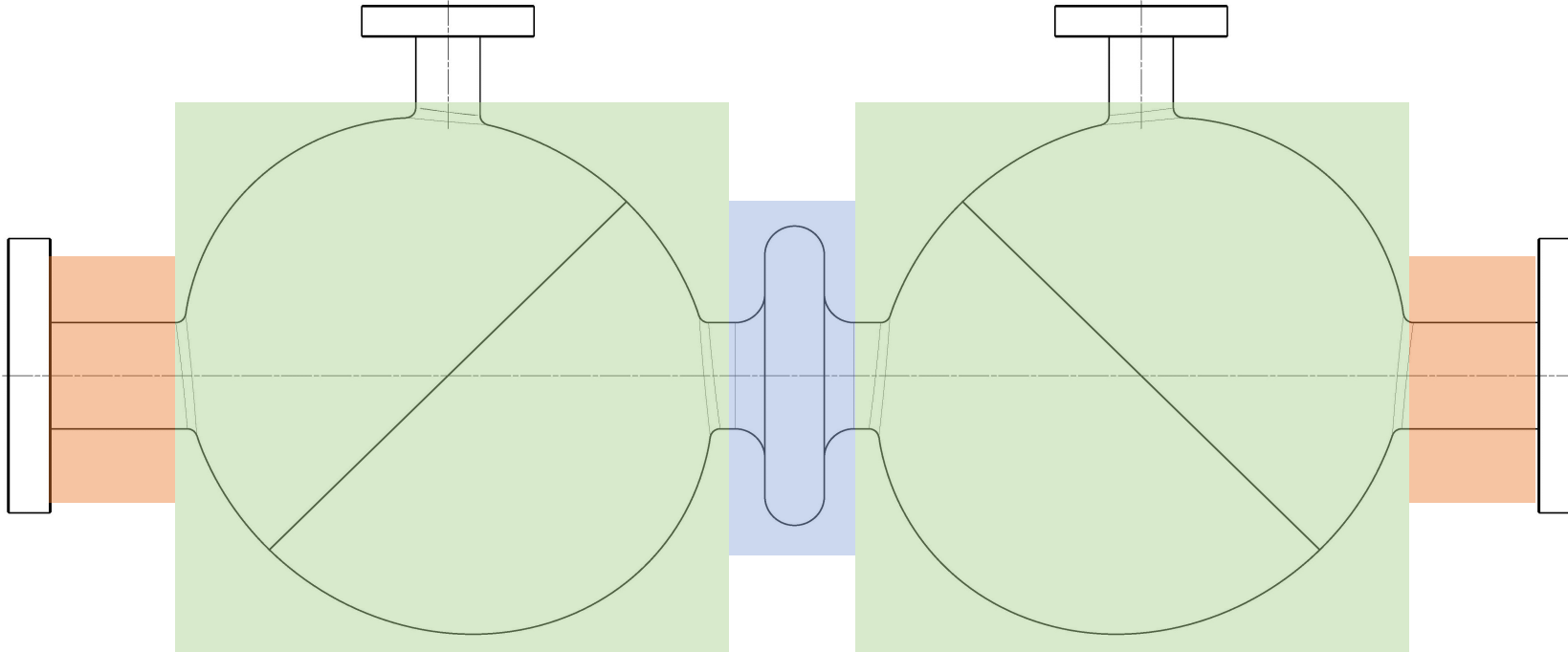


Status of the MAGO cavity & related R&D at DESY/UHH

J. Branlard, L. Fischer, W. Hillert, T. Krokotsch, R. Löwenberg, G. Moortgat-Pick, M. Paulsen, K. Peters, A. Ringwald, L. Springer, M. Wenskat

09.2023

Wallthickness measurement of MAGO



Tubes have an average thickness of 1.91 mm (1.91 mm left / 1.91 mm right)

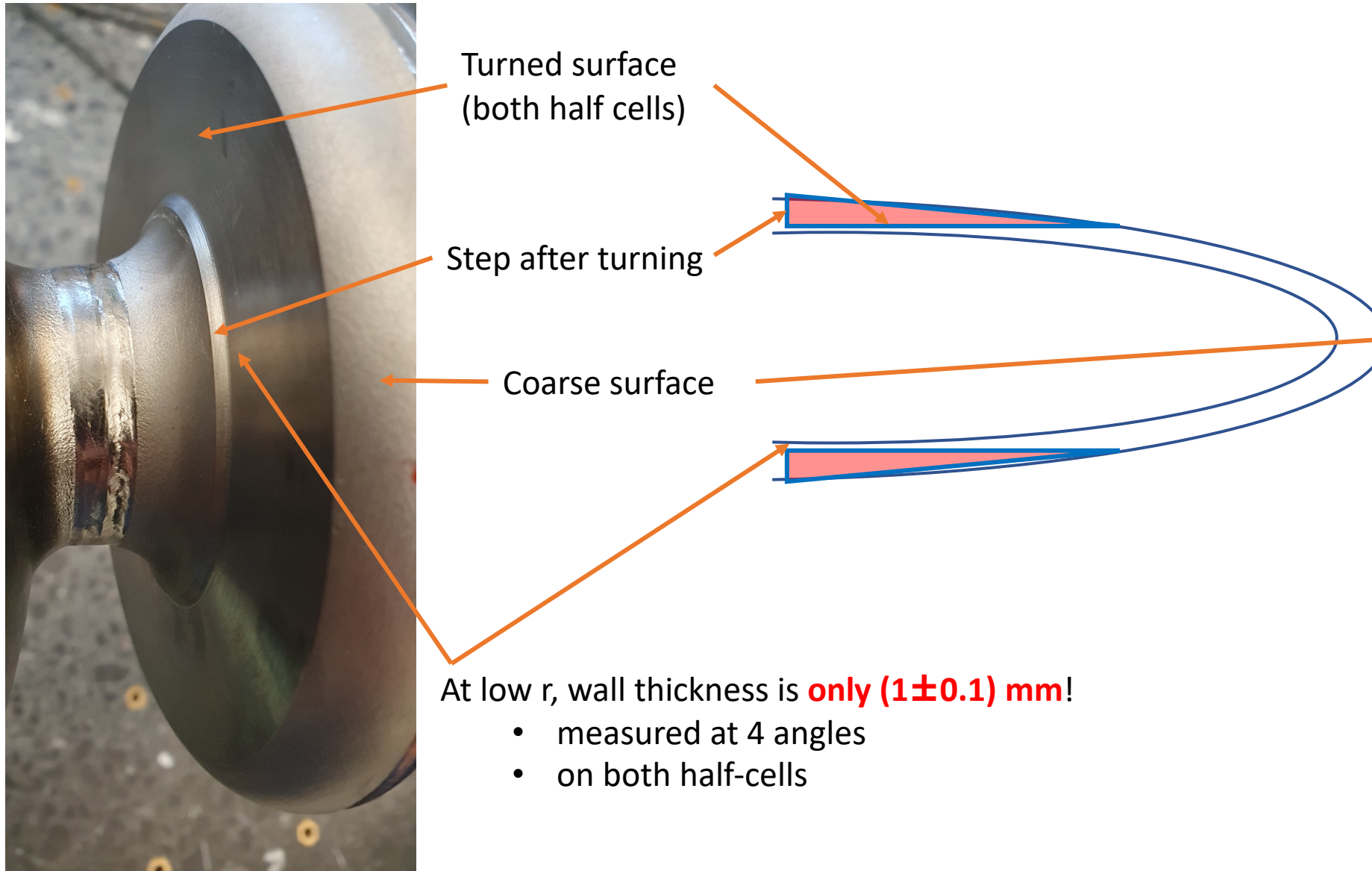
Tunable cell has an average thickness of 2.01mm @ rounding (1.97 mm left half / 2.04 mm right half)

- left half was dented

- cell got turned! Non-constant wall thickness (next slide)

Main cells have an average thickness of 1.87 mm (1.89 mm left / 1.84 mm right) ← w./o. data points on equatorial welds

Tunable cell got turned surface

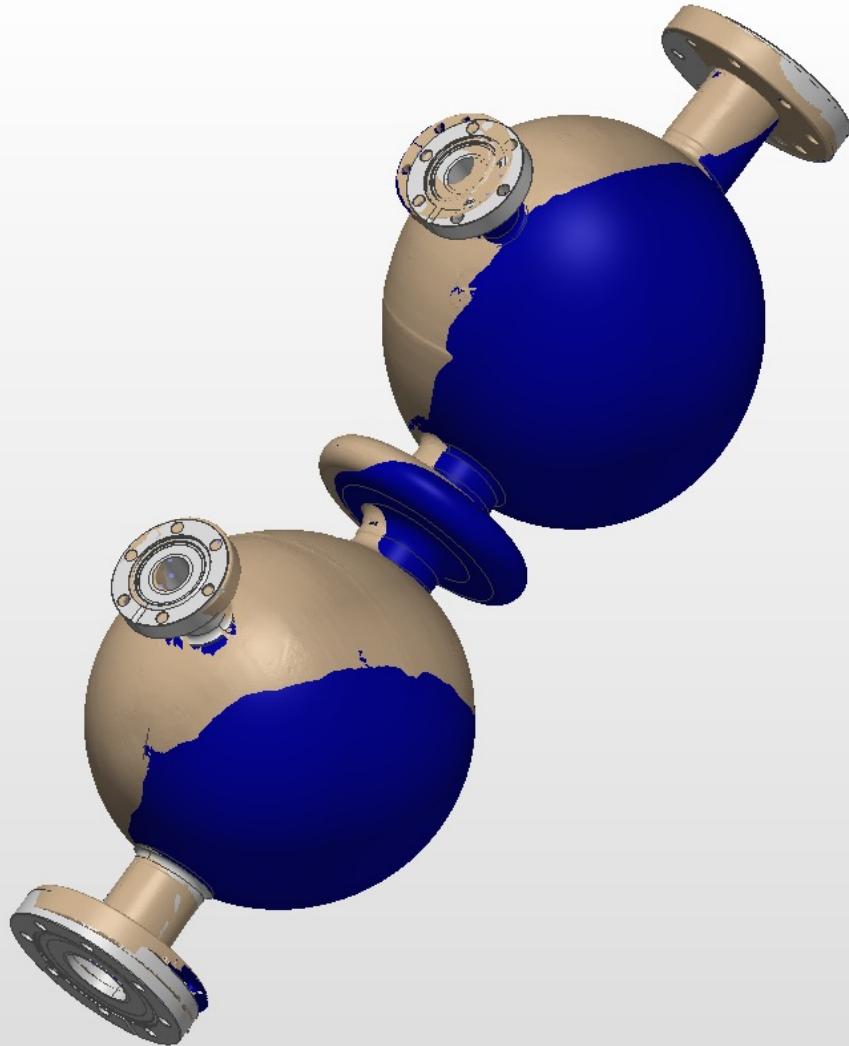


Shipping

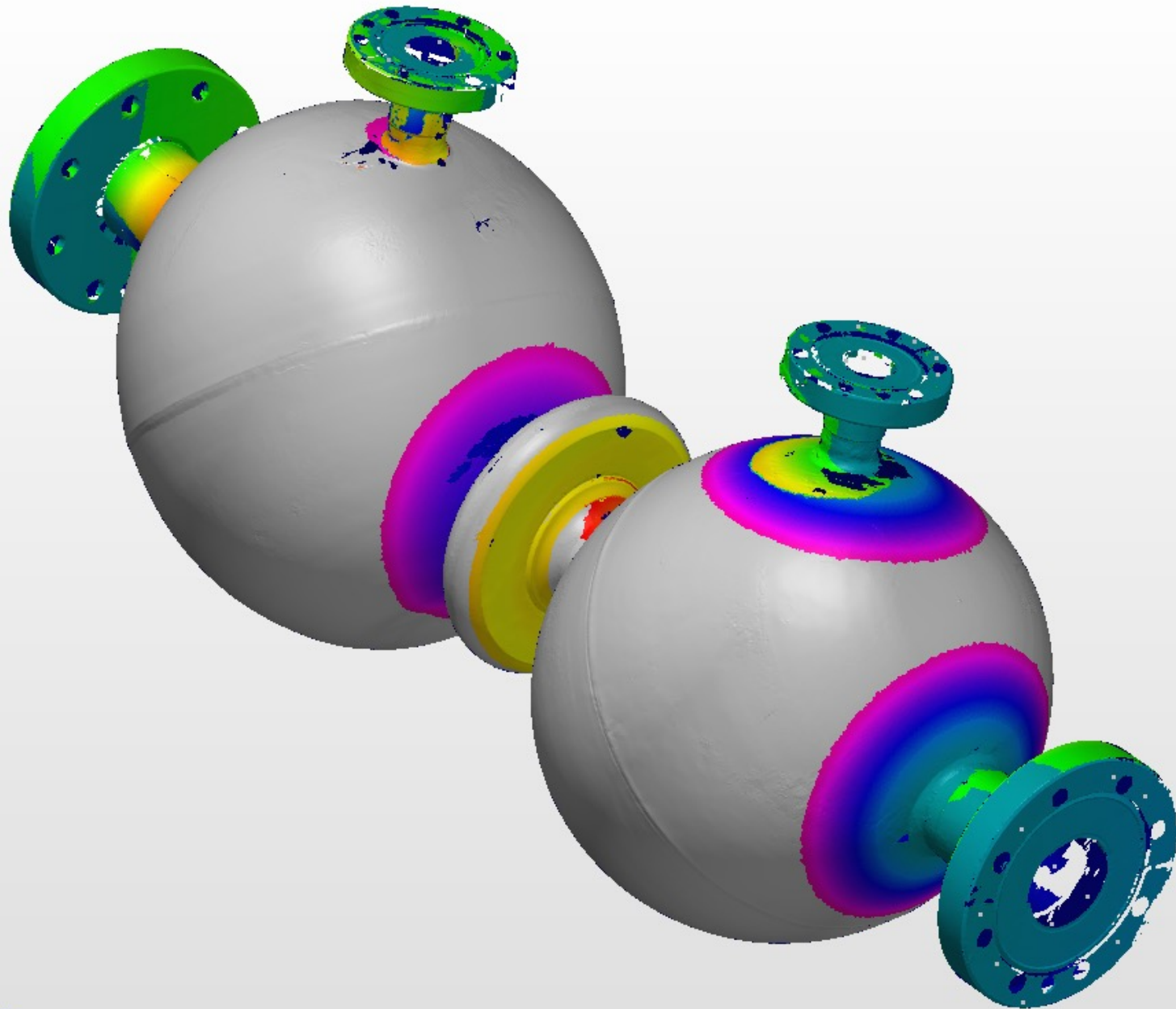
- Transport box is ready
 - Cavity fits – snug as a bug
 - Based on step-file
- CF40 & CF63 flanges + gaskets ready
- Started paperwork – need address



First assesement of geometry scan

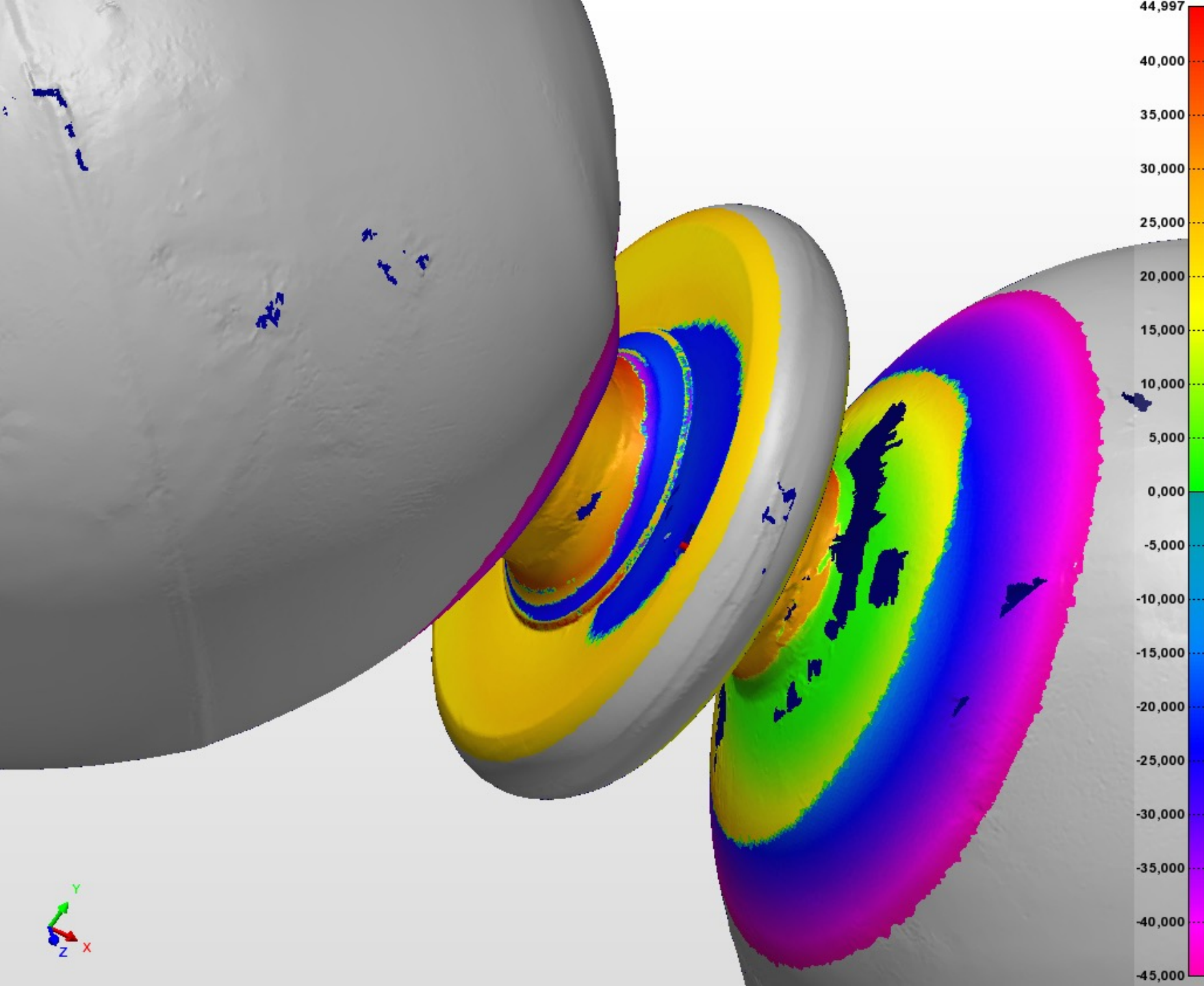


Comparison of measurement
(brown) vs. Step-file (blue/gray)

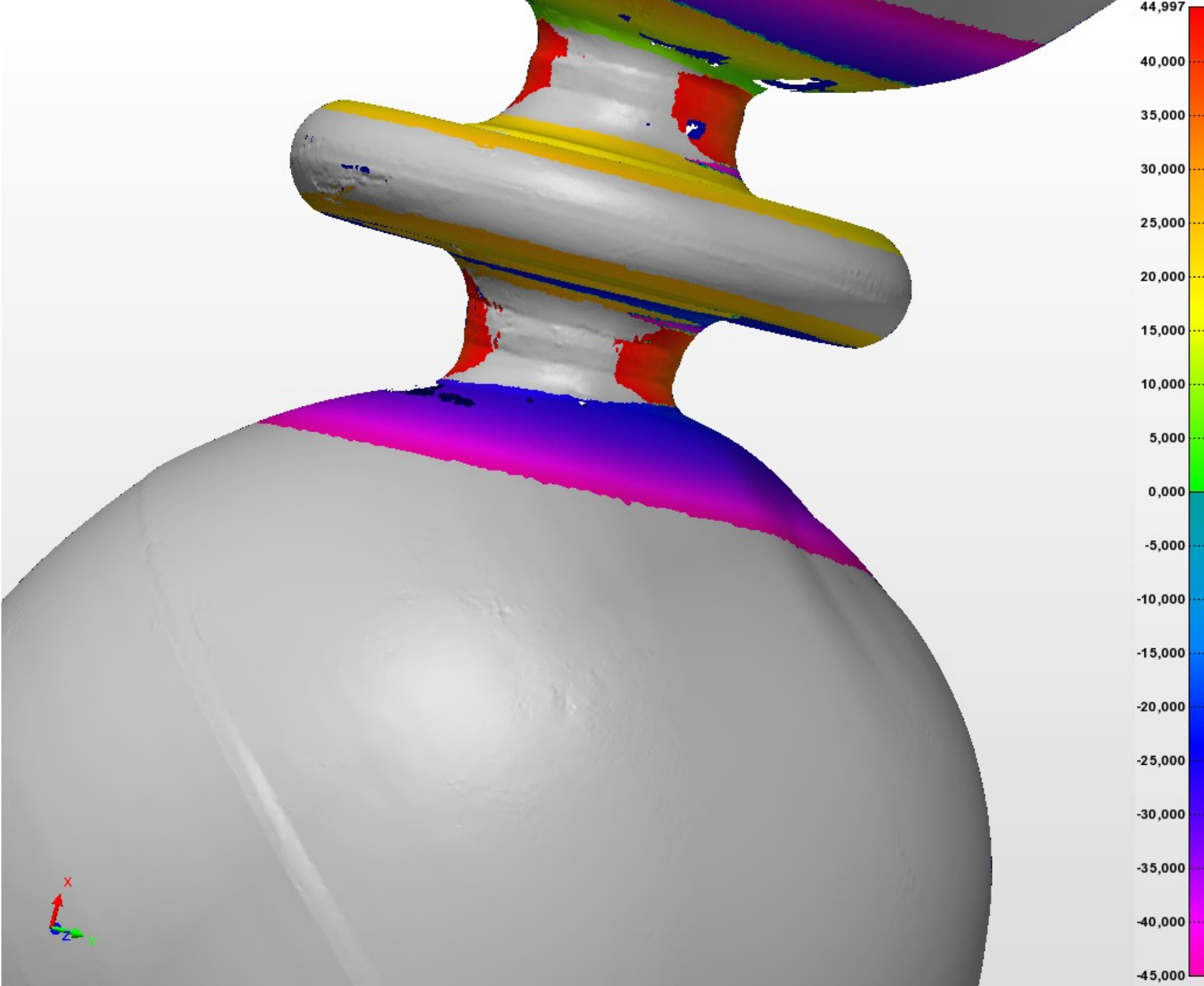


- Areas in gray are beyond the ± 45 mm deviation limit.
- Can be three things:
 - Deformation of the cavity
 - Step file not 100% accurate, e.g. based on old/wrong drawings
 - Significant fabrication issues





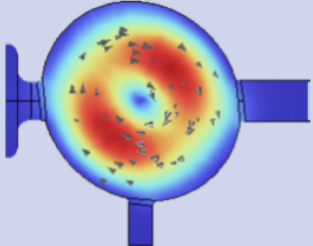
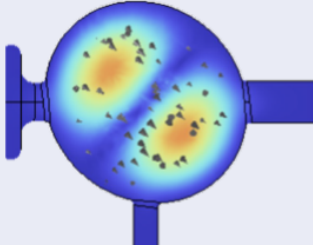
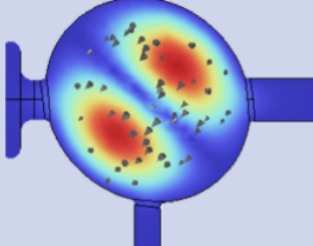
Dent in the tunable cell obvious

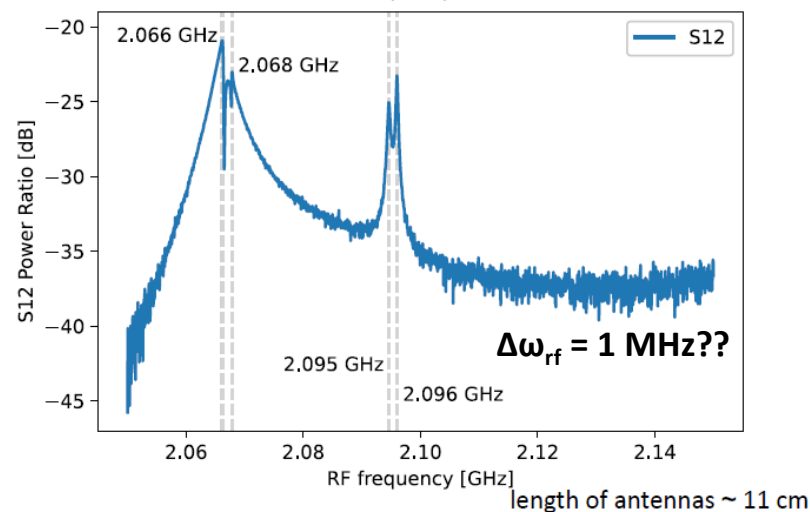
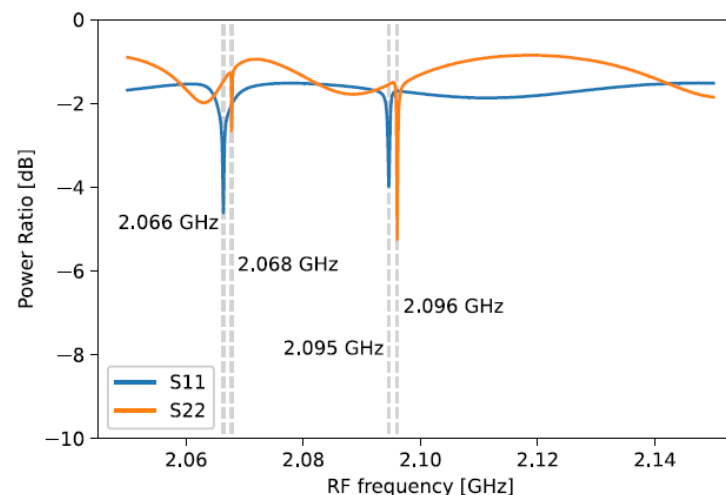


- Dent in the cell is also scanned, but not properly labeled with deviation scale
- Bent is obvious
- Nice feature: the welds are also scanned
- Best next steps:
 - Generate new step-file from this data + wall-thickness measurement
 - Reverse-engineering done by external company

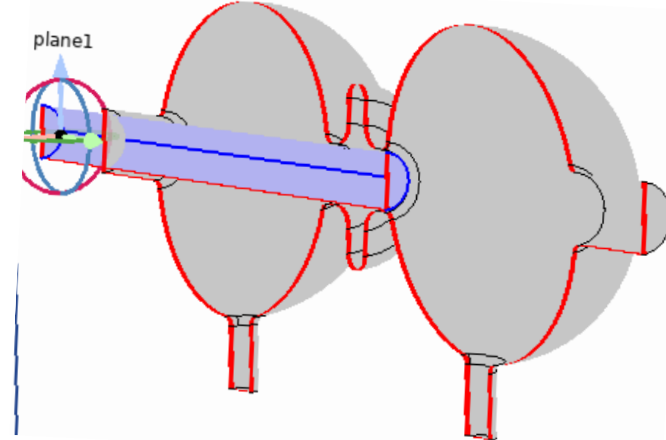
RF measurement is worrysome

Warm Measurement of EM Modes in MAGO cavity

Simulated Eigenfrequency	Electric Field Distributions
(previous mode ~1.80 GHz)	
2.07306 GHz (Pi-mode) 2.07311 GHz (0-mode)	
2.07710 GHz 2.07717 GHz	
(probably bad coupling to antenna)	
TE ₀₁₁ 2.10381 GHz 2.10390 GHz	
(next mode: ~2.26 GHz)	



Idea: Short one cavity and measure them individually



Complements the simulations based on geometry scan