

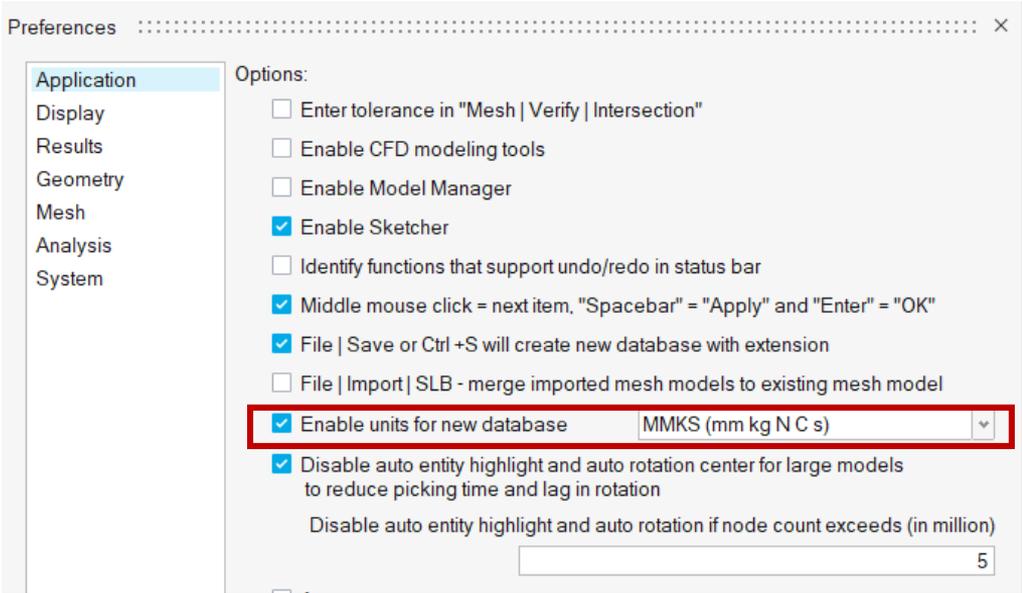
Altair SimLab 2020.1 Features

SYSTEM

Enable Units For New Database

File > Preferences > Application

- Added a toggle to set the selected unit system for new database.

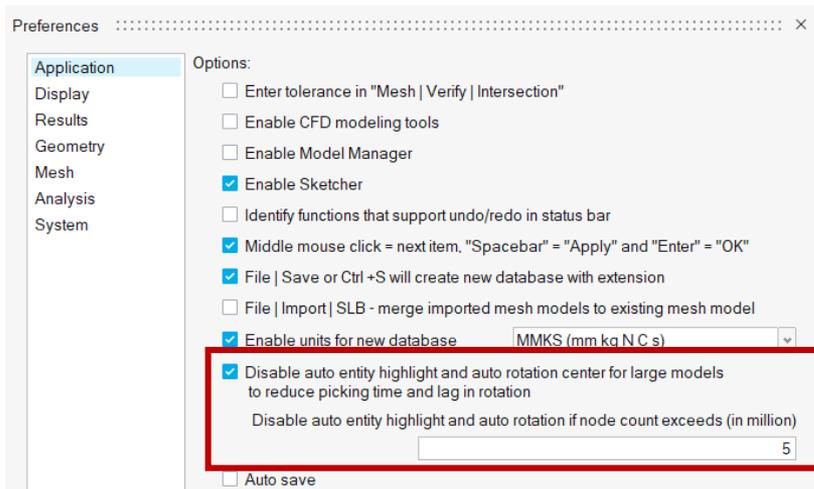


Entity Highlight and Auto Rotation Enter

File > Preferences > Application

- Added a toggle to disable the highlighting of entities and auto rotation center based on user defined node count limit.
- In earlier version of SimLab, if the node count exceeds 1M it will automatically disable the entity highlight and rotation center.

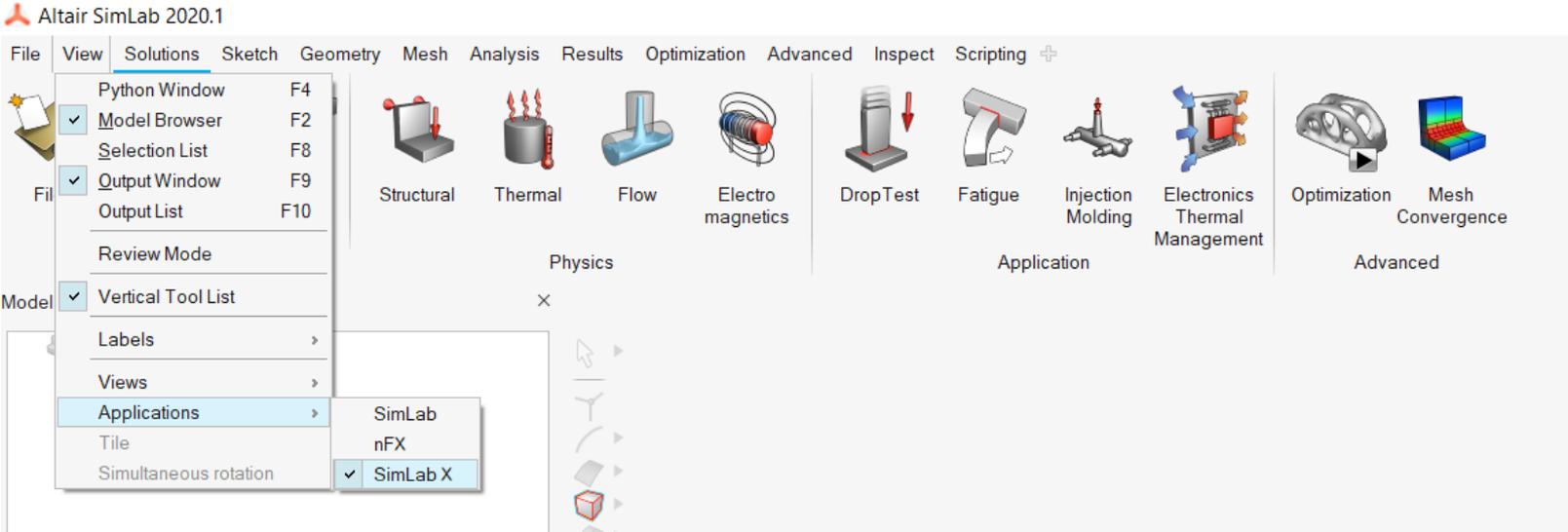
Note: The performance of entity picking, and rotation of large models will be fast by turning on this toggle.

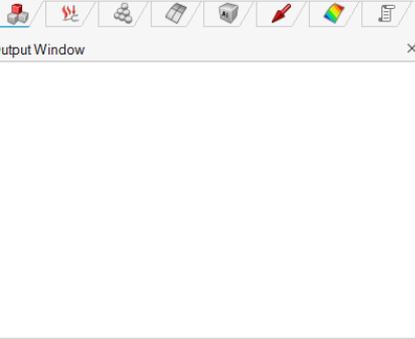
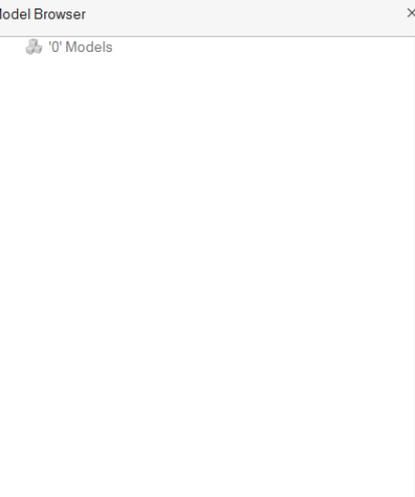
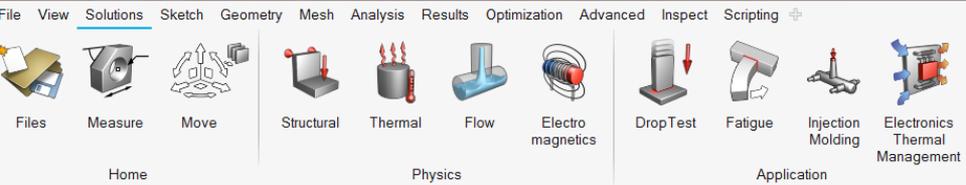


SimLab X

View > Applications

- Made **SimLab X** as default application.





USER INTERFACE

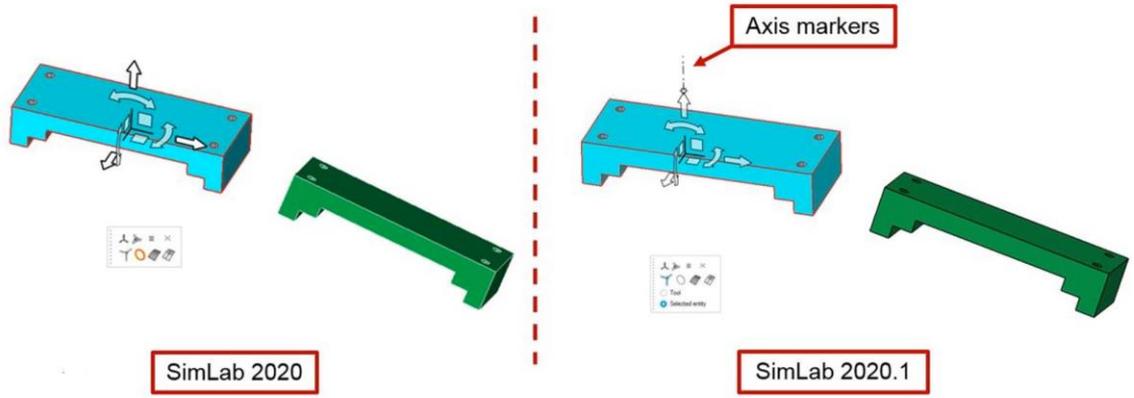
Reposition & Axis

Home > Move

Sample model



- The Reposition mode in the Move tool is simplified for ease of use
- Support is added to reposition the axis of the Move tool/Body using the axis marker



Groups

Sample model



GROUP DISPLAY

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- Improved the group display. By clicking on the group icon will display the entities in the screen with group color.

Model Browser

Name	Color
Block_BoltHoles	Green
Block_Cap_BoltHoles	Blue
Block_WaterJacket	Yellow
Cyl_Bore_1	Red
Cyl_Bore_2	Green
Cyl_Bore_3	Blue
Cyl_Bore_4	Yellow
ExhaustPort	Red
InletPort	Green
Edge Group	Yellow
Edges_br_Washer	Yellow

Selection List

Model Name	Entity ID
M_EngineBlock_F	Face 214478
M_EngineBlock_F	Face 183305
M_EngineBlock_F	Face 222057
M_EngineBlock_F	Face 150636
M_EngineBlock_F	Face 38117
M_EngineBlock_F	Face 63340
M_EngineBlock_F	Face 115912
M_EngineBlock_F	Face 74416
M_EngineBlock_F	Face 39303
M_EngineBlock_F	Face 220847
M_EngineBlock_F	Face 214064
M_EngineBlock_F	Face 93666
M_EngineBlock_F	Face 74512
M_EngineBlock_F	Face 76211
M_EngineBlock_F	Face 221644
M_EngineBlock_F	Face 130140

SimLab 2020

To Activate Group Display Mode

No Entities will be selected while clicking Group Icons

SimLab 2020.1

Model Browser

Name	Color
Block_BoltHoles	Green
Block_Cap_BoltHoles	Blue
Block_WaterJacket	Yellow
Cyl_Bore_1	Red
Cyl_Bore_2	Green
Cyl_Bore_3	Blue
Cyl_Bore_4	Yellow
ExhaustPort	Red
InletPort	Green
Edge Group	Yellow
Edges_br_Washer	Yellow

Selection List

Model Name	Entity ID
M_EngineBlock_F	Face 214478
M_EngineBlock_F	Face 183305
M_EngineBlock_F	Face 222057
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M_EngineBlock_F	Face 38117
M_EngineBlock_F	Face 63340
M_EngineBlock_F	Face 115912
M_EngineBlock_F	Face 74416
M_EngineBlock_F	Face 39303
M_EngineBlock_F	Face 220847
M_EngineBlock_F	Face 214064
M_EngineBlock_F	Face 93666
M_EngineBlock_F	Face 74512
M_EngineBlock_F	Face 76211
M_EngineBlock_F	Face 221644
M_EngineBlock_F	Face 130140

Enable Group Display

To exit group mode

Rotation Performance Improvement

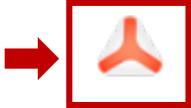
- Rotation performance is improved when nodes are selected in FE bodies.

Model Size (Node Count)	SimLab 2020 (Selected all nodes in the model)	SimLab 2020.1 (Selected all nodes in the model)	Performance Improvement
2.4 Million	1 FPS	14 FPS	93%
0.5 Million	3 FPS	17 FPS	82%
0.4 Million	5 FPS	21 FPS	76%
Note : FPS (Frames per second)			

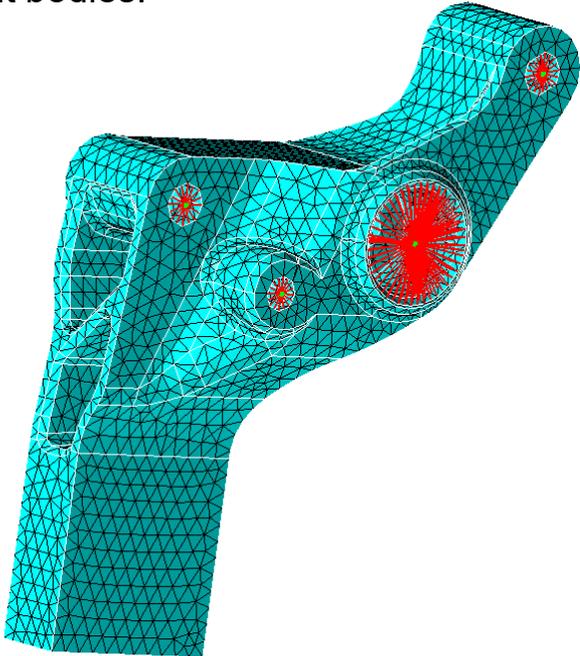
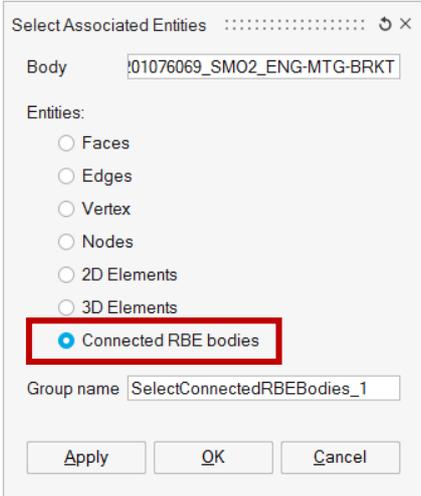
Select Associated Entities

Body Right click > Select

Sample model



- Support added to select connected RBE's from input bodies.



Experiments

Parameters browser > Process Right click

- Added plot support for responses against iteration in DOE.

Design of Experiments

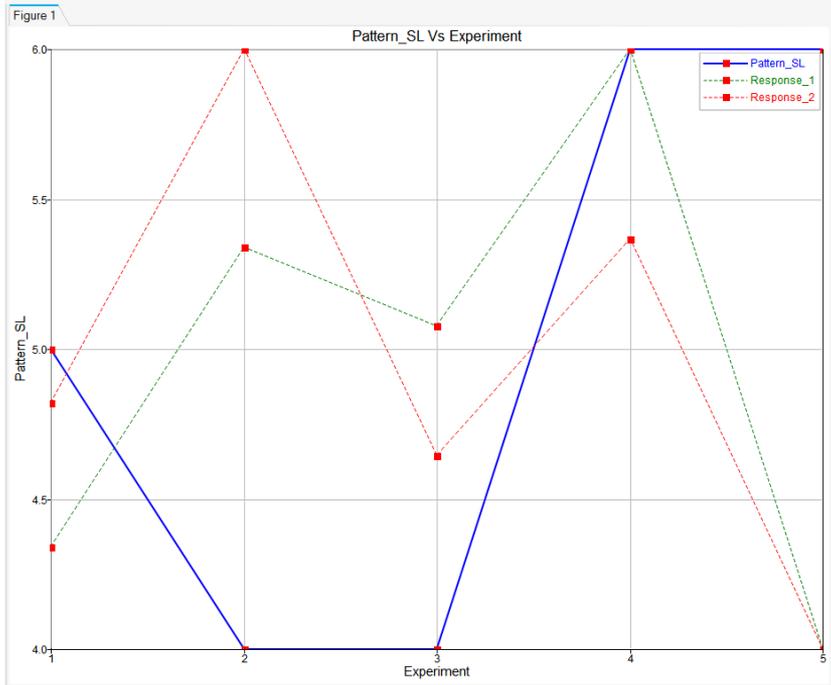
Choose project file

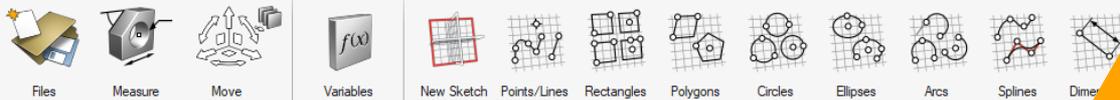
Experiments:

Runs	Pattern_SL	SL_Radius	Response_1 Element Stresses (2D & 3D)-Von Mises	Response_2 Displacement-Resultant
Run 0	5	25	0.0426098	1.42264e-05
Run 1	4	22.5	0.0462458	1.56229e-05
Run 2	4	27.5	0.0452978	1.40169e-05
Run 3	6	22.5	0.0486508	1.48723e-05
Run 4	6	27.5	0.0413739	1.32535e-05

Plot

	Pattern_SL	SL_Radius	Response_1 Element Stresses (2D & 3D)-Von Mises	Response_2 Displacement-Resultant
Plot	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Y Axis	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

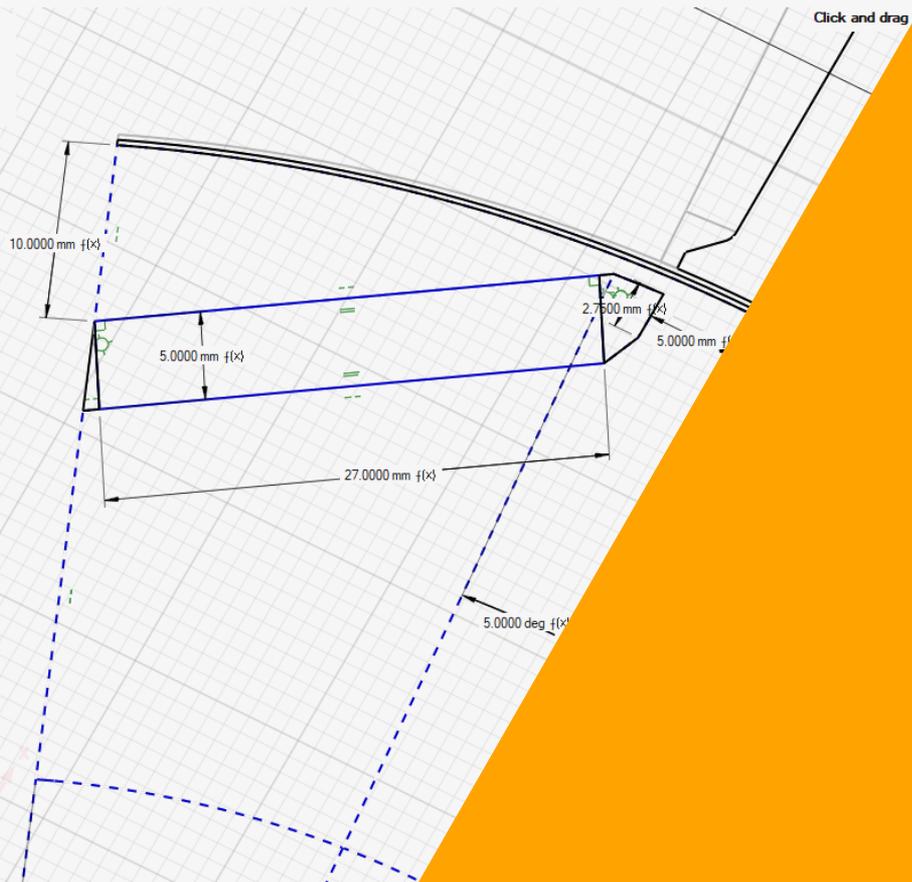




Home

Create

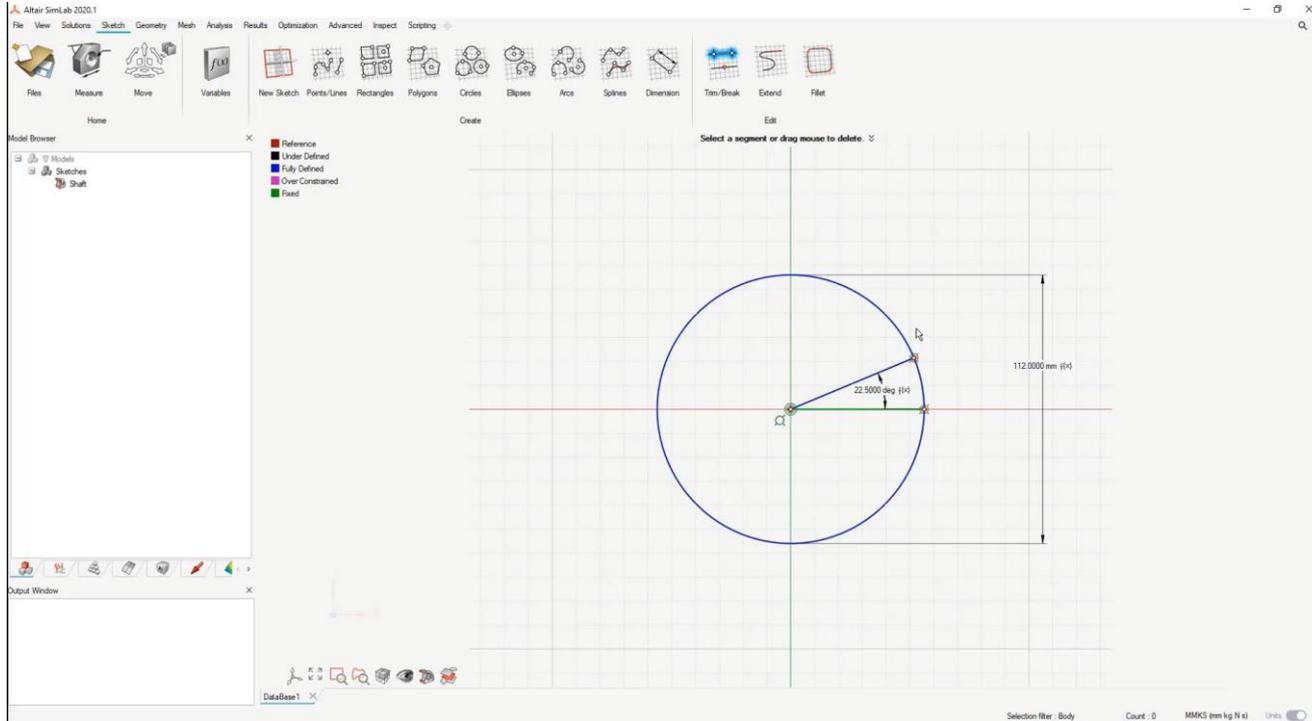
- Reference
- Under Defined
- Fully Defined
- Over Constrained
- Fixed

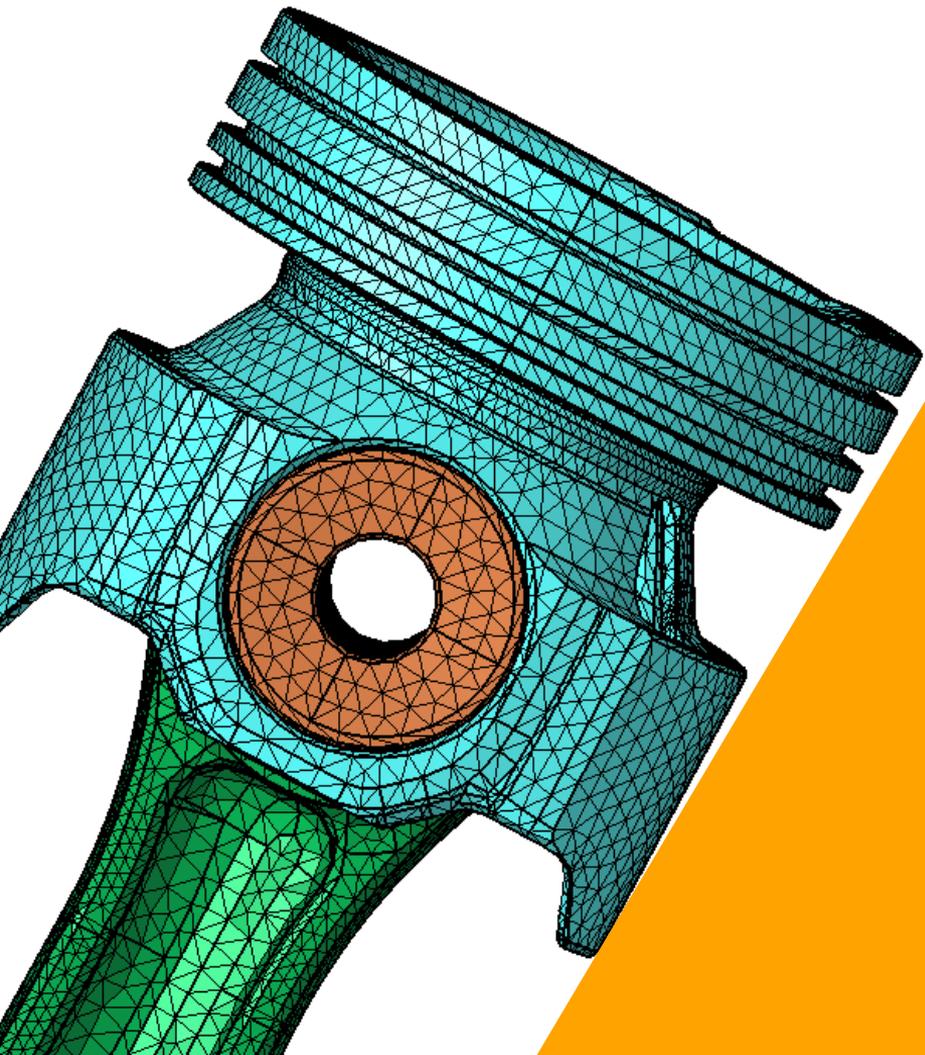


SKETCH

Sketch

- The new ribbon "**Sketch**" is added. It contains the tools to create 2D sketches with design variables.



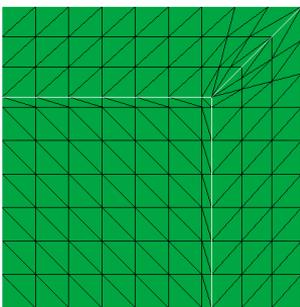


GEOMETRY

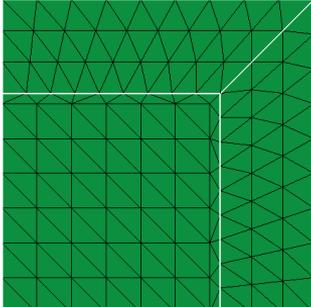
Edge Offset

Geometry > Edge > Create

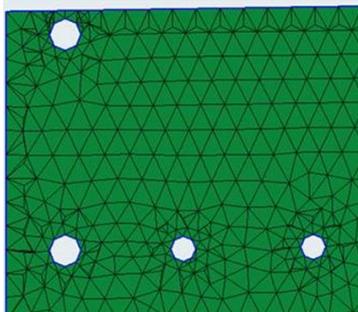
- Enhanced the edge offset tool to improve the mesh quality.



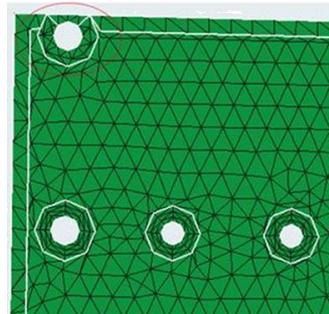
SimLab 2020



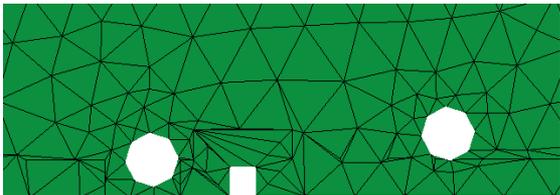
SimLab 2020.1



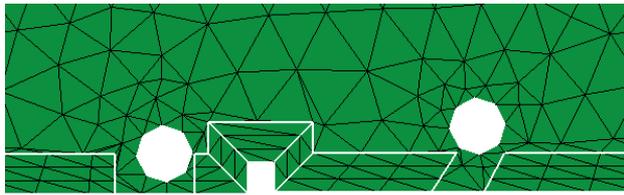
SimLab 2020



SimLab 2020.1



SimLab 2020

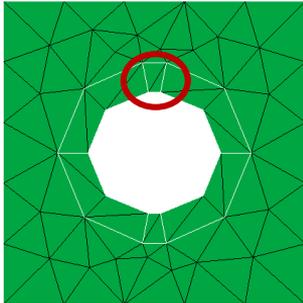
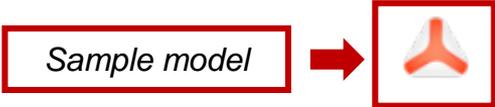


SimLab 2020.1

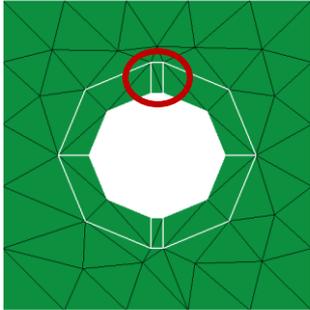
Edge Offset

Geometry > Edge > Create

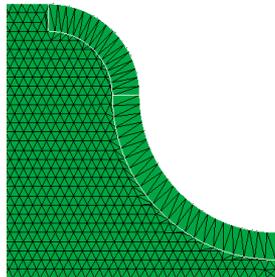
- Robustness is improved in edge offset tool.



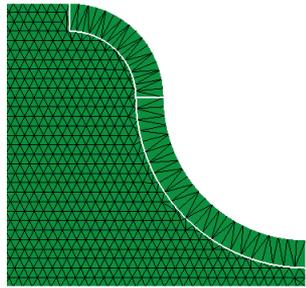
SimLab 2020



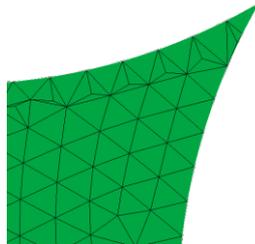
SimLab 2020.1



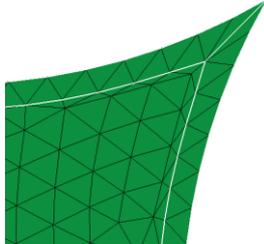
SimLab 2020



SimLab 2020.1



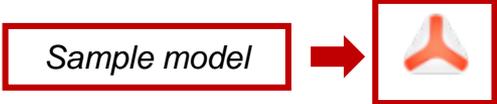
SimLab 2020



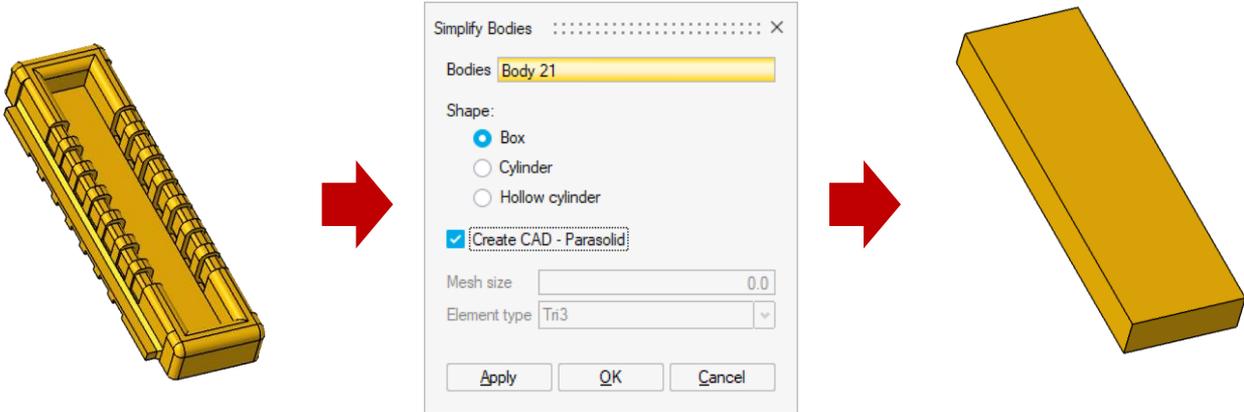
SimLab 2020.1

Simplify

Geometry > Body > More Tools



- Added option – “**Create CAD – Parasolid**” to create simplified CAD geometry.



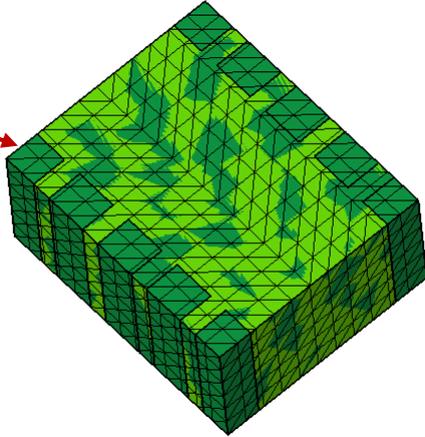
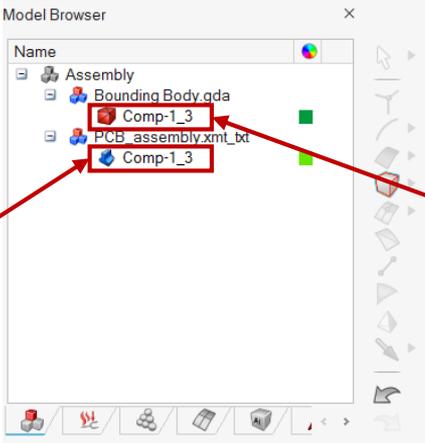
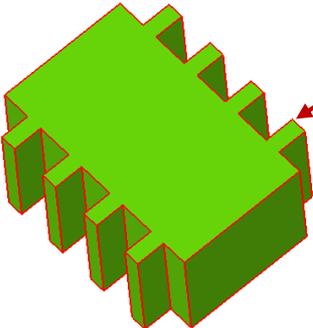
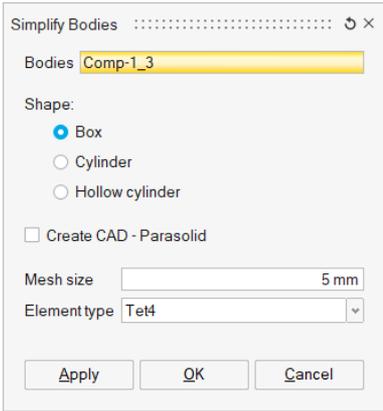
Simplify

Geometry > Body > More Tools

Sample model

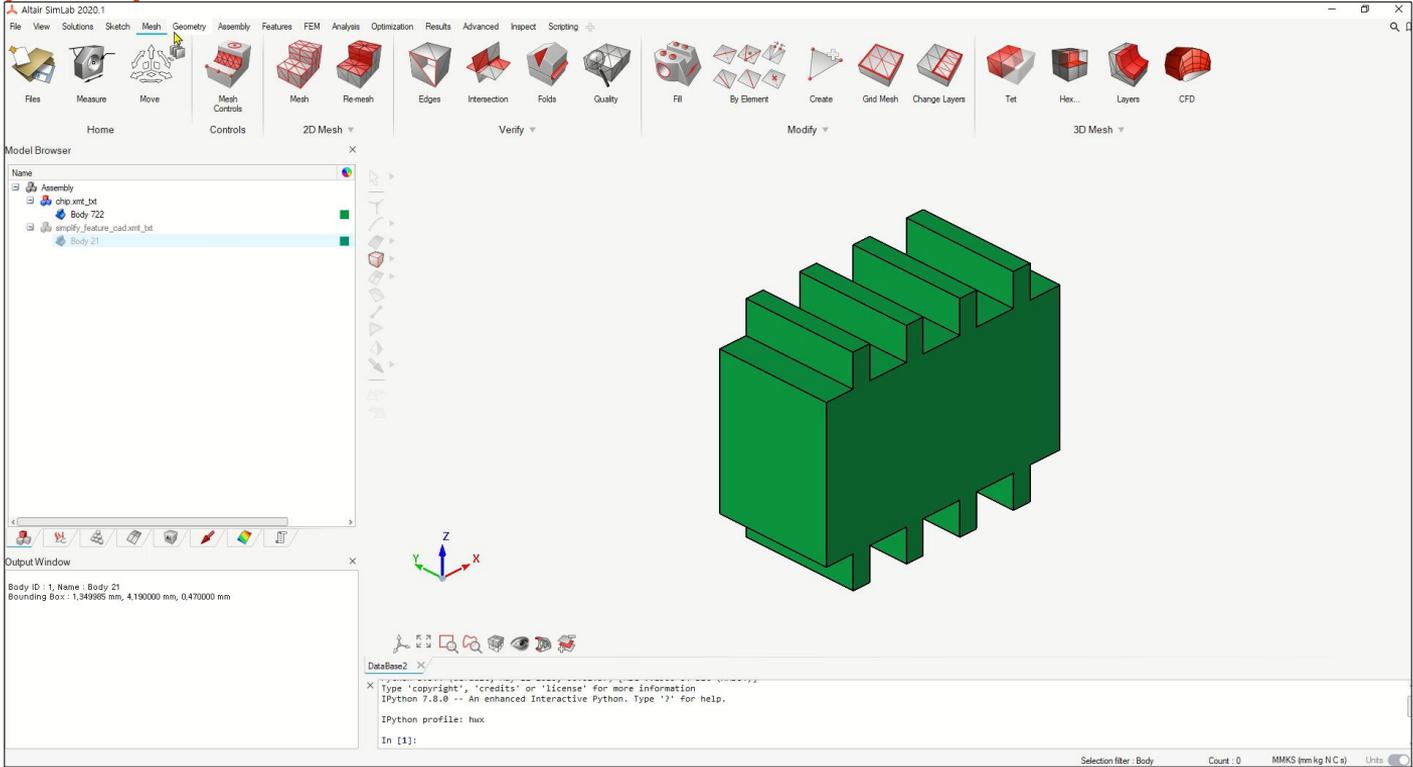


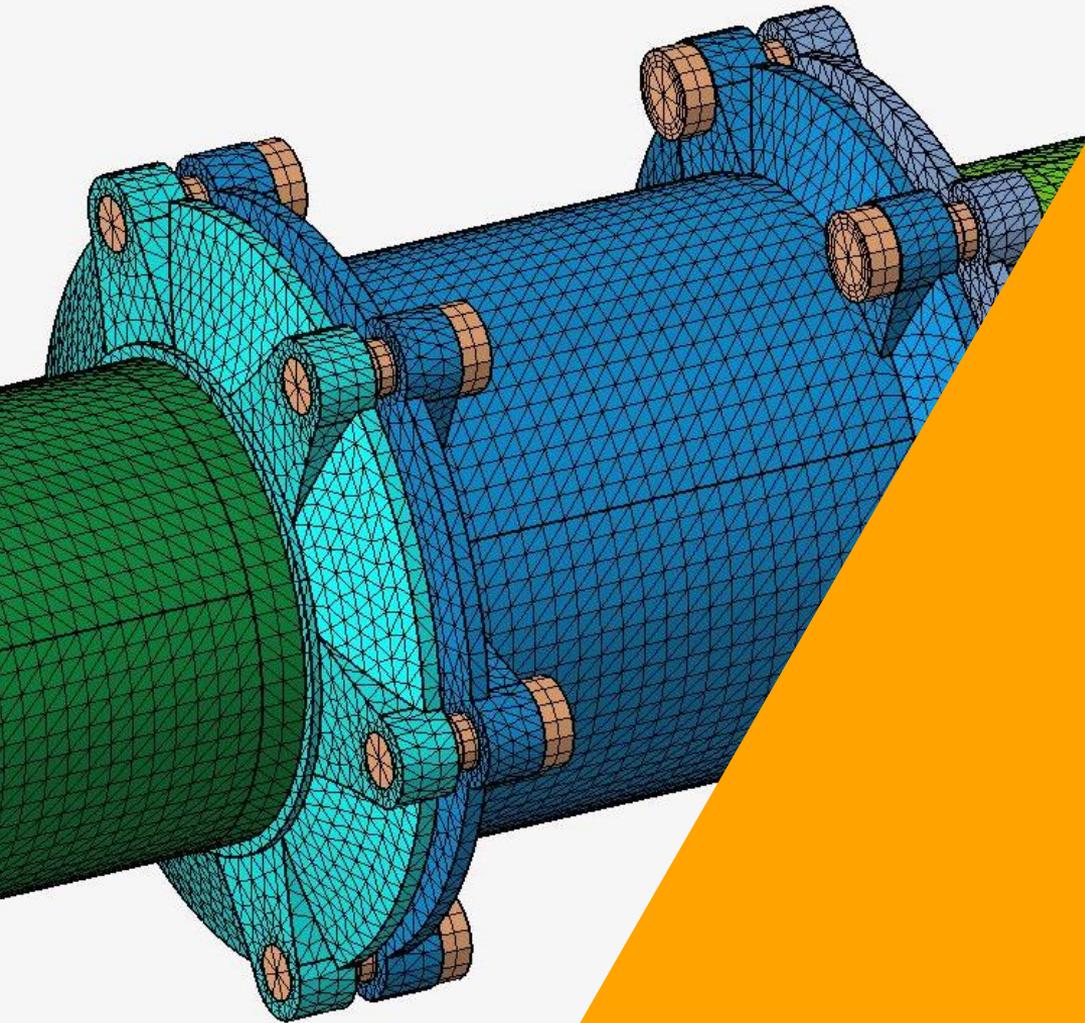
- In case of single body as input, input body name is retained for simplified body.
- Undo supported .



Simplify

Geometry > Body > More Tools





MESH

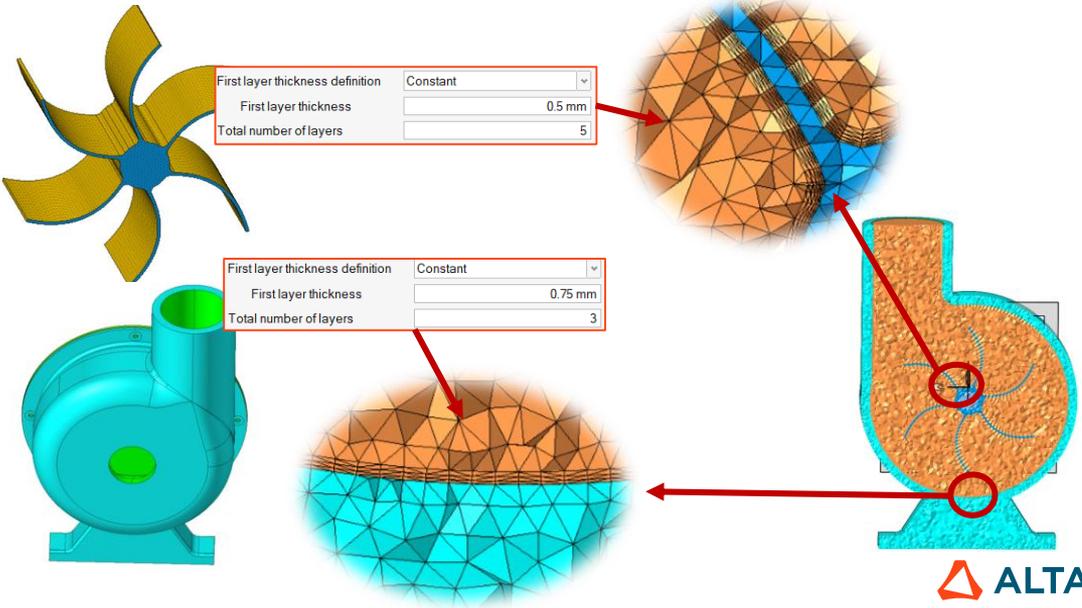
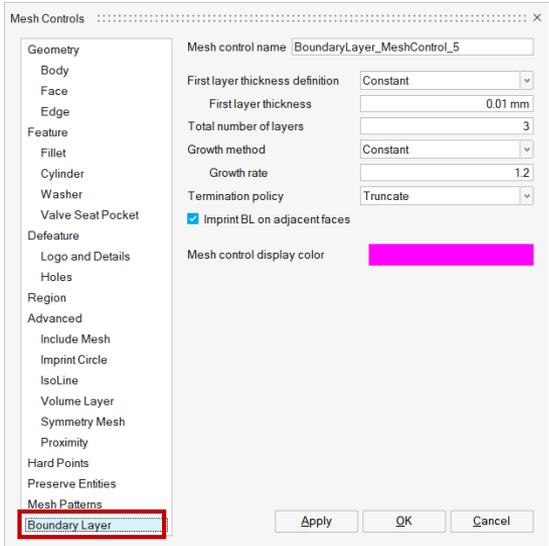
Mesh Control

Mesh > Controls

Sample model



- Added boundary layer mesh control to define various boundary layer parameters for different domains.
- These boundary layers can be created in one shot through Mesh > 3D Mesh > CFD.



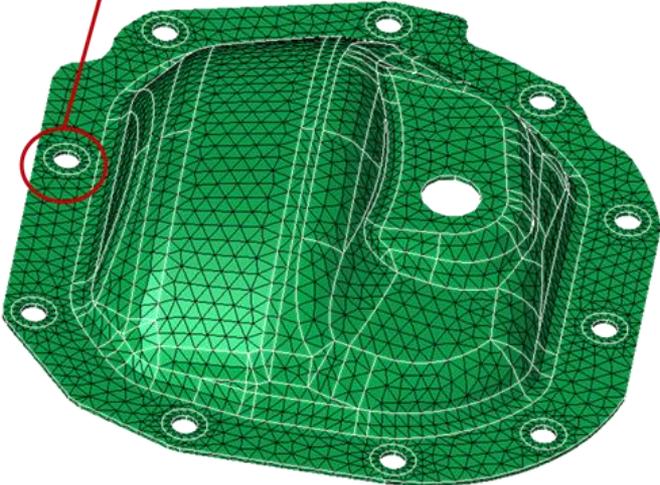
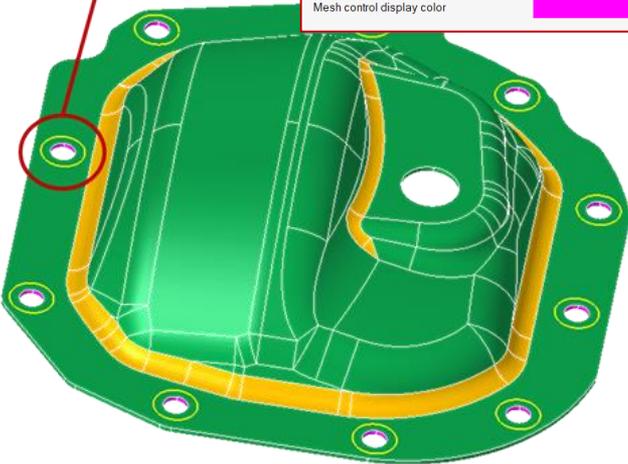
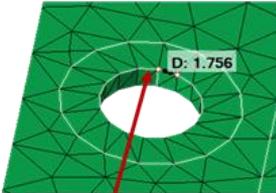
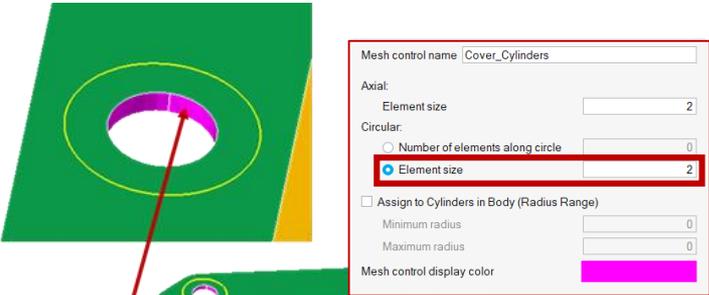
Circular Element Size

Mesh > Controls > Mesh controls

Sample model



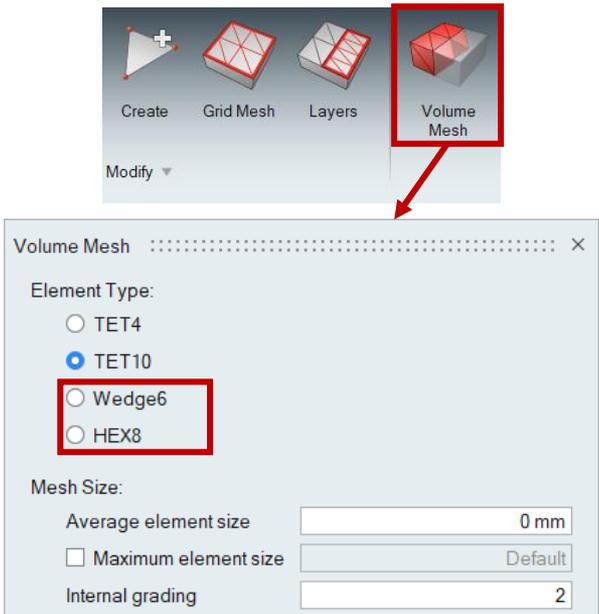
- Option added in cylinder mesh control to specify “element size” for circumference of cylinder.



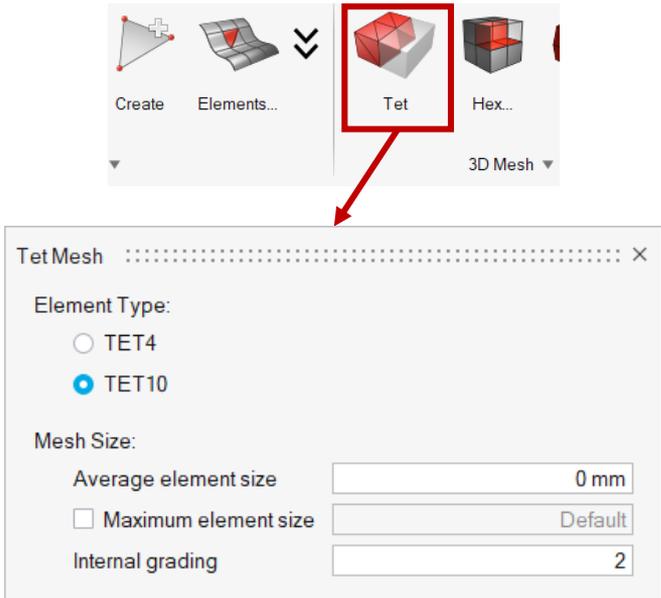
Tet Mesh

Mesh > 3D Mesh

- Renamed “Volume Mesh” to “Tet Mesh”.
- Removed Wedge6 and Hex8 options. These options are moved to ‘2.5D Hex Mesh’ tool.



SimLab 2020

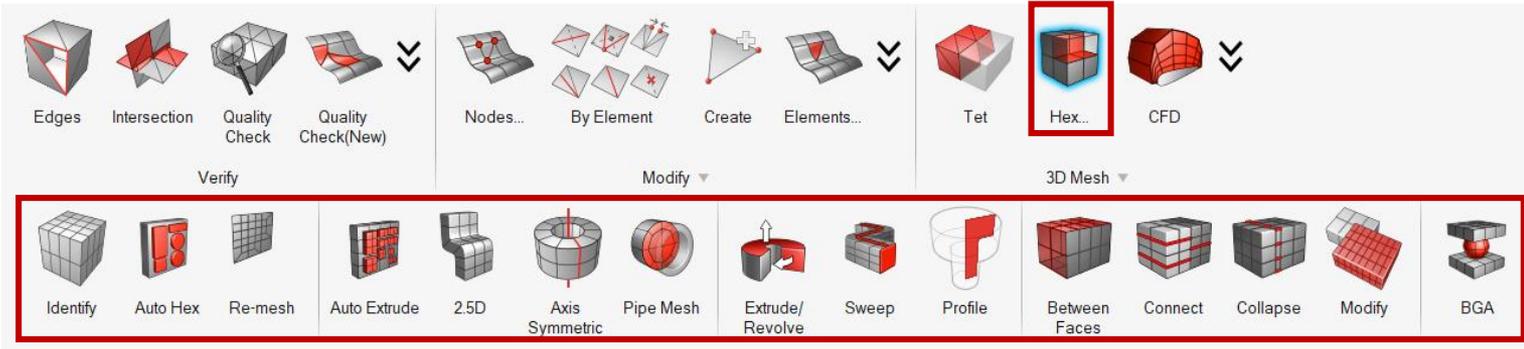


SimLab 2020.1

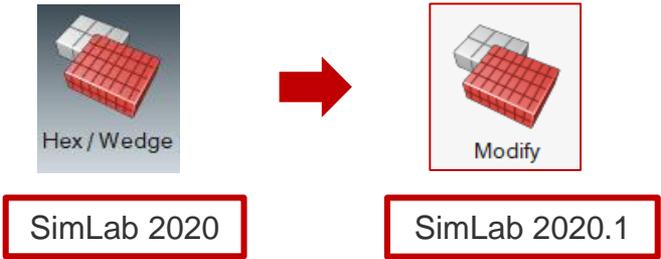
Hex Mesh

Mesh > 3D Mesh

- Hex Mesh related tools are grouped and placed under new secondary ribbon 'Hex Mesh'.



- Hex / Wedge' tool is renamed as 'Modify'



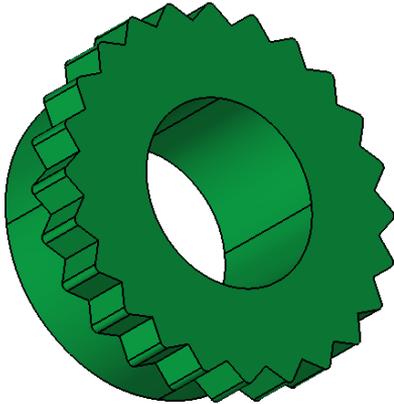
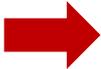
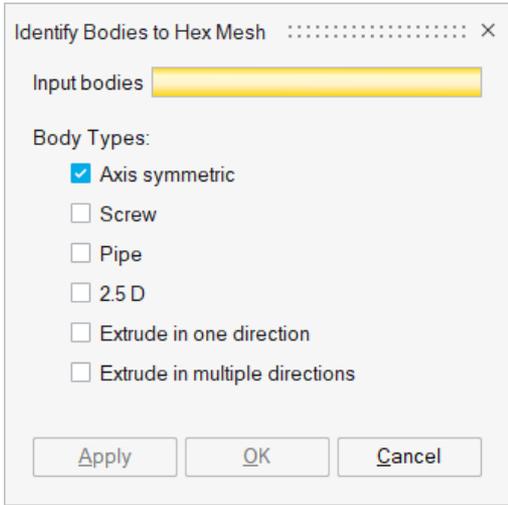
Identify Bodies to Hex Mesh

Mesh > 3D Mesh > Hex Mesh

Sample model



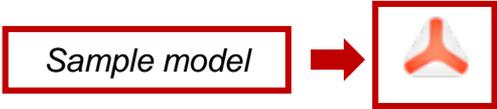
- Enhanced the tool to identify the cyclic symmetric bodies using 'Axis symmetric' option.



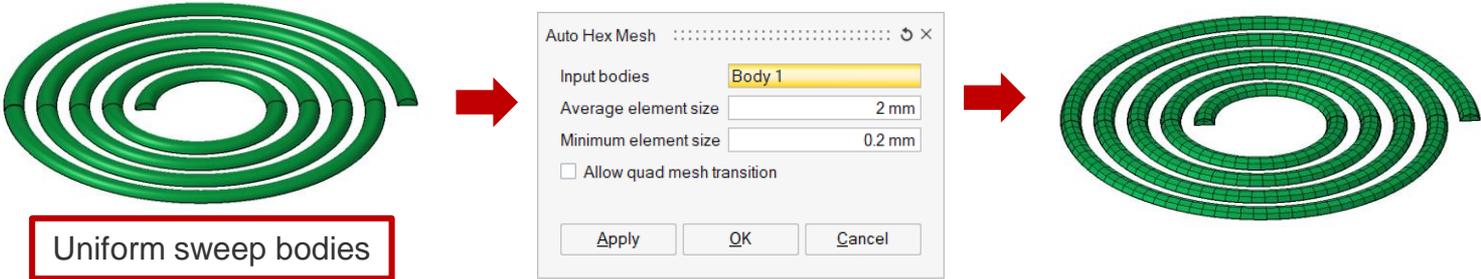
Cyclic Symmetric Body

Auto Hex Mesh

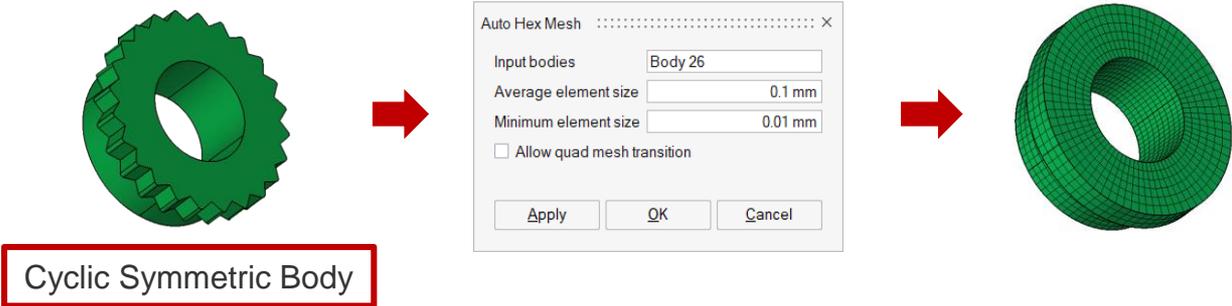
Mesh > 3D Mesh > Hex Mesh



- Support added to hex mesh the uniform sweep bodies.



- Enhanced the tool to hex mesh the cyclic symmetric bodies.



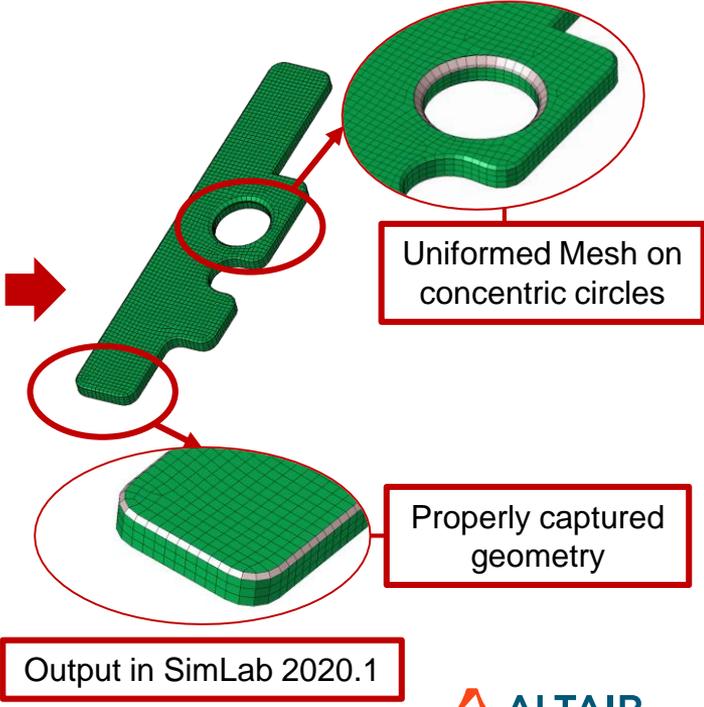
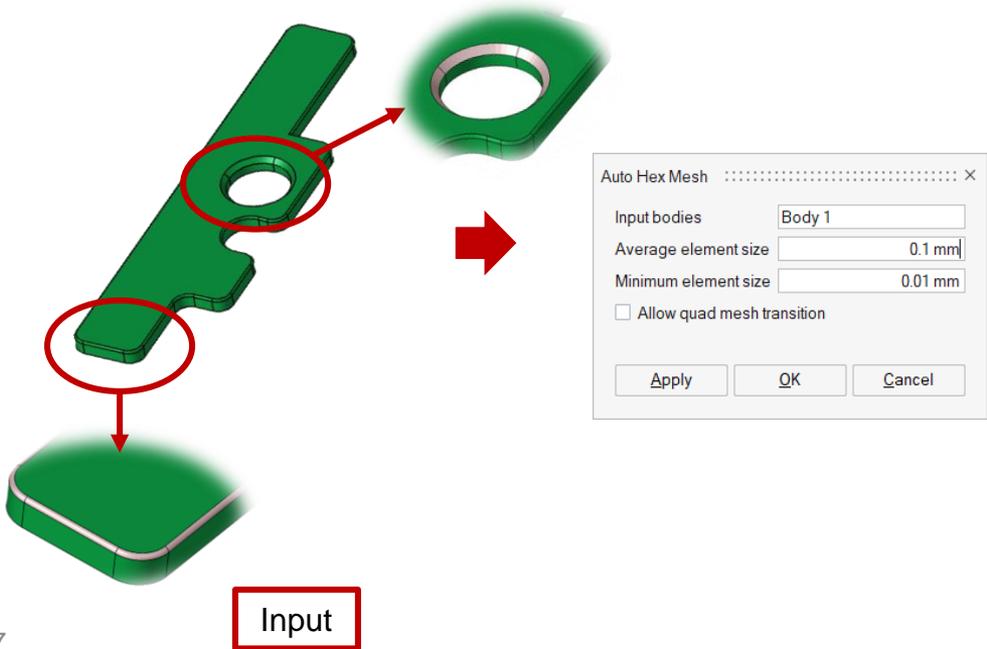
Auto Hex Mesh

Mesh > 3D Mesh > Hex Mesh

Sample model

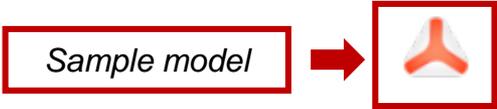


- Enhanced the tool to capture geometry properly and to have uniform mesh on concentric circles for 2.5D bodies.

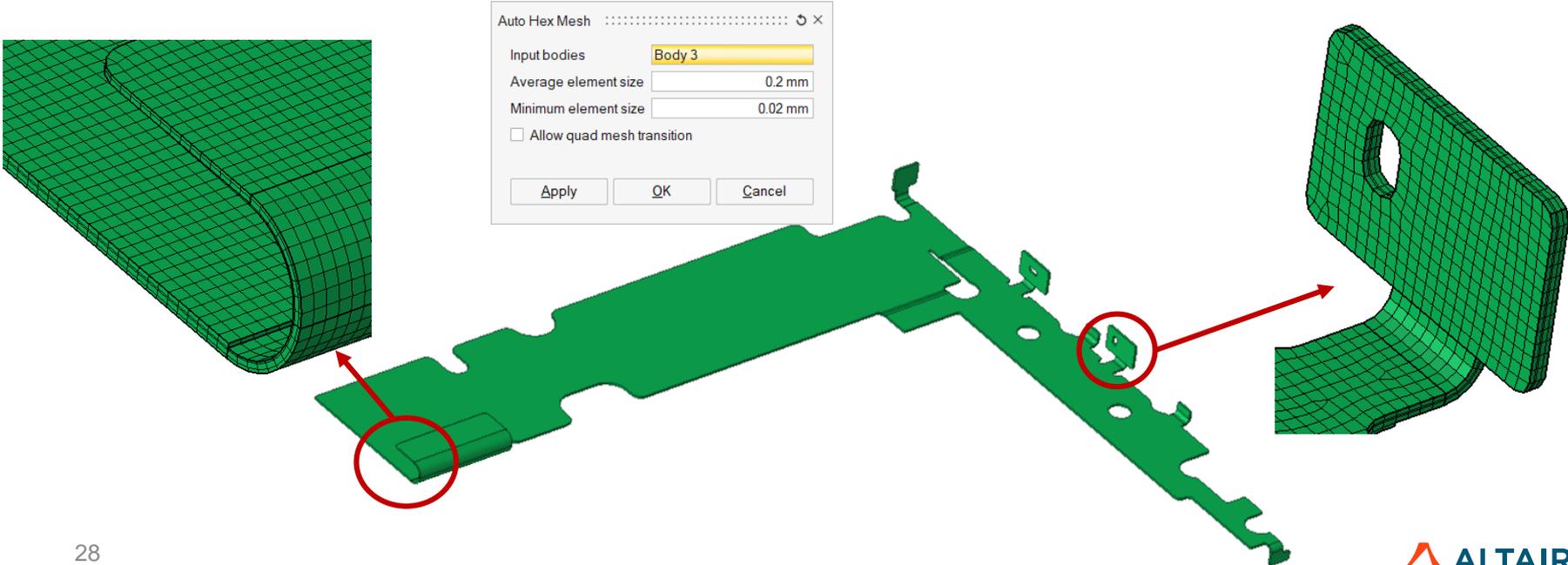


Auto Hex Mesh

Mesh > 3D Mesh > Hex Mesh

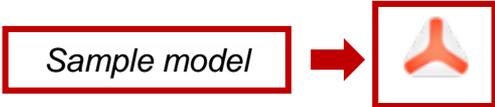


- Enhanced the tool to mesh the bodies extruded along with multiple directions.

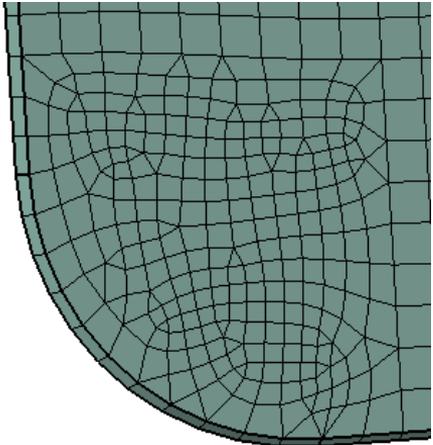
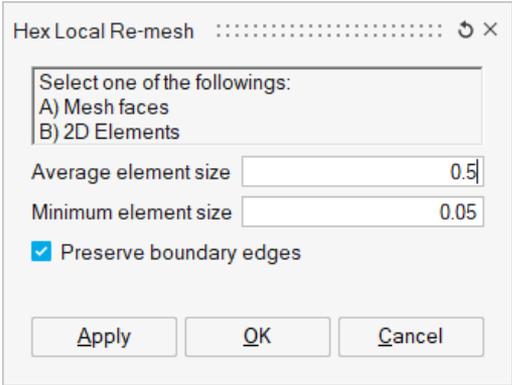
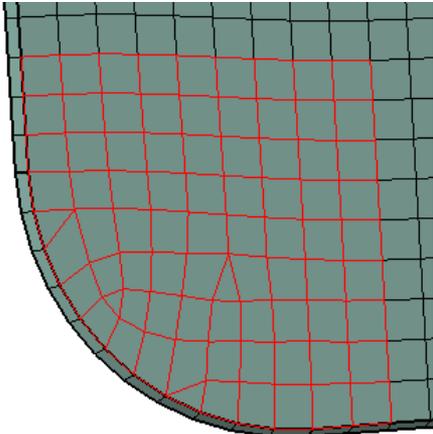


Re-mesh

Mesh > 3D Mesh > Hex Mesh



- Added a tool to support re-meshing on a hex meshed body.



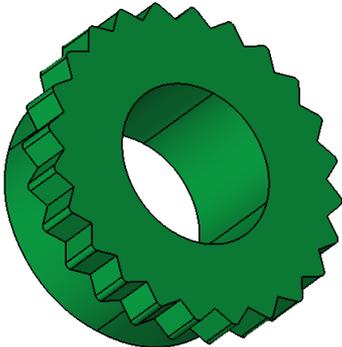
Axis Symmetric

Mesh > 3D Mesh > Hex Mesh

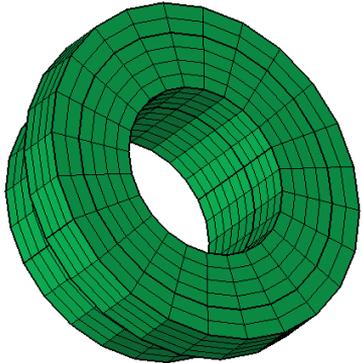
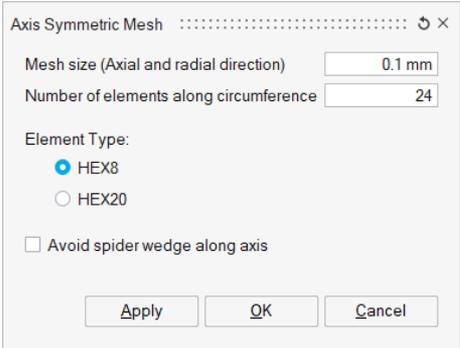
Sample model



- Enhanced the tool to hex mesh the cyclic symmetric bodies.

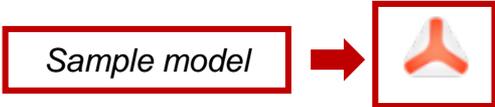


Cyclic Symmetric Body

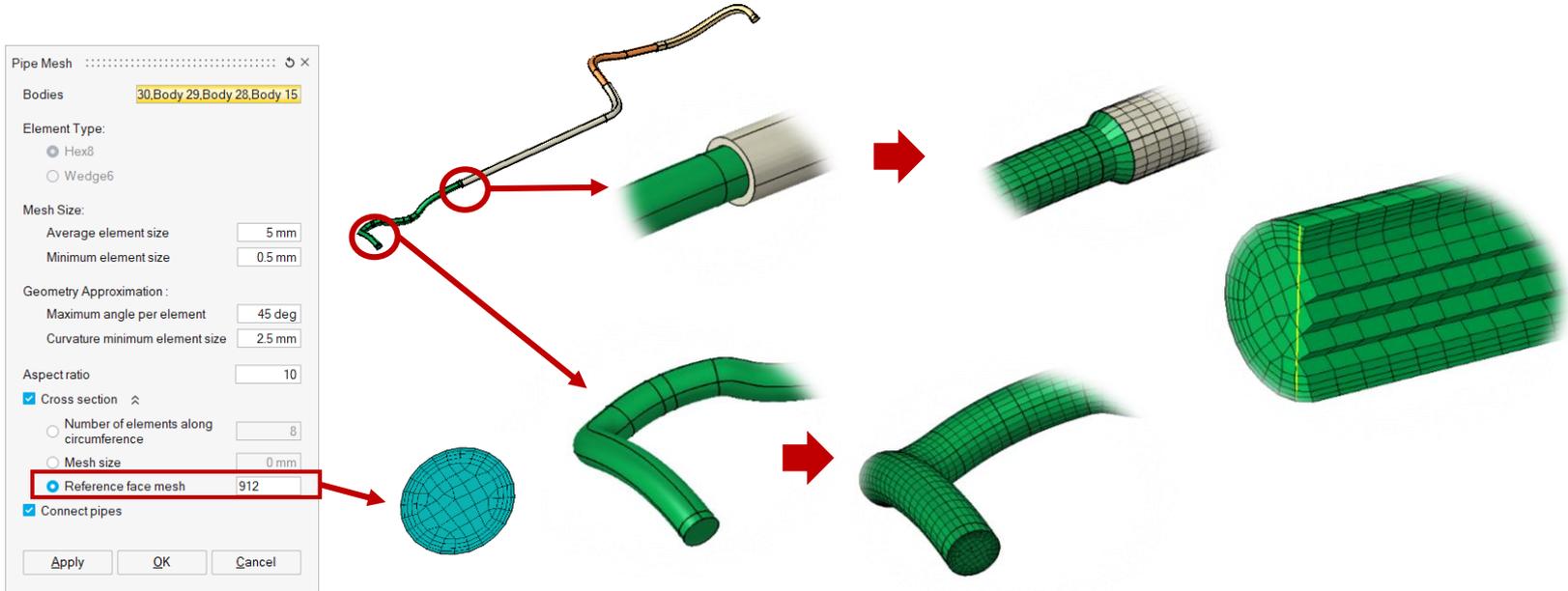


Pipe Mesh

Mesh > 3D Mesh > Hex Mesh

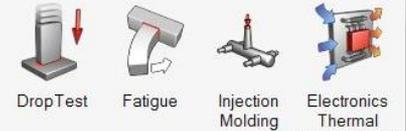


- Added a new tool to Hex mesh the various cross-sectional pipes bodies with reference cross sectional mesh.





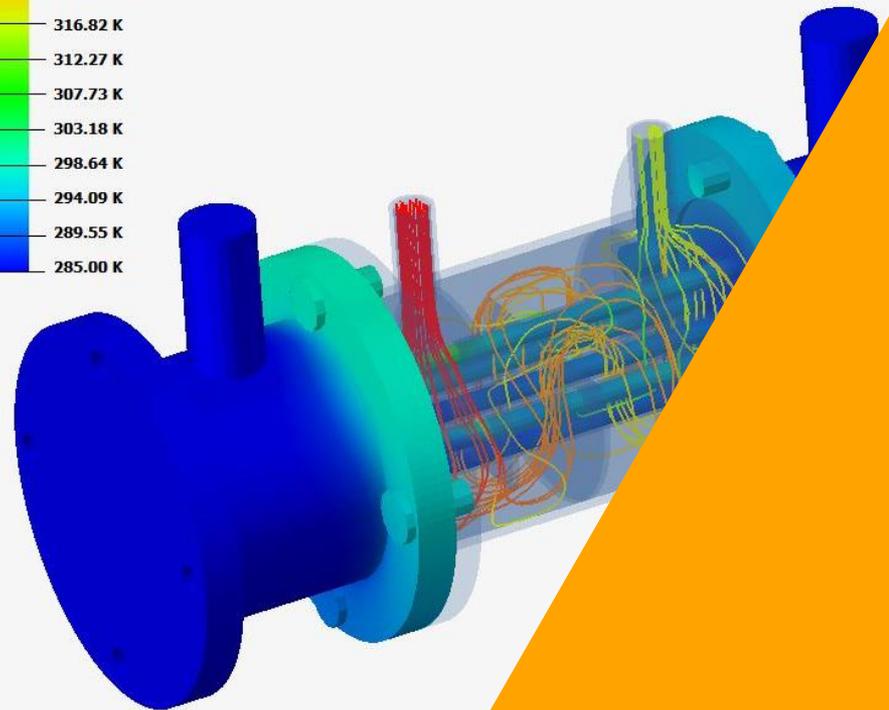
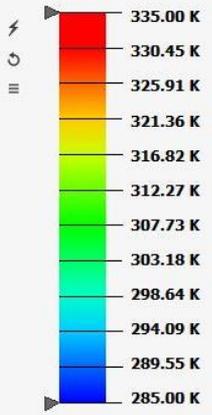
Physics



Application



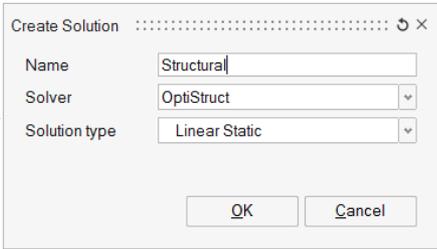
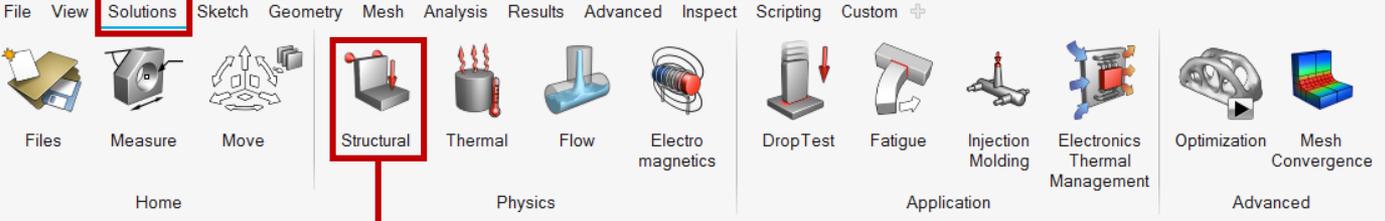
Advanced



SOLUTIONS

Solutions Ribbon

- Moved the Solutions ribbon to the front of all the ribbons
- Added support to dynamically update the ribbons when a solution is defined



Dynamic update of tools in analysis ribbon

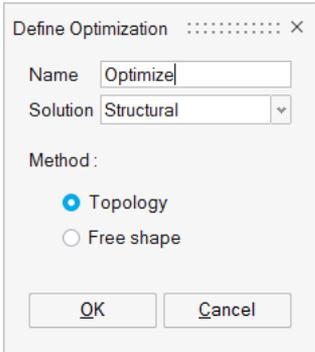
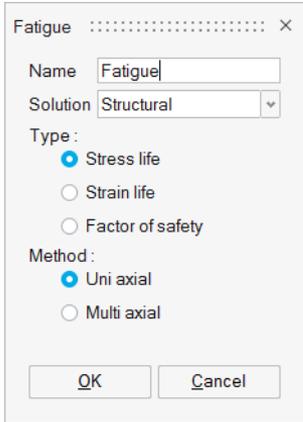
Create Solution

Fatigue and Optimization Solutions

Solutions Ribbon

- Added an option to create Fatigue and Optimization solution in solution ribbon.

Note: These solutions can be created only when the database contains at least one Optistruct solution.

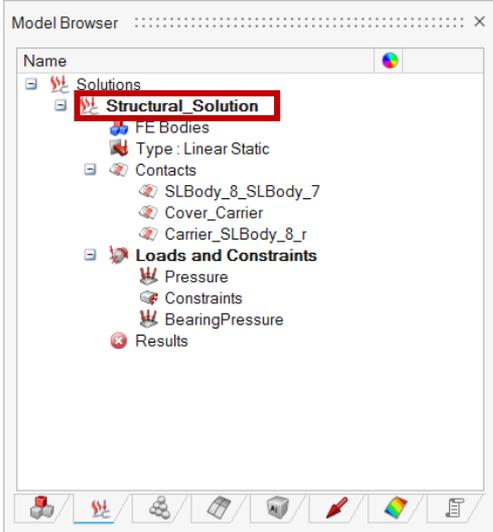


Solution Folder Name

Solutions Browser > Update

- Simplified the solution folder name by removing solving date and time. Now, solution name will be the name of the solution folder.

This change will help the user to predict the solution folder name in automation.



Name	Date modified	Type
Structural_Solution_2020-04-24-14-03-53	24-04-2020 02:03 ...	File folder
Structural_Solution_2020-04-24-14-04-04	24-04-2020 02:04 ...	File folder
Structural_Solution_2020-04-24-14-04-09	24-04-2020 02:04 ...	File folder

SimLab 2020

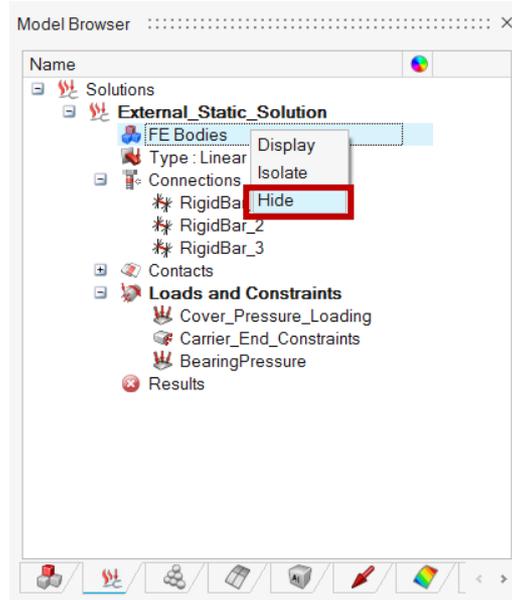
Name	Date modified	Type
Structural_Solution	24-04-2020 02:03 ...	File folder
Structural_Solution(1)	24-04-2020 02:03 ...	File folder
Structural_Solution(2)	24-04-2020 02:03 ...	File folder

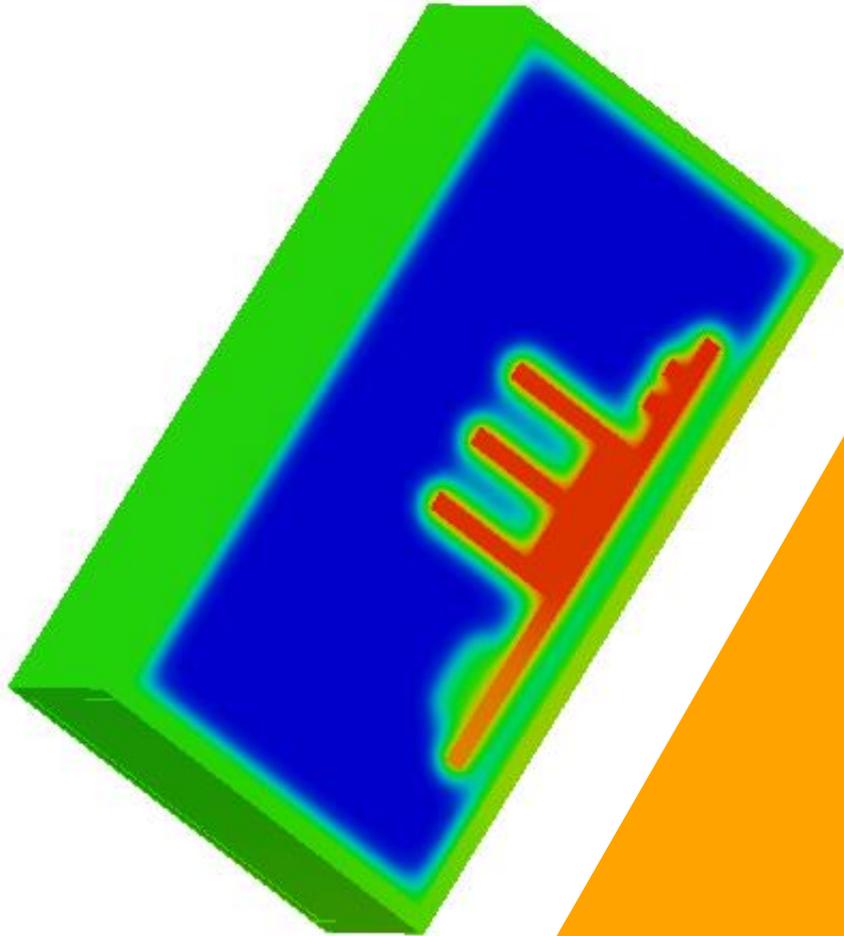
SimLab 2020.1

Hide Solution Bodies

Solutions Browser > FE Bodies > Right Click

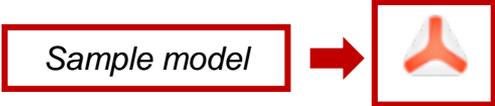
- Added an option to hide the bodies associated with solution.



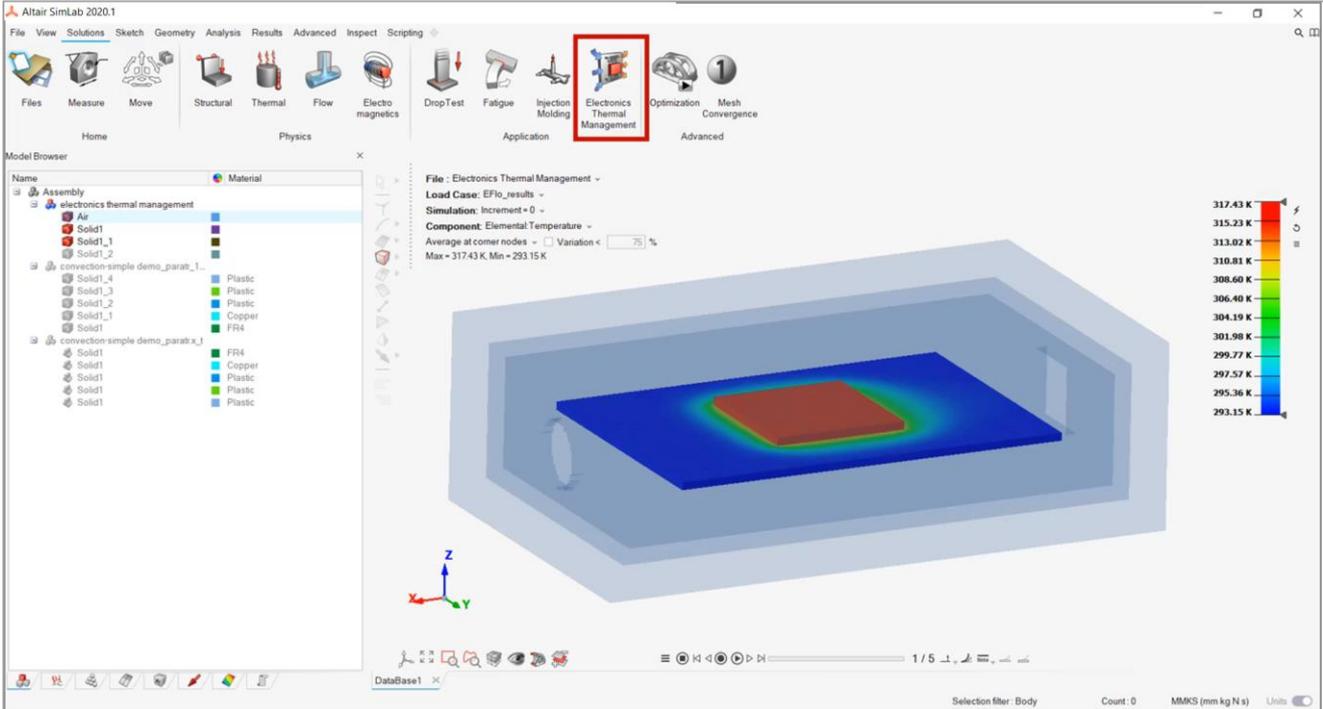


ELECTROFLO SOLUTION

ElectroFlo Solution



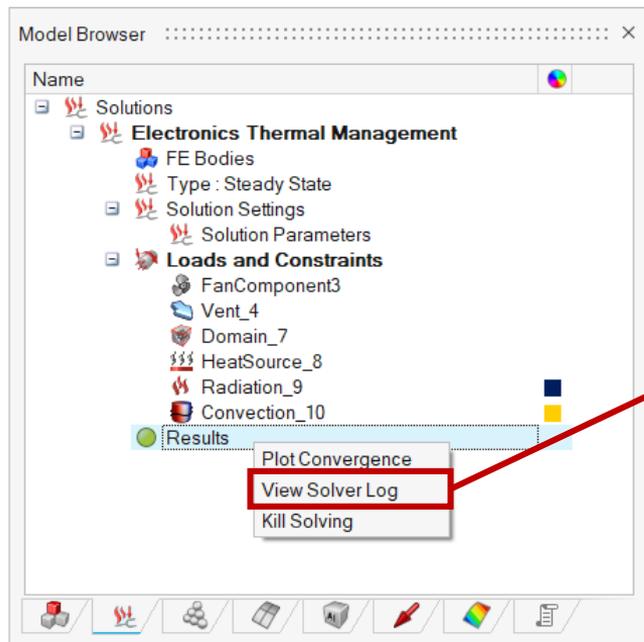
- Added Electronic Thermal Management solution.



Background Solve and Solver Log

Results > Right Click

- Support added for background solve and viewing the solver log file while solving.



```
Log file: Electronics Thermal Management
```

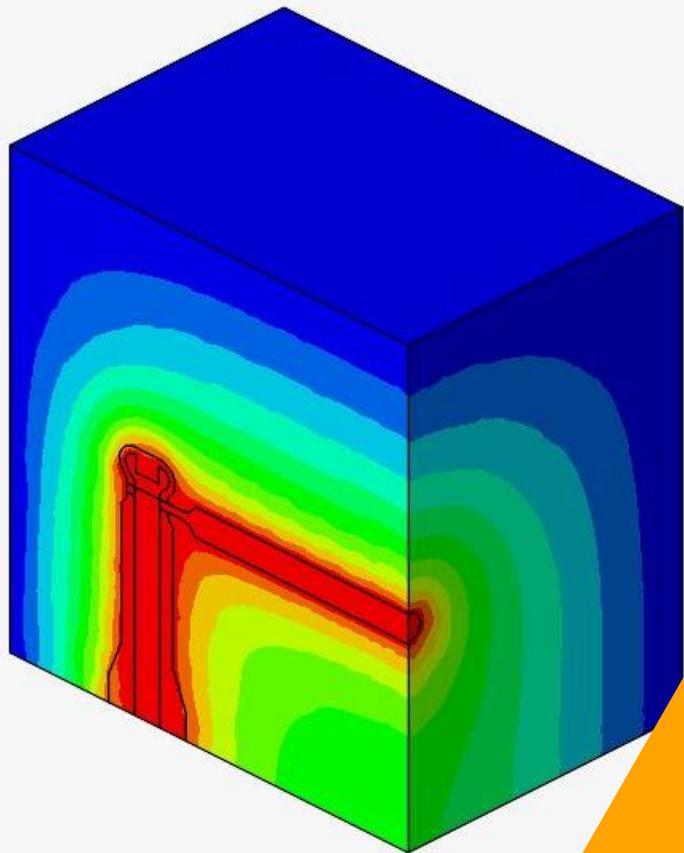
```
EFlo solver version: 2020.1.0  
EFlo solver revision: 72927  
chnlap37 License request successful
```

```
=====
```

```
ITERATION:      1
```

```
=====
```

Energy		Iter:	89		293.14996	<T <	295.80179		time=	0.8
Energy		Iter:	19		293.14990	<T <	295.58932		time=	1.0
Pressure		Iter:	299		-0.189E+00	<P <	0.758E+00		time=	12.6
Momentum-x		Iter:	76		-0.183E+01	<Ux<	0.946E-02		time=	28.8
Momentum-y		Iter:	76		-0.768E+00	<Uy<	0.740E+00		time=	23.2
Momentum-z		Iter:	76		-0.102E+01	<Uz<	0.869E+00		time=	22.4



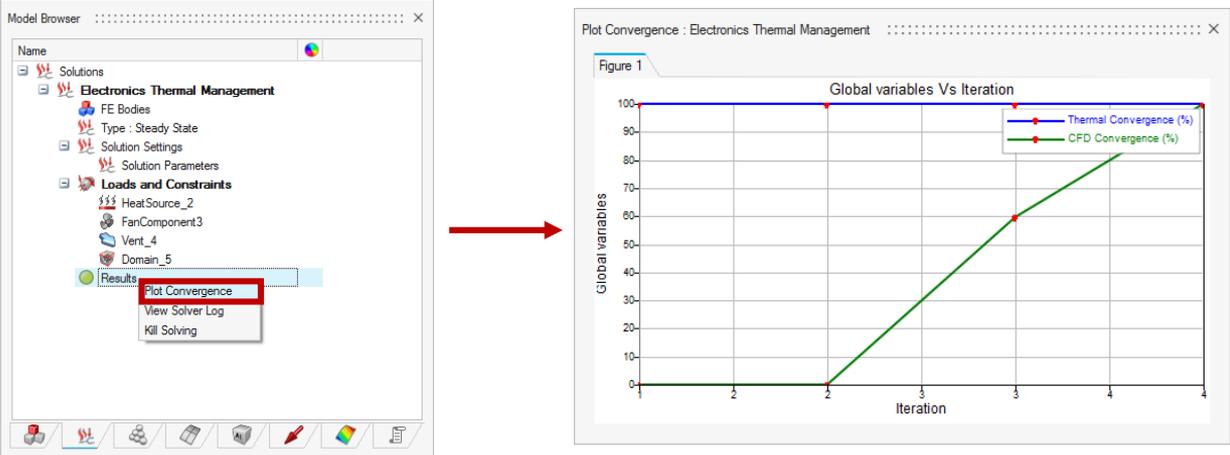
RESULTS

Plot Convergence

Solution > Results > Plot Convergence

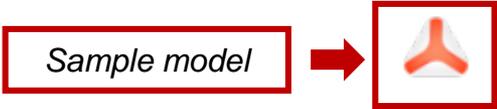
- Added support to check the progress of solving. This option is supported for the following solvers
 - ElectroFlo
 - Radioss
 - AcuSolve
 - OptiStruct (Only for Non-Linear static solutions)

Note: For AcuSolve solutions Convergence can be plotted after the solution is solved.

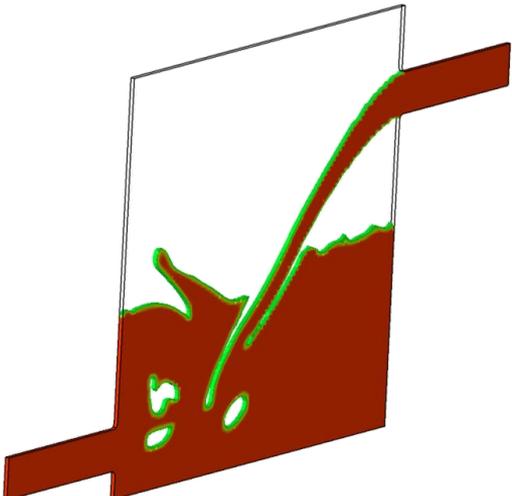
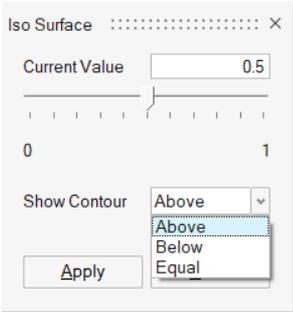
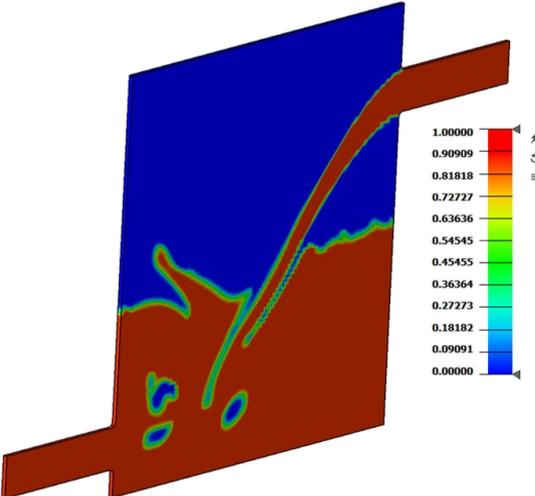


Iso Surface

Results > Tools



- Added support for Iso Surface post processing.



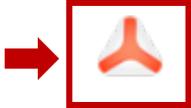


WELD

Create Plug Weld

Advanced > Weld

Sample model



- Added a new tool to create plug weld.

Create Plug Weld [Close]

Top circle edges: 6374,6413,6415,6418

Bottom faces: 6010,6014

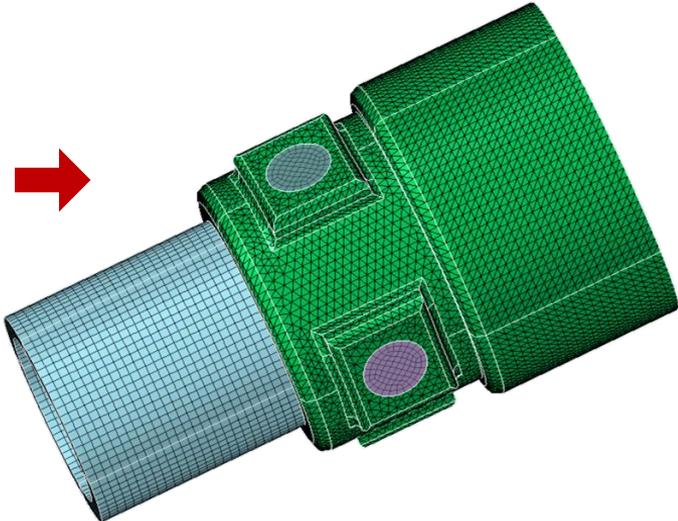
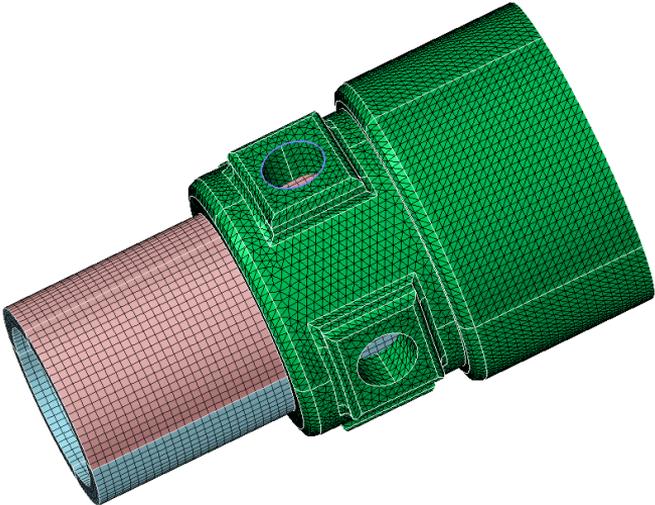
Axial number of layers: 4

Create Boundary Offset at Bottom Edges:

Offset distance: 2.0

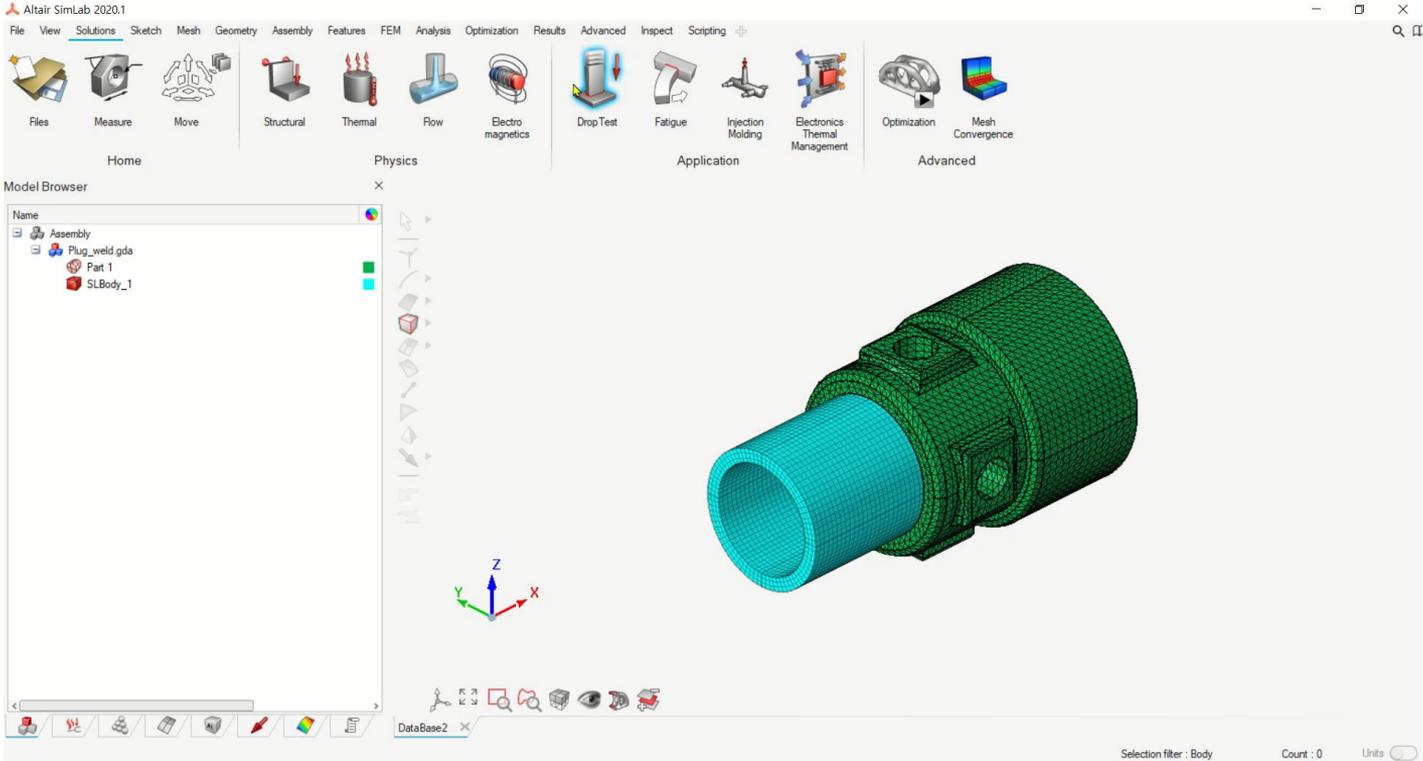
Element count: 1

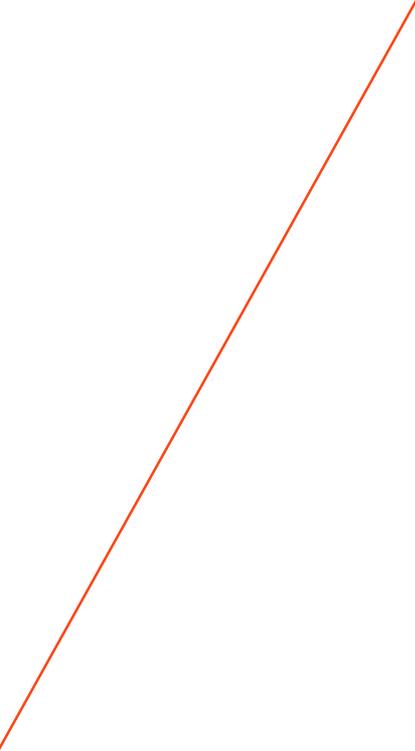
Apply OK Cancel



Create Plug Weld

Advanced > Weld





THANK YOU

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#ONLYFORWARD