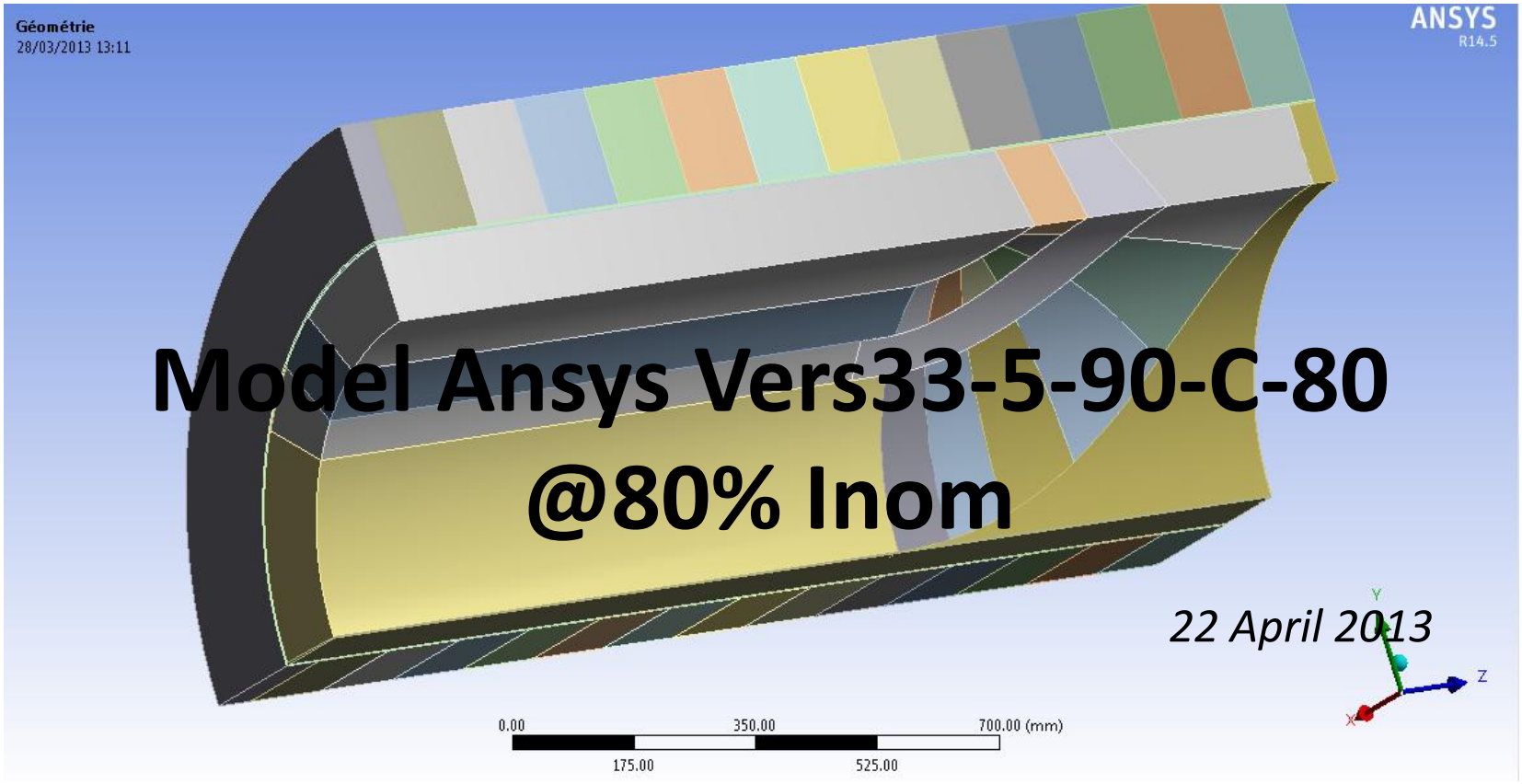


Model Ansys Vers33-5-90-C-80 @80% Inom

22 April 2013

Model Ansys Vers33-5-90-C-80

Revision and Abstract

Description	Revision	Date
Creation	A	19/04/2013-AS
Update view page 20	B	22/04/2013-AS

ABSTRACT

This report presents calculation made by Sigmaphi.

This simulation was carried out with the following parameters:

- Coil mesh 28mm
- Spacer mesh size 28 mm
- Orthotropic orientation for conductor material and CTE

Model Ansys Vers33-5-90-C-80

Data input of the model

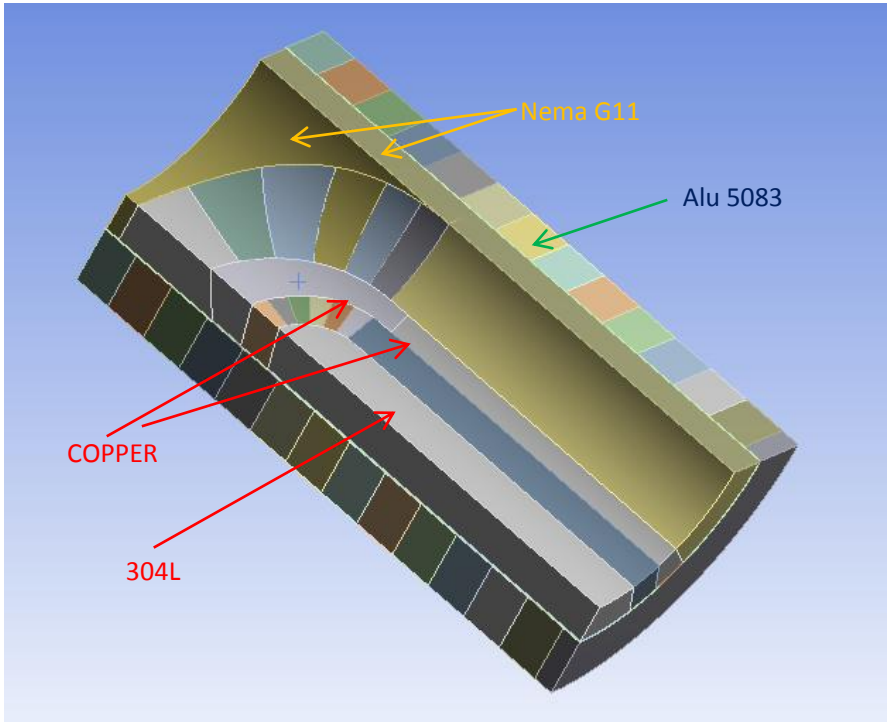
- Collar temperature 90°C (interference fit 90-22=68 K)
- Coil material :

  Young Modulus X axis : 20Gpa /Poisson ratio 0.31
  Young Modulus Y axis : 20Gpa / Poisson ratio 0.31
  Young Modulus Z axis : 100Gpa / Poisson ratio 0.31

- Forces density imported from opera
- Cooldown to 4K

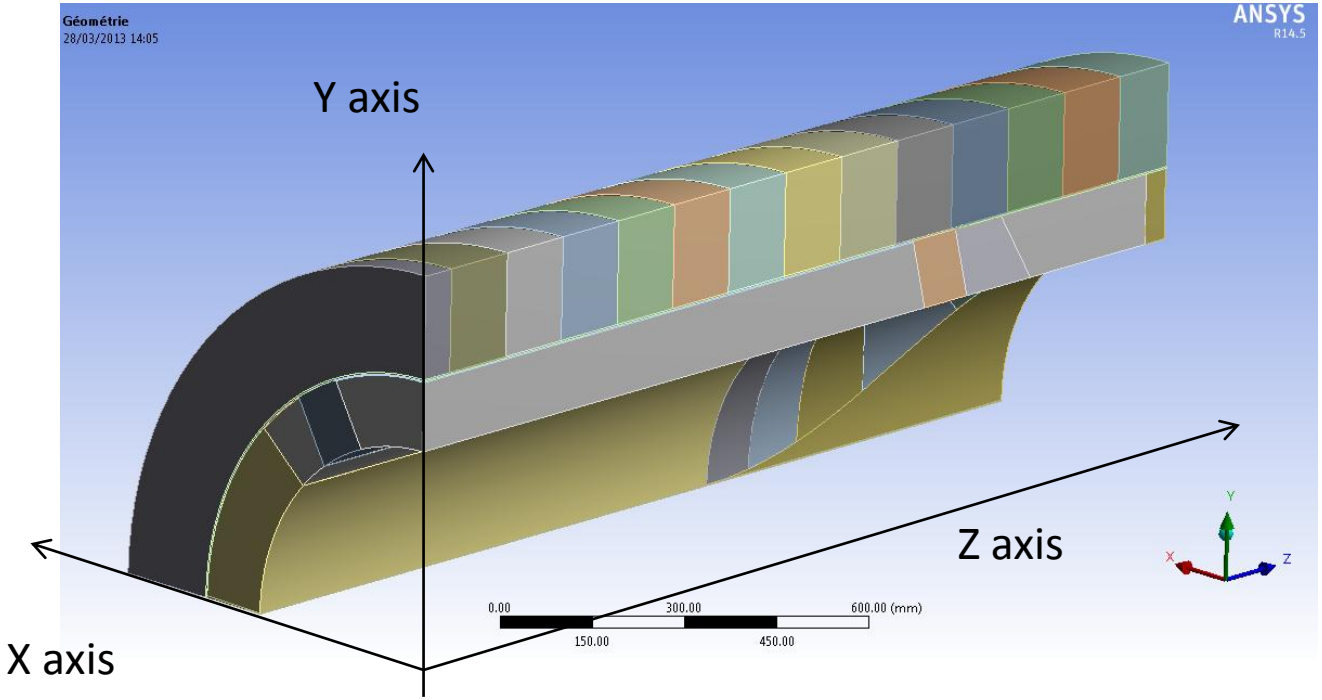
Model Ansys Vers33-5-90-C-80

Material



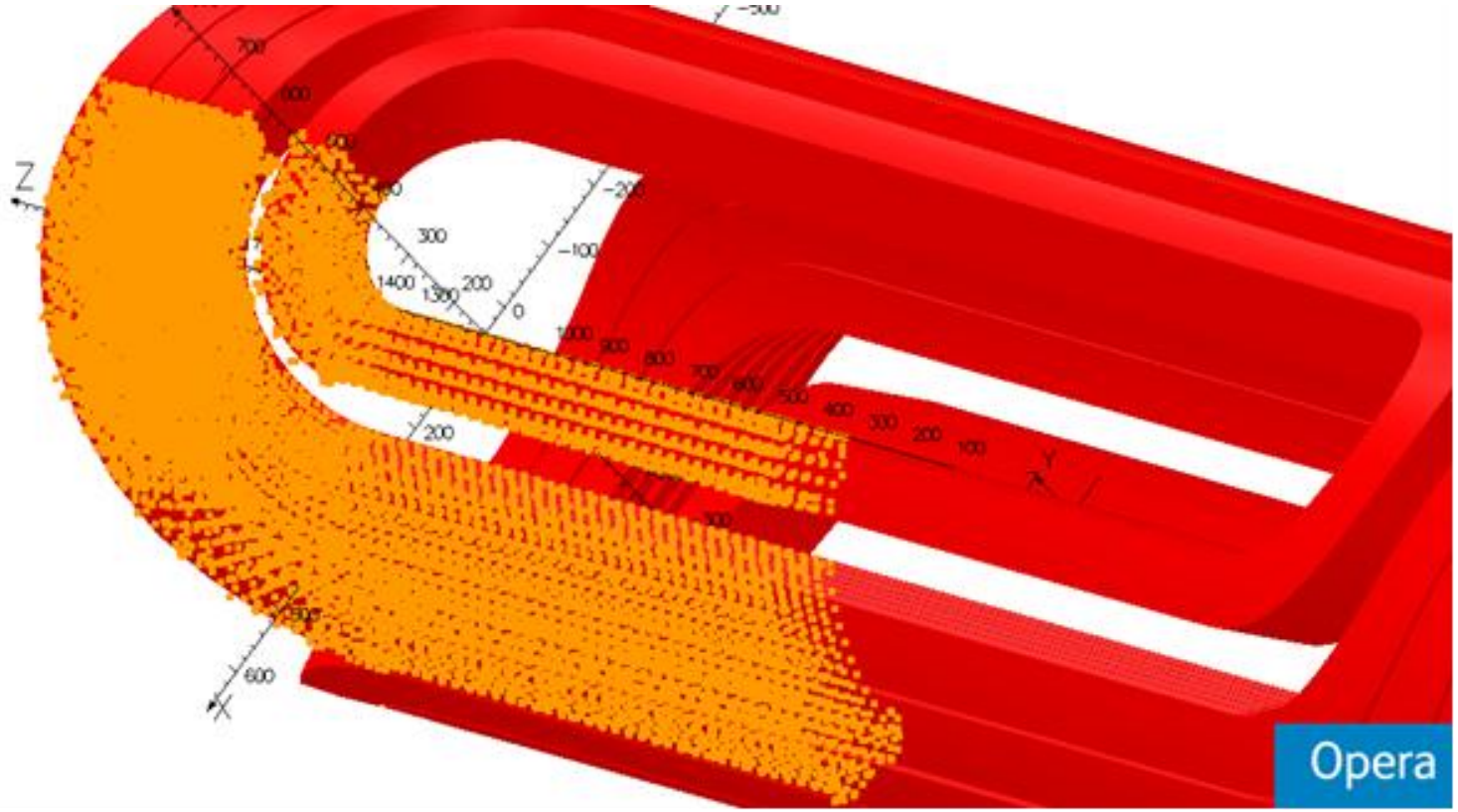
Model Ansys Vers33-5-90-C-80

Opera and Ansys axis (Orientation of the model)



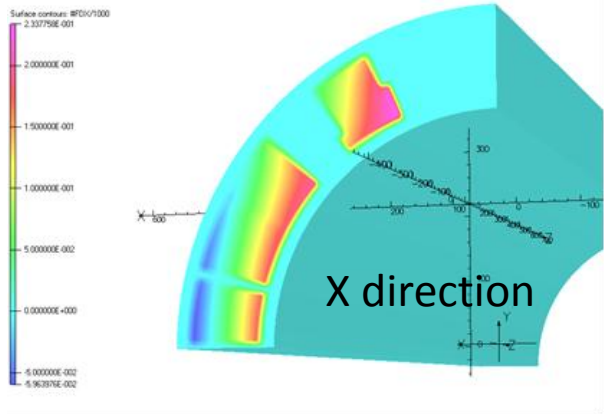
Model Ansys Vers33-5-90-C-80

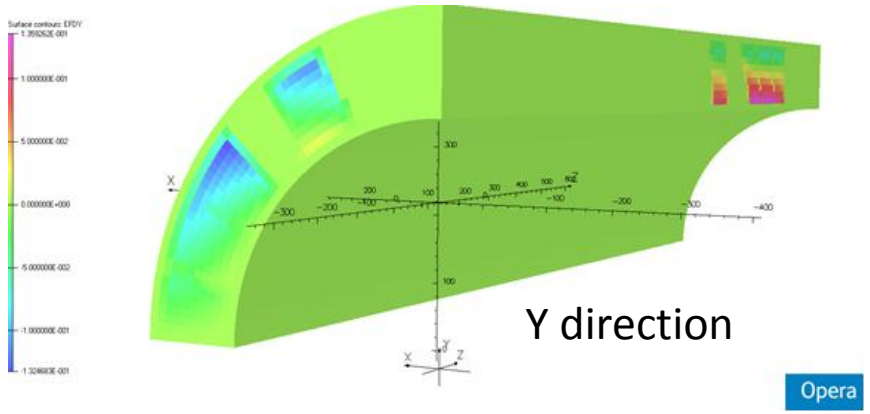
Localization of the forces density centroids

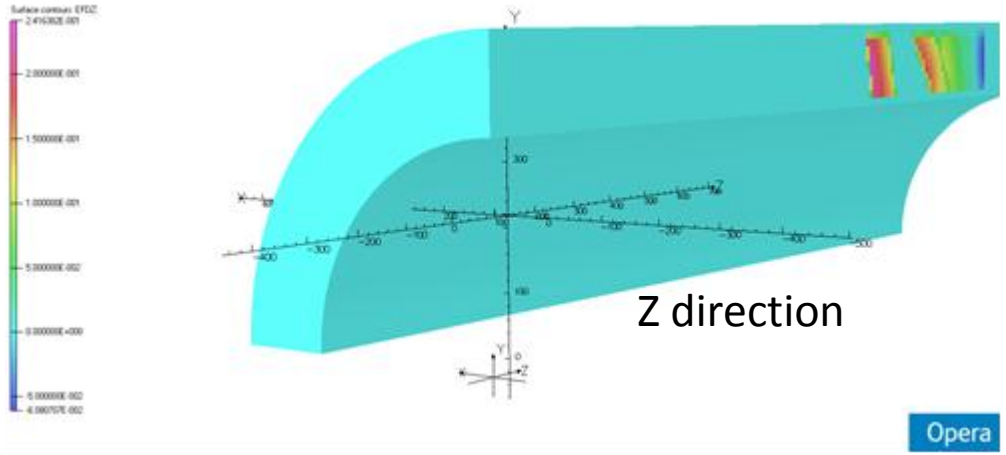


Model Ansys Vers33-5-90-C-80

Density distribution of forces in the Opera model

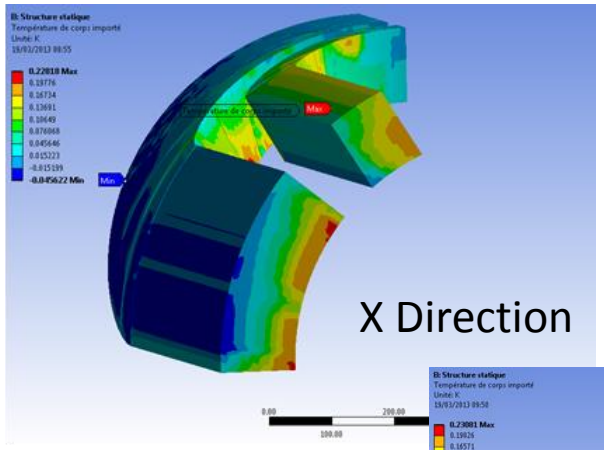


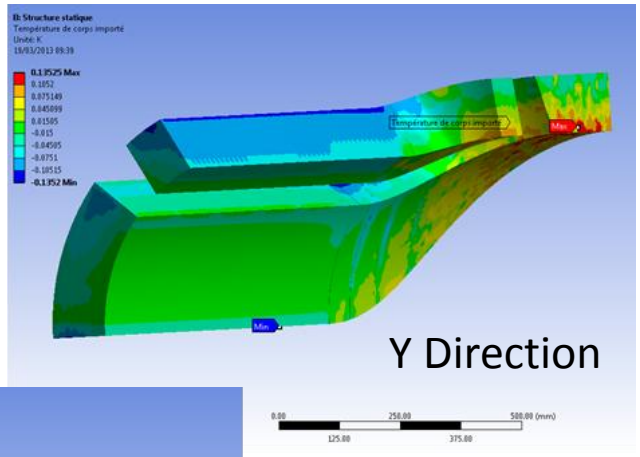


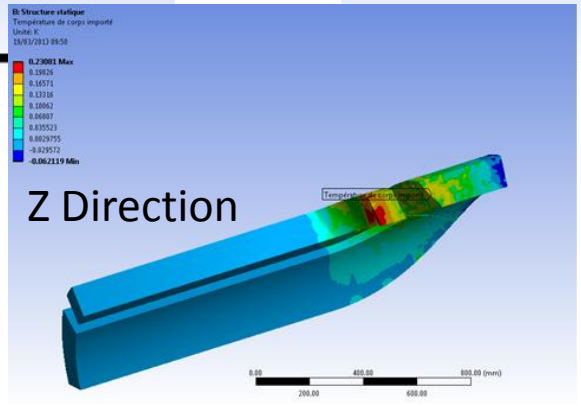


Model Ansys Vers33-5-90-C-80

Density distribution of forces in the Ansys model

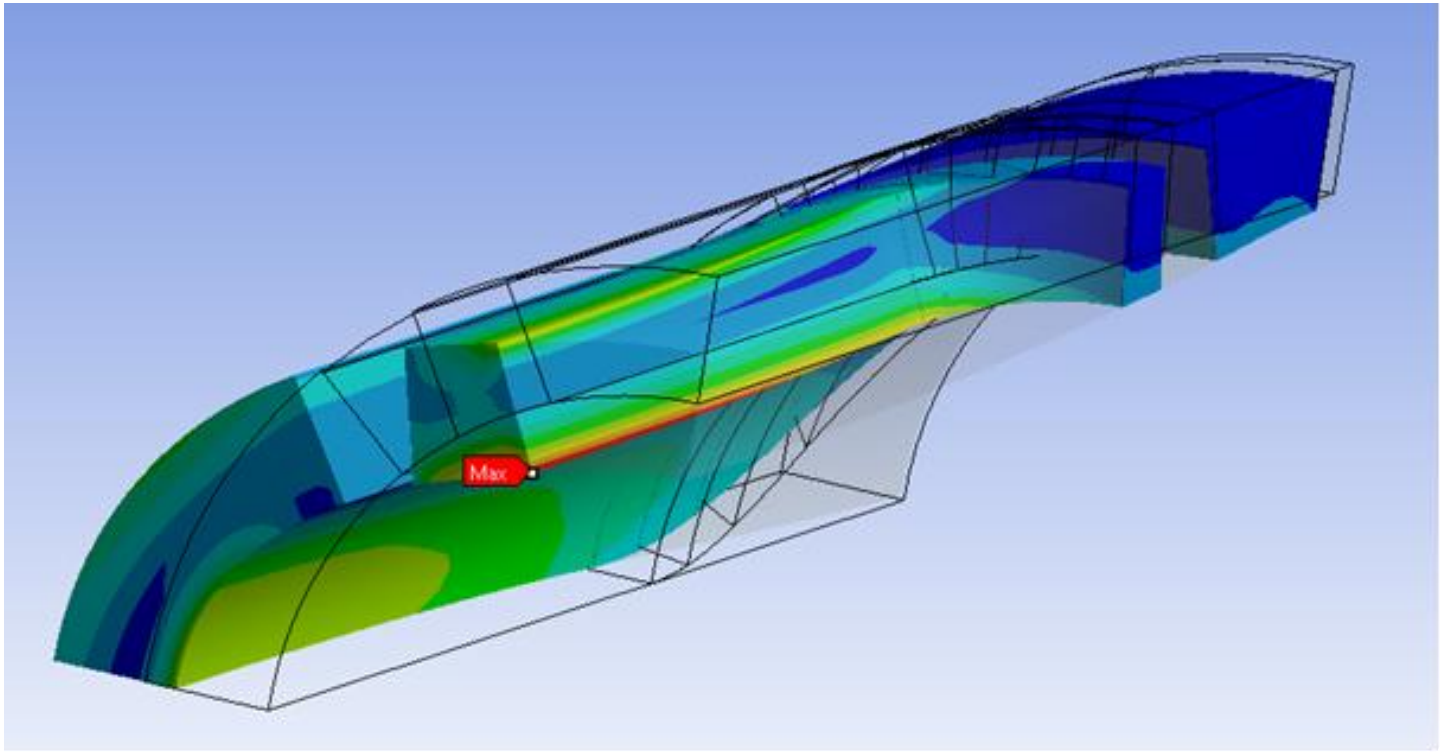






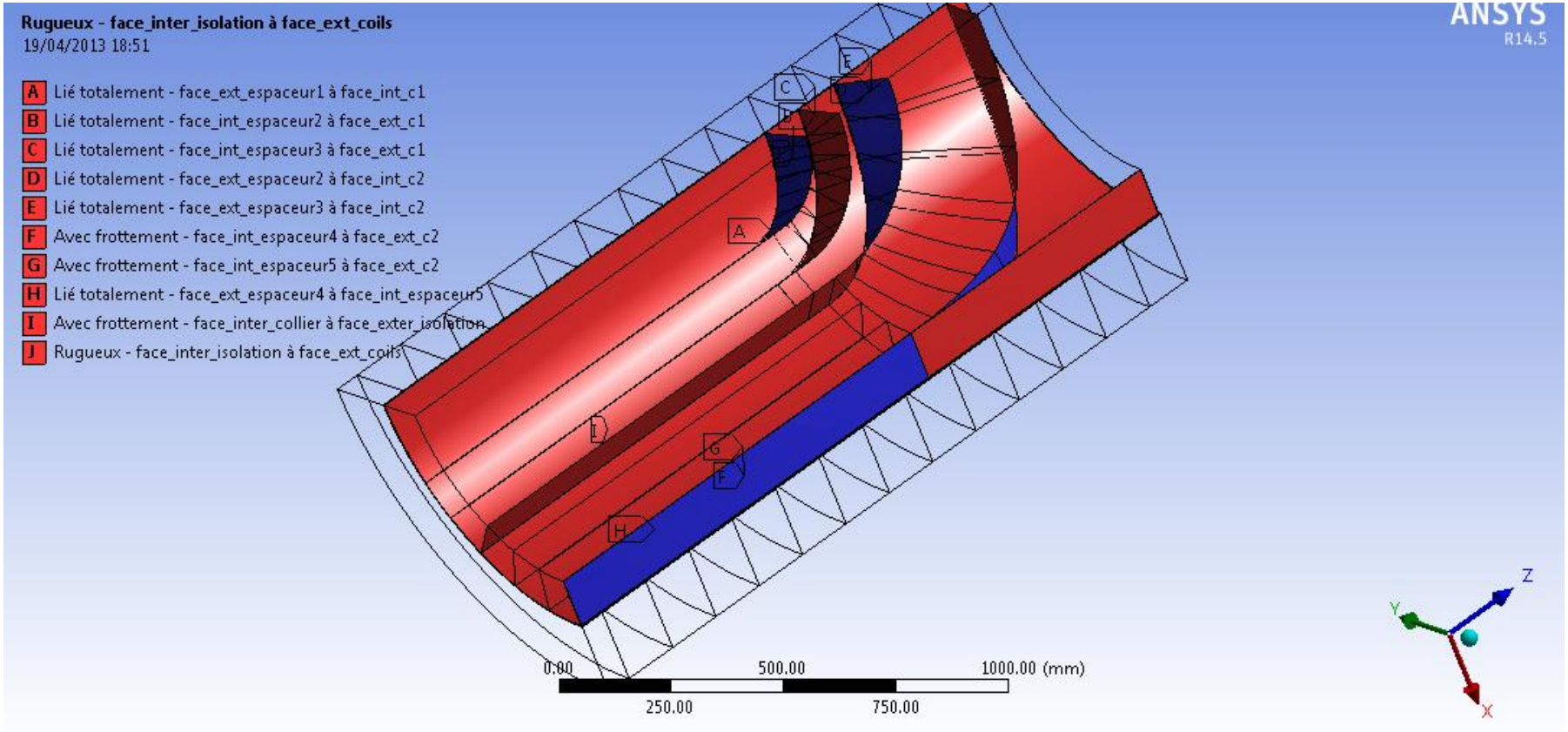
Model Ansys Vers33-5-90-C-80

Distorted views of the coil (wired original geometry)



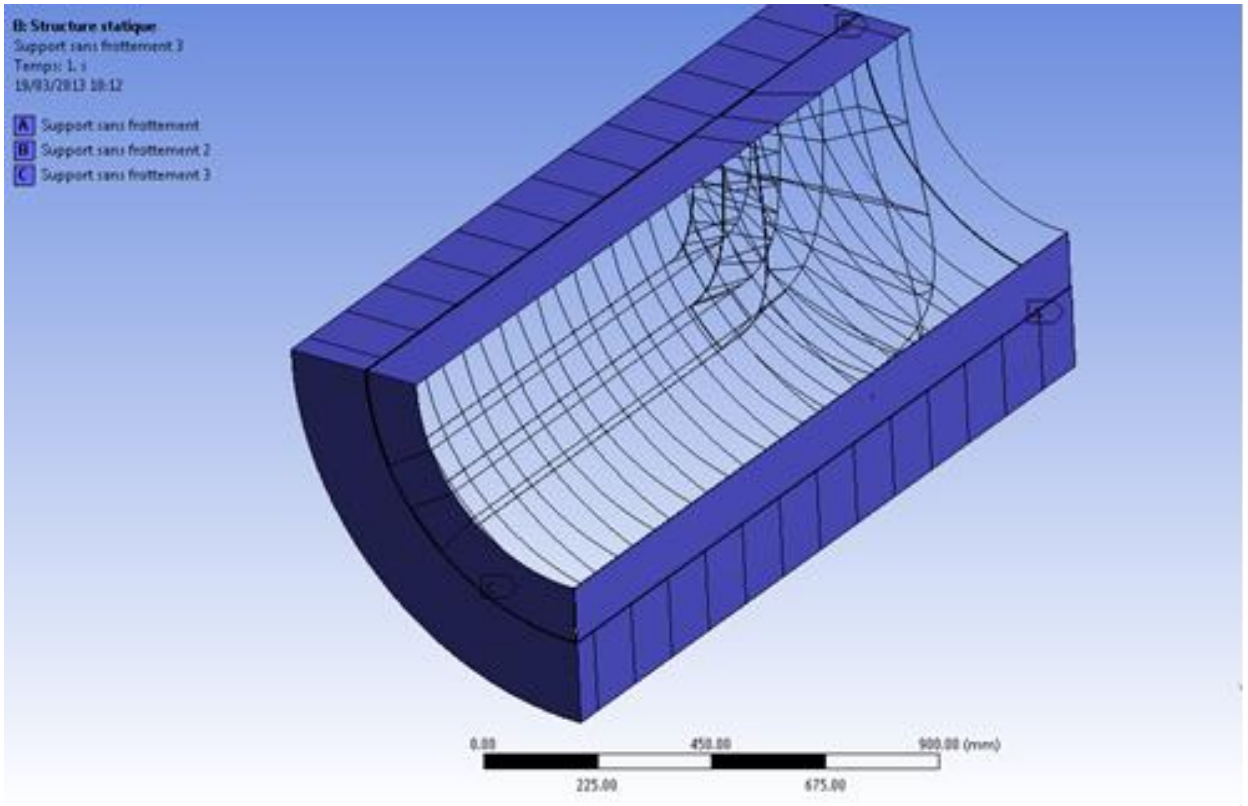
Model Ansys Vers33-5-90-C-80

Contacts



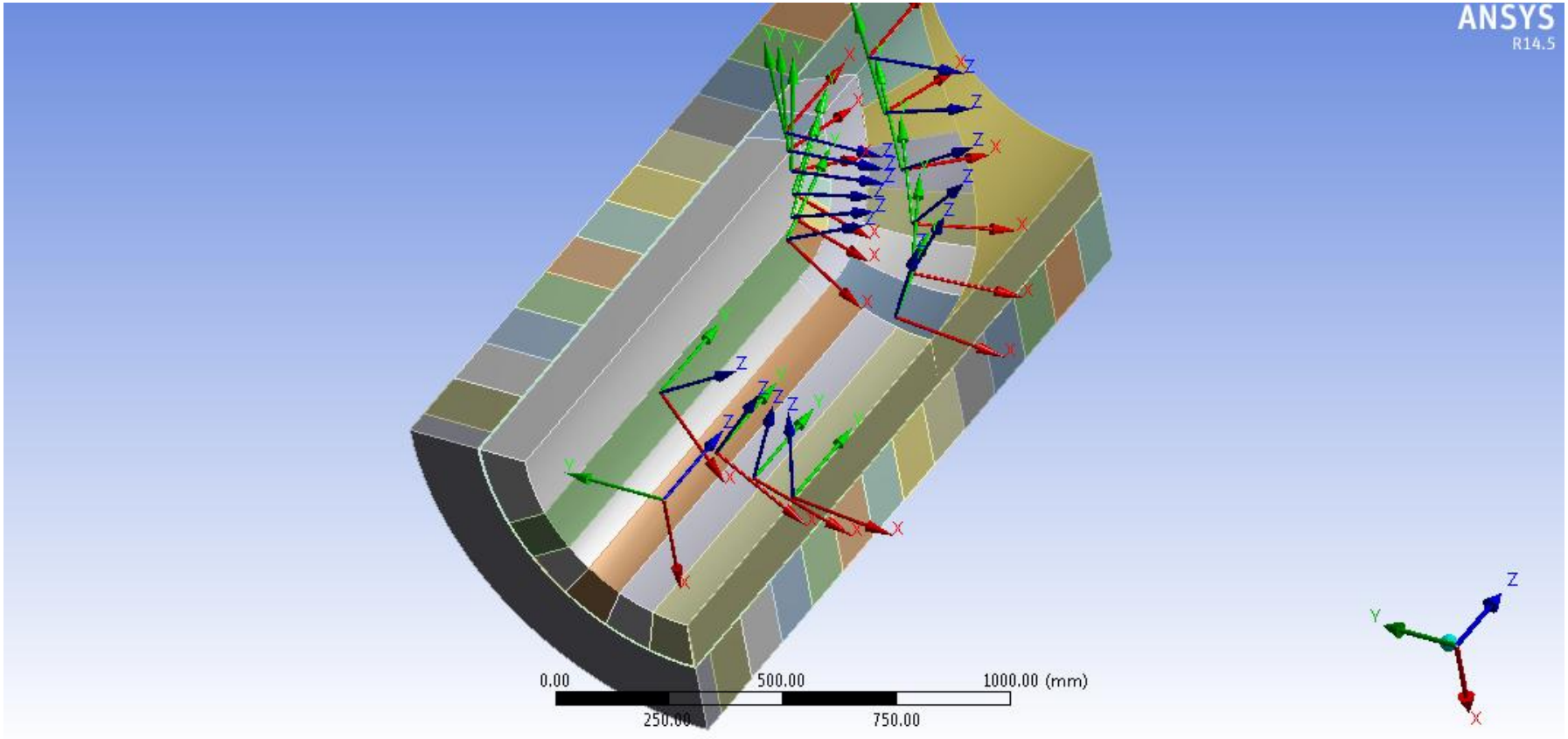
Model Ansys Vers33-5-90-C-80

Supports



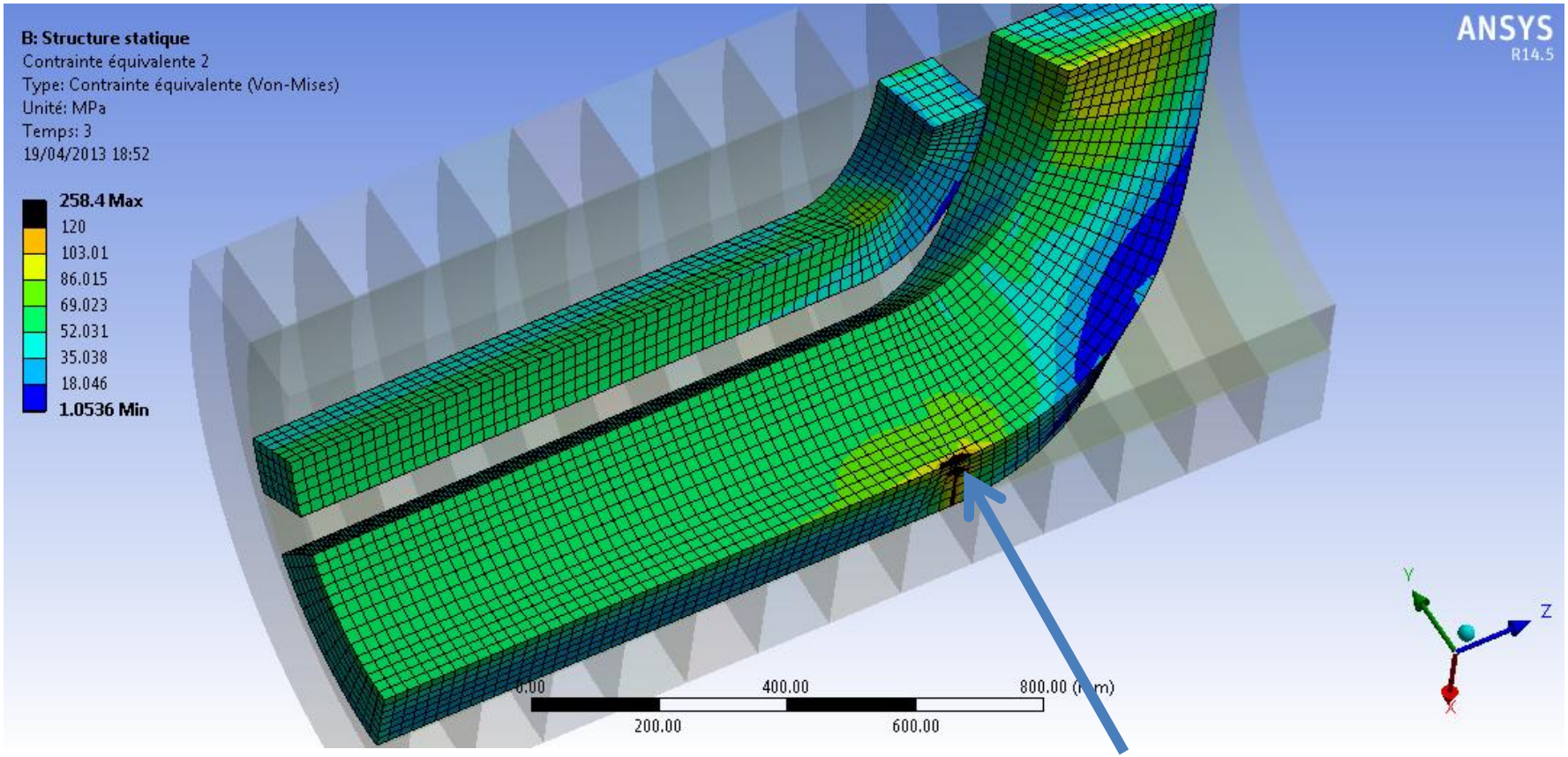
Model Ansys Vers33-5-90-C-80

Orientation axis for the orthotropic material. (Coils)



Model Ansys Vers33-5-90-C-80

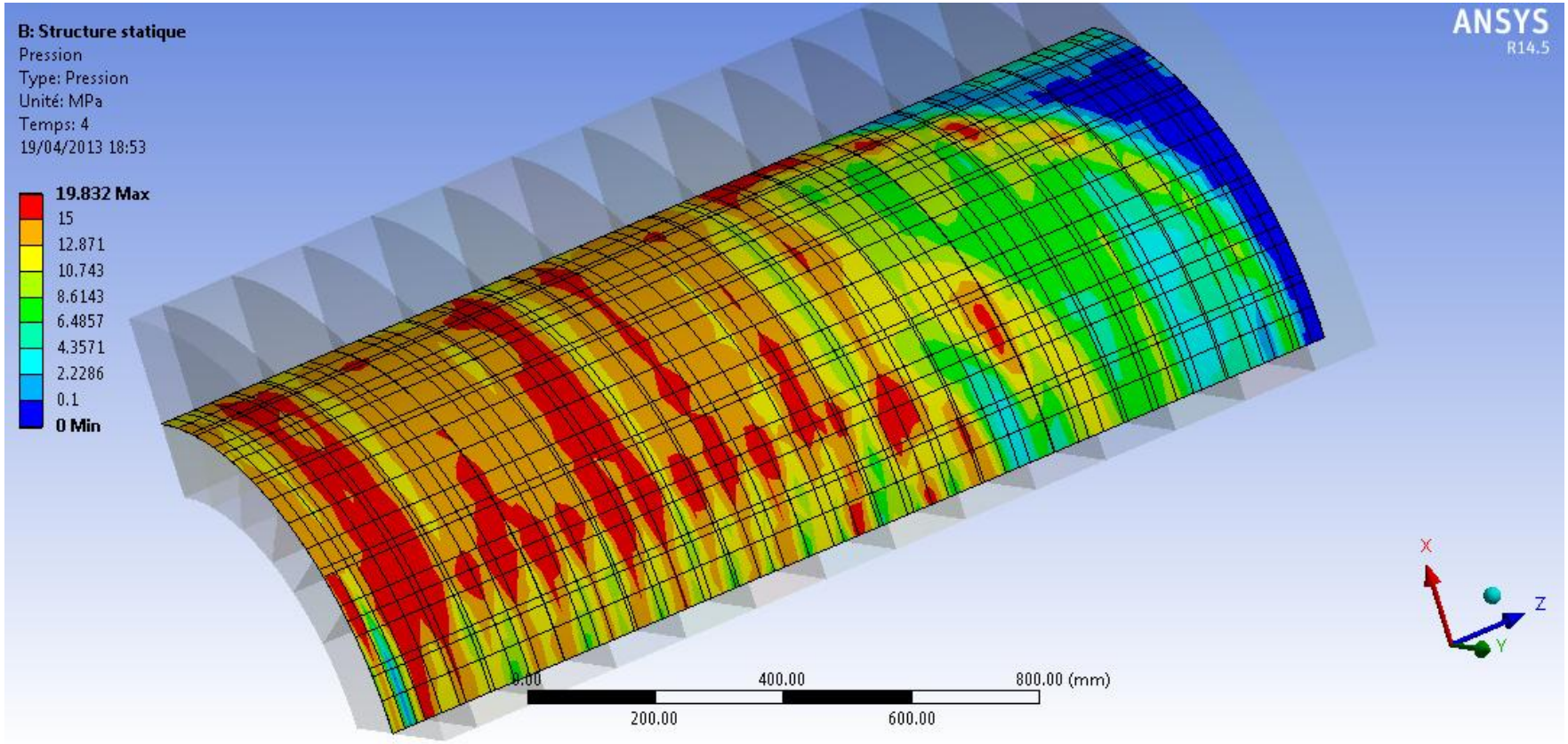
Cooldown 4K– VON MISES STRESS



Peak stress not relevant at the sharp edge, artefact due to the bad mesh shape ratio between the coil and the sharp end spacer

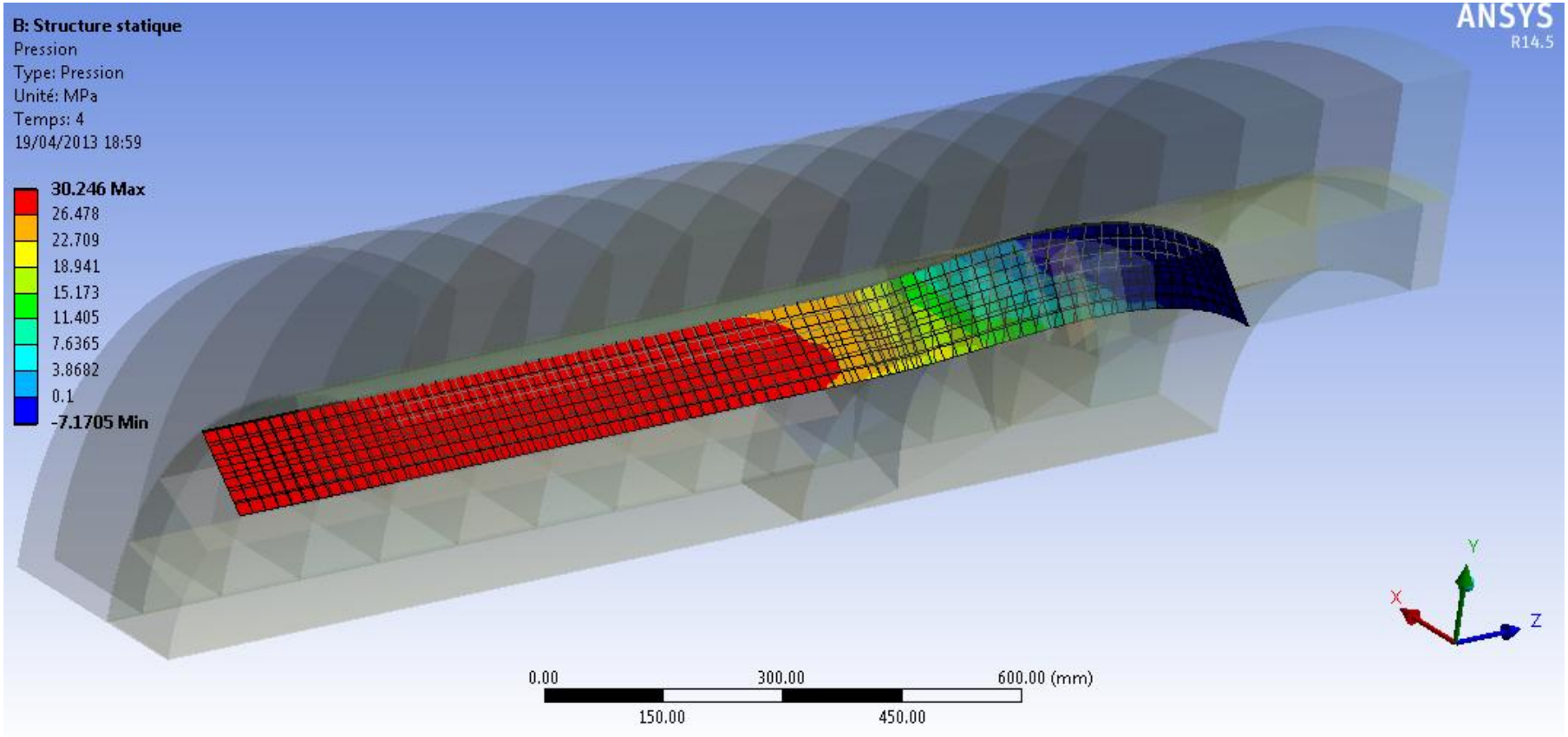
Model Ansys Vers33-5-90-C-80

Cooldown 4K– CONTACT PRESSURE BETWEEN COLLARS AND COIL



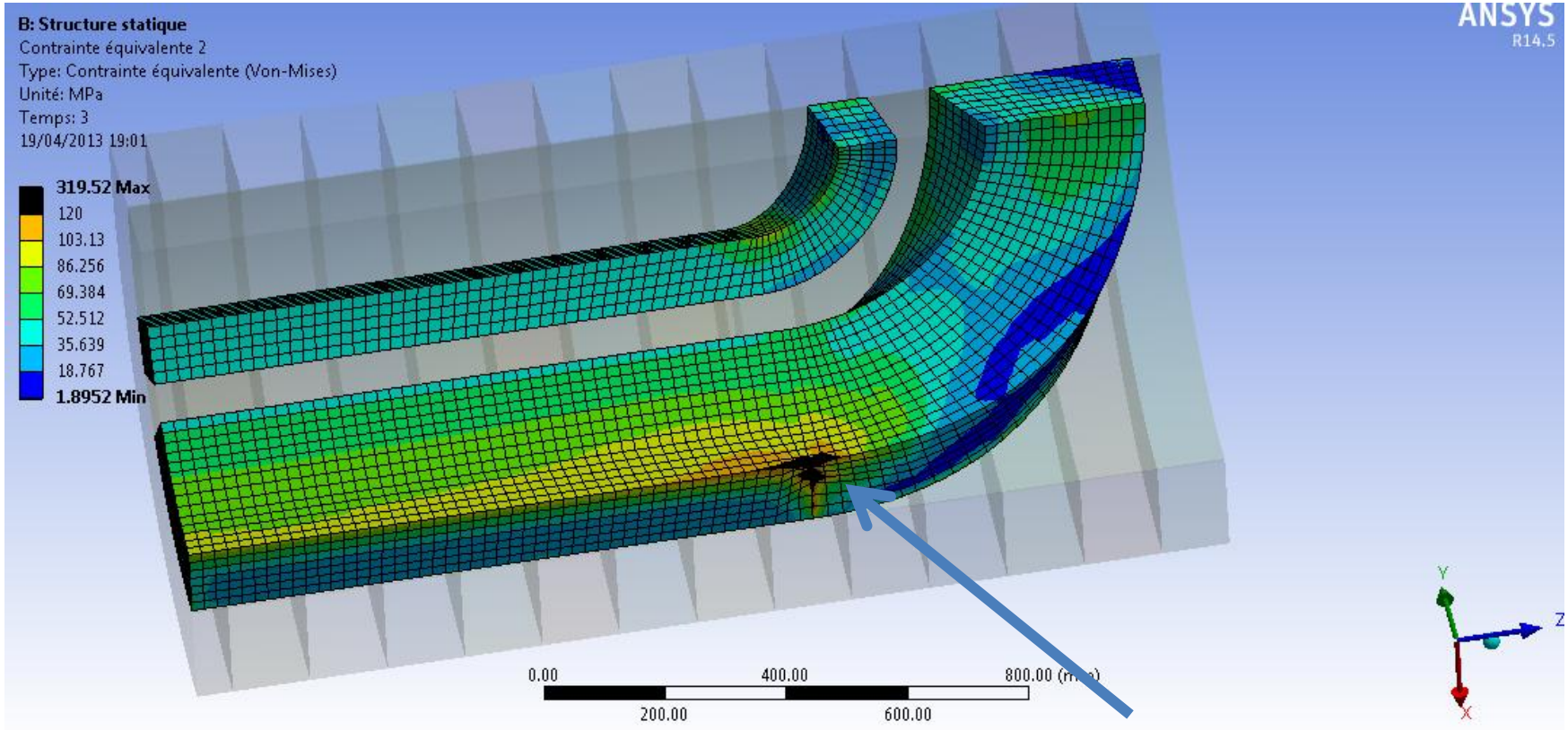
Model Ansys Vers33-5-90-C-80

Cooldown 4K– CONTACT PRESSURE BETWEEN CENTRAL SPACER AND COIL



Model Ansys Vers33-5-90-C-80

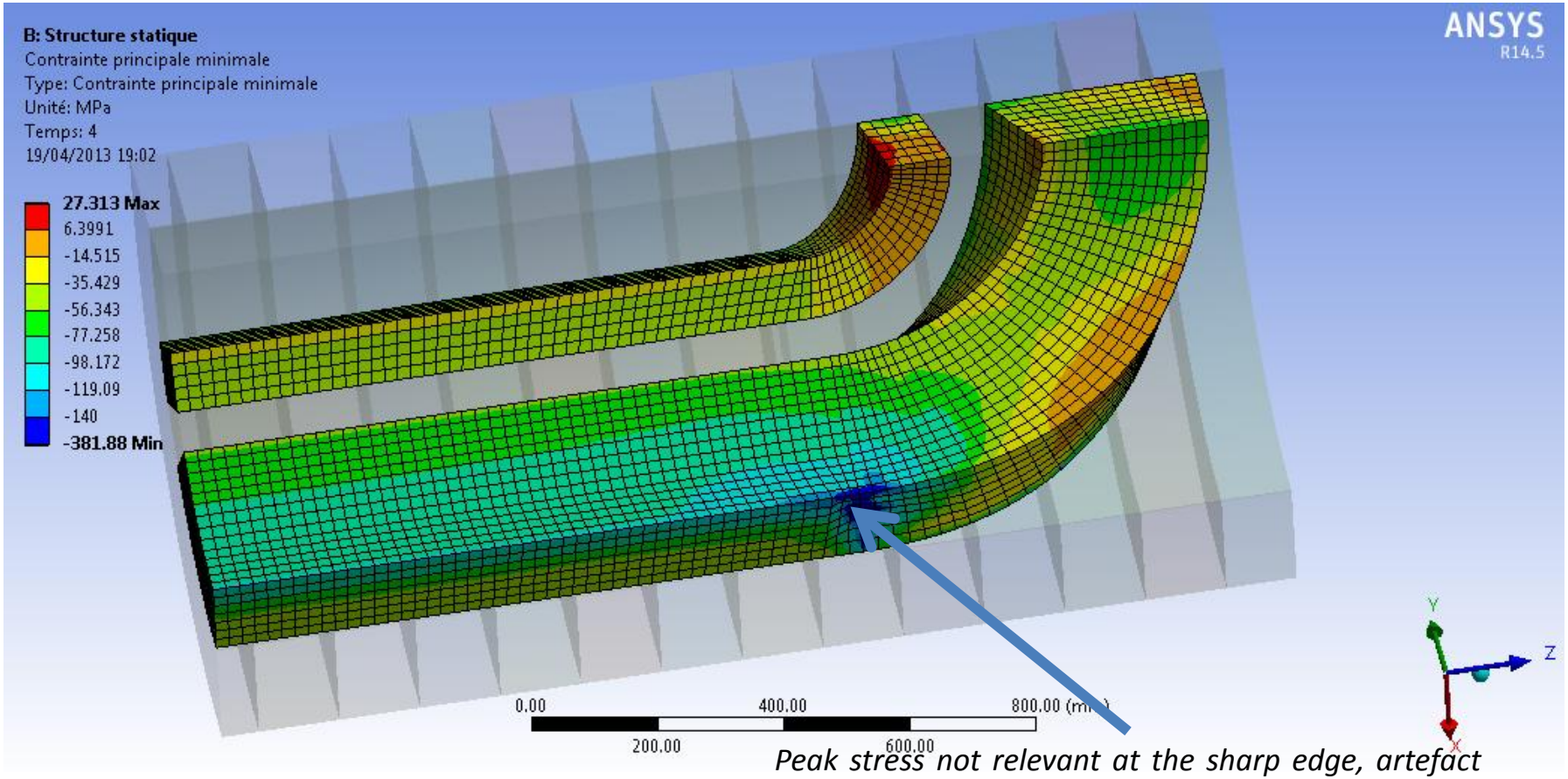
Cooldown 4K + forces– VON MISES STRESS



Peak stress not relevant at the sharp edge, artefact due to the bad mesh shape ratio between the coil and the sharp end spacer

Model Ansys Vers33-5-90-C-80

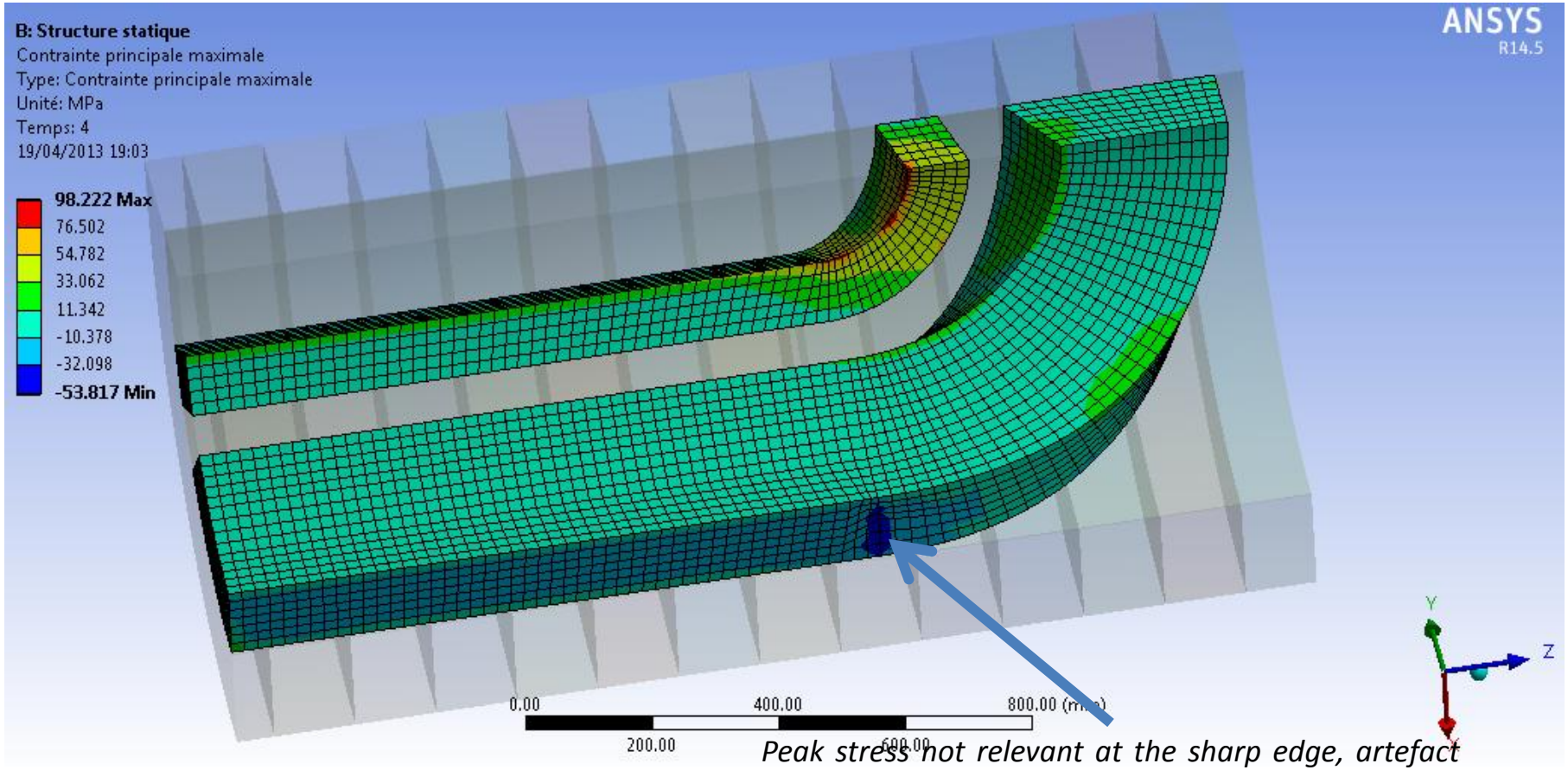
Cooldown 4K + forces– Minimum principal stress



Peak stress not relevant at the sharp edge, artefact due to the bad mesh shape ratio between the coil and the sharp end spacer

Model Ansys Vers33-5-90-C-80

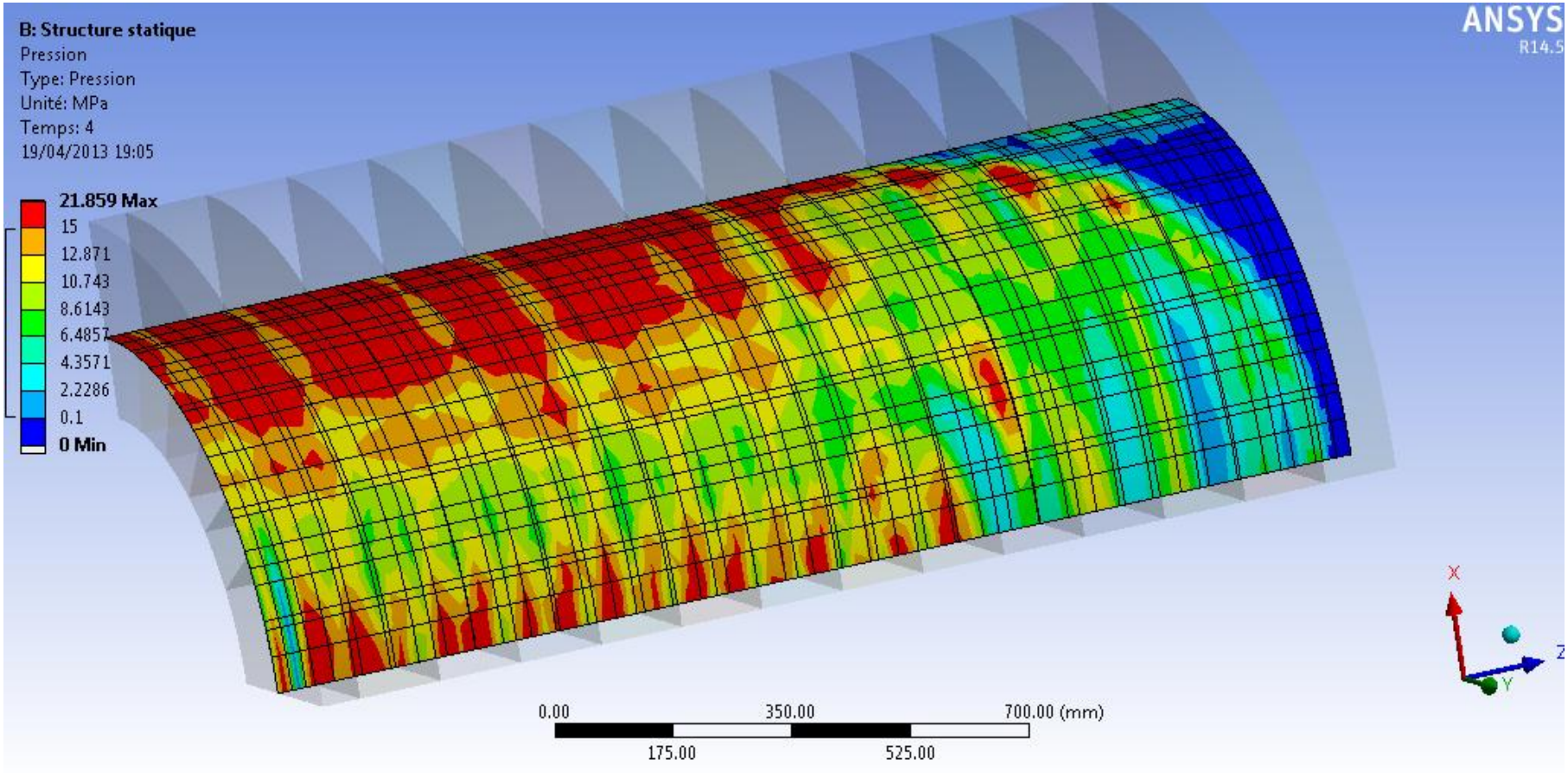
Cooldown 4K + forces– Maximum principal stress



Peak stress not relevant at the sharp edge, artefact due to the bad mesh shape ratio between the coil and the sharp end spacer

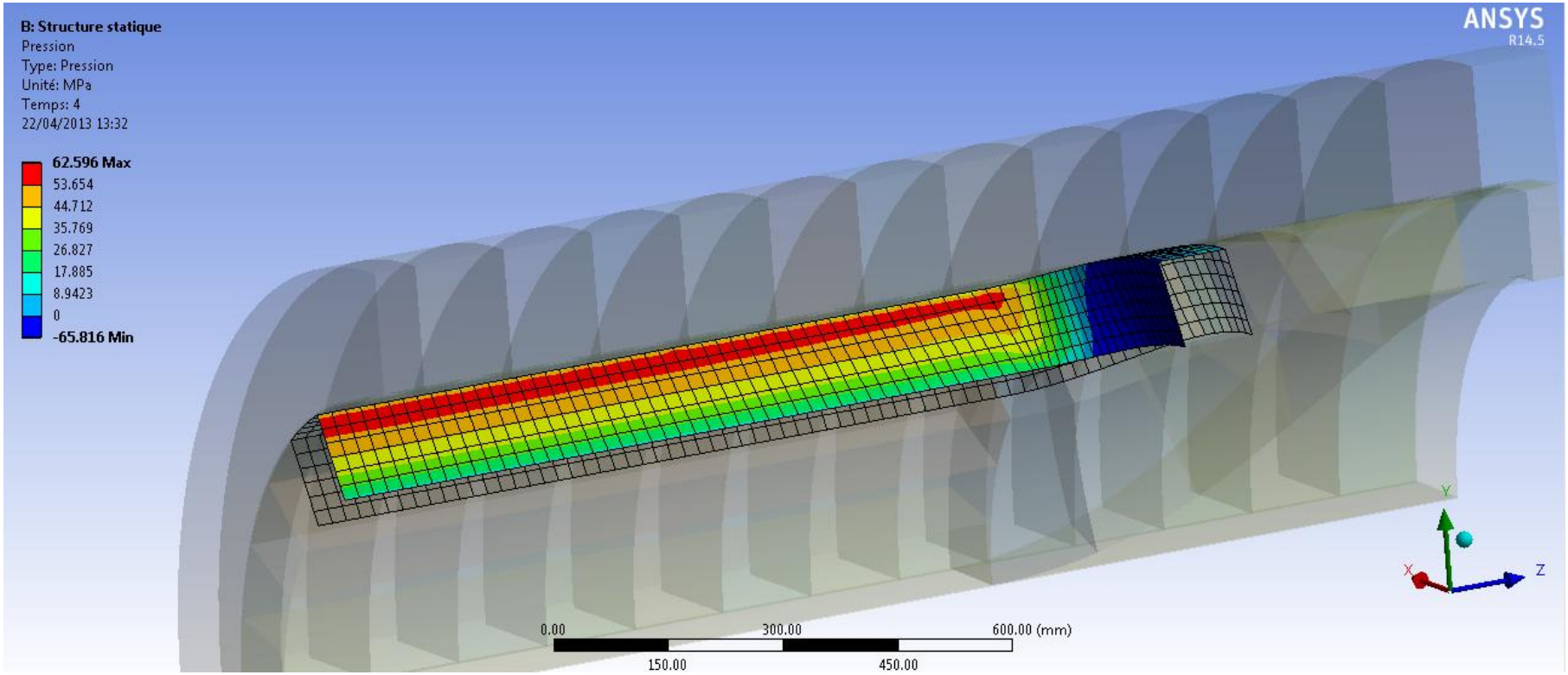
Model Ansys Vers33-5-90-C-80

Cooldown 4K + forces– CONTACT PRESSURE BETWEEN COLLARS AND COIL



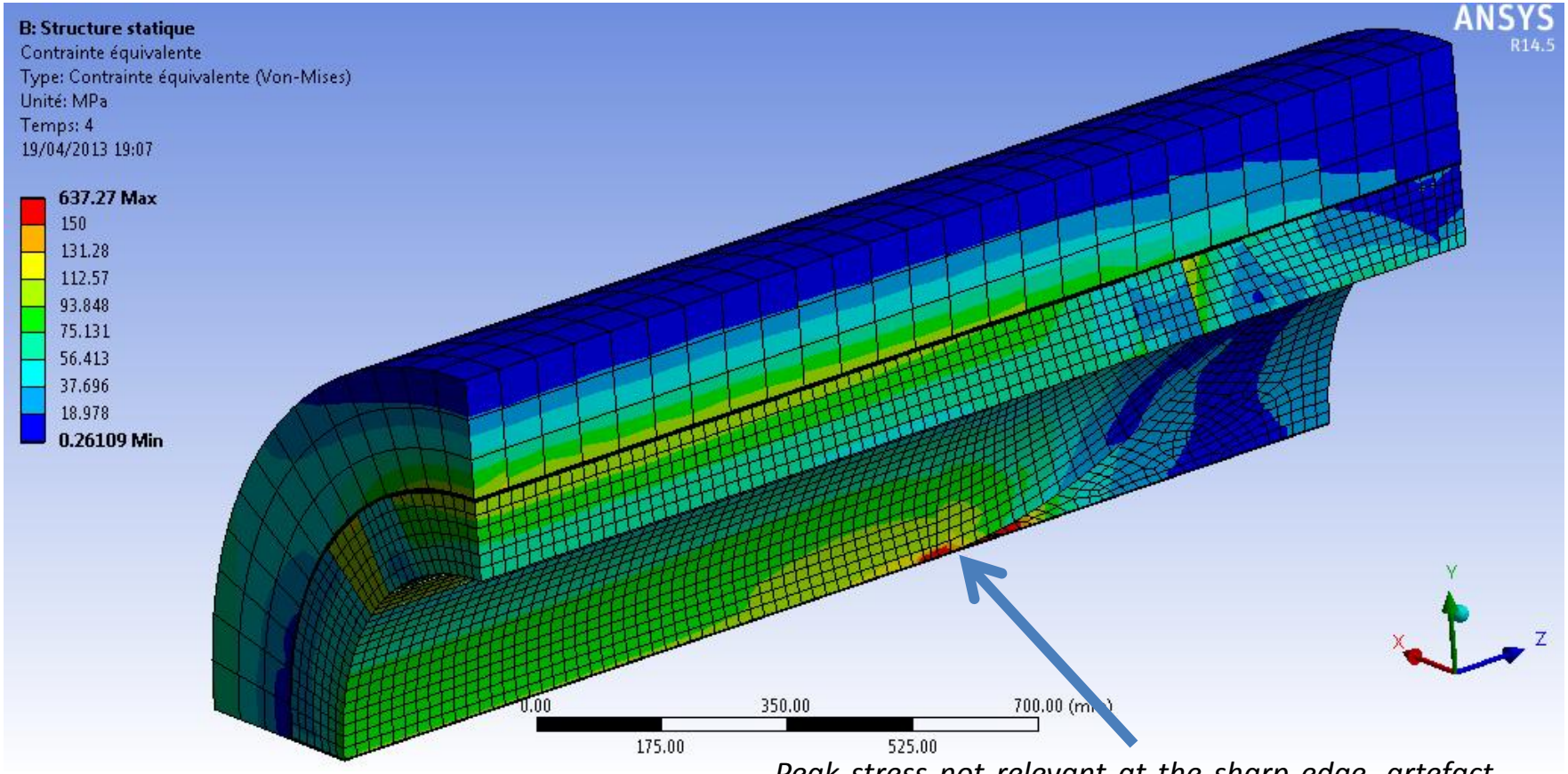
Model Ansys Vers33-5-90-C-80

Cooldown 4K + forces– CONTACT PRESSURE BETWEEN CENTRAL SPACER AND COIL



Model Ansys Vers33-5-90-C-80

Cooldown 4K + forces– Stress (Von Mises) assembly



Peak stress not relevant at the sharp edge, artefact due to the bad mesh shape ratio between the coil and the sharp end spacer