MMU 420

FINITE ELEMENT ANALYSIS

FINAL TAKE HOME QUESTION

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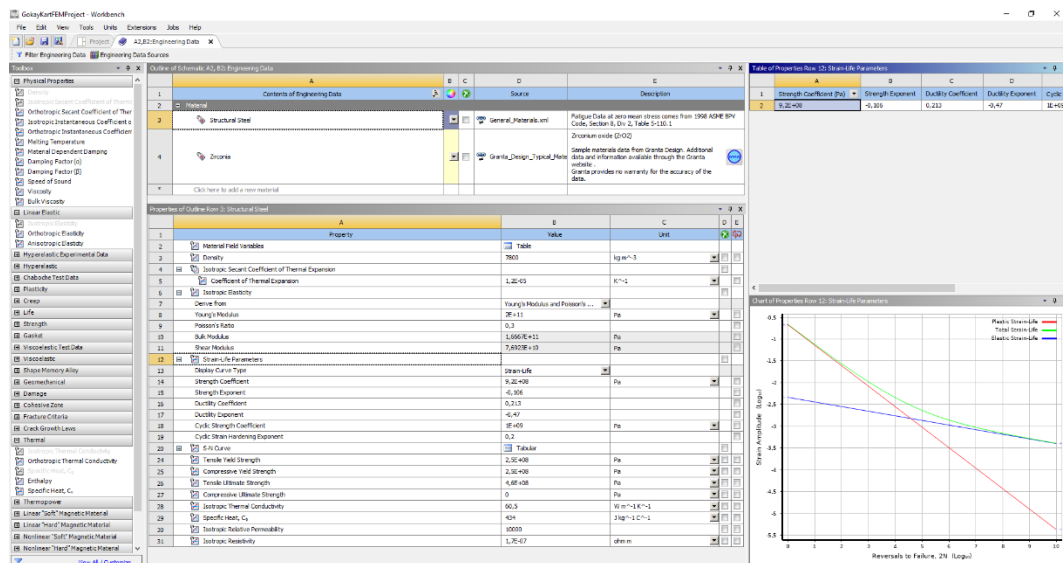
First, we defined the materials.
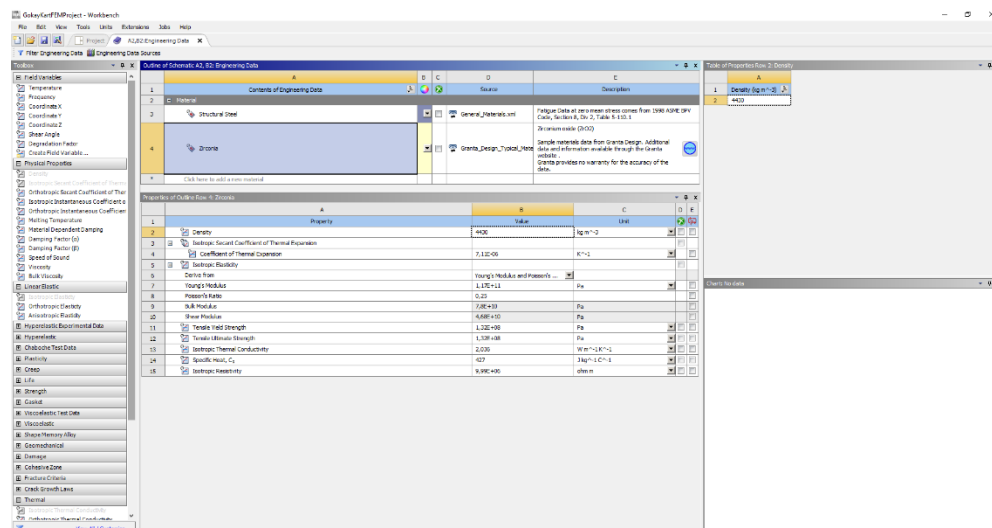

Figure 1 : Structural Steel
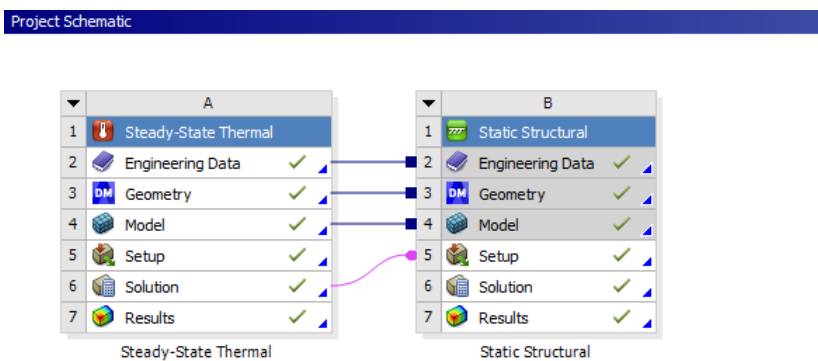

Figure 2 : ZrO2
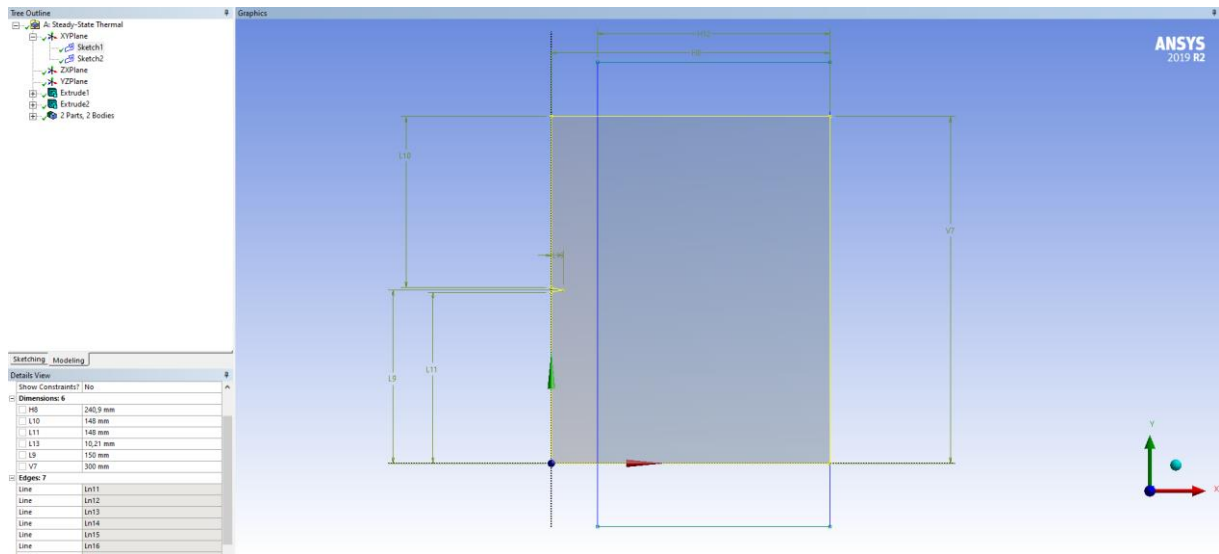

Figure 3: Project Page Screenshoot
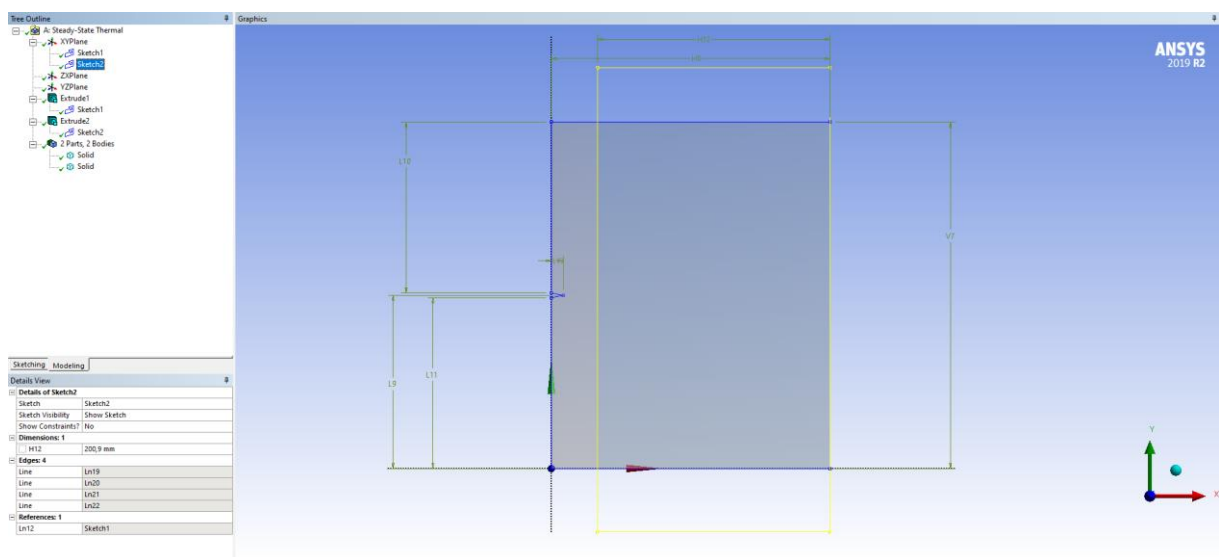
Figure 5 : Bodies and Dimensions

Figure 6: The slice operation I made to divide it into two bodies according to the

dimensions in the question.
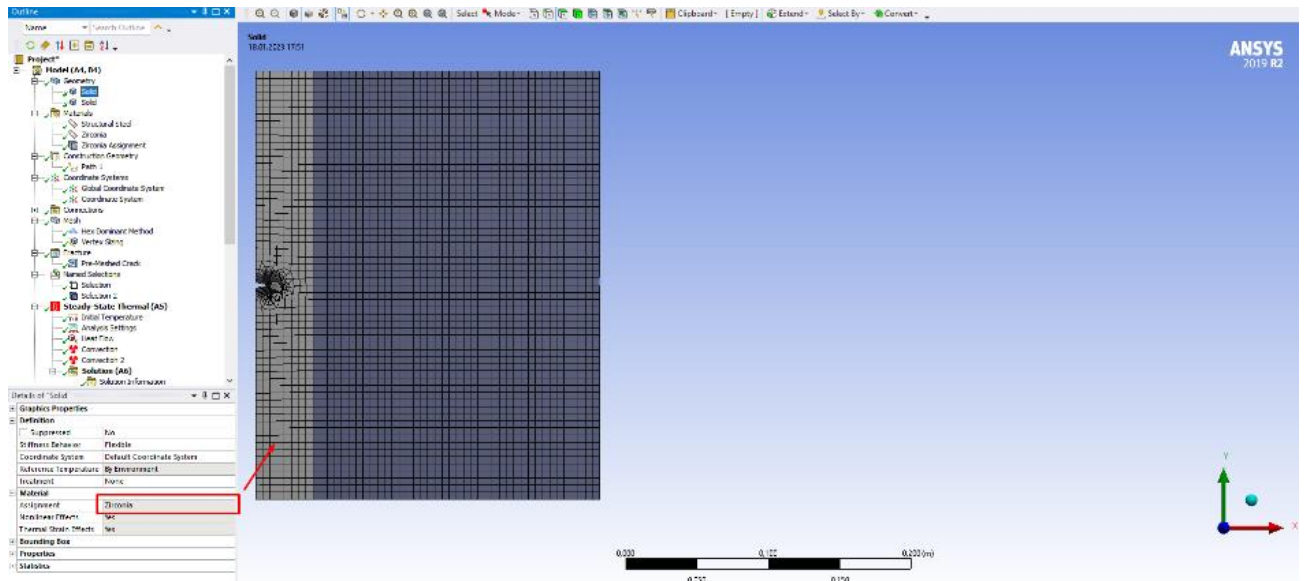
We set the track in two parts.
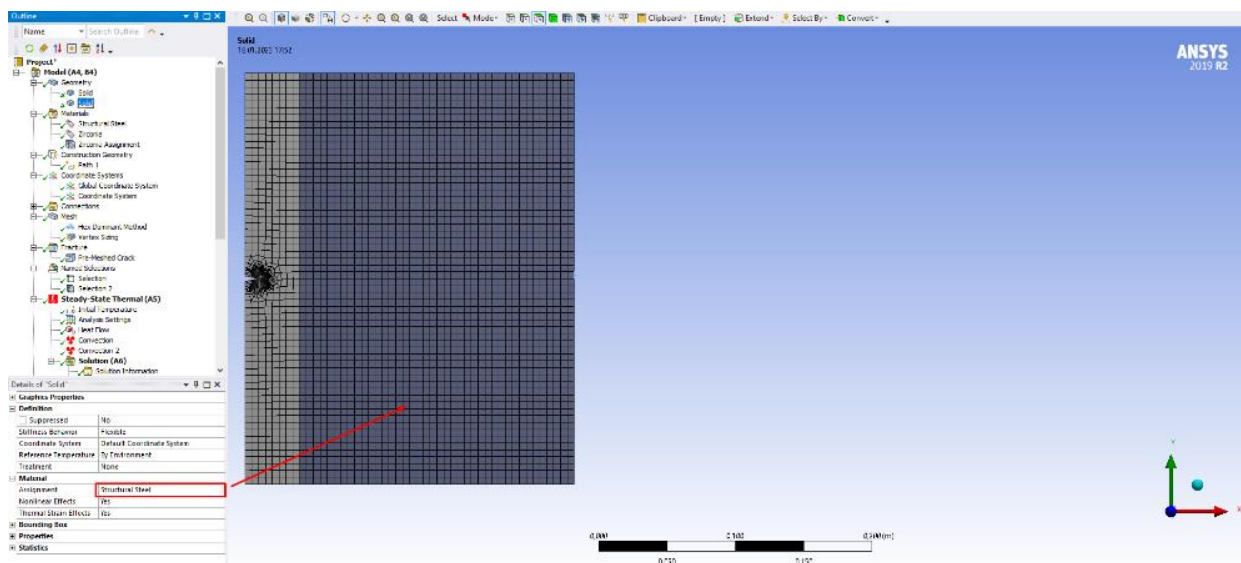

Figure 7 : Convection for tc

Figure 8 : Convection for tl
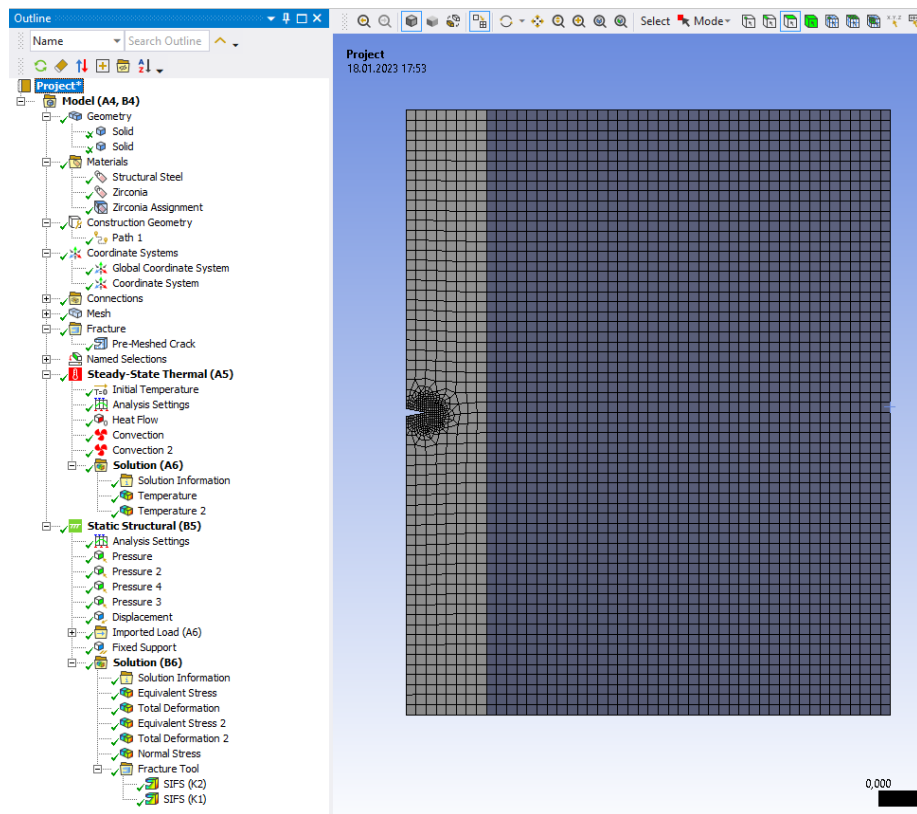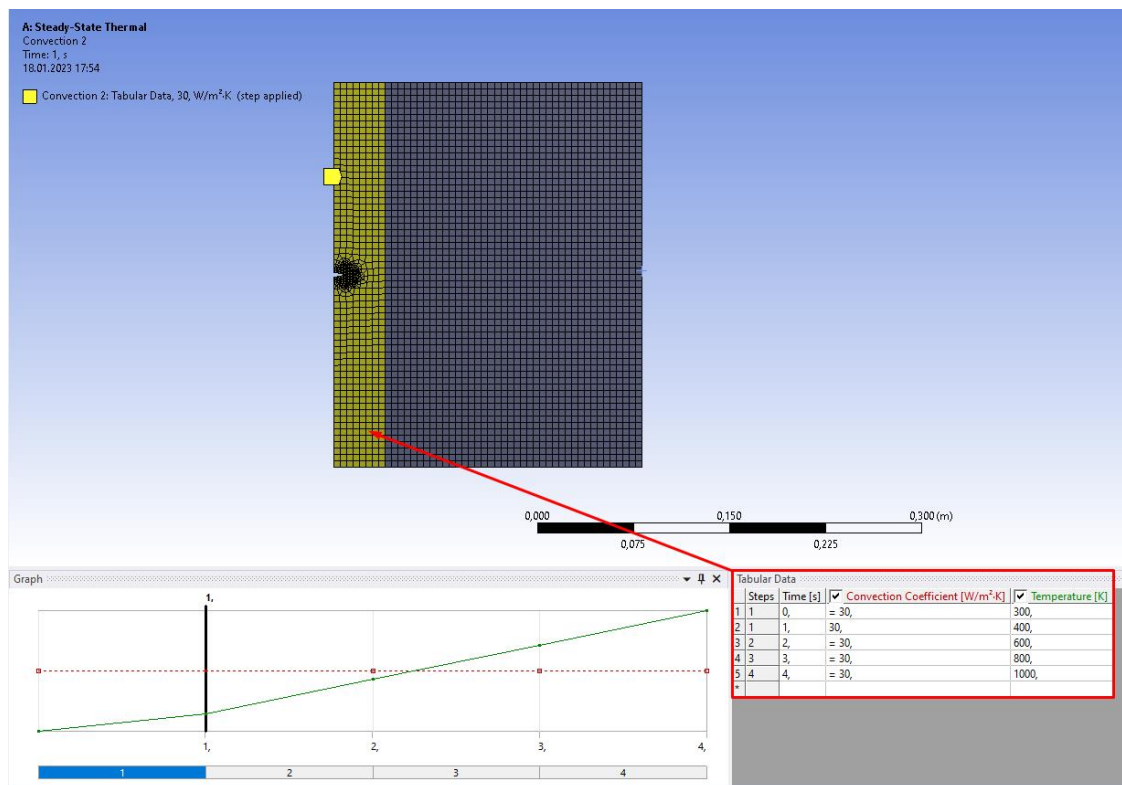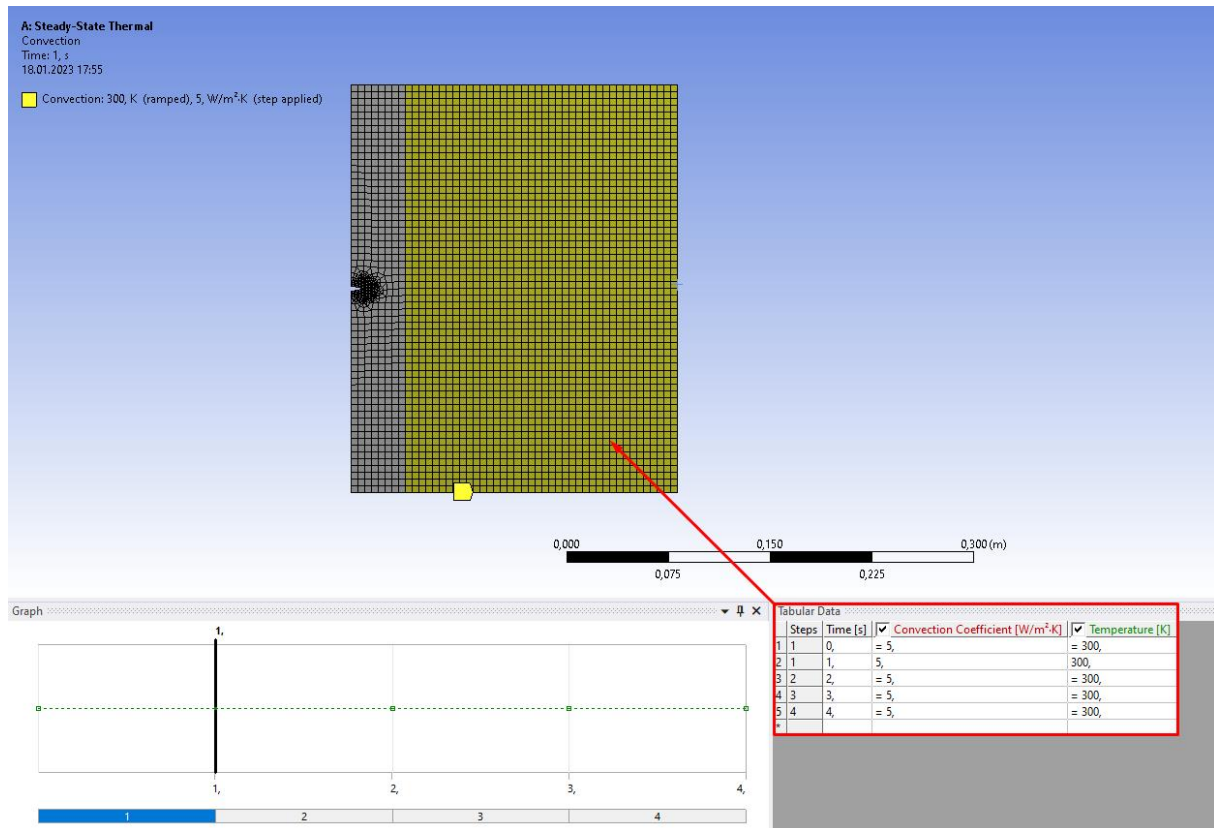
Project part is as shown below.

Figure 9 : Project Table

The given key features are processed as shown below.

RESULTS

a) Plot the equivalent von-Mises stress distribution on the path defined from (a ,L/2) to (tc + tl/2,L/2) at T0 = 300, 400, 600, 800, 1000 K on the same graph. Give some contour plots for temperature field.
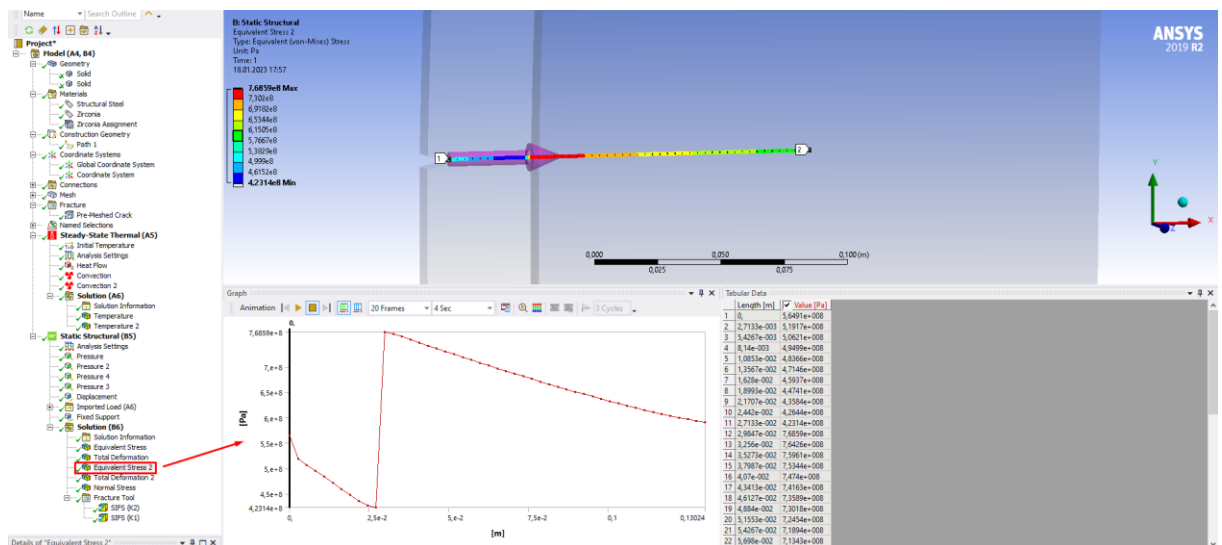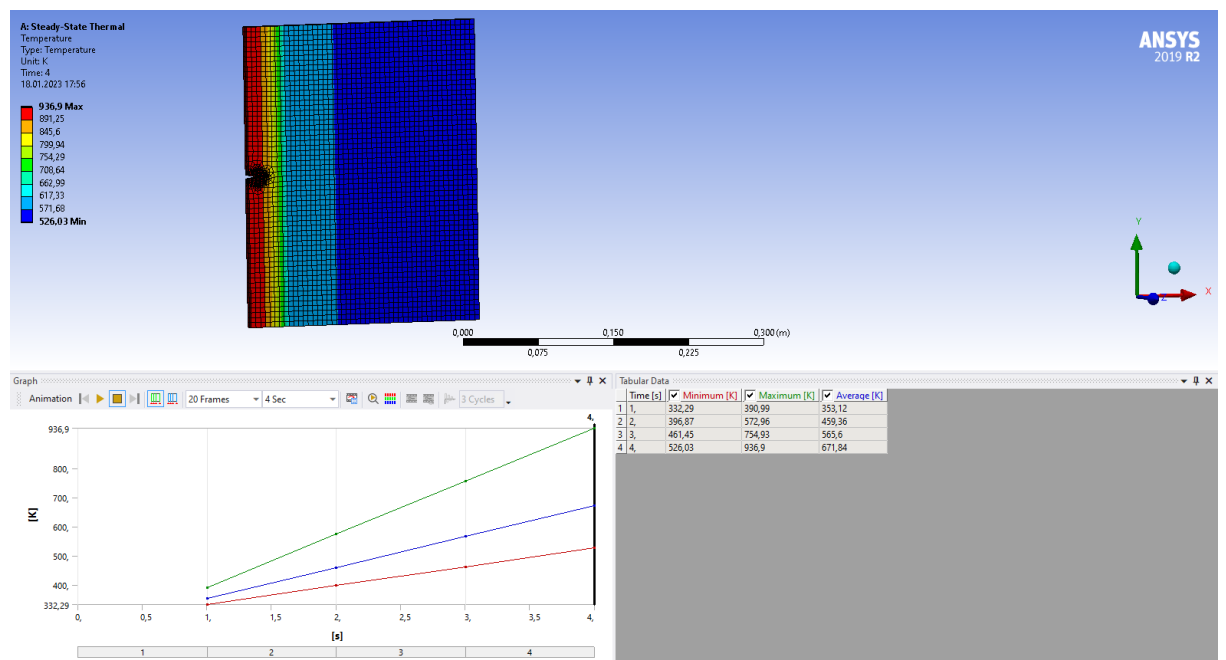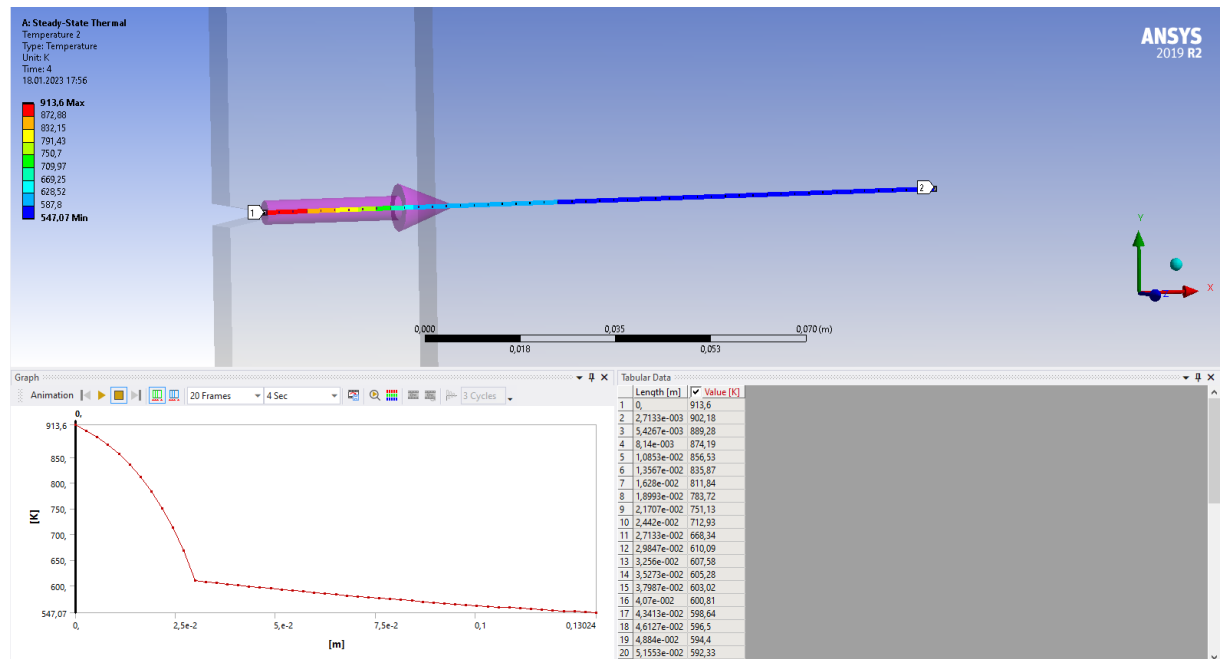

Figure 10 : Section of a answer

Results for thermal properties;

b) Plot the mode-I and mode-II stress intensity factor KI and KII (MPaVm) with respect to T0 where T0 = {300, 400, 500, 600, … ,1000} K on the same graph. Give some contour plots for von-Mises stress plot.
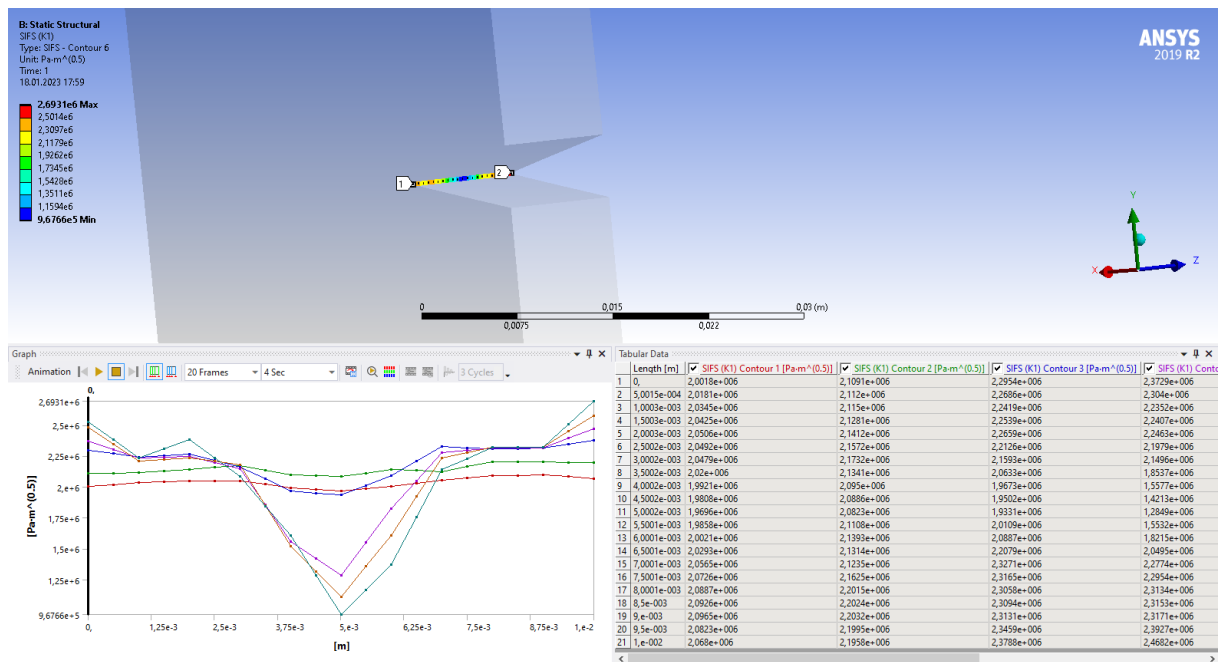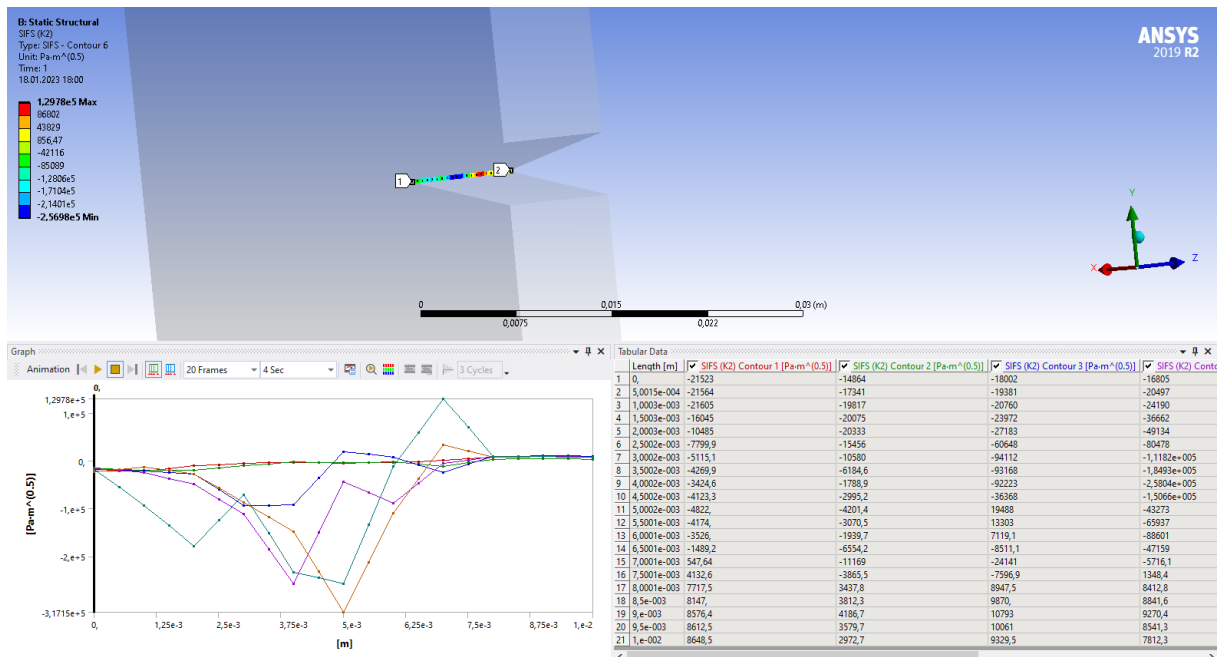

Figure : Section of b answer for K1

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