SESAM EXAMPLE

Support Rigid Link
Dependent and Released Rotations and More

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Support Rigid Link: Dependent and Released Rotations and MoreTechnique Date: July 2022

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1 Introduction

This document explains alternative setting of the Support Rigid Link using four different models and how the different setting will impact the analysis result with the same load.

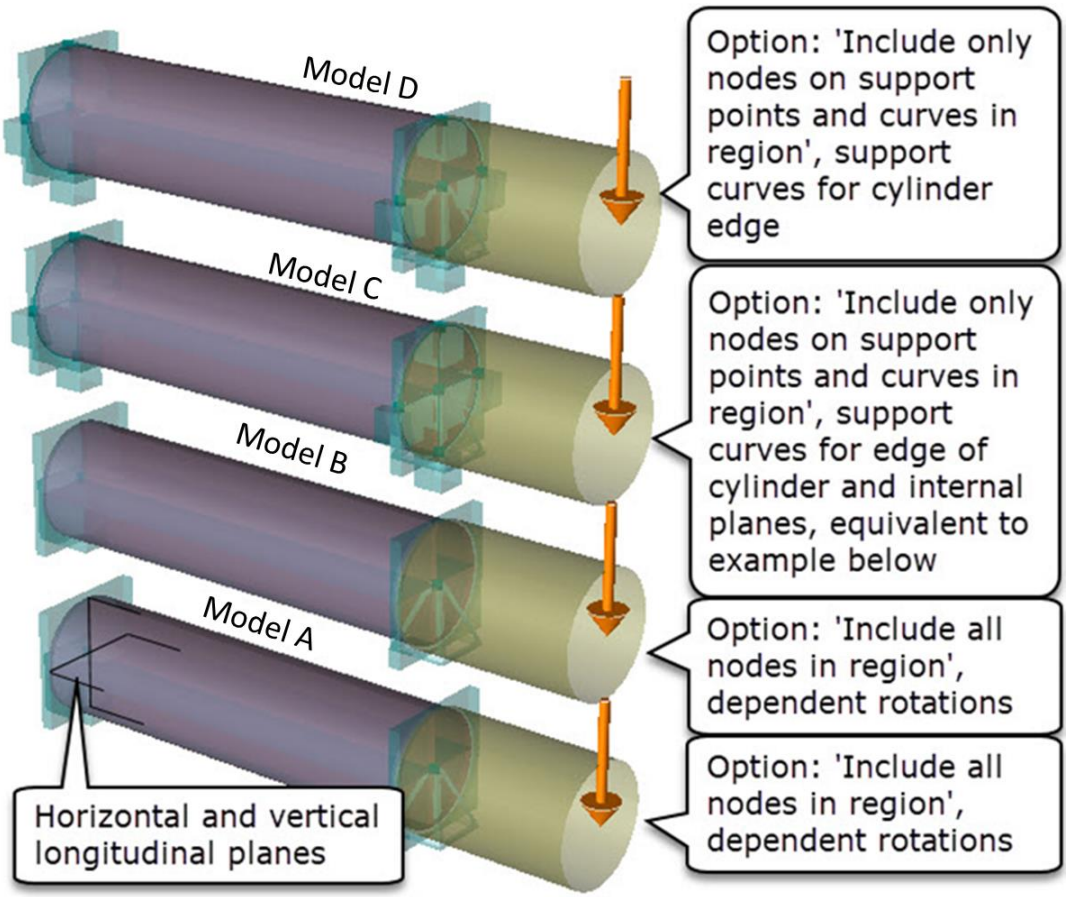


Figure 1-1 Concept Model

2 Modelling & Analysis

Start GeniE, create a new workspace and import the SupportRigidLinkAlternatives.gnx (Top Dropdown menu: File -> Import -> Workspace (GNX file)).

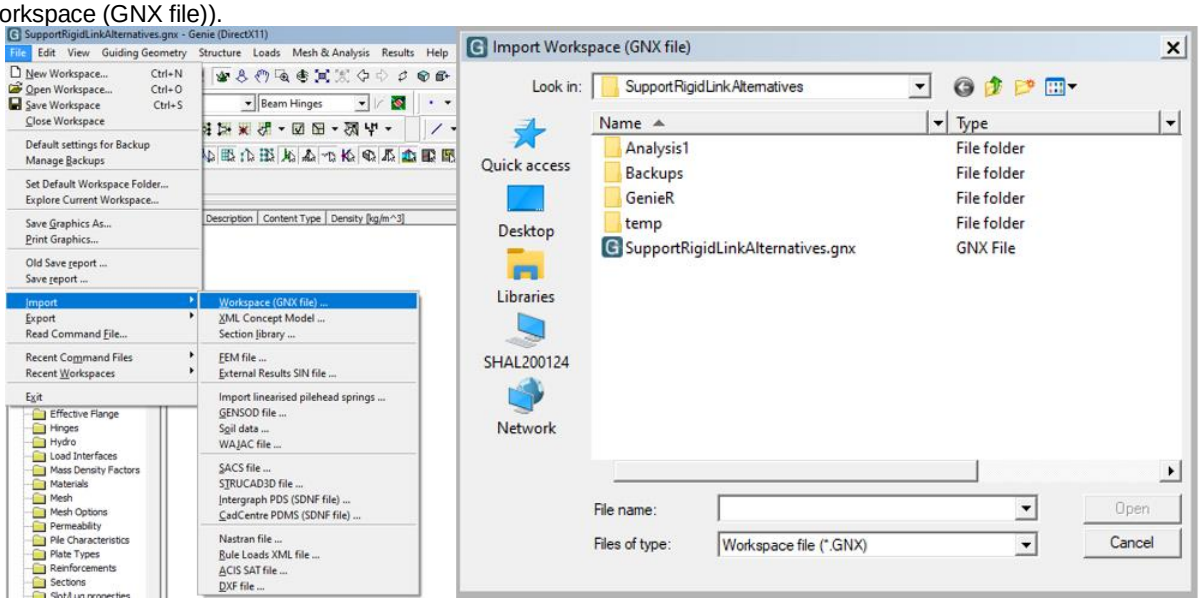


Figure 2-1 Create Workspace

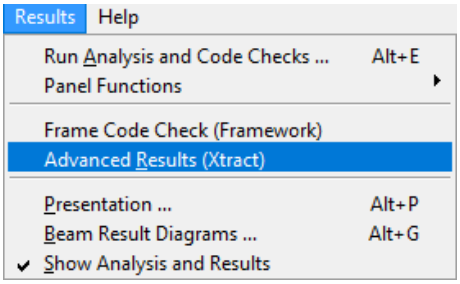
There are four independent models. All geometrically identical: Cylinder with internal longitudinal horizontal and vertical plates. The cylinder is fixed at one end and at the other a beam with tubular section is attached as an extension of the cylinder. Support rigid links are used both at the fixed end and at the connection between the cylinder and beam.

The difference between the models is in choice of options for the support rigid link:

- Model A: Option "Include all nodes in region, released rotations" is used in both ends.
- Model B: Option "Include all nodes in region, dependent rotations" is used.
- Model C: Option "Include only nodes on support points and curves in region" is used and there are support curves (with all dofs dependent) for edges of cylinder and longitudinal planes
- Model D: Option "Include only nodes on support points and curves in region" is used and there are support curves (with all dofs dependent) for cylinder edge only

3 Results

The analysis result can be reviewed in the postprocessor Xtract (Top Dropdown menu: Results ->Advanced Results (Xtract)).



The displacement results for Model B & Modal C are identical: Z displacement where load is applied is -5.37892E-5 m. The Model A is a bit softer (Z = -5.38587E-5 m) since the rotations for dependent nodes are released. The Model D is also softer (Z = -5.451E-5 m) since the nodes of the two longitudinal planes are free.

The figure below shows Z displacement by load case as displayed by Xtract.

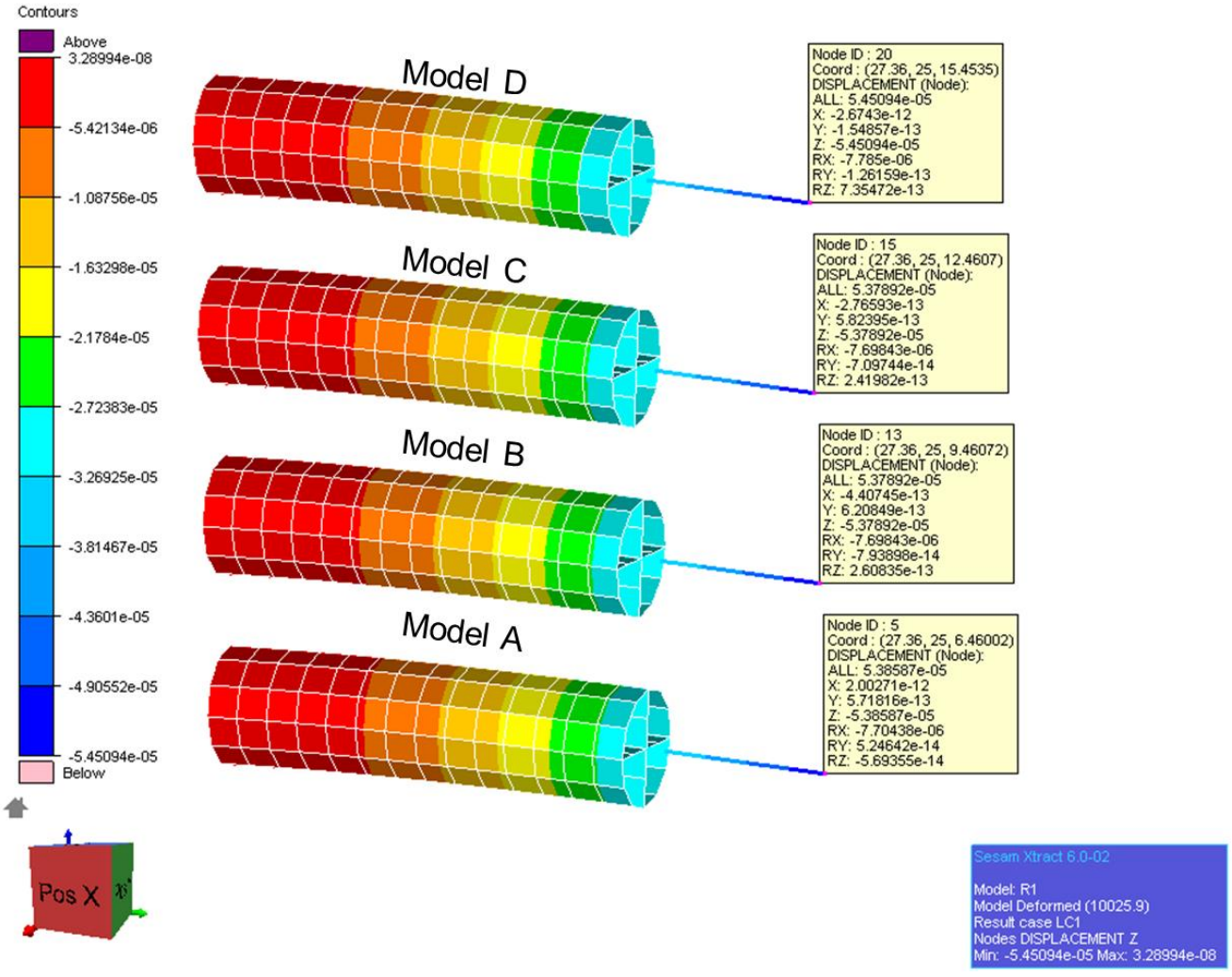


Figure 3-1 Displacement Z Plot

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