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ANALYSIS AND SIMULATION USING SALOME MECA

Internship Report

Objective

- To familiarize with the interface of Salome-Meca open source analysis software.
- To carry out linear static analysis on a cantilever beam and compute the deformation and stress involved when a force is applied at the free end.
- To compare the same problem using windows and linux operating systems to identify the most compatible operating system for Salome Meca whilst theoretically comparing the results.

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Cantilever Beam

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Boundary Conditions

- Dimension’s : 200 mm * 20 mm * 20 mm
- Youngs Modulu’s, y : 210 GPa
- Poisson’s Ratio, ν : 0.3
- Boundary Conditions & Load:-
  - Load, F : 100 N
  - Base fixed
- Material : Steel

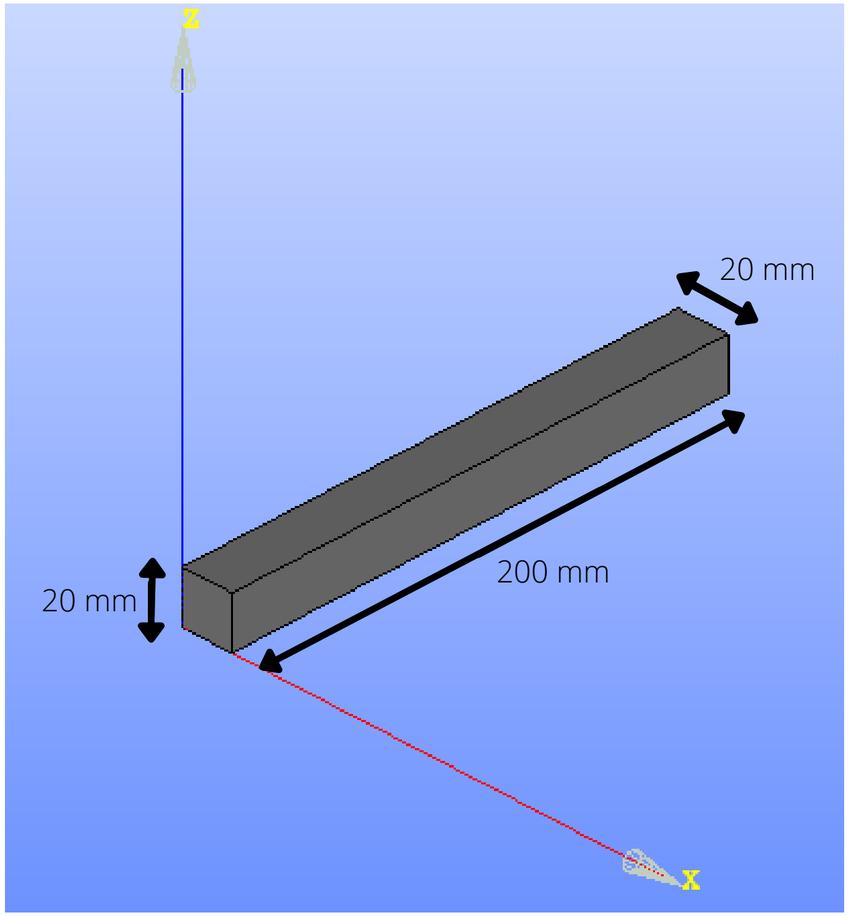

Fig. 13: Cantilever beam in geometry module

Analysis

- The required beam created in the geometry module in Salome Meca.
- Meshing carried out in the Mesh module with the required algorithm.
- Asterstudy Module, pre-processing, result file generated.
- Paravis, for visually viewing the results.

- Deformation:

  Δ = 0.077 mm

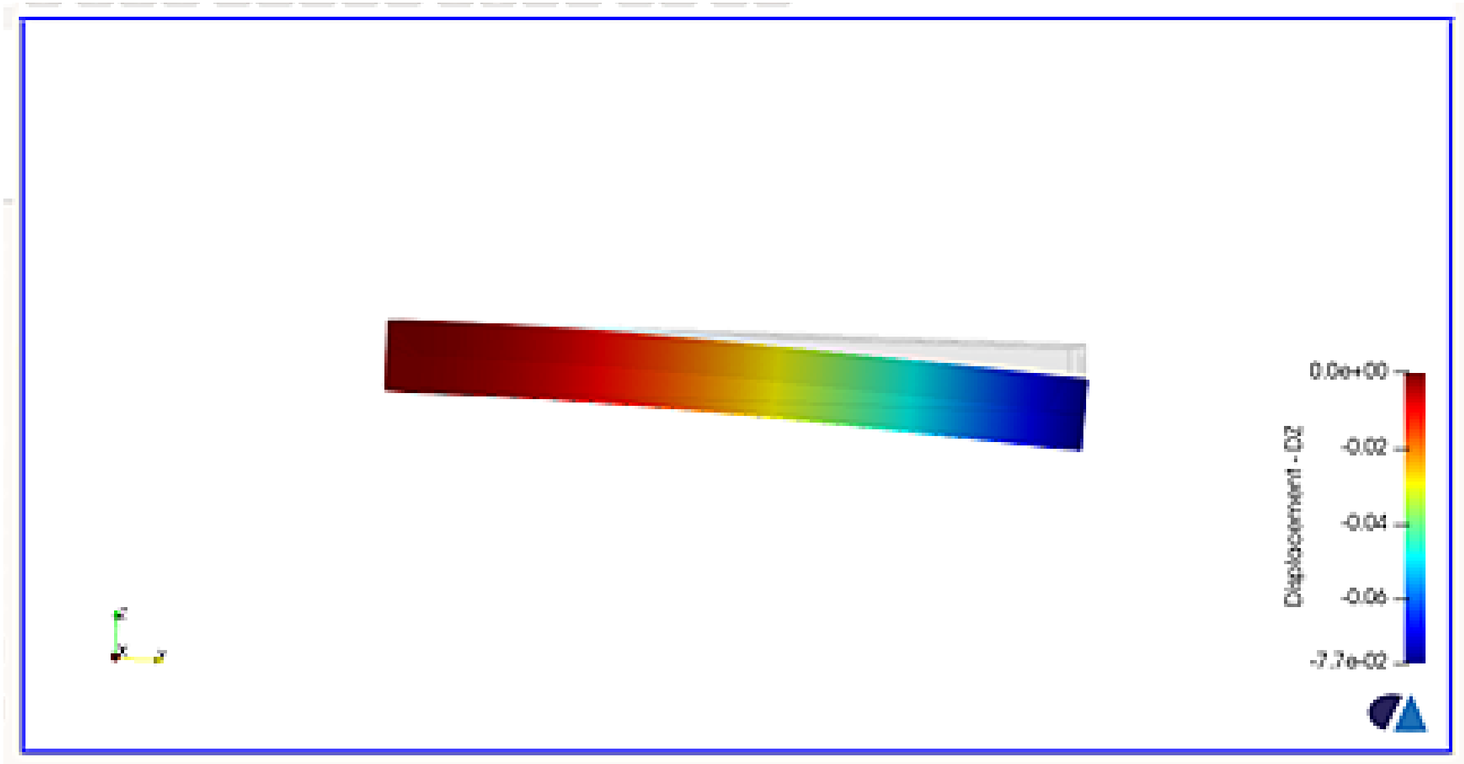

Fig. 14: Deformation of cantilever beam in paravis

Simulation Results

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- Stress:

  σ_t = + 12 N/(mm)^2

  σ_c = - 12 N/(mm)^2

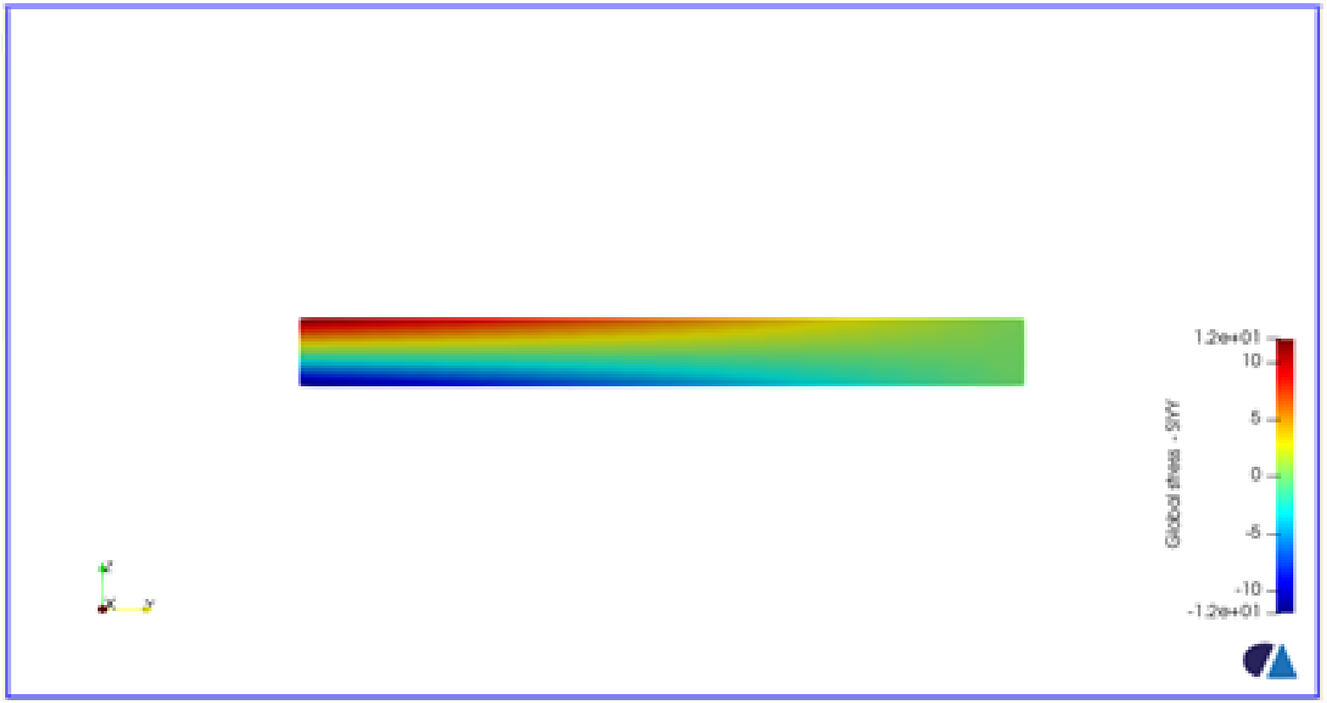

Fig. 15: Stress results of cantilever beam in paravis

- Deformation:

  Δ = 0.079 mm

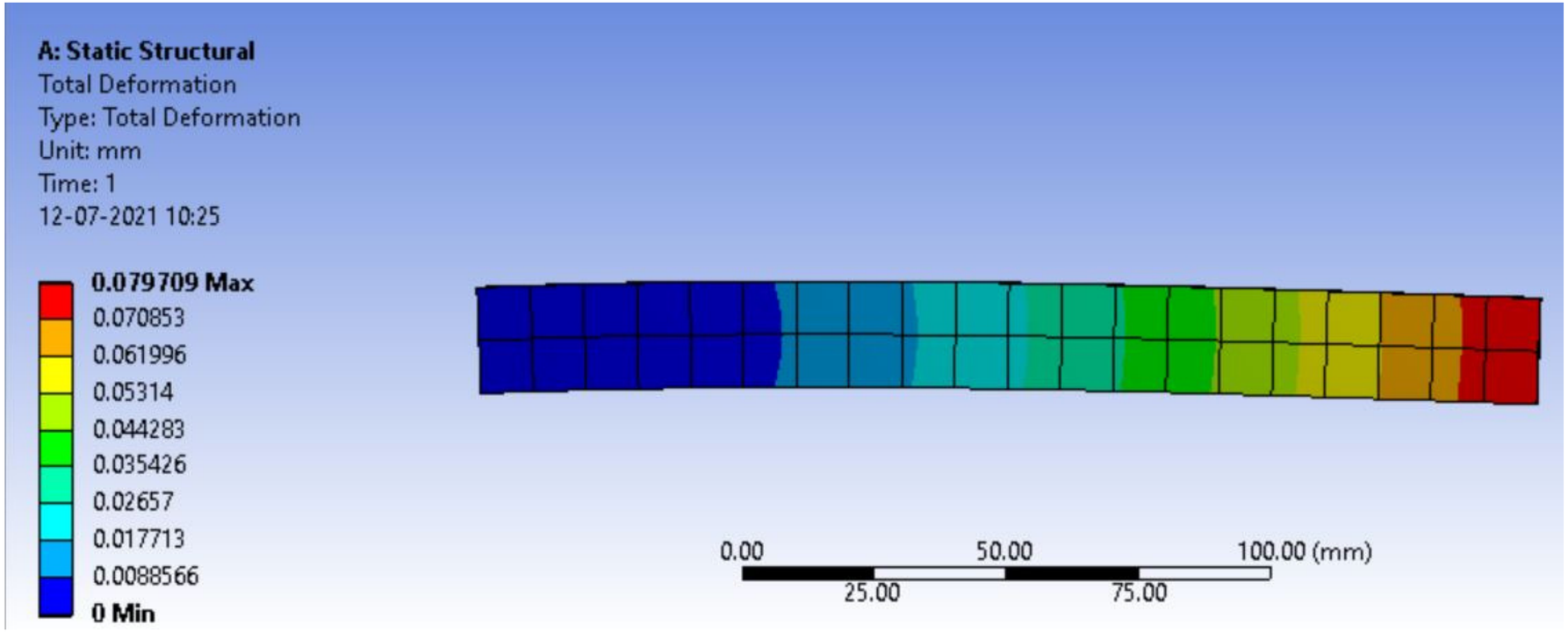

Fig. 16: Deformation of cantilever beam in Ansys

Simulation Results

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- Stress:

  σ_t = + 12.055 N/(mm)^2

  σ_c = - 12.055 N/(mm)^2

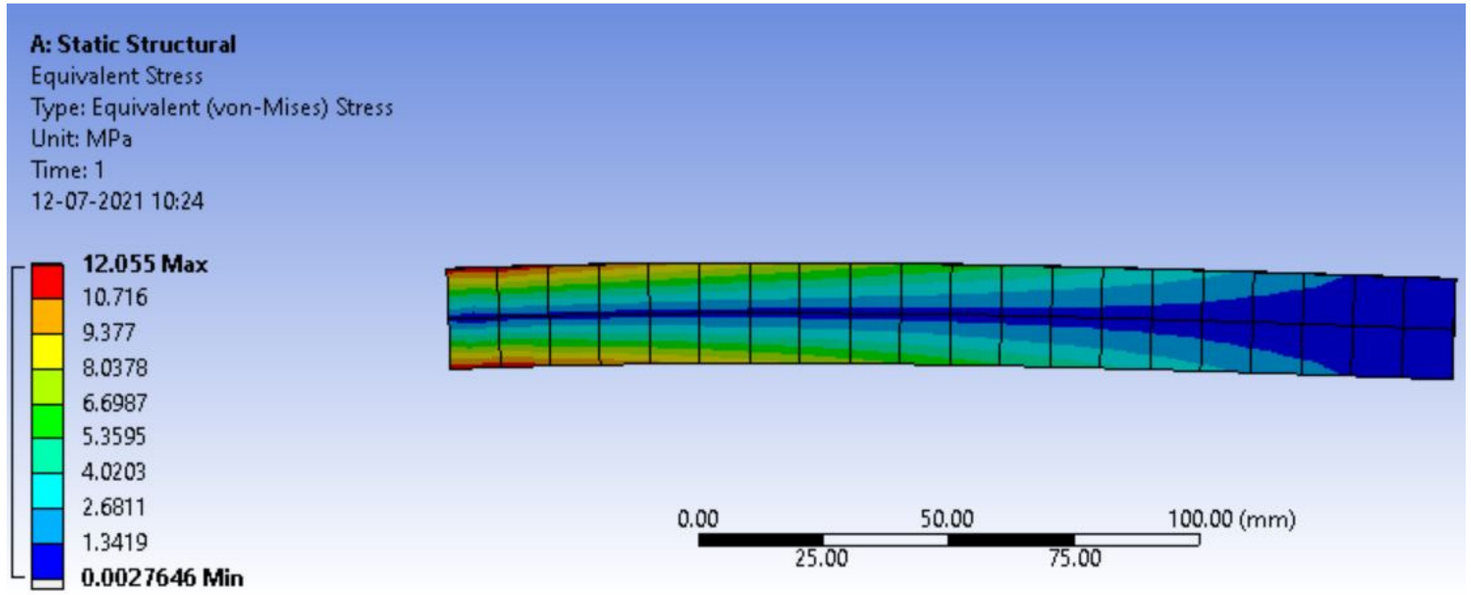

Fig. 17: Stress results of cantilever beam in Ansys

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Wind Turbine Tower

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Boundary Conditions

- Youngs Modulu's, γ : 210 GPa
- Poisson's Ratio, ν : 0.3
- Boundary Conditions & Load:-
  - Load, F : 10000 N in X direction
  - Base flange fixed
- Material : Steel

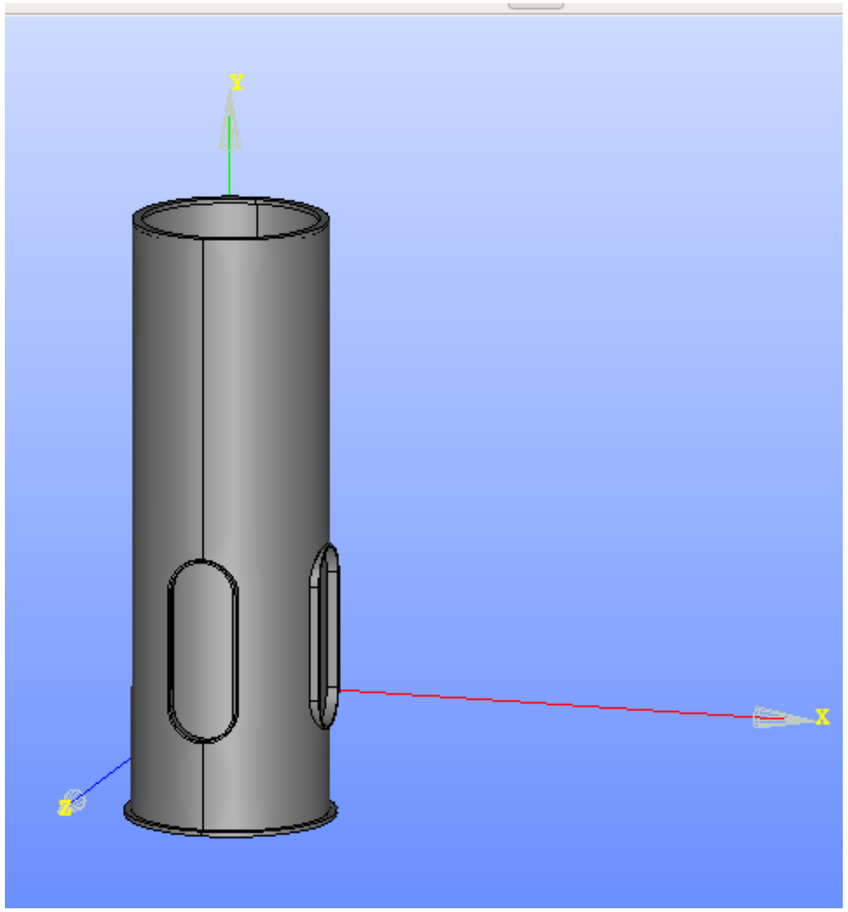

Fig. 18: Cantilever beam in geometry module

Simulation Results

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- Deformation:

  Δ = 8.2*10^(-5) mm

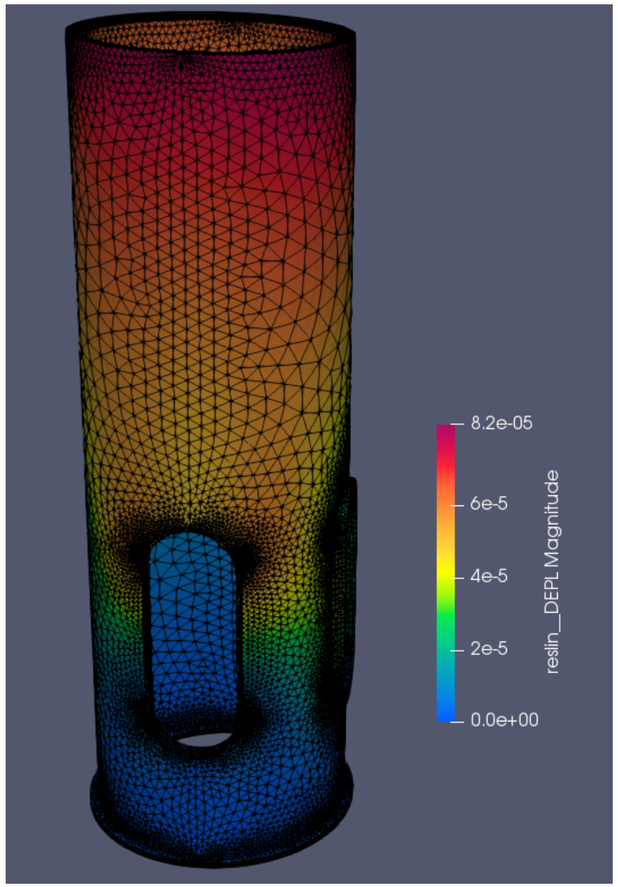

Fig. 19: Deformation of Tower in Salome Meca

Simulation Results

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- Deformation:

$\Delta = 5.6156*10^{(-5)}$ mm

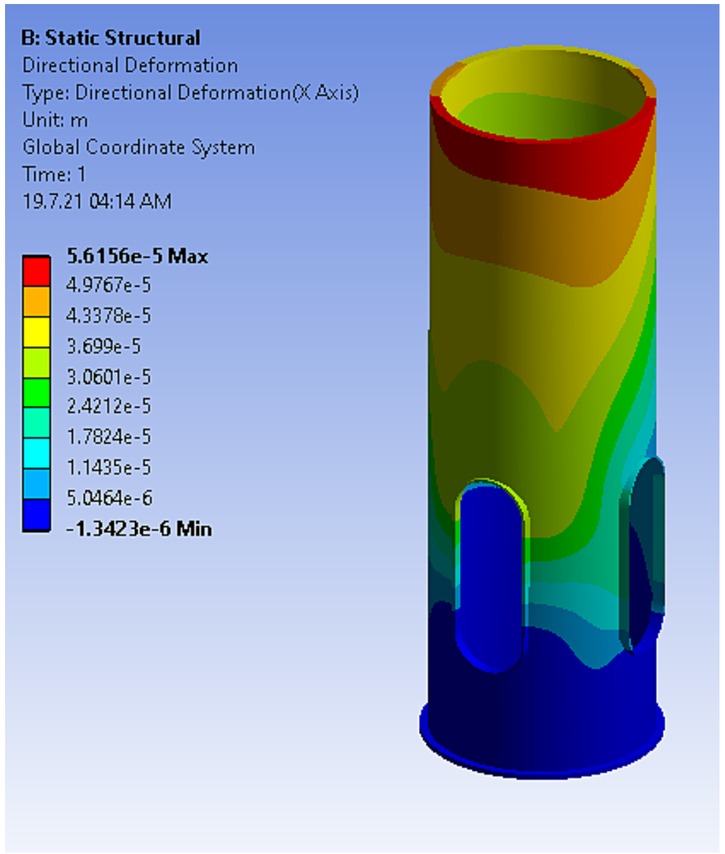

Fig. 20: Deformation of cantilever beam in Ansys

THANK YOU