

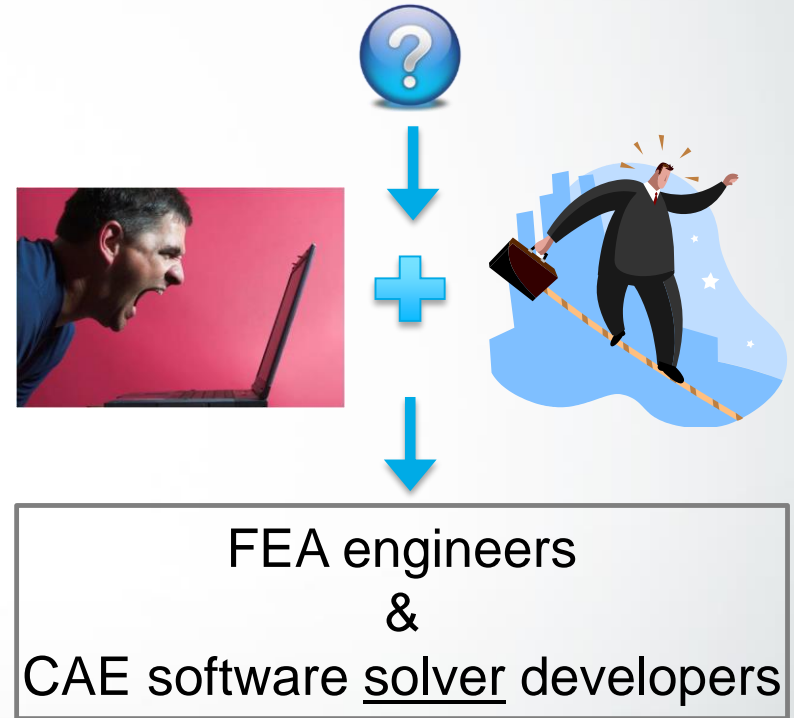
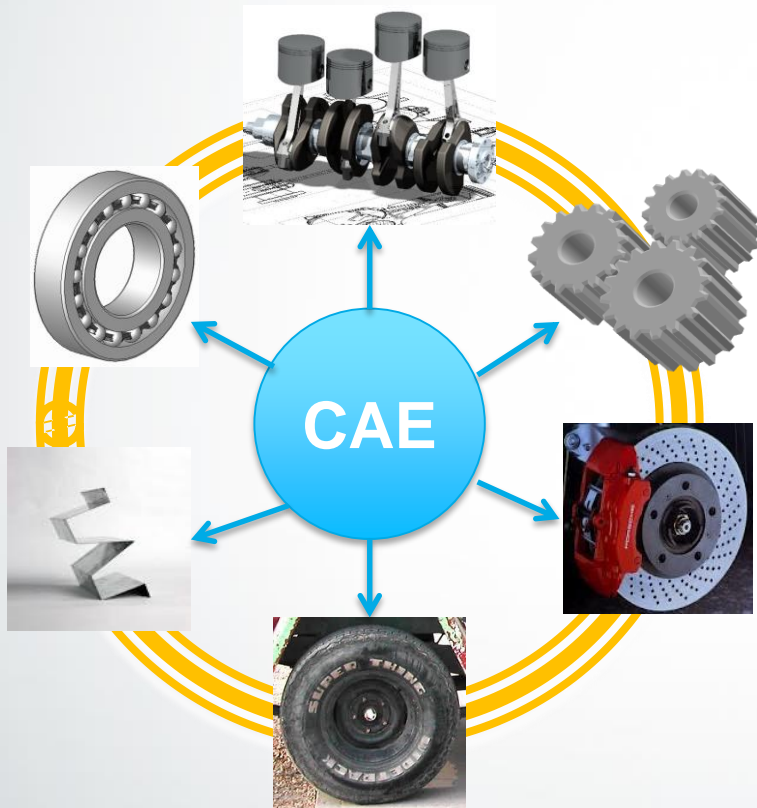
Advanced Techniques for Predicting Mechanical Product Design via COMSOL Multiphysics

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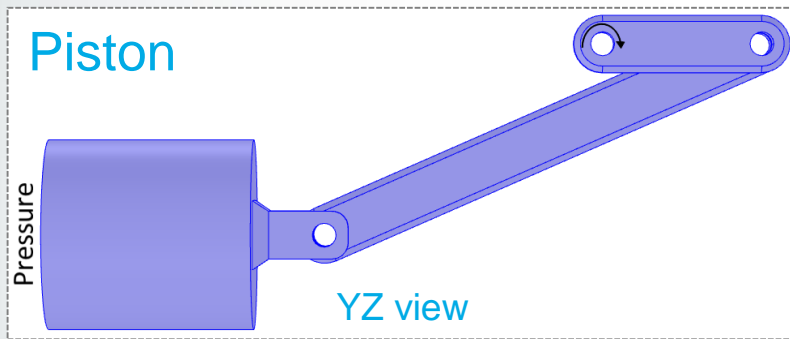
Introduction

- Mechanical design simulation
- One big challenge

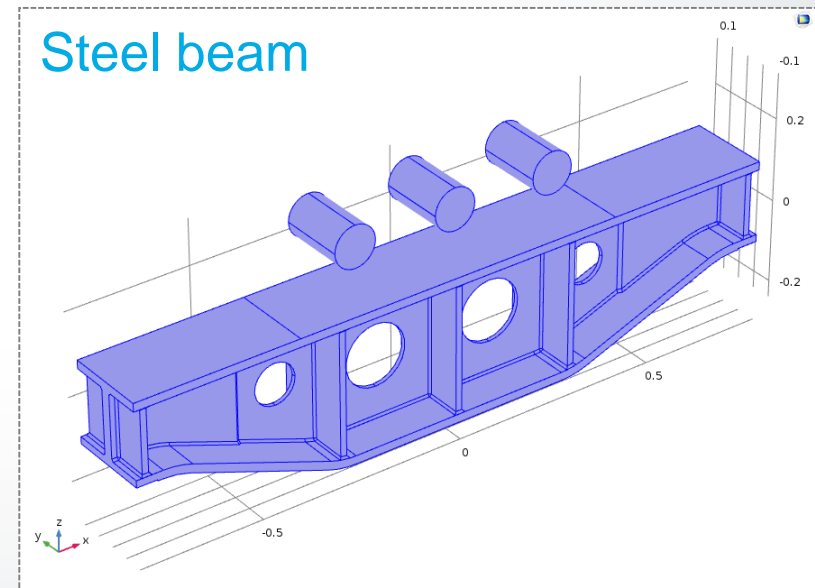
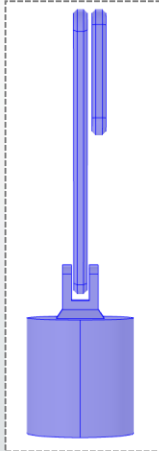


Objective

- Predict joint/bolt connection via rigid connectors
- Discuss contact simulation via penalty method

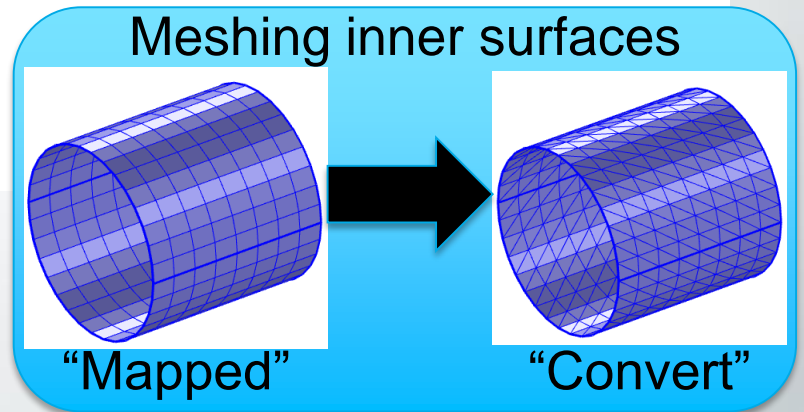
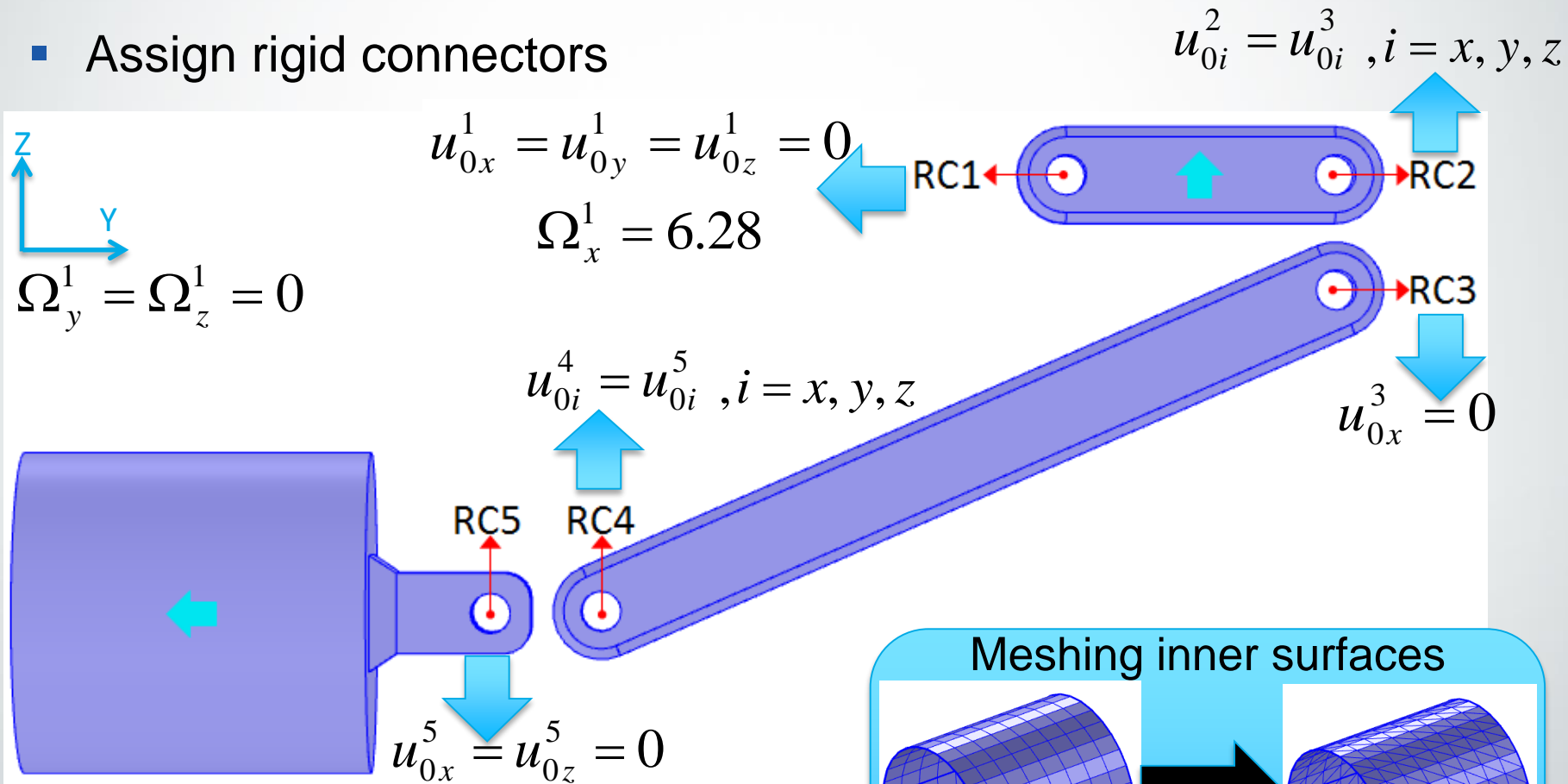


XY view

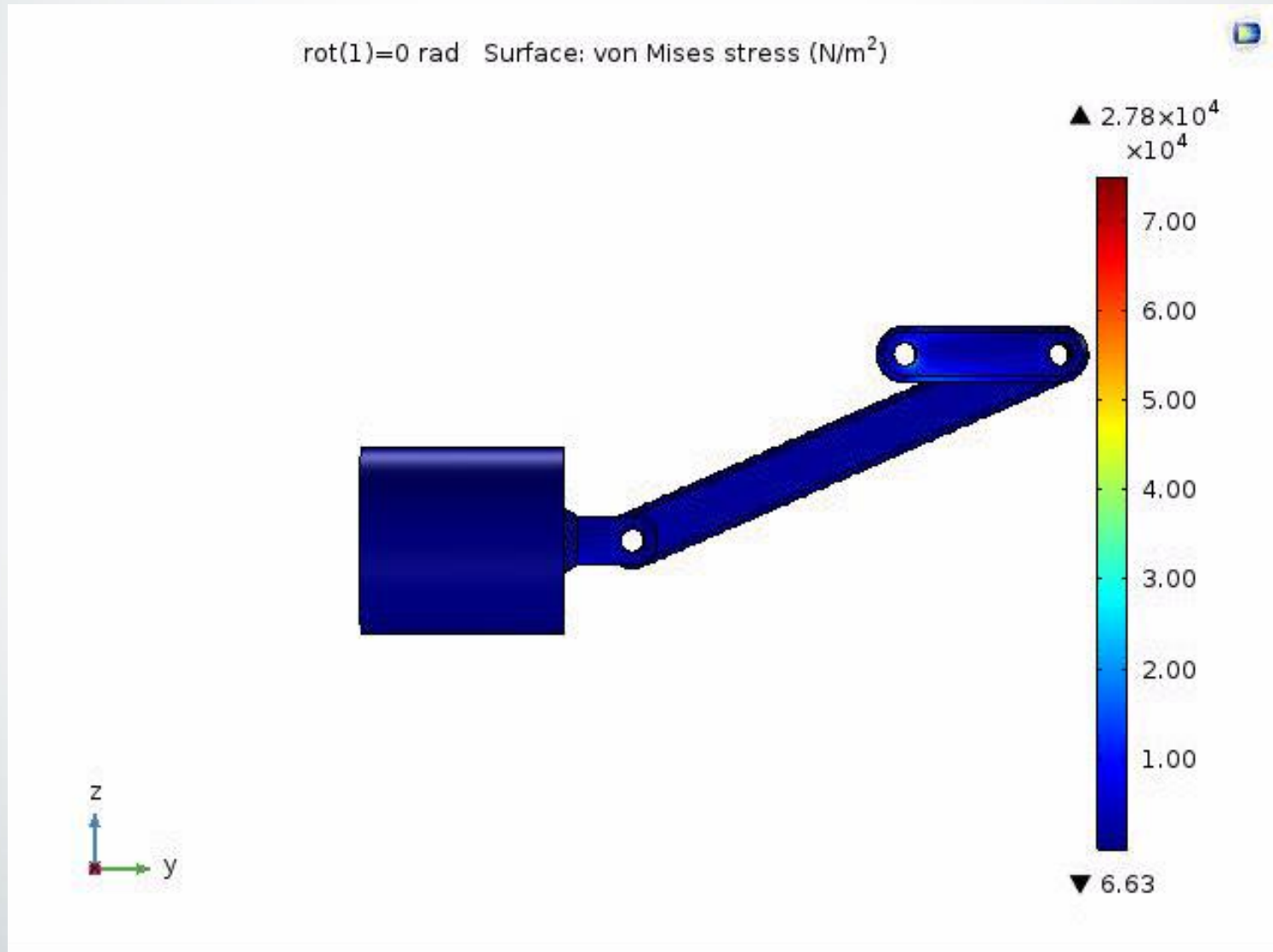


Modeling - Piston

- Assign rigid connectors

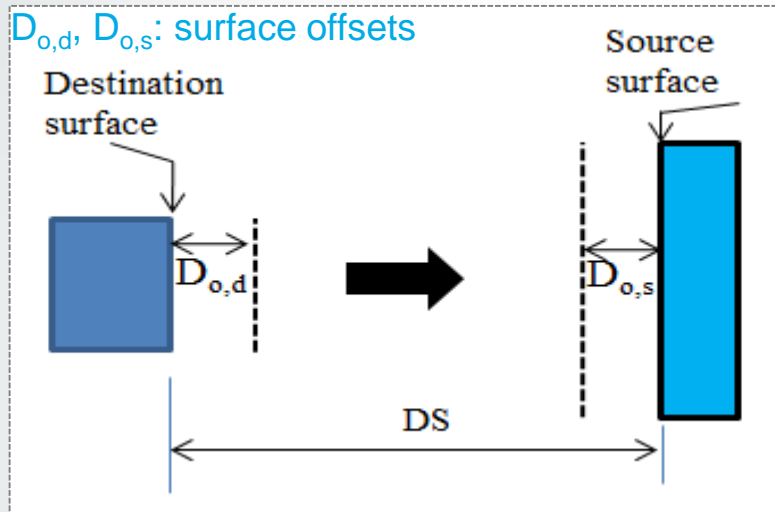


Results - Piston

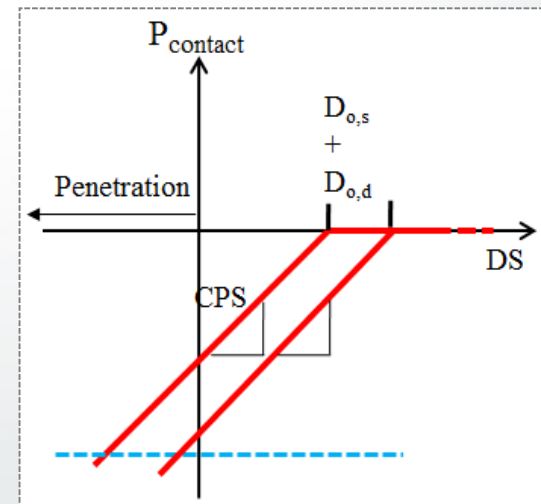
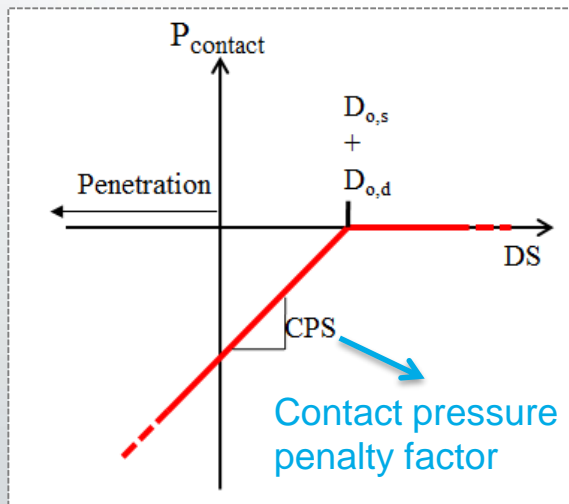
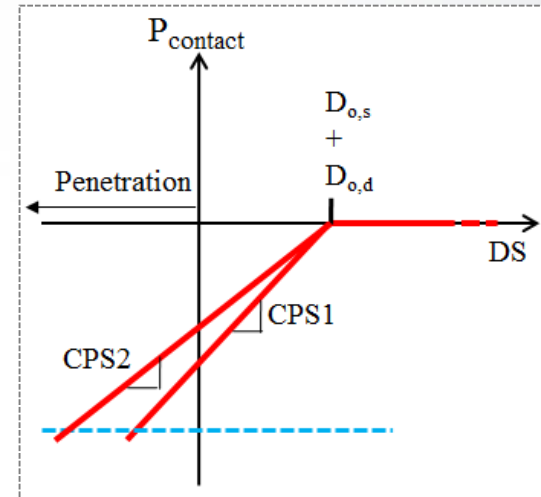


Contact Executed by Penalty Method

- Contact calculation

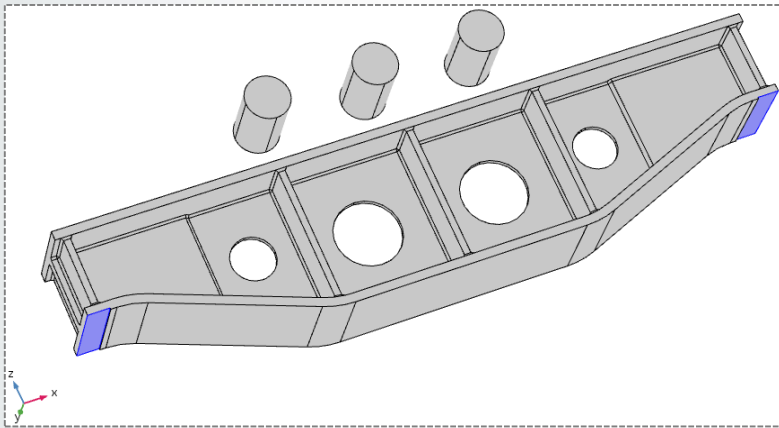


- Contact handling



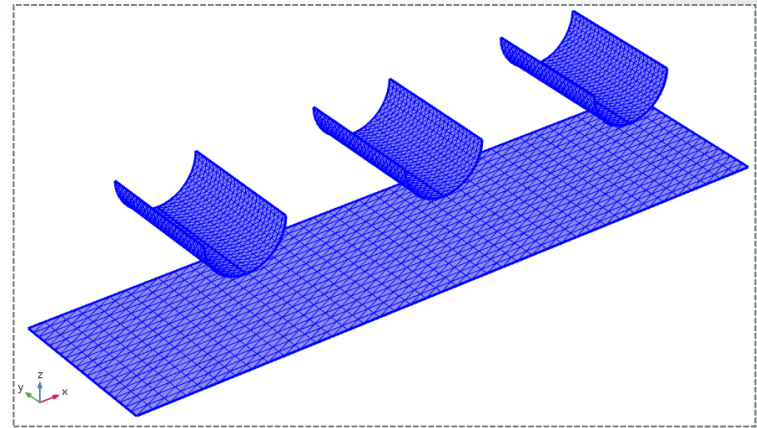
Modeling - Steel Beam

- Constraints

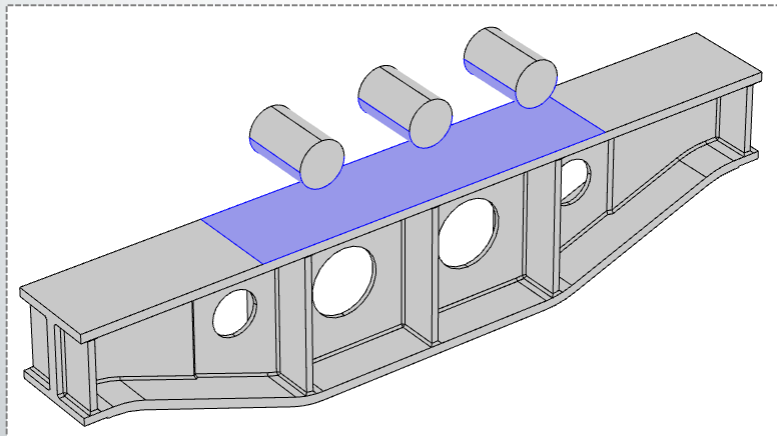


Fixed surfaces

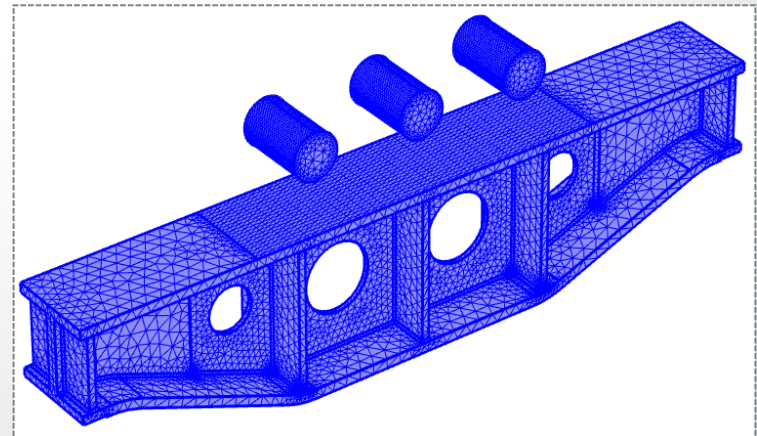
- Meshing



Meshed contact surfaces

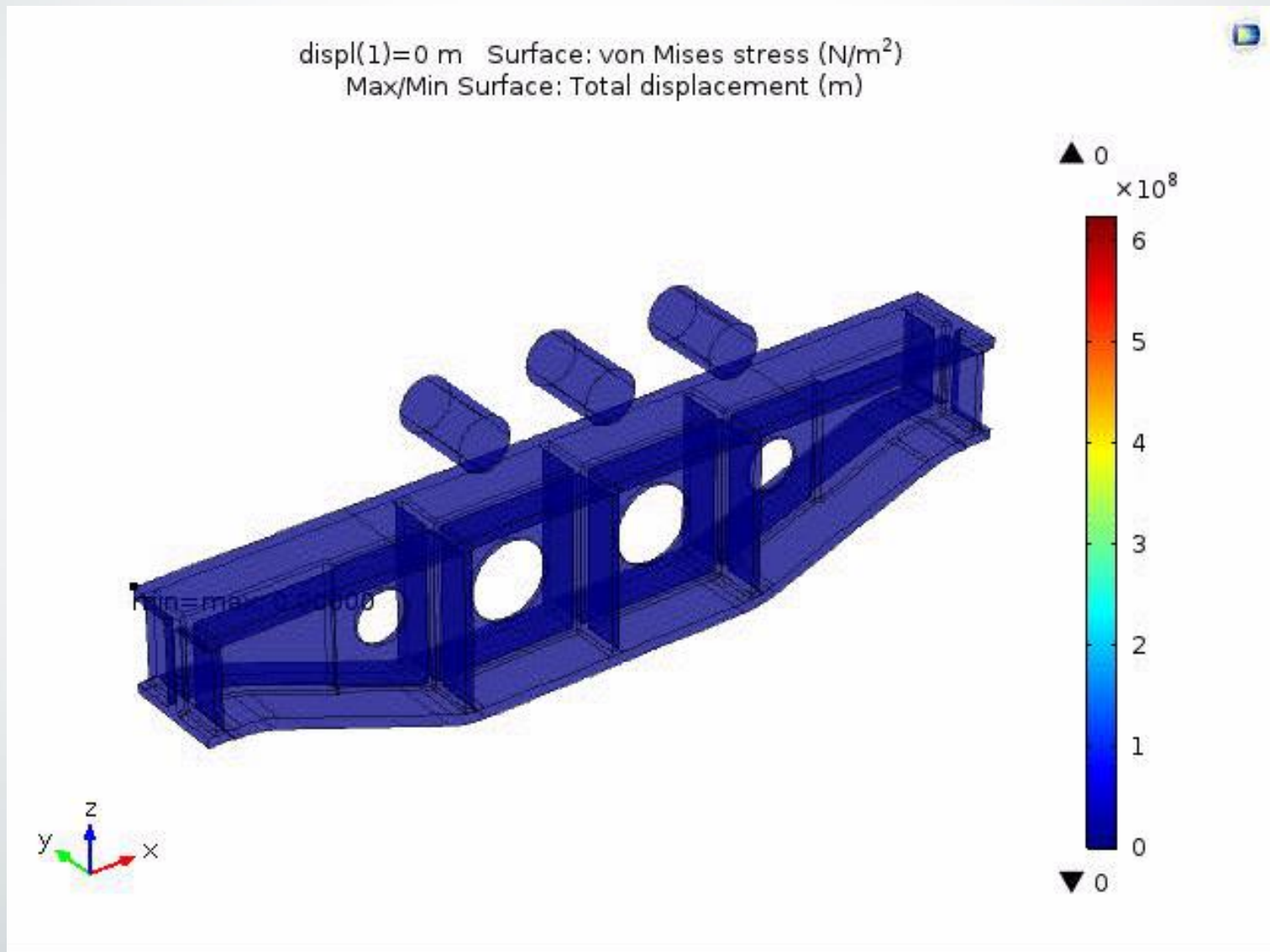


Contact pair



Whole meshed model

Results – Steel Beam



Conclusions

- Rigid connector can greatly help represent and simplify joint/bolt connections.
- Contact definition can be easily set up in COMSOL Multiphysics.
- Contact executed by penalty method has good performance in COMSOL Multiphysics.

THANKS FOR YOUR ATTENTION!



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