© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

ALTAIR

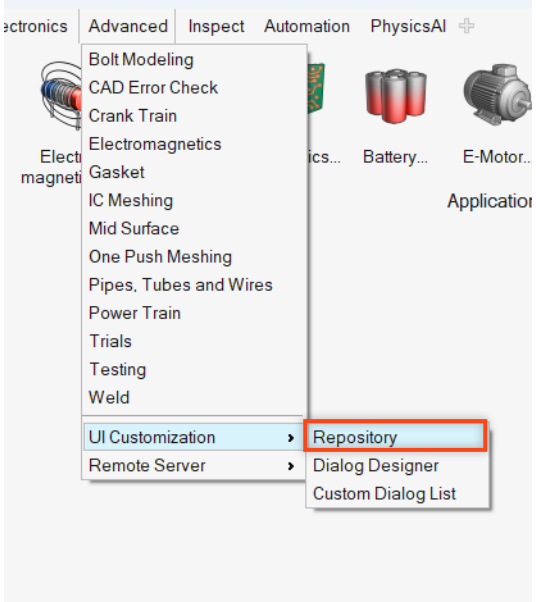
ALTAIR SIMLAB AUTOMATION SAMPLES CONNECTOR SCRIPTS

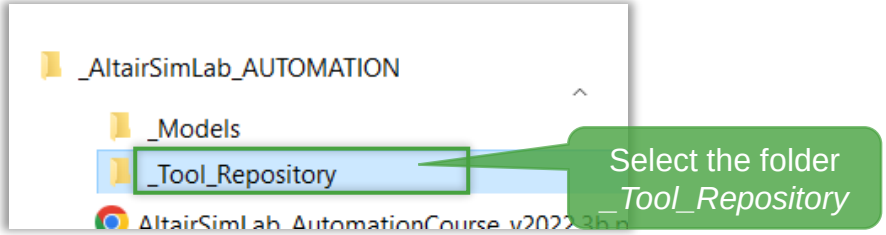
Alessio Librandi – v2025

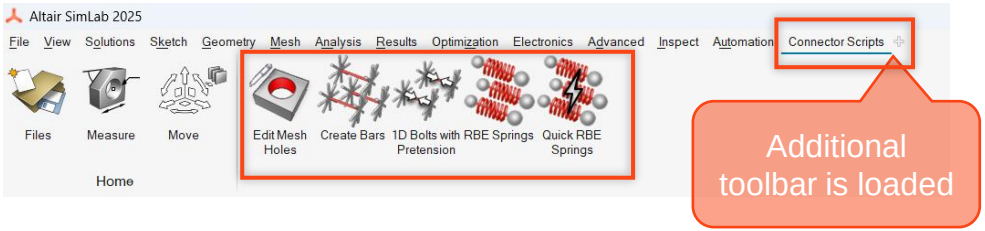
© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

Tool Repository folder

Select the *Repository* folder







ALTAIR | Altair SimLab™

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

EDIT MESH HOLES

[CONE TO CYLINDER + EDIT CYLINDER RADIUS]

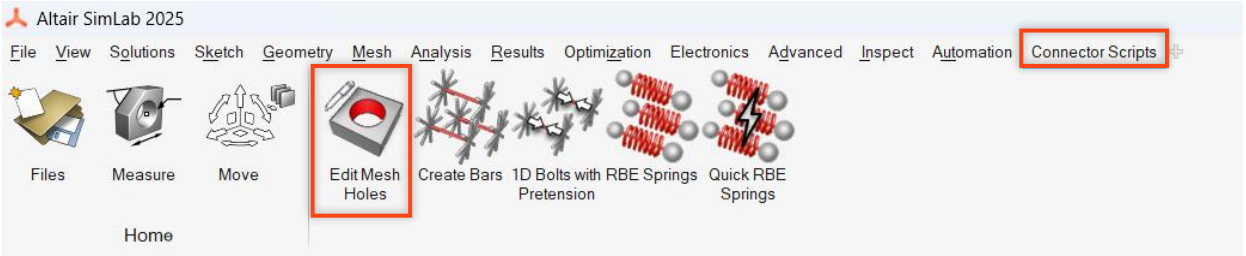
ALTAIR

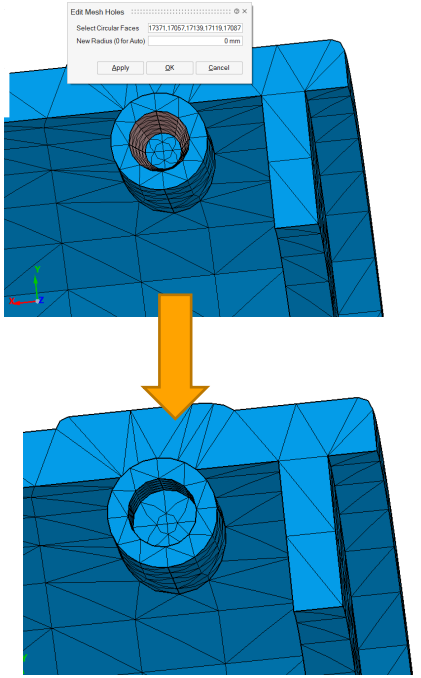
© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

Script: Edit Mesh Holes

- Select circular **Mesh Faces** to edit the radius (works cone and cylinders, open/closed, full/ partial).
- **Cone** faces will be converted into cylinders (useful for creating **hex bolts in plastic parts with cone holes**).
    - Leave Radius = 0 to create a cylinder using the max cone radius.

Use *Select Features* to select many cylinders/cones at once (retrieve the selection with *Previous Selection* after panel opens).

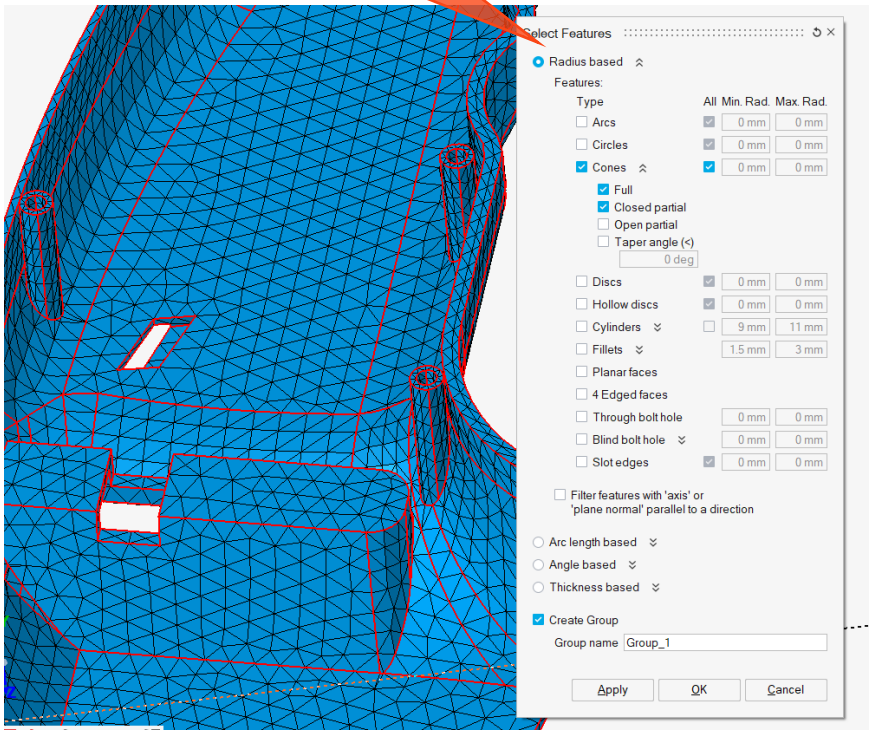


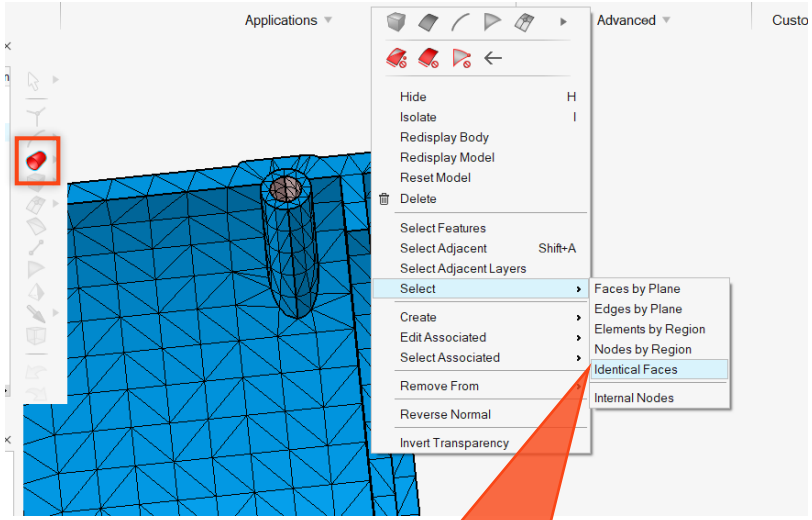


ALTAIR | Altair SimLab™

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

Use *Select Features* to find all conical holes





Also: pick one cone and *Select* | *Identical Faces*

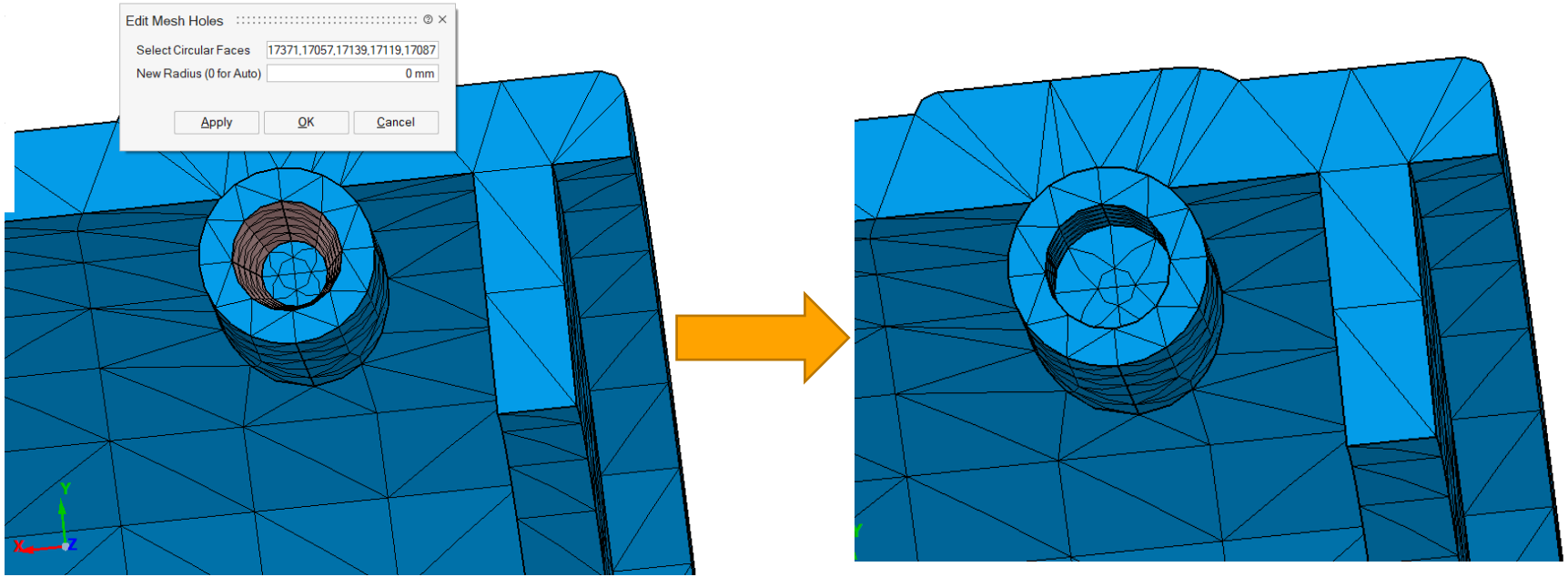
Retrieve selection after opening the Macro GUI

ALTAIR

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

Cone to Cylinder

Radius = 0 will convert cones into cylinder using the maximum cone radius.

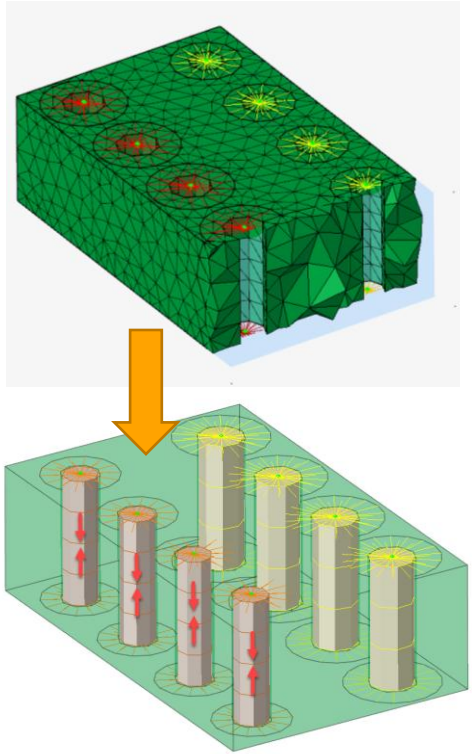


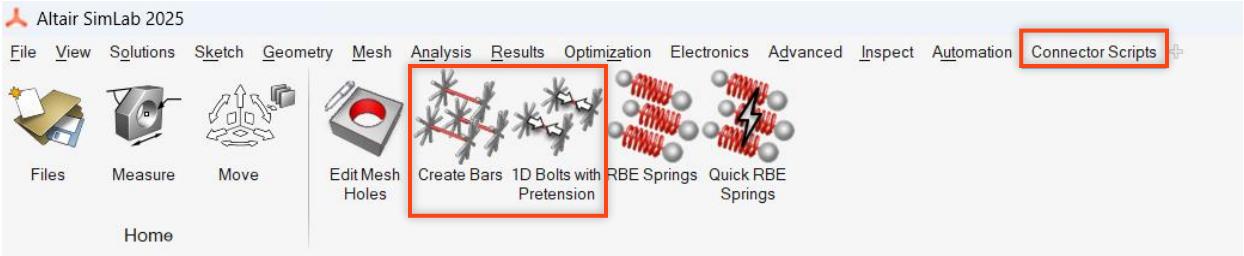
ALTAIR

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

Scripts: 1D Bolts, Bar and Beams

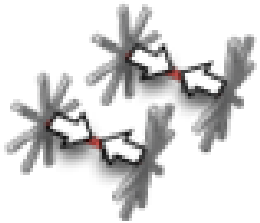
- The two scripts create Bar or Beam elements between RBE center nodes to model 1D Bolts.
- It can be specified the number of bars to be used for the connection.
- Material and Properties are created for Bar or Beam elements.
- Pretension load can be added.





ALTAIR | Altair SimLab™

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.



1D BOLTS WITH PRETENSION

[PRETENSIONED BARS FROM RBES]

Altair SimLab 2025

File View Solutions Sketch Geometry Mesh Analysis Results Electronics Advanced Inspect Automation Script Tools Custom

Files Measure Move Fast Spring_Set Create Bars 1D Bolts with Pretension

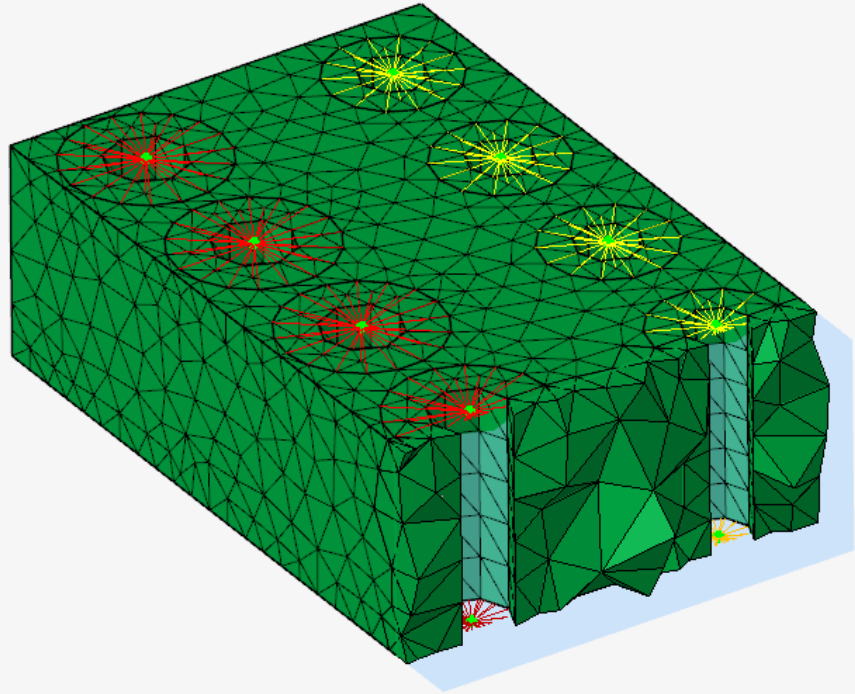
Home

Start the script to connect Lower and Upper RBE Bodies through 1D Bolts with pretension

Assembly Browser

Name	Property	Material
Assembly		
mesh_gda_MMKS.gda		
RBE2_2B		---
RBE2_2A		---
RBE2_1B		---
RBE2_1A		---
beam_example_0...		

The script will search for the nearest center nodes across the two RBE groups and join them.



Selection List Output Window

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

Altair SimLab 2025

File View Solutions Sketch Geometry Mesh Analysis Results Electronics Advanced Inspect Automation Script Tools Custom

Files Measure Move Fast Spring_Set Create Bars 1D Bolts with Pretension

Home

Assembly Browser

Name | Property | Material

- Assembly
  - mesh_gda_MMKS.gda
    - RBE2_2B
    - RBE2_2A
    - RBE2_1B
    - RBE2_1A
    - beam_example_0..

Pick merged RBE bodies, 1 on each side

Bolt diameter, number of bars, pretension force

Define Material
Use different IDs if you don't want to overwrite existing materials

Element Type (BAR / BEAM)

1D Bolts with Pretension

RBE Body - Top	RBE2_1A
RBE Body - Bottom	RBE2_1B
Diameter	10 mm
Number Of Bars	2
Pretension Force	100 N

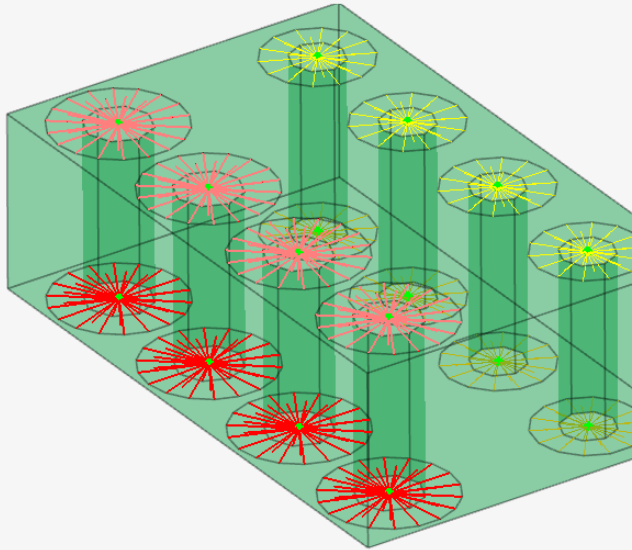
Material:

ID (unused)	1001
Density	7.8e-09 kg/mm3
Young's Modulus	208000 MPa
Poisson's Ratio	0.3
Damping Coefficient	0.04

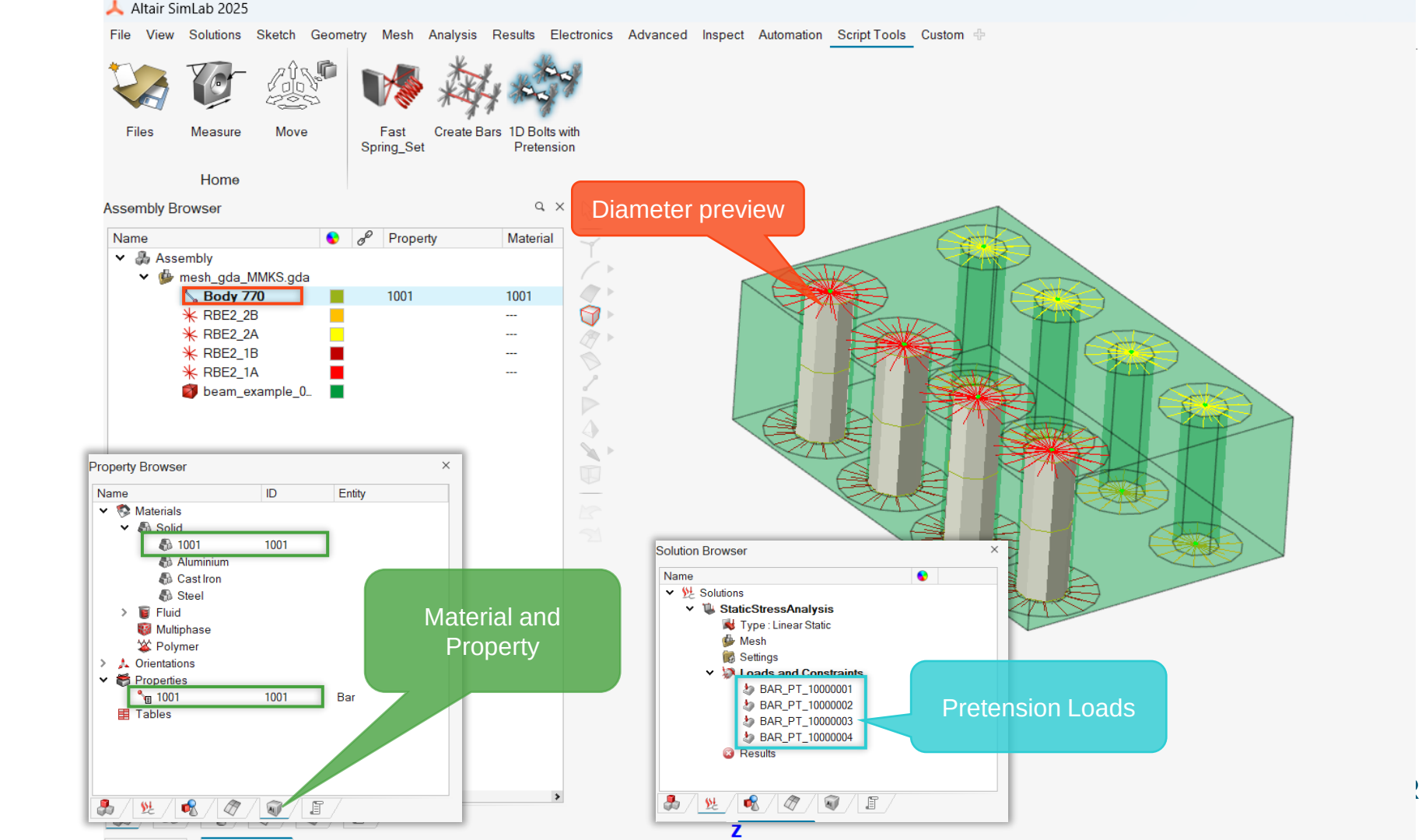
Analysis Property:

Create:	One property
Element Type	BAR

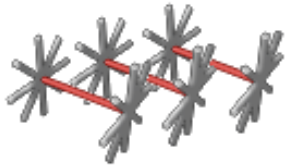
Apply OK Cancel



ALTAIR


Altair SimLab 2025
File View Solutions Sketch Geometry Mesh Analysis Results Electronics Advanced Inspect Automation Script Tools Custom
Files
Measure
Move
Home
Fast Spring_Set
Create Bars
1D Bolts with Pretension
Assembly Browser
Name
Property
Material
Assembly
mesh_gda_MMKS.gda
Body 770
1001
1001
RBE2_2B
RBE2_2A
RBE2_1B
RBE2_1A
beam_example_0_
Diameter preview
Property Browser
Name
ID
Entity
Materials
Solid
1001
1001
Aluminium
Cast Iron
Steel
Fluid
Multiphase
Polymer
Orientations
Properties
1001
1001
Bar
Tables
Material and Property
Solution Browser
Name
Solutions
StaticStressAnalysis
Type : Linear Static
Mesh
Settings
Loads and Constraints
BAR_PT_10000001
BAR_PT_10000002
BAR_PT_10000003
BAR_PT_10000004
Results
Pretension Loads

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.



CREATE BARS

[CONNECT RBES WITH BAR/BEAM ELEMENTS]

ALTAIR

Altair SimLab 2022.3

File View Solutions Sketch Geometry Mesh Analysis Results Optimization Electronics Advanced Inspect Automation **Script Tools**

Files Measure Move Edit Mesh Holes **Create Bars**

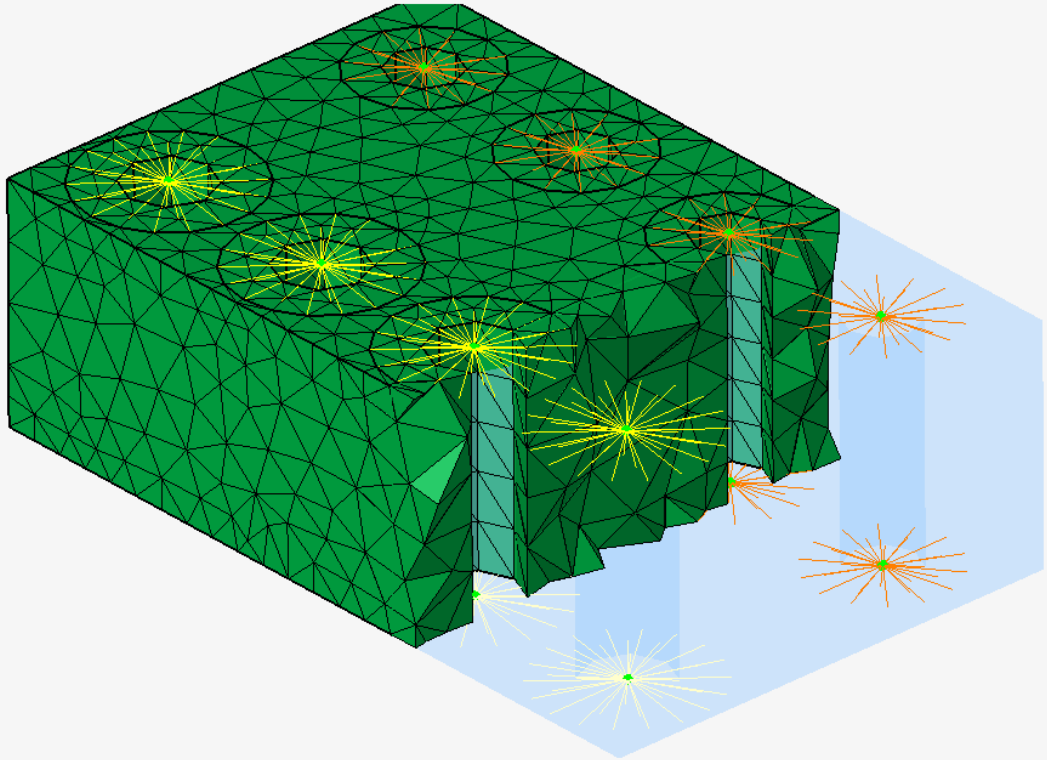
Home

Start the script to connect Lower and Upper RBE Bodies through BAR or BEAM elements

Assembly Browser

Name	Original Name	Mesh Con
Assembly		
mesh_gda_MMKS.gda		
RBE2_2B		
RBE2_2A		
RBE2_1B		
RBE2_1A		
beam_example_02.prt.1		

The script will search for the nearest center nodes across the two RBE groups and join them.



Altair SimLab 2022.3

File View Solutions Sketch Geometry Mesh Analysis Results Optimization Electronics Advanced Inspect Automation Script Tools

Files Measure Move Edit Mesh Holes Create Bars

Home

Assembly Browser

Name	Original Name
Assembly	
mesh_gda_MMKS.gda	
RBE2_2B	
RBE2_2A	
RBE2_1B	
RBE2_1A	
beam_example_02.prt.1	

Pick RBE bodies, 1 on each side

Create Bars

RBE Body - 1	RBE2_1A
RBE Body - 2	RBE2_1B
Bar Body Name	RBEBars
Radius	4 mm
Number Of Bars	2

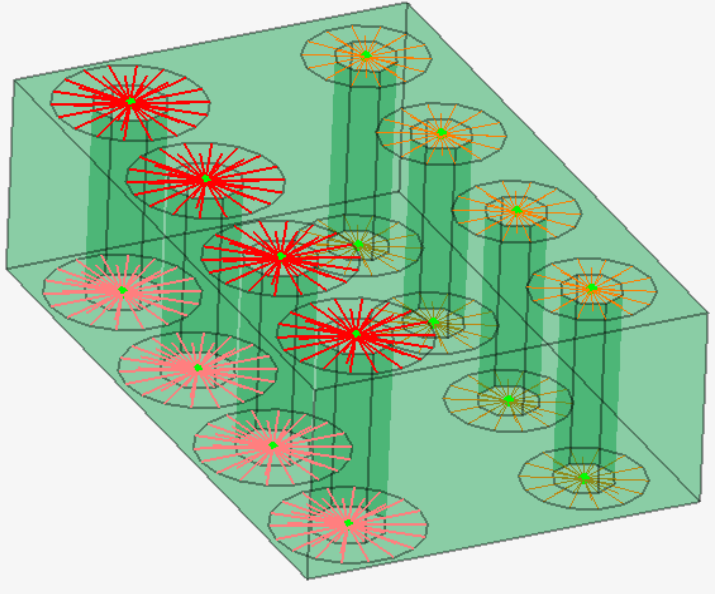
Material / Property:

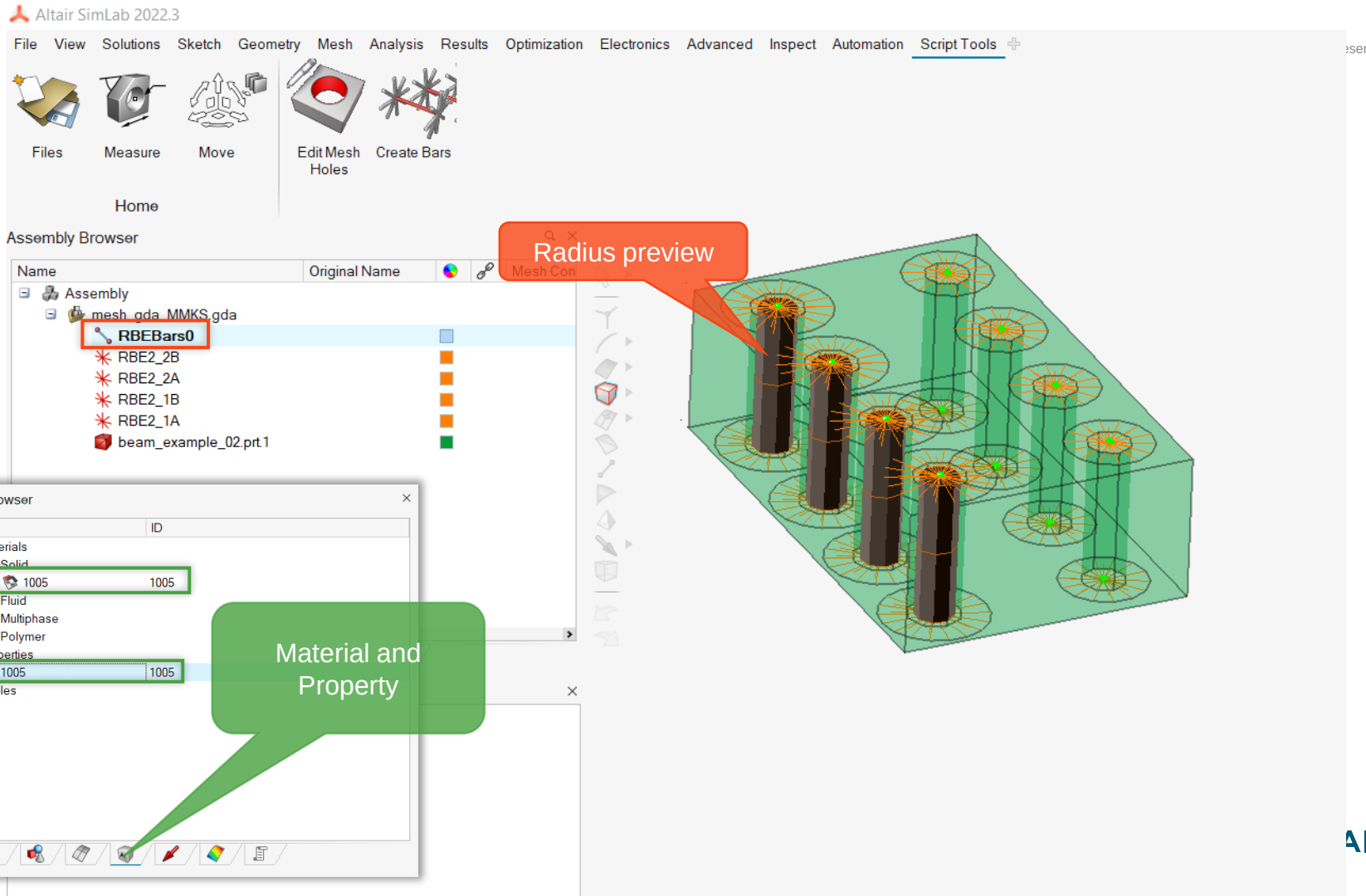
Create Property	☑
ID	1005
Density	7.8e-09 kg/mm3
Young's Modulus	210000 MPa
Poisson's Ratio	0.3
Damping Coefficient	0.04
Element Type	BAR

Apply OK Cancel

Material and Element Type (BAR / BEAM)

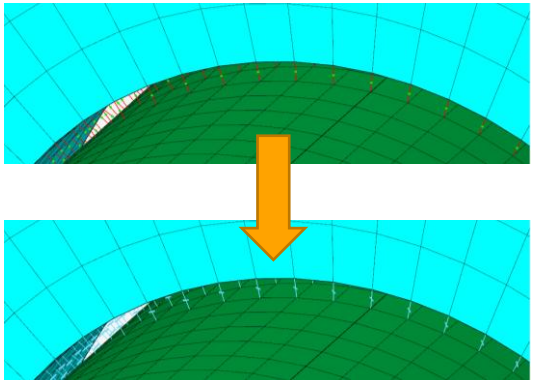
Use different IDs if you don't want to overwrite existing materials



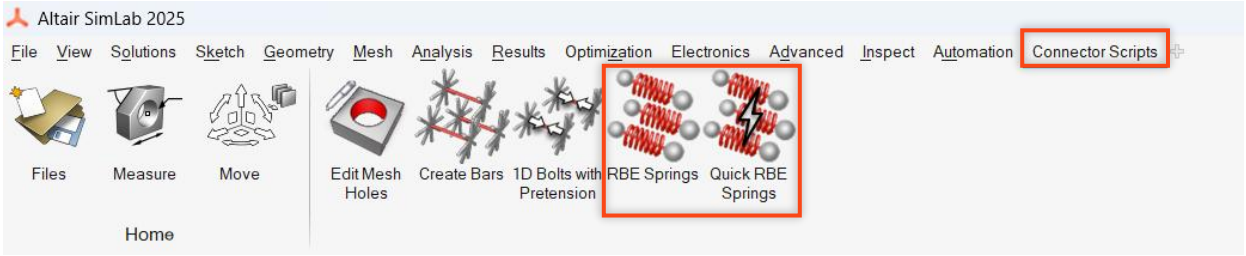

Altair SimLab 2022.3
File View Solutions Sketch Geometry Mesh Analysis Results Optimization Electronics Advanced Inspect Automation Script Tools
Files
Measure
Move
Edit Mesh Holes
Create Bars
Home
Assembly Browser
Name
Original Name
Mesh Con
Assembly
mesh_gda_MMKS.gda
RBEBars0
RBE2_2B
RBE2_2A
RBE2_1B
RBE2_1A
beam_example_02.prt.1
Radius preview
Property Browser
Name
ID
Materials
Solid
1005
1005
Fluid
Multiphase
Polymer
Properties
1005
1005
Tables
Material and Property

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

Scripts: Multiple Spring Connectors



- The two scripts convert multiple RBEs into Spring (or Bush) connectors.
- The “RBE Springs” tool allows to equivalence RBE free nodes to the adjacent bodies before creating the connectors. It supports both Spring and Bush elements.
- The “Quick RBE Springs” tool should be preferred when thousands of connectors are involved.
- Both tools allow to specify:
    - Stiffness values
    - Coordinate system in which the stiffnesses are defined
    - Option to define stiffness through parameters.



© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

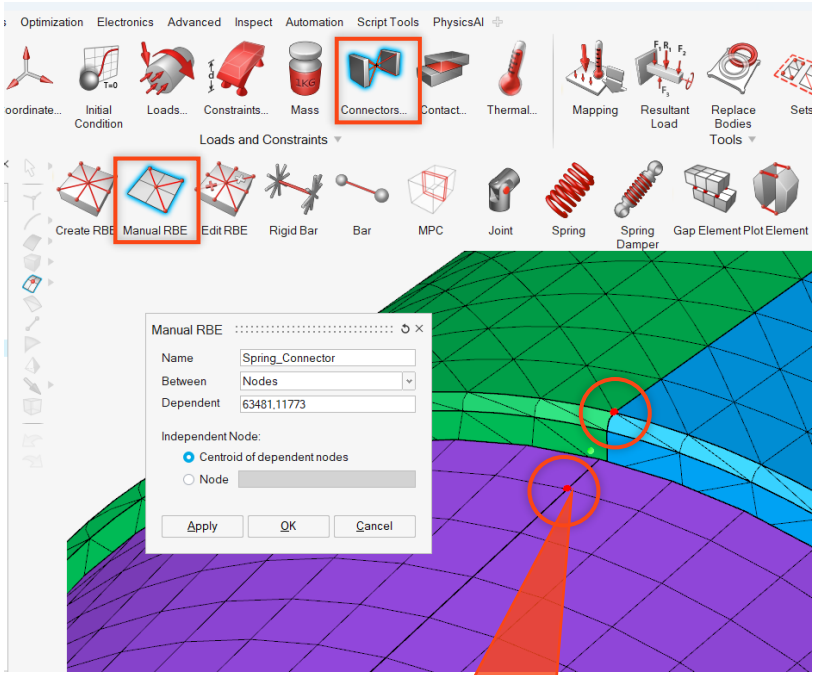
RBE SPRINGS

[CONVERT RBE BODIES INTO SPRING/BUSH CONNECTORS]

ALTAIR

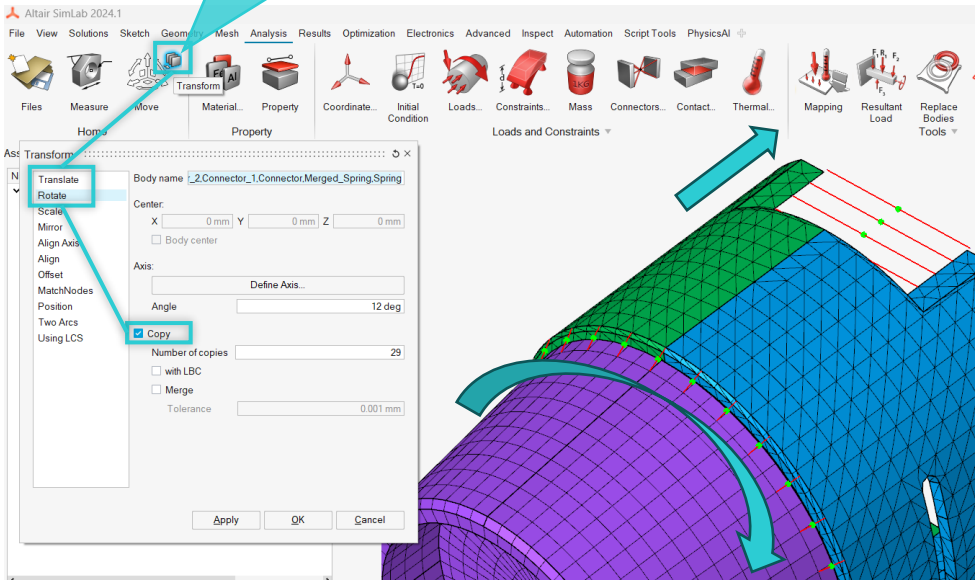
© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

Spring/Bush Connectors through RBEs



Create node-to-node connectors with *Manual RBE*

Use *Transform* to copy the connector

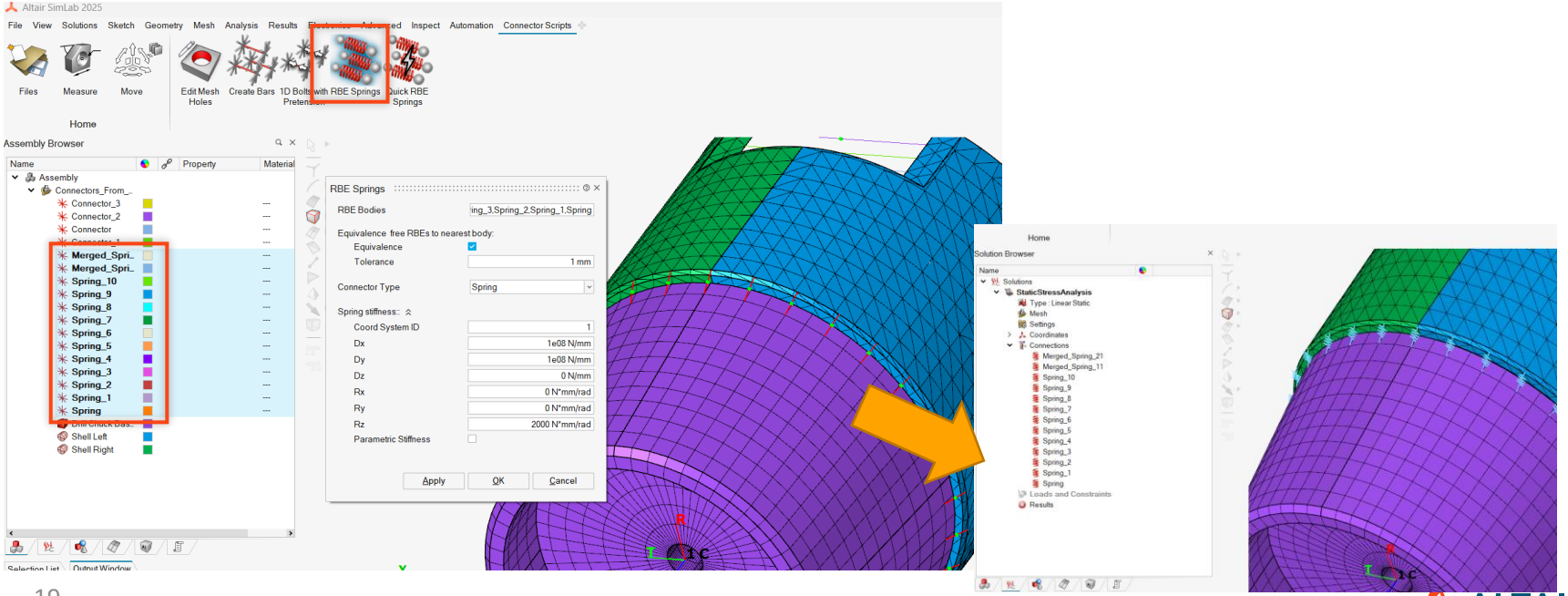


ALTAIR

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

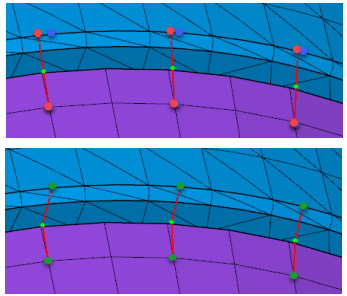
Select existing RBE bodies to link them to the nearest node and convert them into Springs or Bushes.

- Springs/Bushes are created in the current solution or alternatively in the LC Browser.
- Supported for all solvers with Spring/Bush elements.
- Both RBE2/RBE3 are supported.
- RBE name will be retained for the connectors.



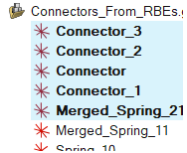
© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

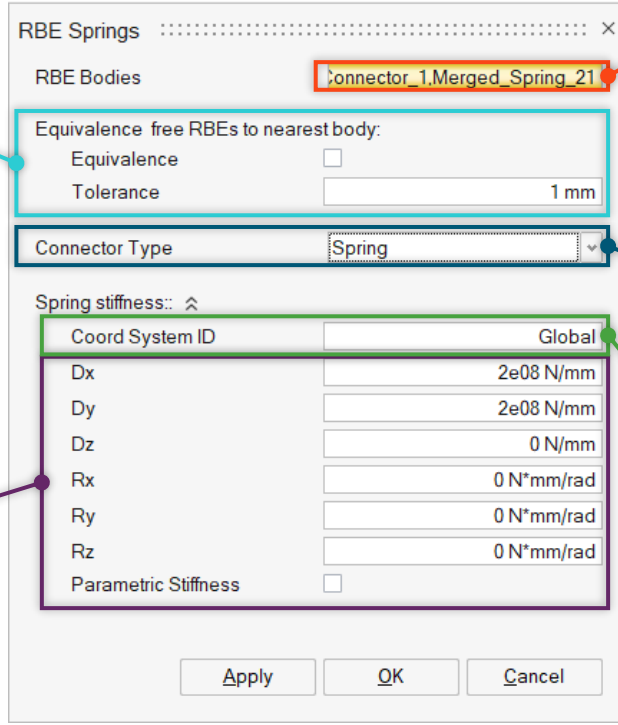
Equivalence nodes within tolerance to connect free RBEs to the nearest body



RBE bodies to convert

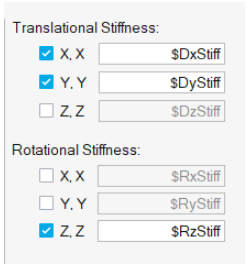
- RBE names are used for connectors;
- If RBE are merged, springs will be grouped accordingly (bushes will not be grouped)





Spring Stiffnesses

Parametric option will use SimLab parameters



Inputs for **coordinate system**:

- "**Global**" (default)
- "**Element**" (for Bush connectors only)
- **ID** ("1", "2", etc.) for local coordinate systems

ALTAIR

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

QUICK RBE SPRINGS

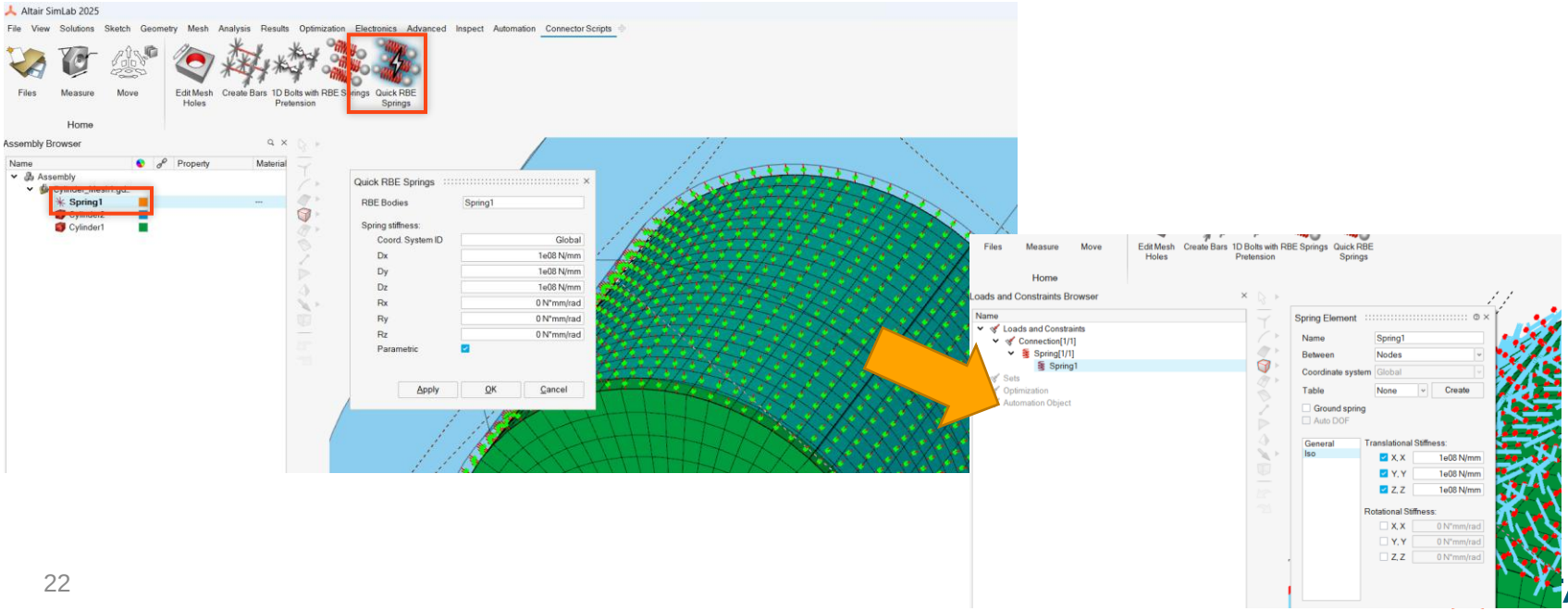
[CONVERT MANY RBE BODIES INTO SPRINGS]

ALTAIR

© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

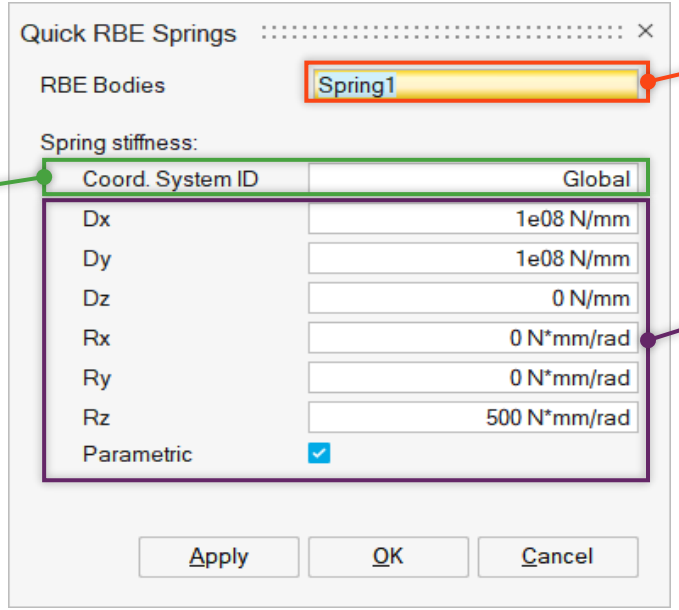
Similar to “RBE Springs” tool, but:

- No equivalencing and no bushes available
- Better performance for a HIGH NUMBER of connectors to be created (thousands of springs)
- Automatic check of failed spring creation
- Please merge springe together to improve the performances.



© 2025 Altair Engineering, Inc. Proprietary and Confidential. All rights reserved.

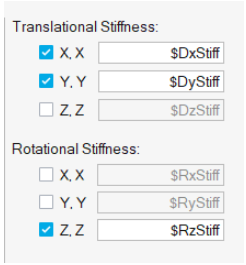
Inputs for **coordinate system**:
- "**Global**" (default)
- "**ID** ("1", "2", etc.) for local coordinate systems



RBE bodies to convert
- RBE names are used for connectors;
- If RBE are merged, springs will be grouped accordingly

Spring Stiffnesses

Parametric option will use SimLab parameters



ALTAIR