Fermilab

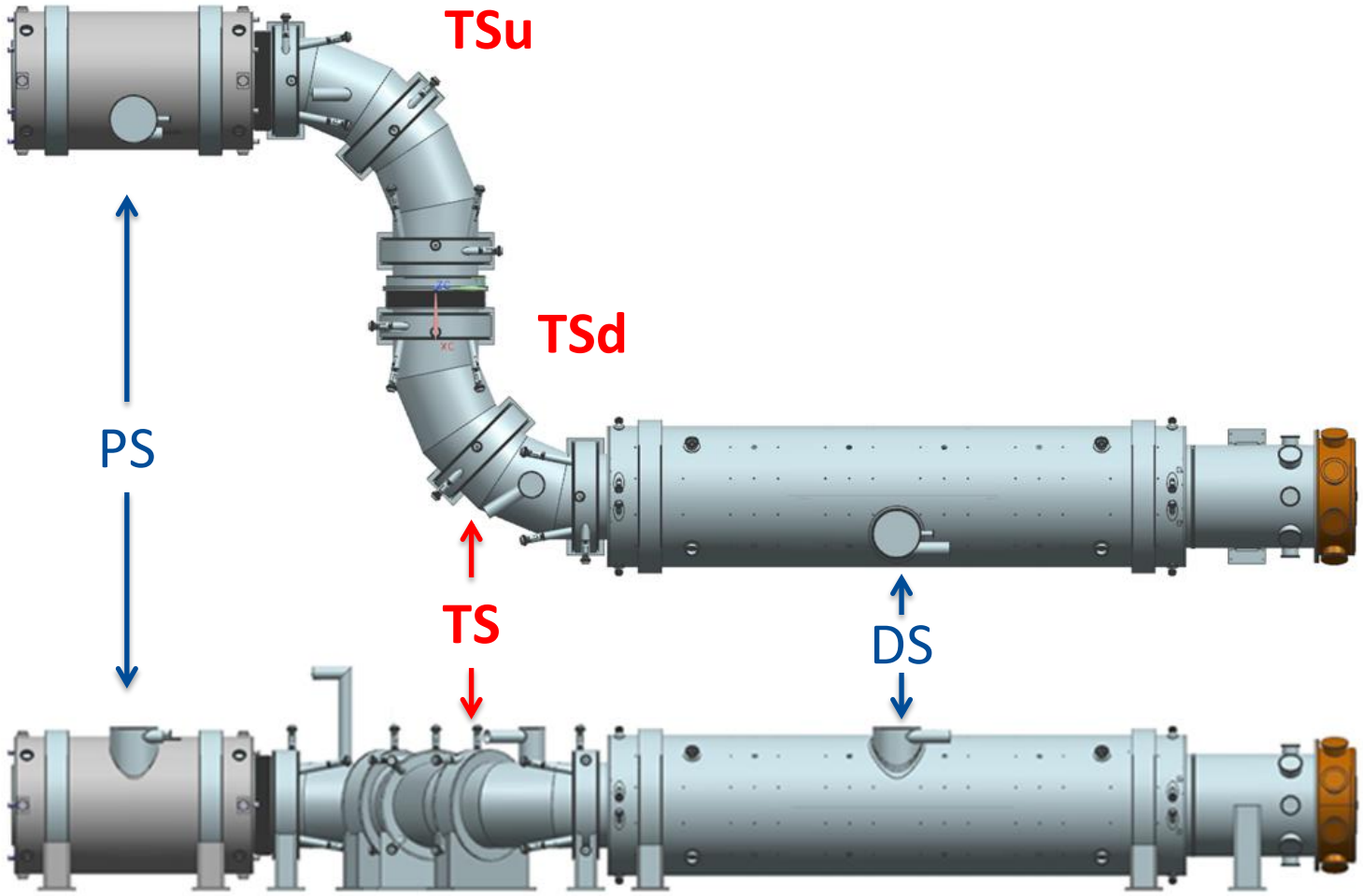
Managed by Fermi Research Alliance, LLC for the U.S. Department of Energy Office of Science

The Mu2e Transport Solenoid Alignment Issues

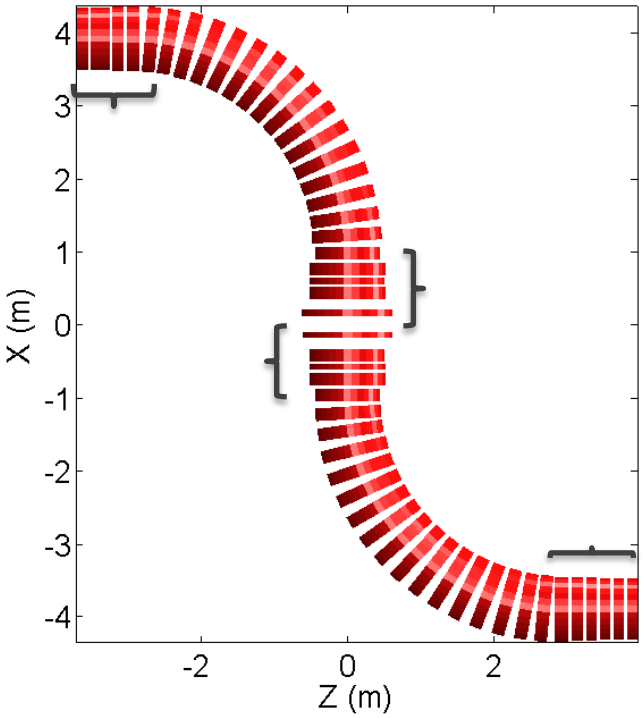
Veronica Ilardi

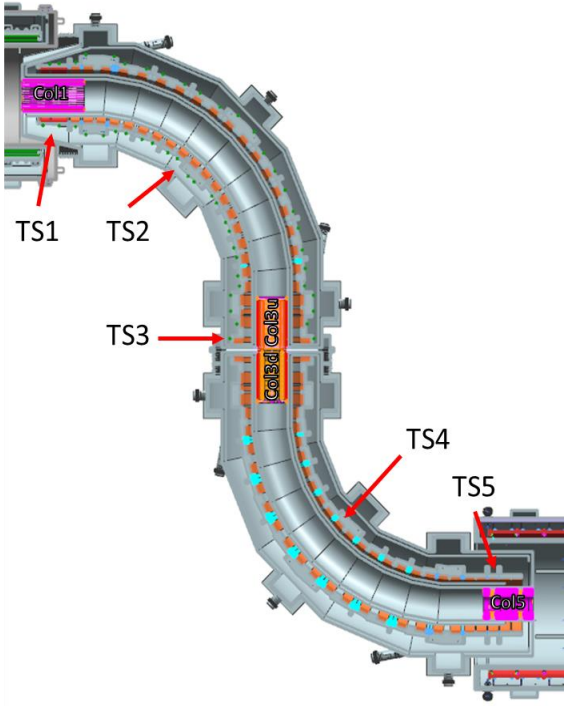
23 September 2015

Scope



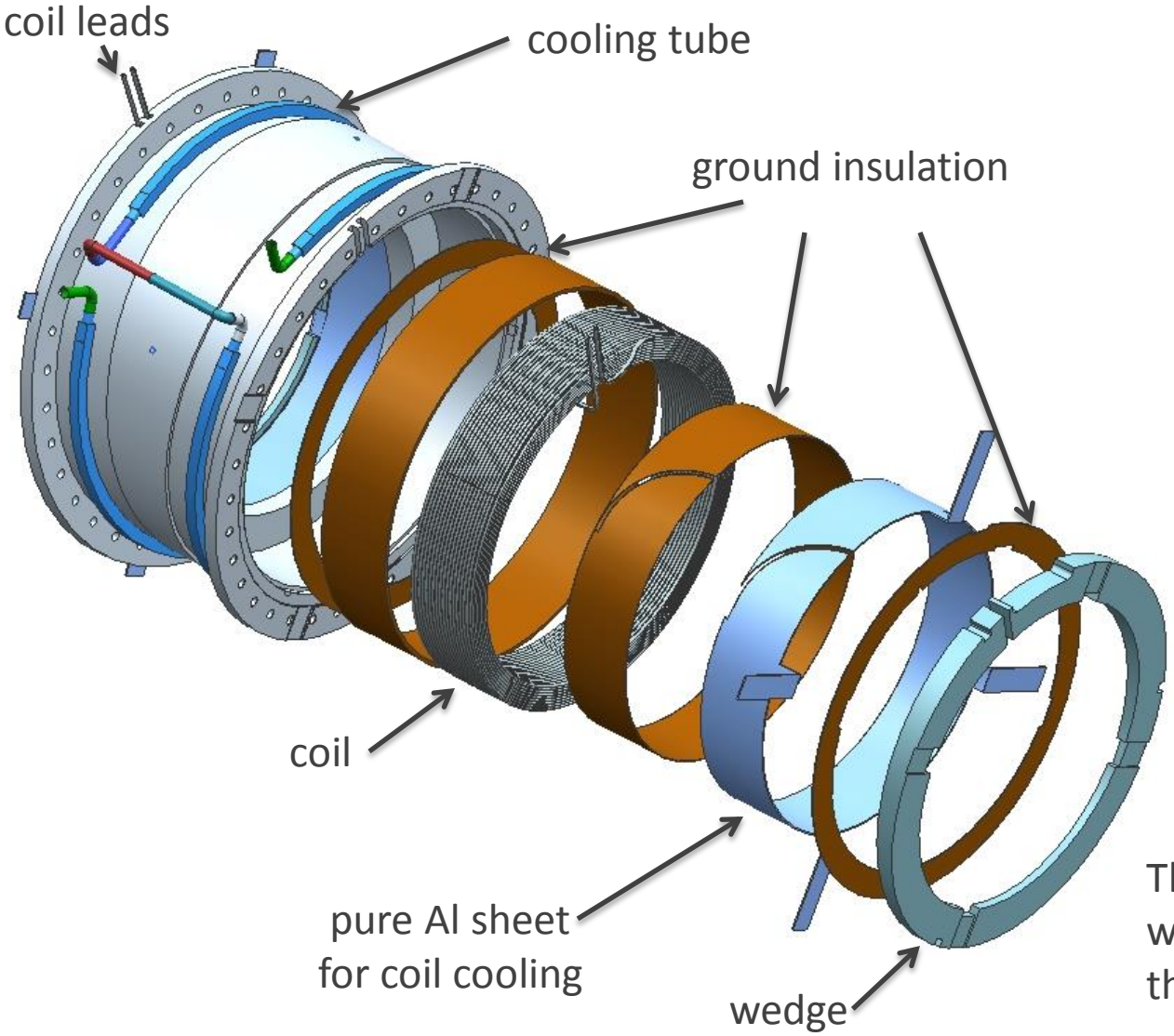
Design – Magnet System

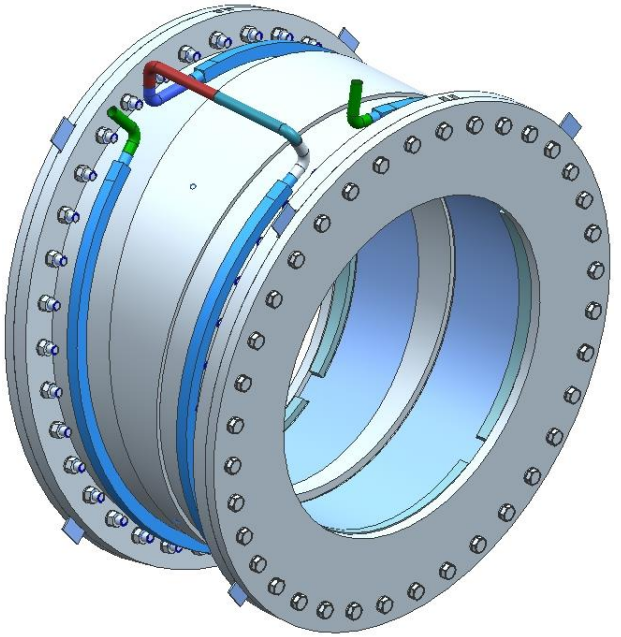




- TS is formed by 52 solenoid coils.
- Most coils have the same aperture. TS3 coils have slightly bigger aperture to help with the large gap between cryostats.
- There are four collimator elements. COL3u and COL3d are located in TS3 and they are used to filter particles based on electric charge and momentum.

TS coil module prototype



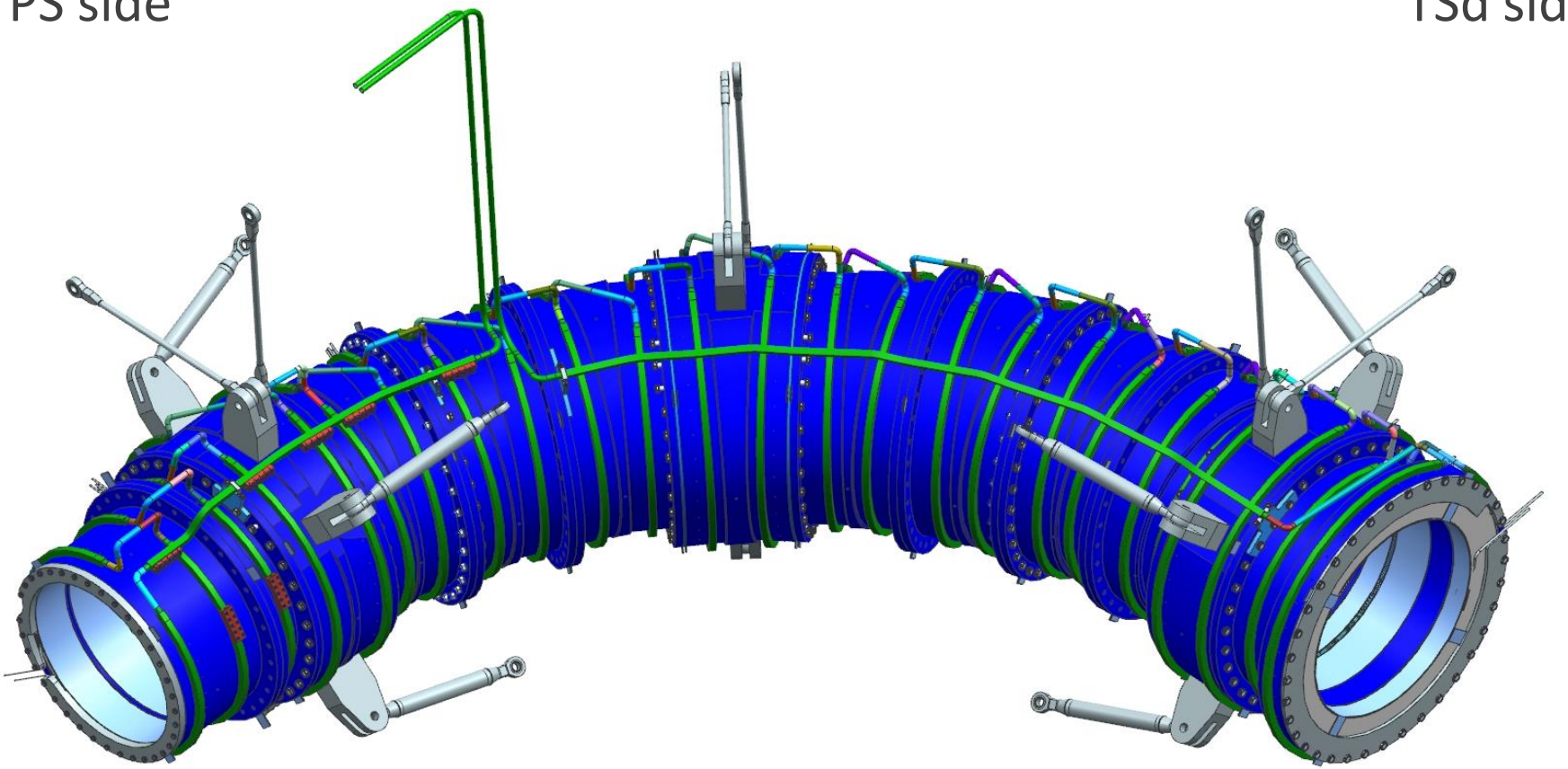


The coils are epoxy impregnated with the ground insulation and the Al sheet.

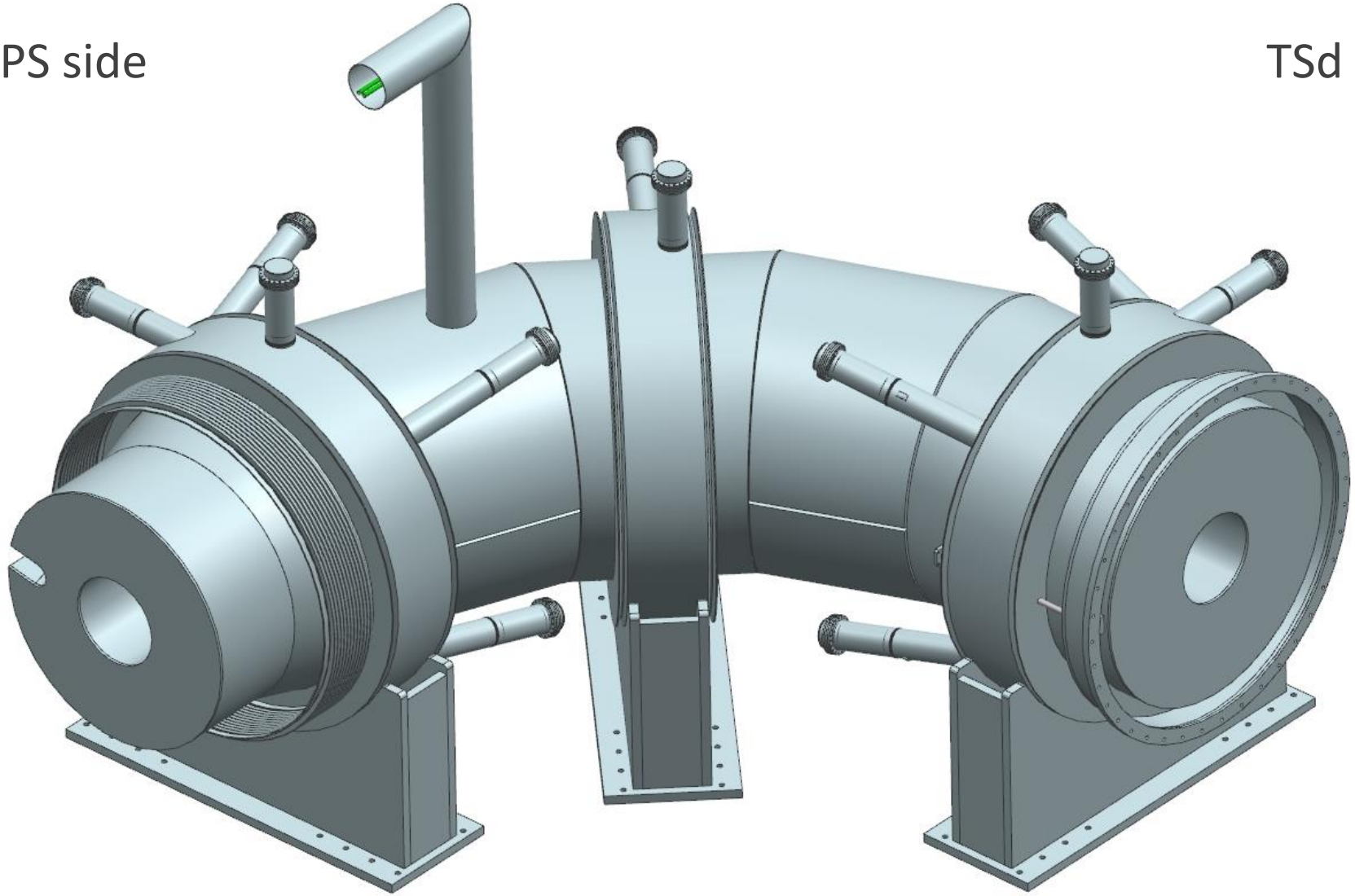
Design – Cold mass assembly

PS side

TSd side



Design – Cryostat assembly



TS support rod prototype

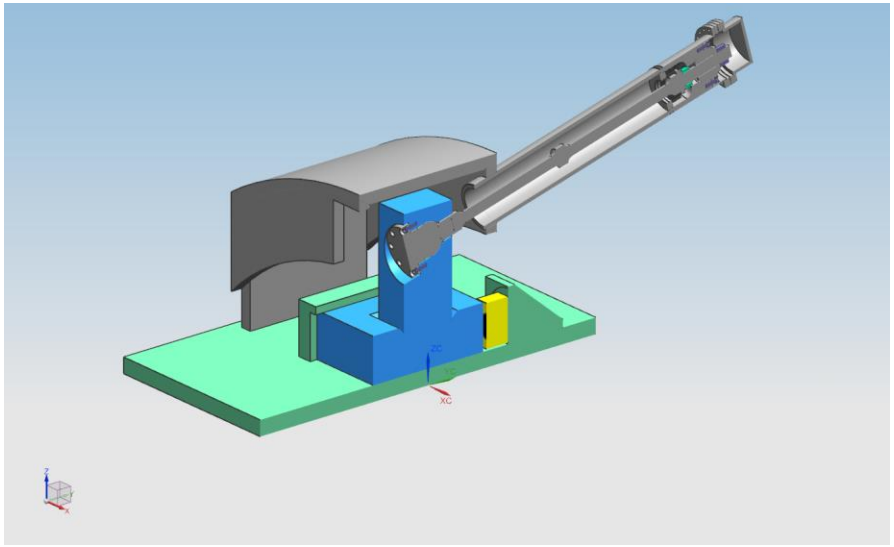
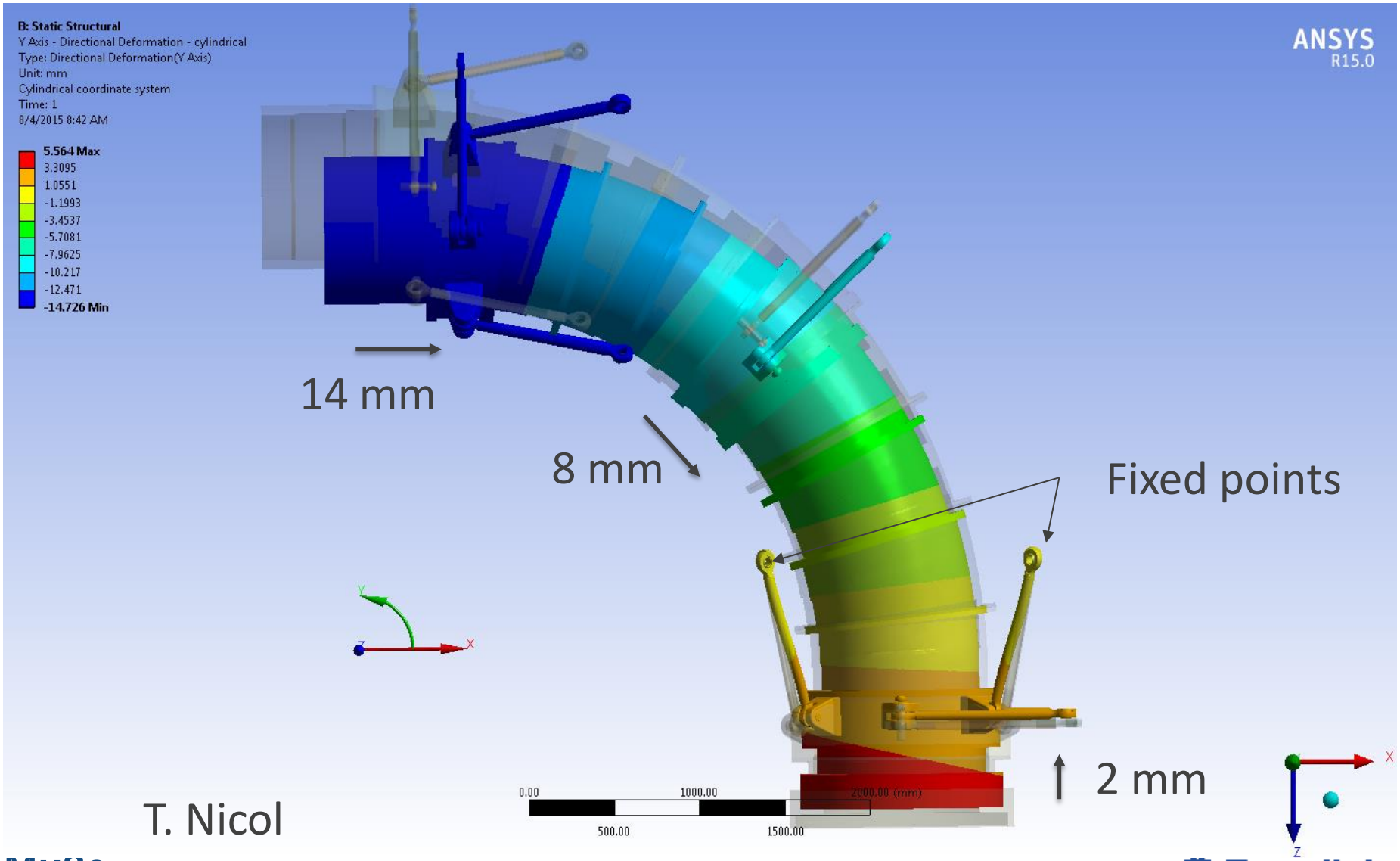
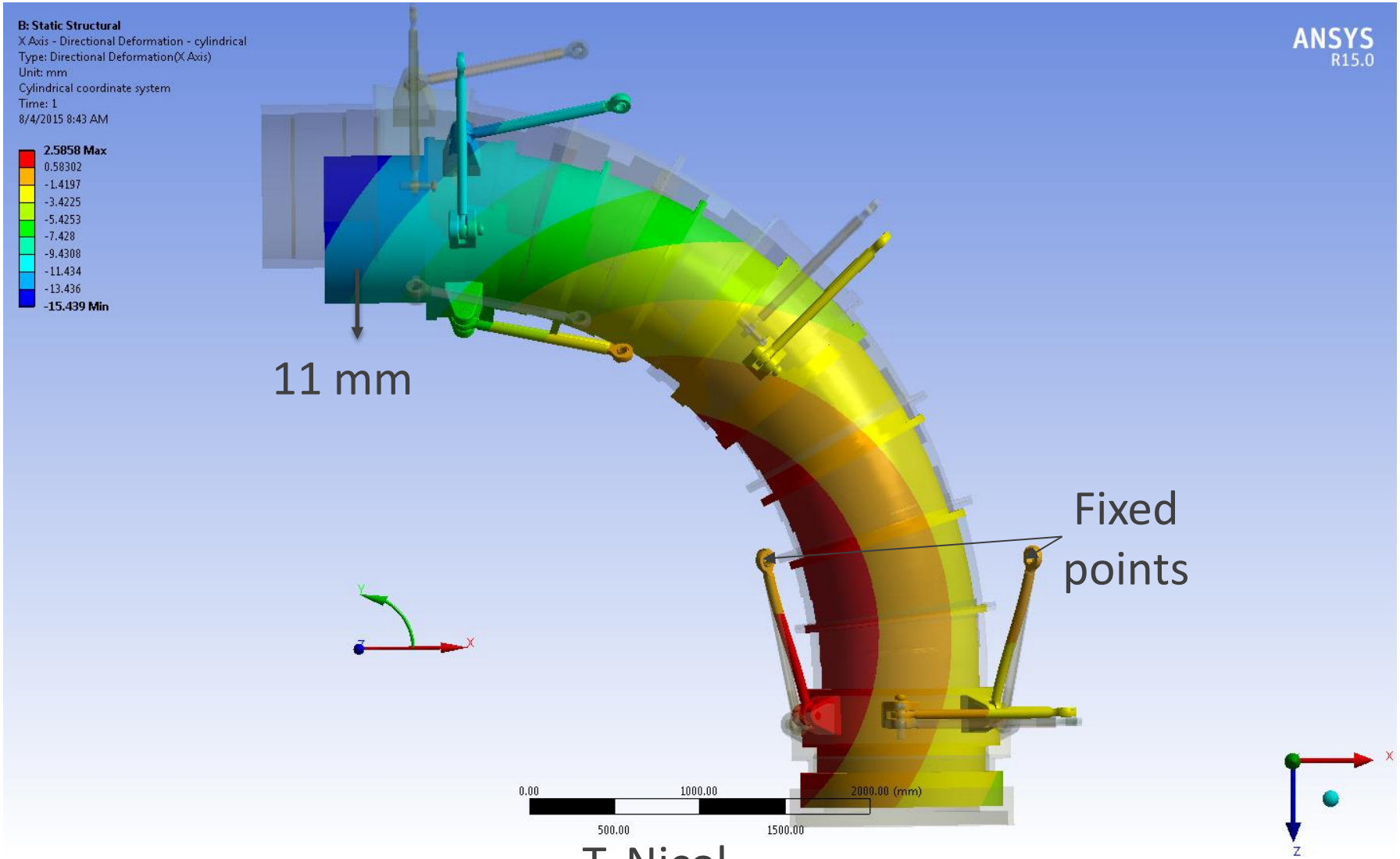


Photo by Reidar Hahn

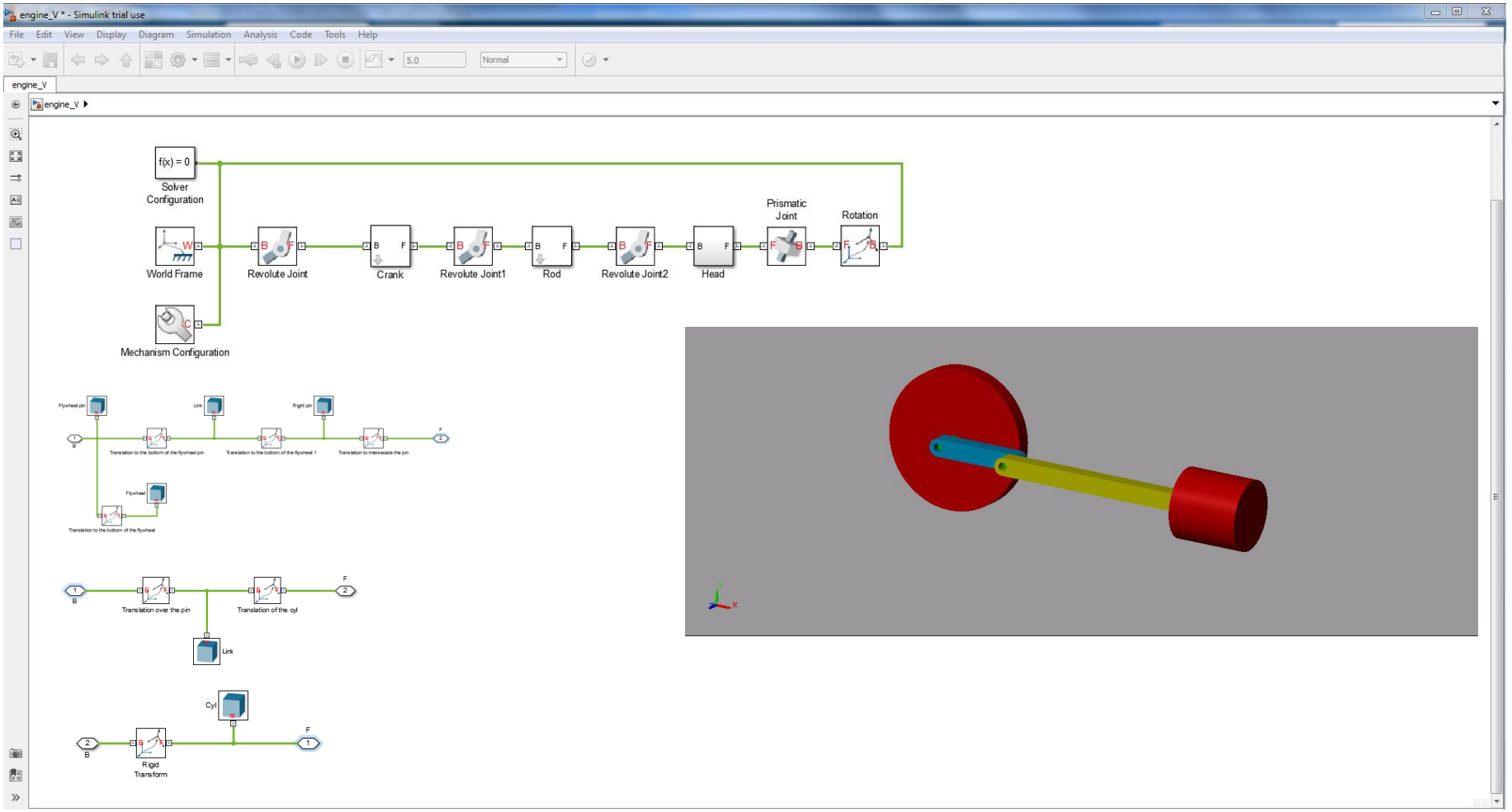
TSU support lug displacement during cool-down



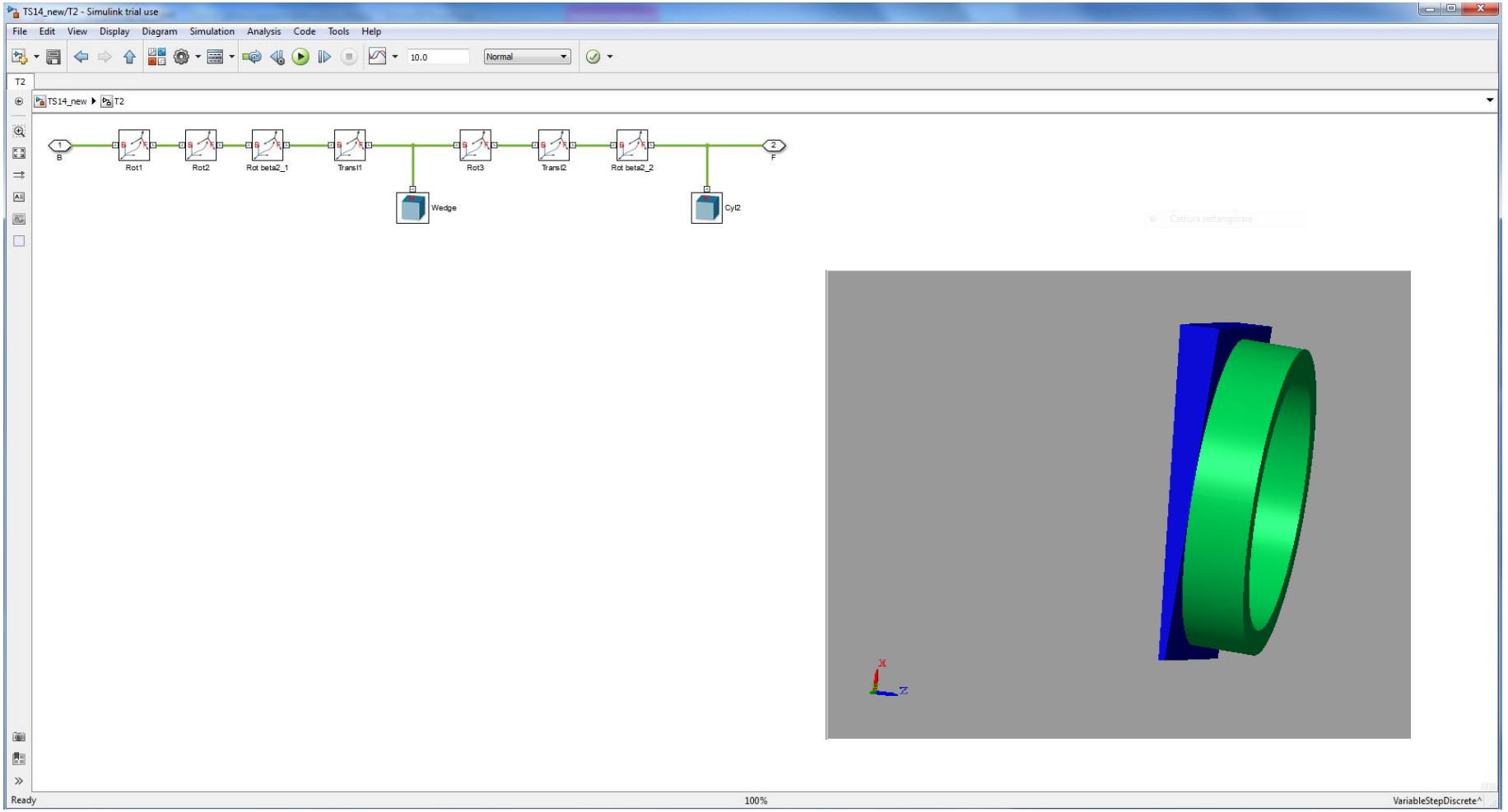
TSU support lug displacement during cool-down



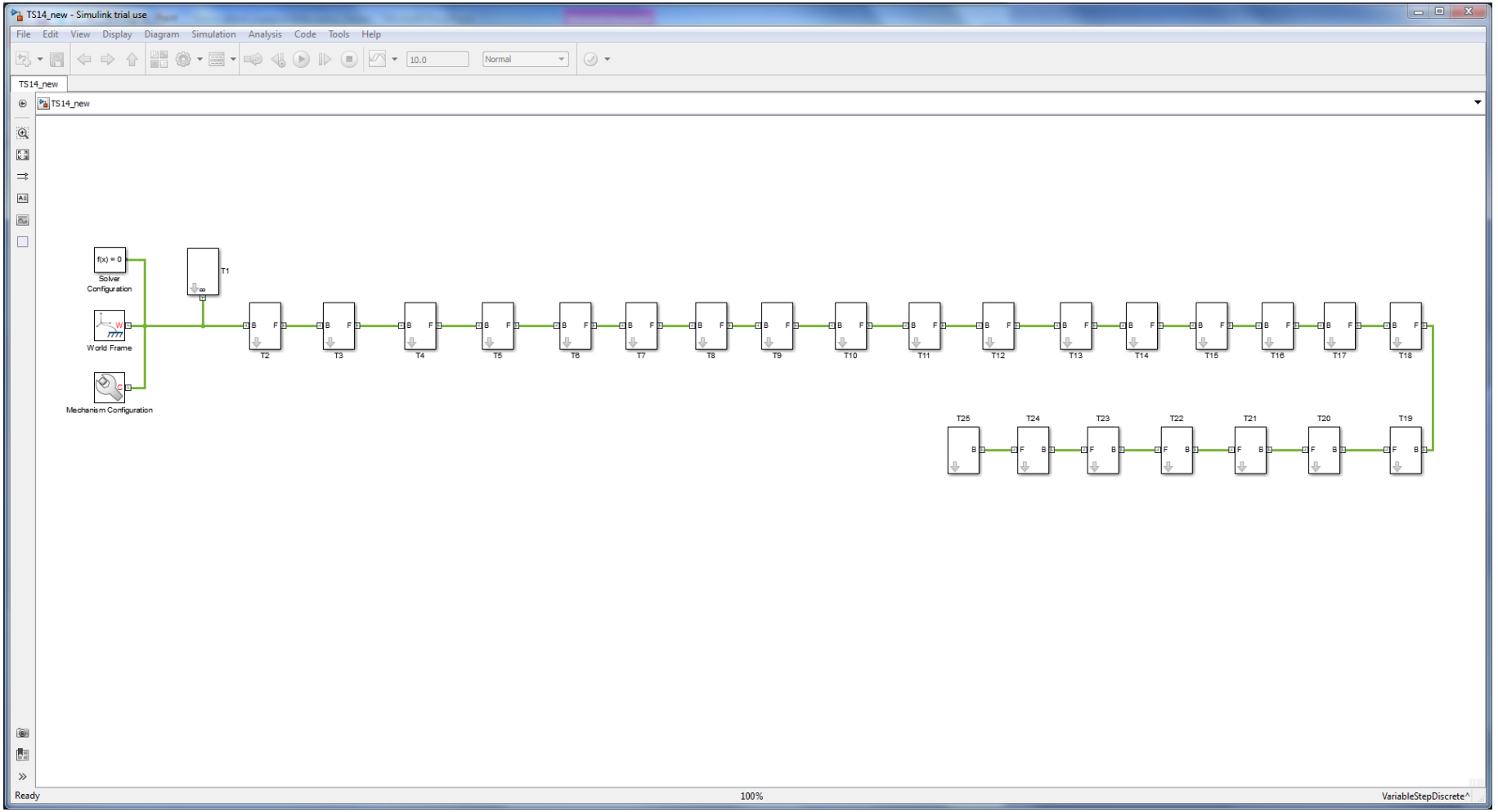
Mechanical modeling (SimMechanics)



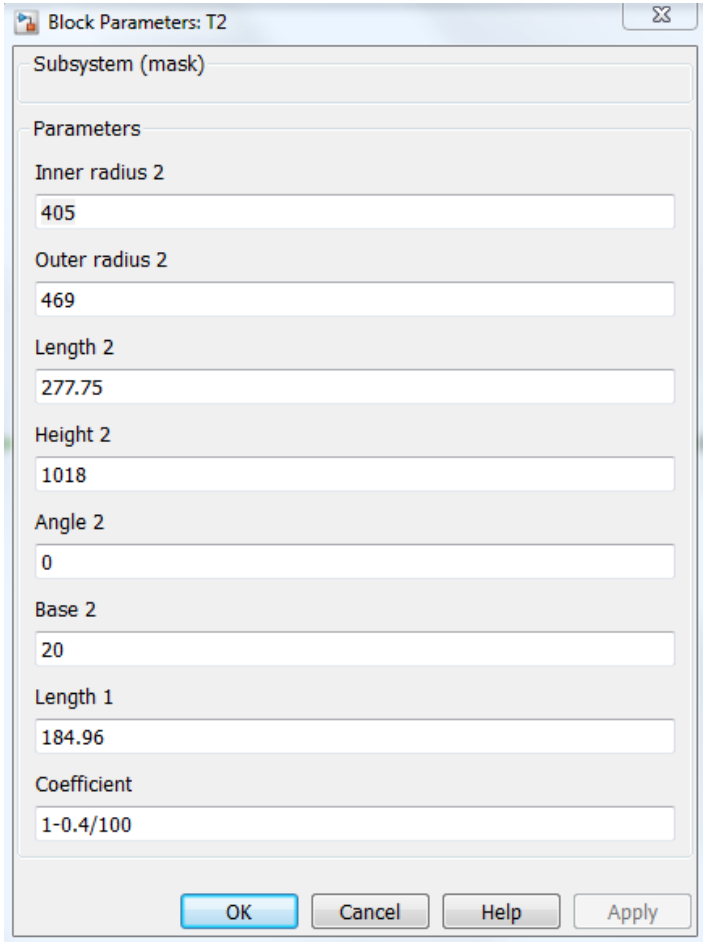
Mechanical modeling (SimMechanics)

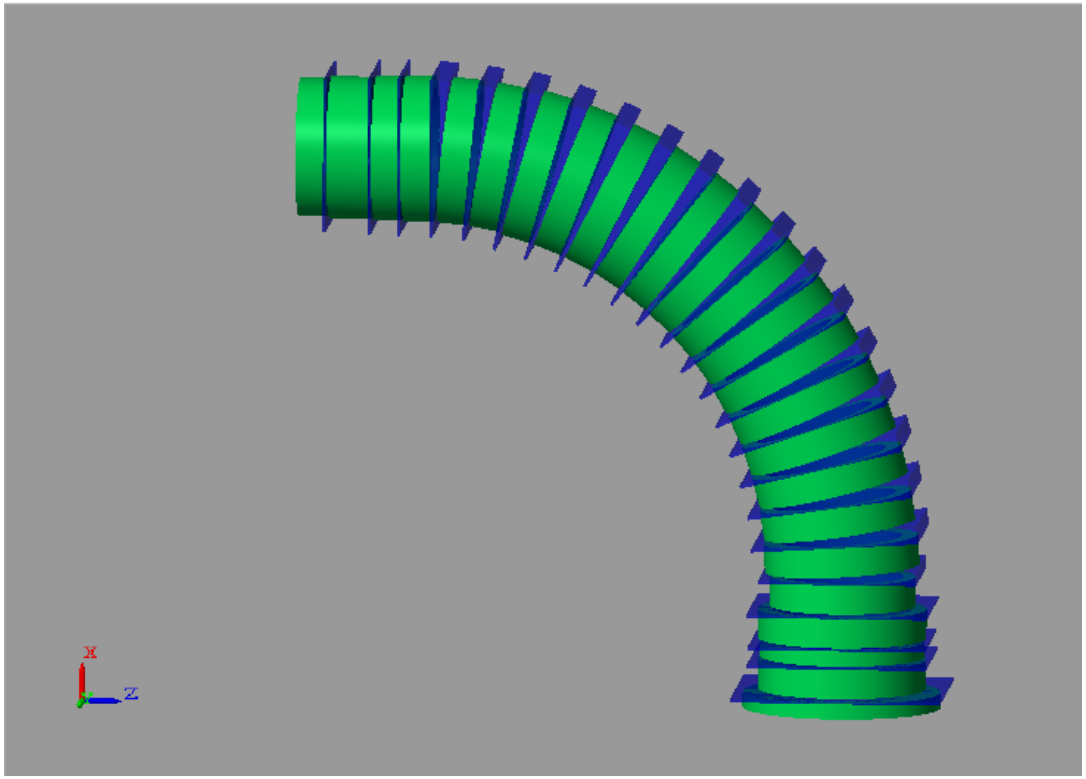


Mechanical modeling (SimMechanics)

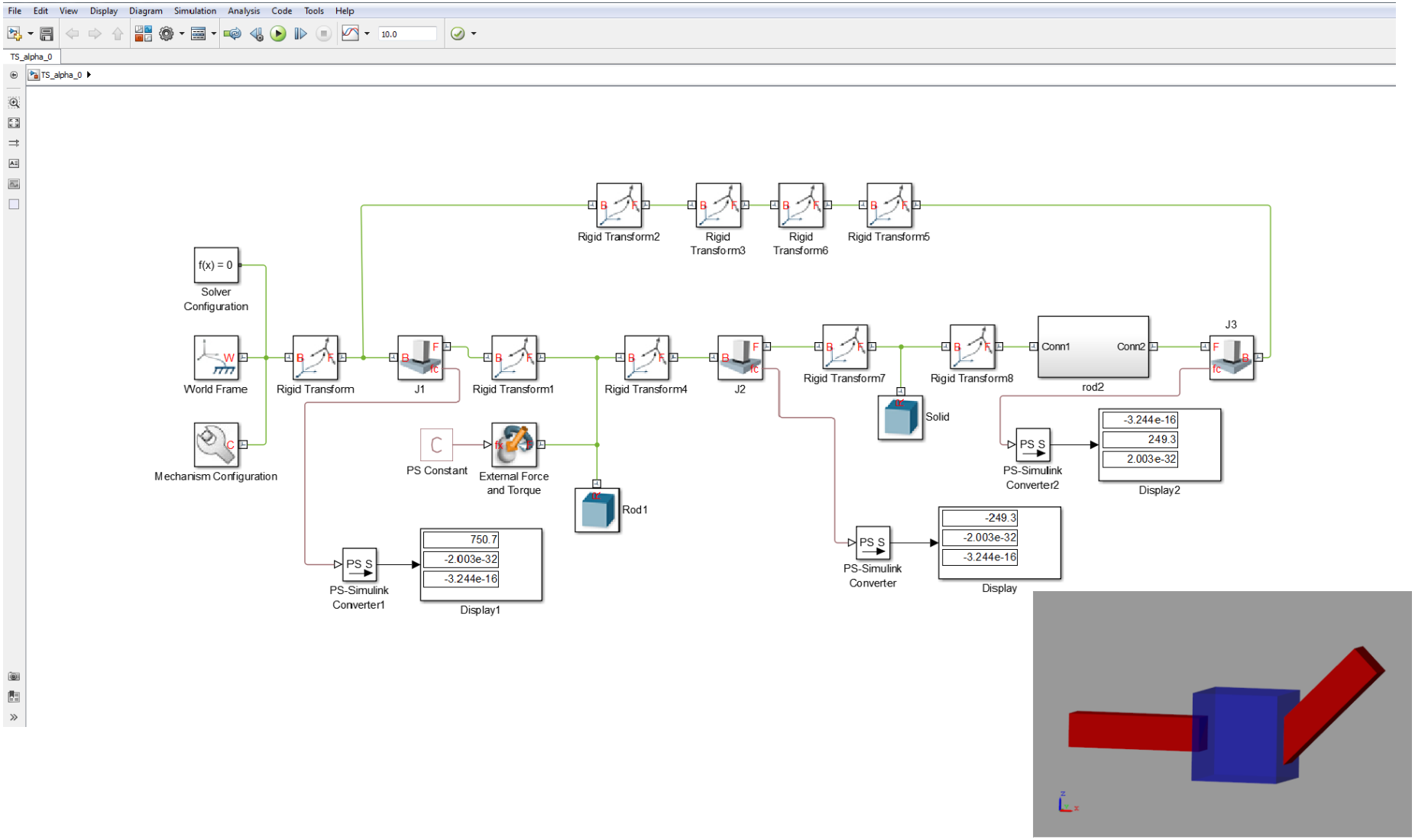


Mechanical modeling (SimMechanics)





Mechanical modeling (SimMechanics)



Project proposal

- Mechanical simulations of the cold masses under different non-ideal initial conditions. The goal is to evaluate the ranges of expected variations of the forces applied on the rods, in order to contribute to understand the alignment of each support rod;

- Comparing the results obtained from the Mechanical Modeling and those from the Finite Element Method analysis.

Fermilab

Thank you!

Veronica Ilardi

23 September 2015