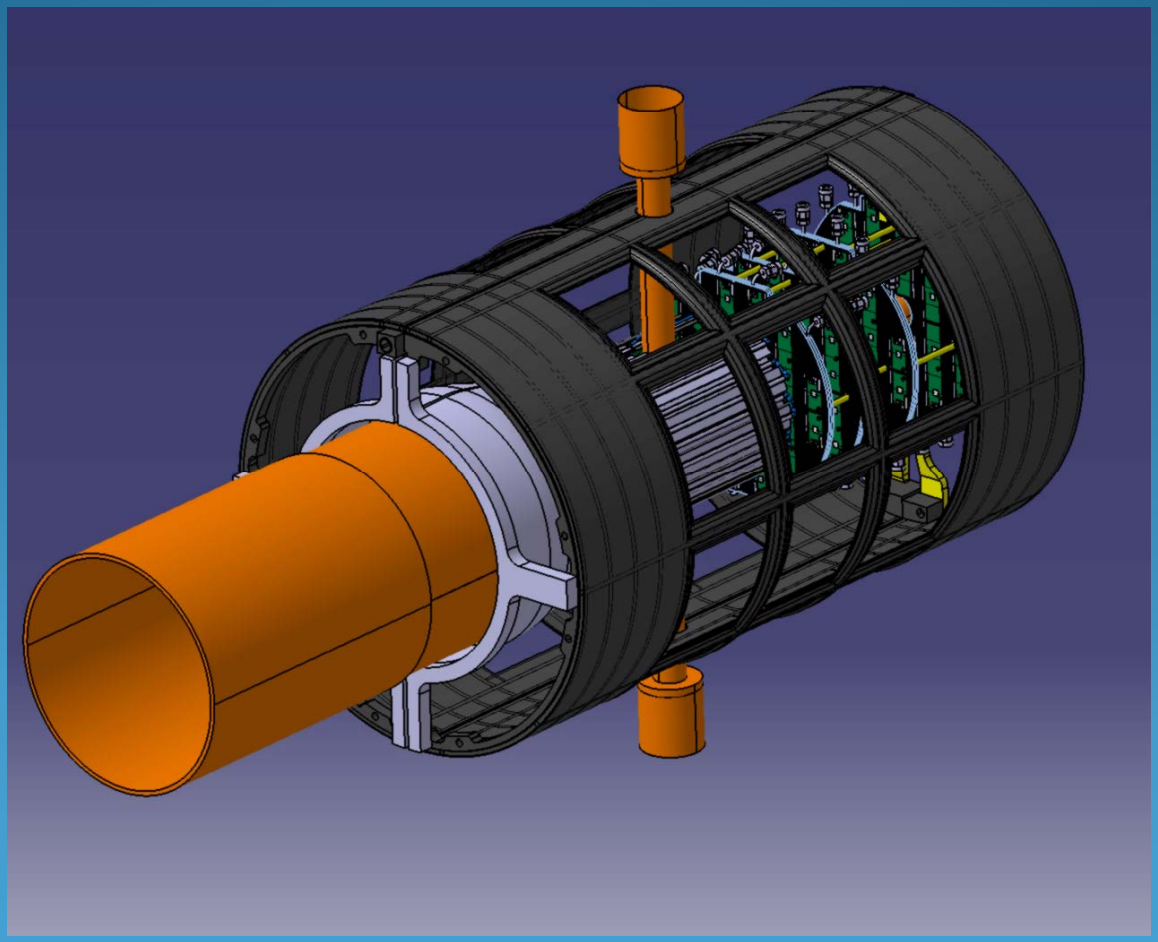
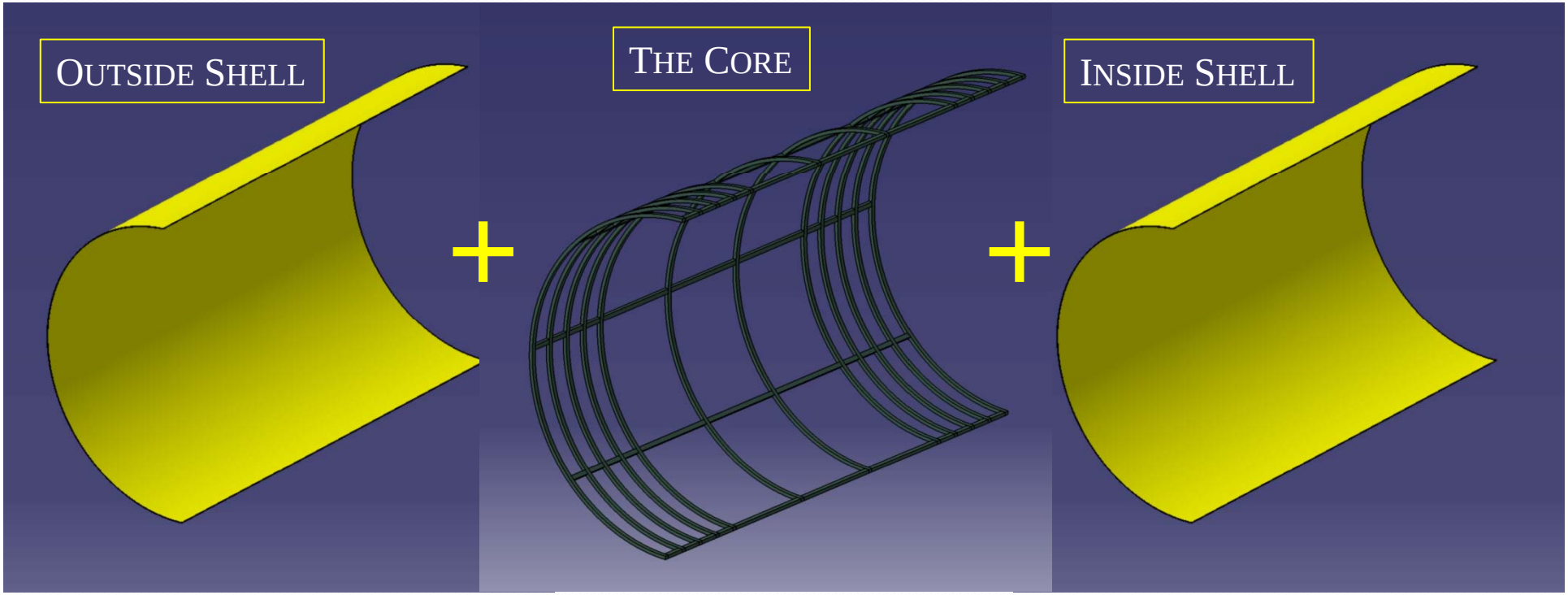
PANDA Collaboration Meeting – MVD, FZJ, September 8 , 2009
Thomas Würschig,

- 13 -

Following the new constraint a new frame is under study.
Ribs are embedded into the structure.



MVD's frame



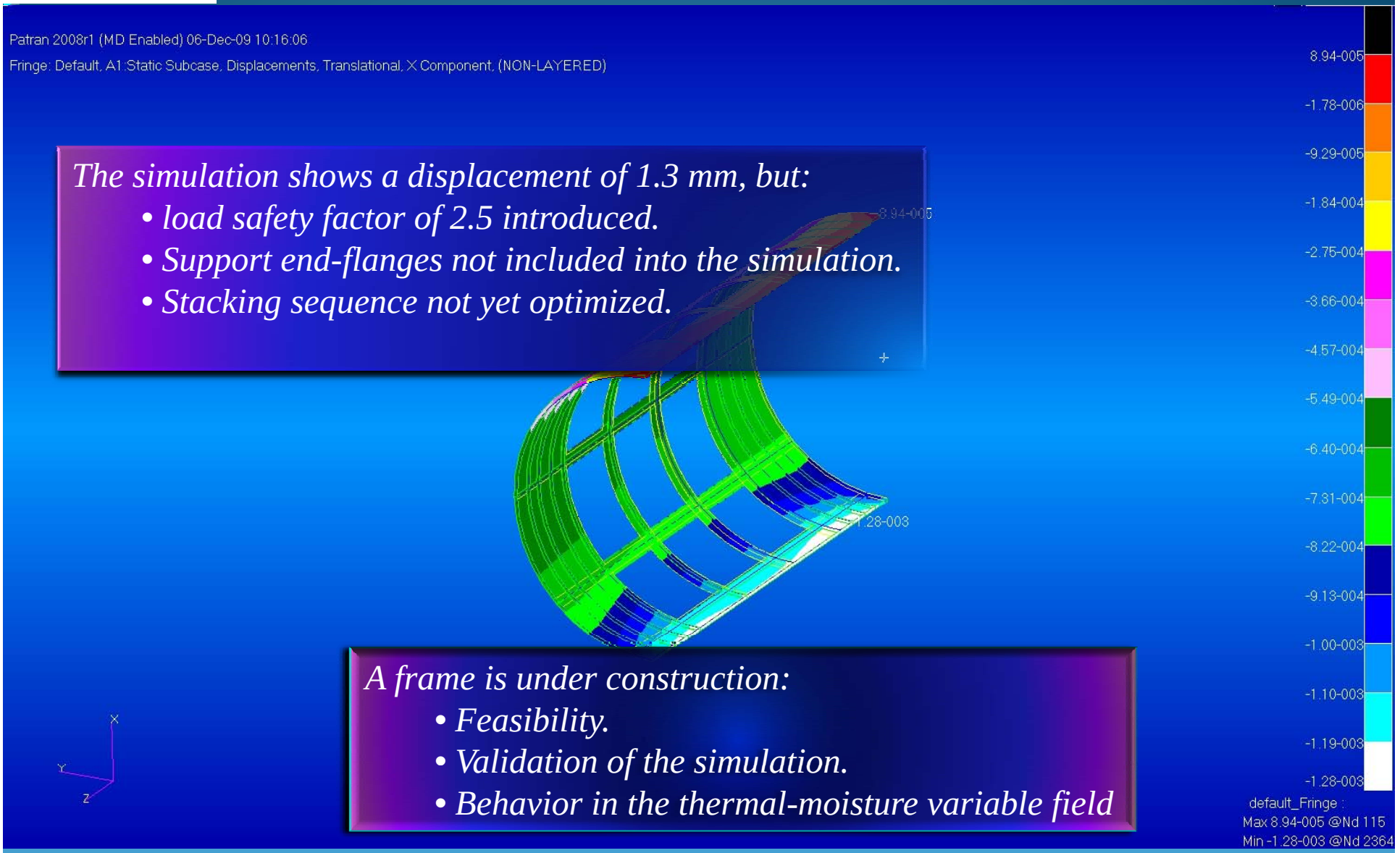
1 SHELL $Ø_E$282 mm
TH. 0.50 mm

12 SEMI-CIRCULAR SEMI-CIRCULAR RIBS
4 LINEAR LONGITUDINAL RIBS
EMPTY VOLUMES FILLED WITH ROHACELL

1 SHELL $Ø_I$274 mm
TH. 0.50 mm

ALL ELEMENTS →M55J/LTM 10-5

FEM results:



The simulation shows a displacement of 1.3 mm, but:

- *load safety factor of 2.5 introduced.*
- *Support end-flanges not included into the simulation.*
- *Stacking sequence not yet optimized.*

A frame is under construction:

- *Feasibility.*
- *Validation of the simulation.*
- *Behavior in the thermal-moisture variable field*

Some ancillary parts as micro fittings and micro curves for the cooling circuit made out of Ryton R-4-220 are under construction.

Delivery at beginning of 2010

Test foreseen:

- *visual & dimensional,*
- *water absorption,*
- *long term functional operation.*