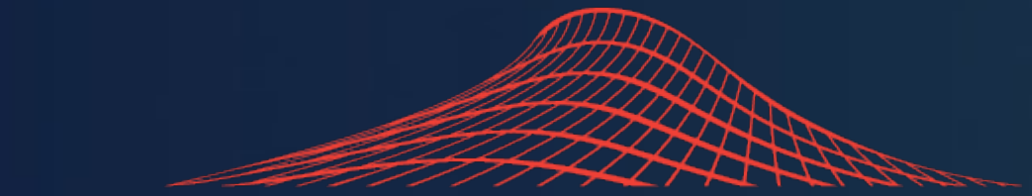

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Since 2008 Applied CAx has guided companies to realize their investment in digital engineering tools.

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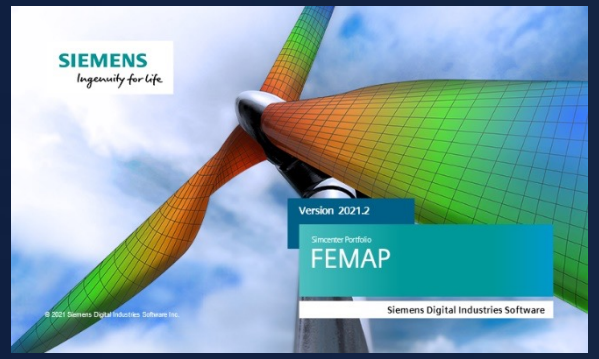
Our Next Femap Training Opportunity
June 6th – June 16th, 2022
Live, Online
AppliedCAx.com/Training

CAE Support Review:

As far as tech support is concerned, I have had fast and top-quality responses. The awesome thing is, I get a lot of information during the support communication, but I also receive the full concept and learn a lot. Even if the issue is very simple, I get a quick response. If someone asks me about buying Siemens products, I will surely recommend Applied CAx.

Srivatsa Pradeep, MSME
Project Consultant (Structures & FEA)
Hatch LTK Engineering Services

HATCH LTK
Positive Change for the Next Century



Simcenter Femap Practices: What's New and What's Good in Femap v2022.1

A Seminar for Simulation Engineers

Adrian Jensen, PE, MBA – Senior Application Engineer, CAE

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Seminar Outline

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User Interface

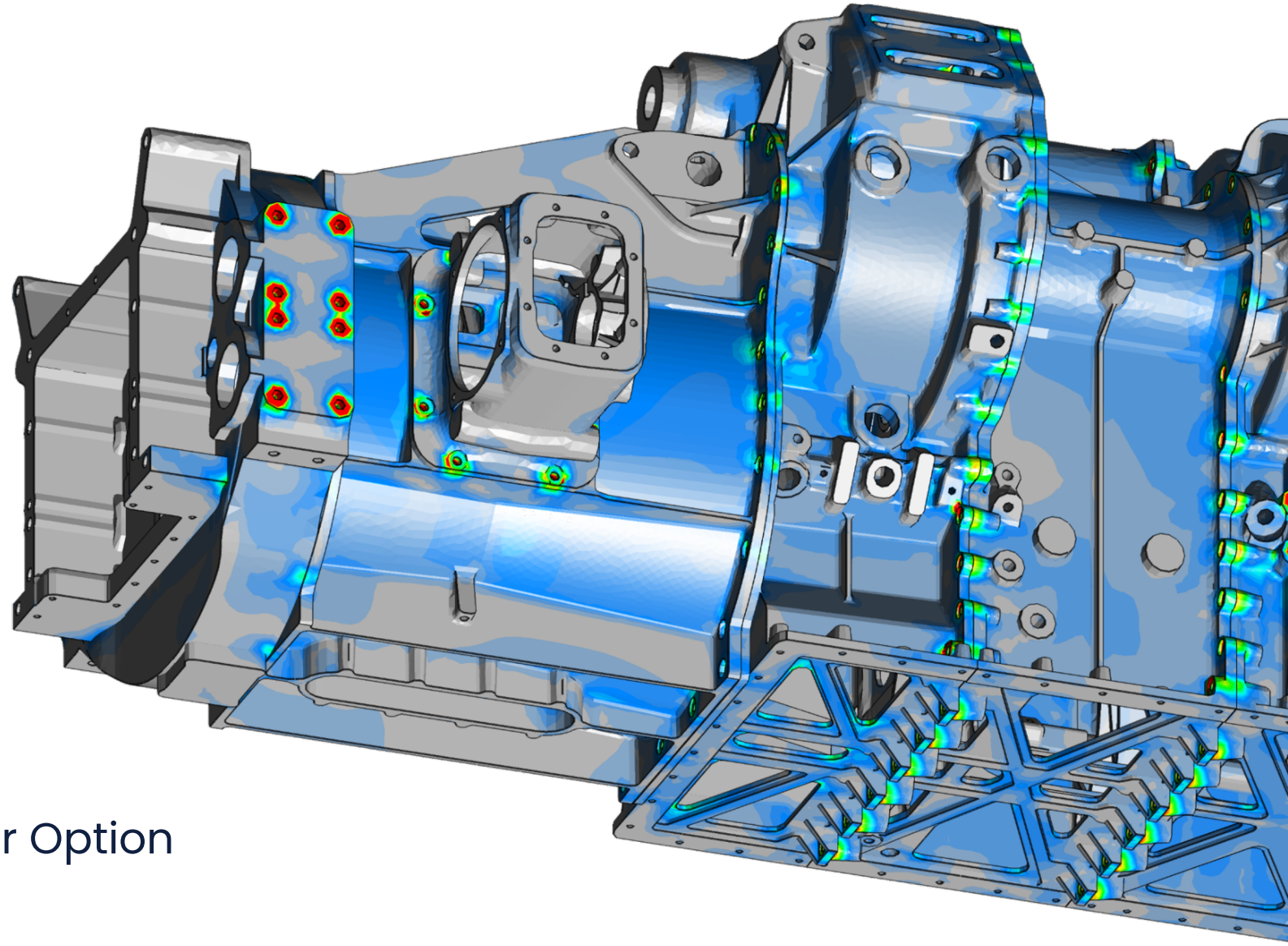
- Help Files
- Entity Display

Pre-Processing

- Mesh Control Explorer
- Hex – Automatic?!
- Tet – Body Mesher
- Plate – STAR Refinement
- Mesh Interference Check

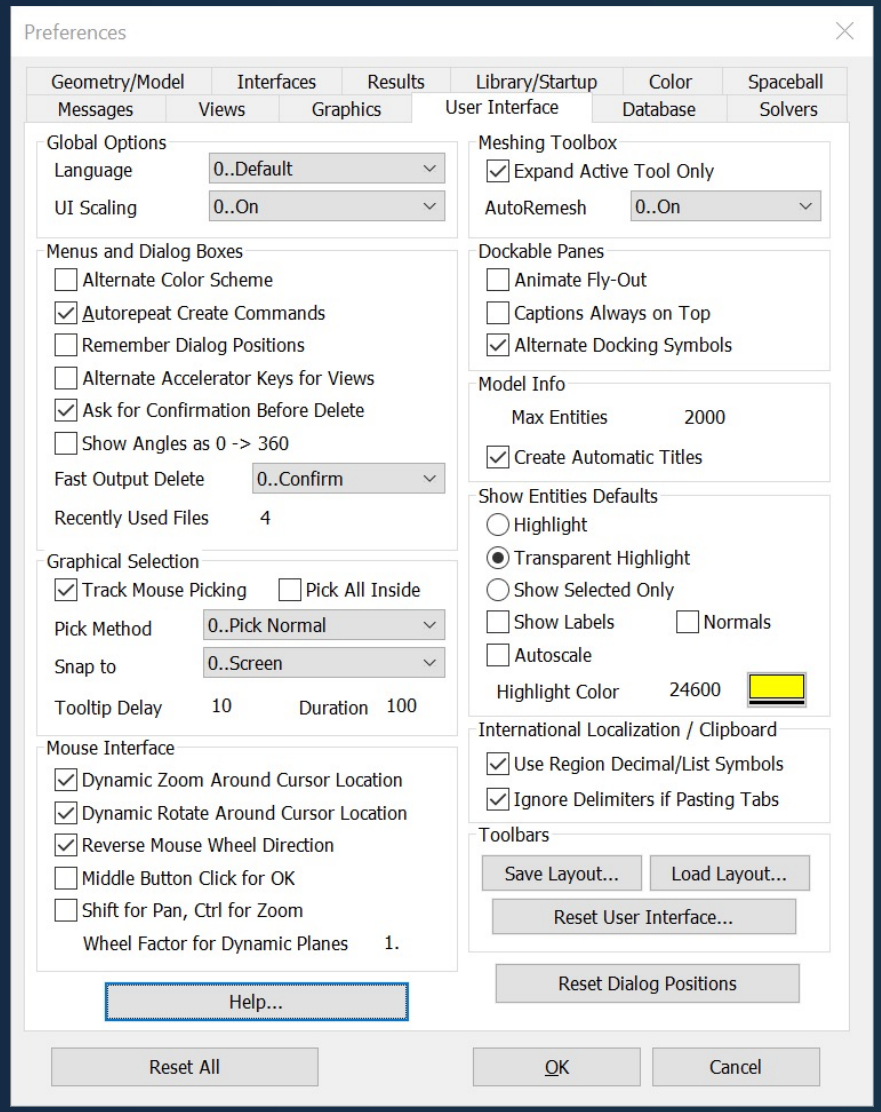
Post-Processing

- JT File
- Solid Element Stress Contour Option



Femap Help Files

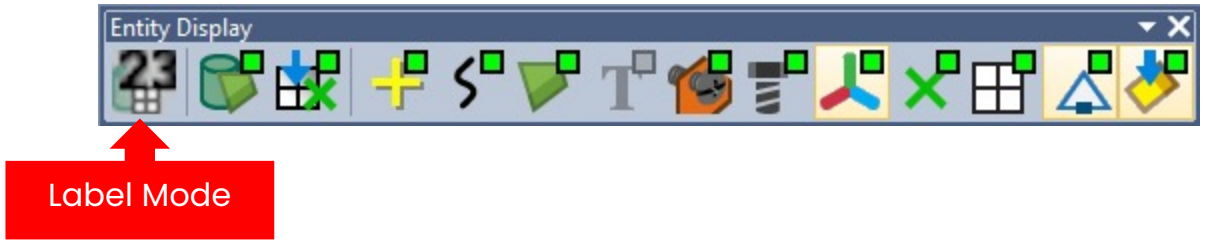
- A big change to Femap's user experience is a new Help System providing the ability to select Online Help or Local Help.
  - A new **Help...** button is added to the **File → Preferences** command on the **User Interface** tab of the Preferences dialog box.



Standard Entity Display Toolbar

- First Icon now indicates if toolbar controls Overall Display of Entity Types:

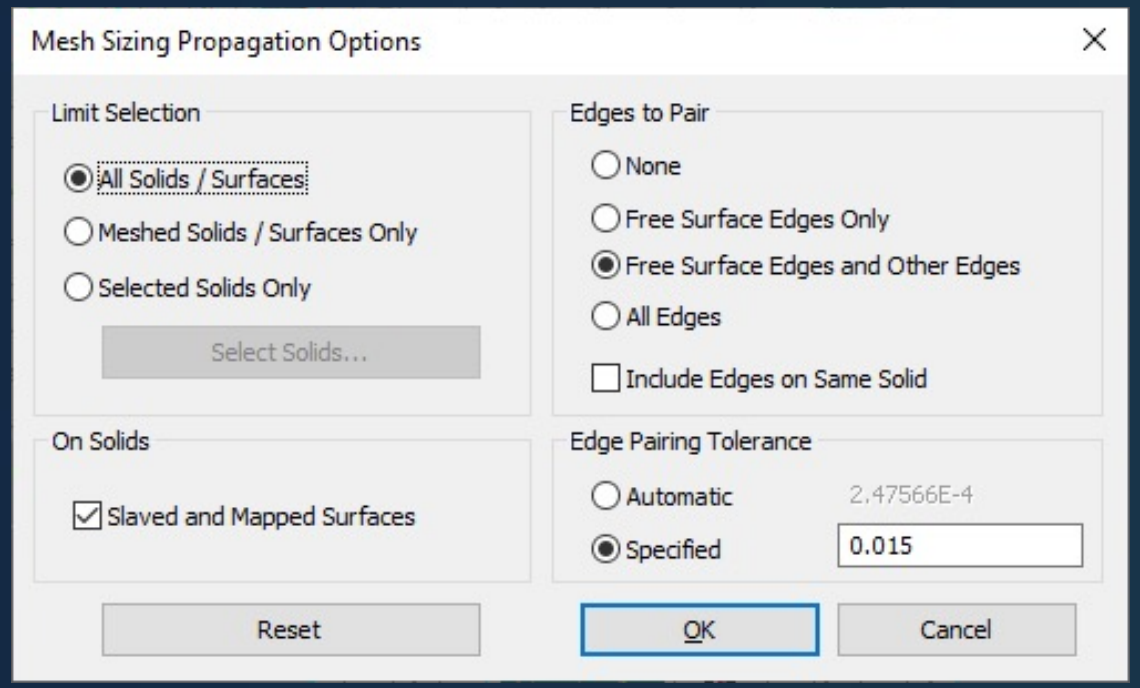
- …or if toolbar controls Overall Display of Labels for Entity Types:



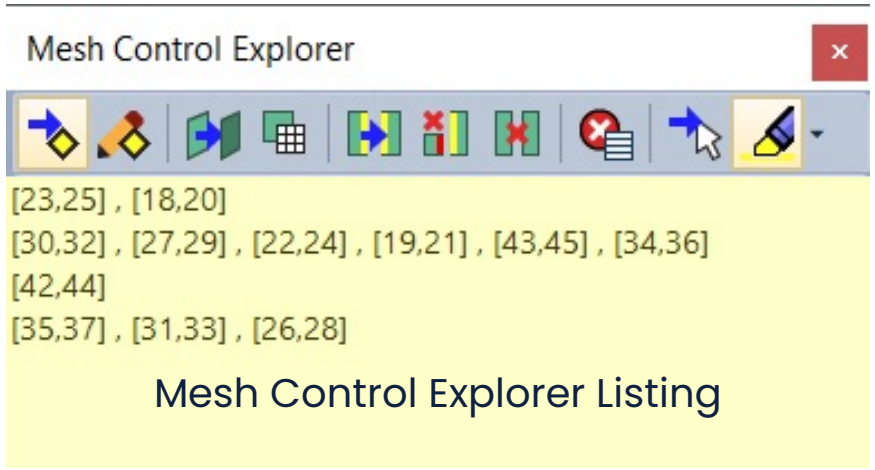
- For more control, use the "*Visibility*" dialogue box
  - Ctrl-Q is the shortcut

Mesh Control Explorer

- Select the surfaces and solids which should be considered for Mesh Propagation
- Control which type of edges should be considered for pairing
- Specify a Tolerance to use for edge pairing
  - Automatic – using the value calculated for Merge Tolerance
  - Specified – entered by the user



Mesh Control Explorer

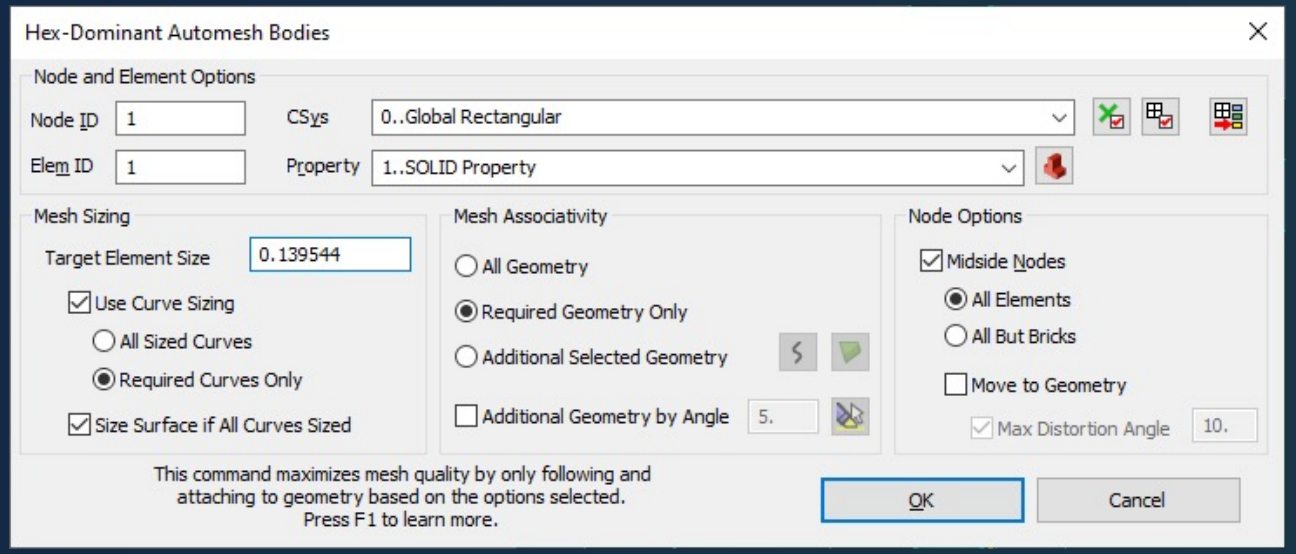


Mesh Control Explorer Listing

- Turn Mesh Control Explorer On/Off
- Mesh Control Explorer Options
- Show Slaved Surfaces
- Show Surfaces with Mapped Approaches
- Show Edge Paired by Mapping and Proximity
- Show Un-Paired Free Edges that are Adjacent to Other Edges
- Show Un-Paired Free Edges that are Not Adjacent to Other Edges
- Control Mesh Control Explorer List
- Select Entity To Locate in the List
- Show When Selected Options

Automatic Hex-Dominant Meshing

- Constrained nodal locations make it difficult to get an acceptable hex-dominant mesh
- Options are therefore very similar to the Body Mesher, introduced in v2021.2, a “Target Element Size” is specified, not an exact size
- Higher mesh control and associativity at required locations only
- Node Options to control Element Order and projection to geometry.



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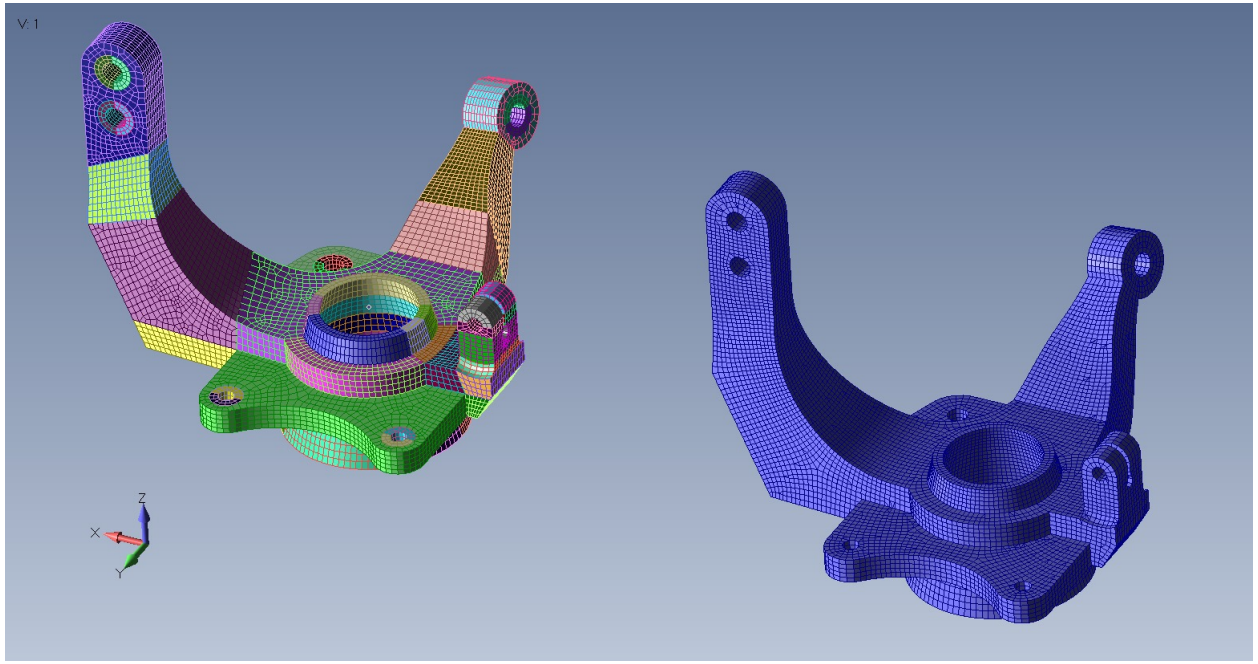
Automatic Hex Dominant Meshing



- New Mesh, HexMesh Bodies command
- Leverages Meshing Technology developed by FloEFD, (another product offered by Siemens Digital Industries Software)
  - Large majority of elements created by this mesher are hexahedral (brick) elements
  - Fills the rest of the volume for each part with a combination of wedge, pyramid, and tetrahedral elements

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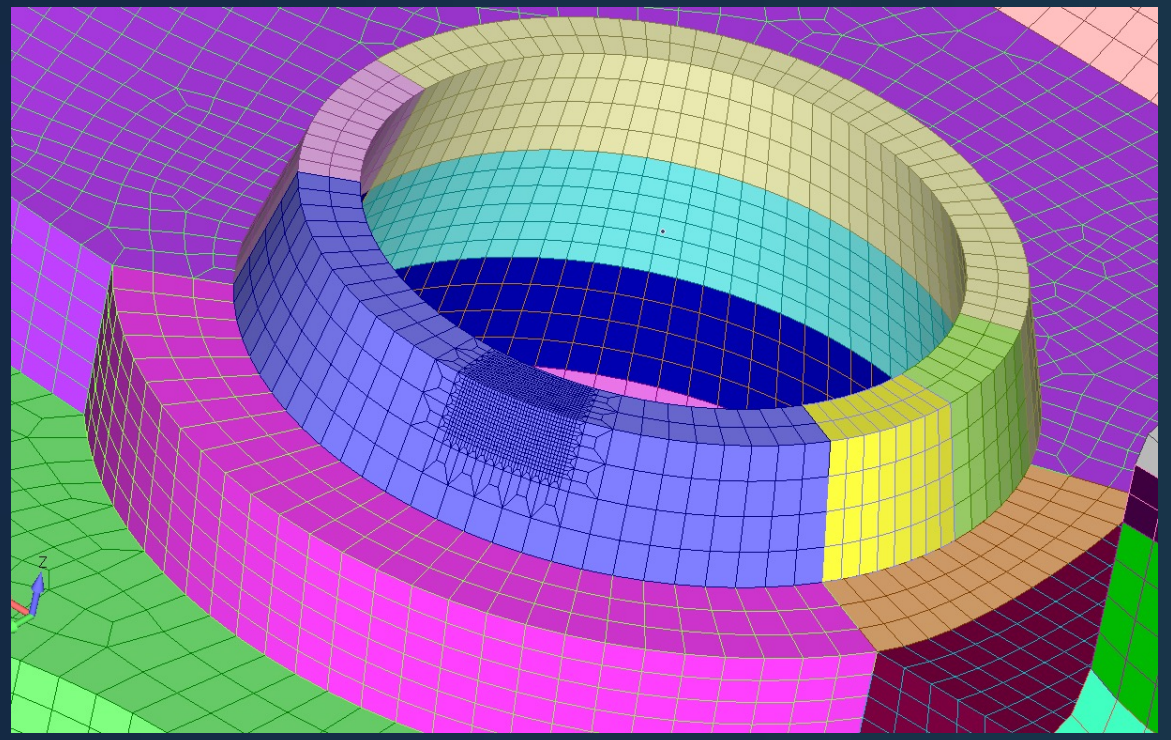
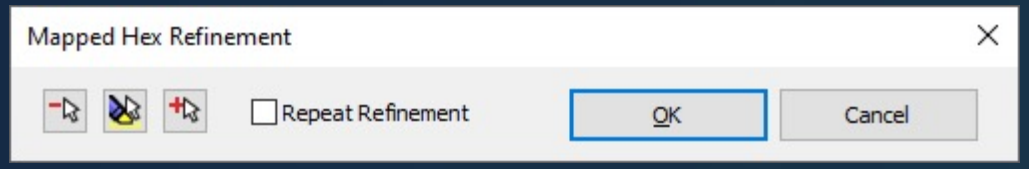
Working with Existing Hex Mesh

- New ***Mesh, Editing, Mapped Hex Refine*** command
- Works in a similar manner as ***Mesh, Editing, Element Refine*** command, where the elements to split are first highlighted, then highlighted elements are split when user clicks OK
- Repeat Refinement Option to Automatically continue refinement also available





Pre-Processing

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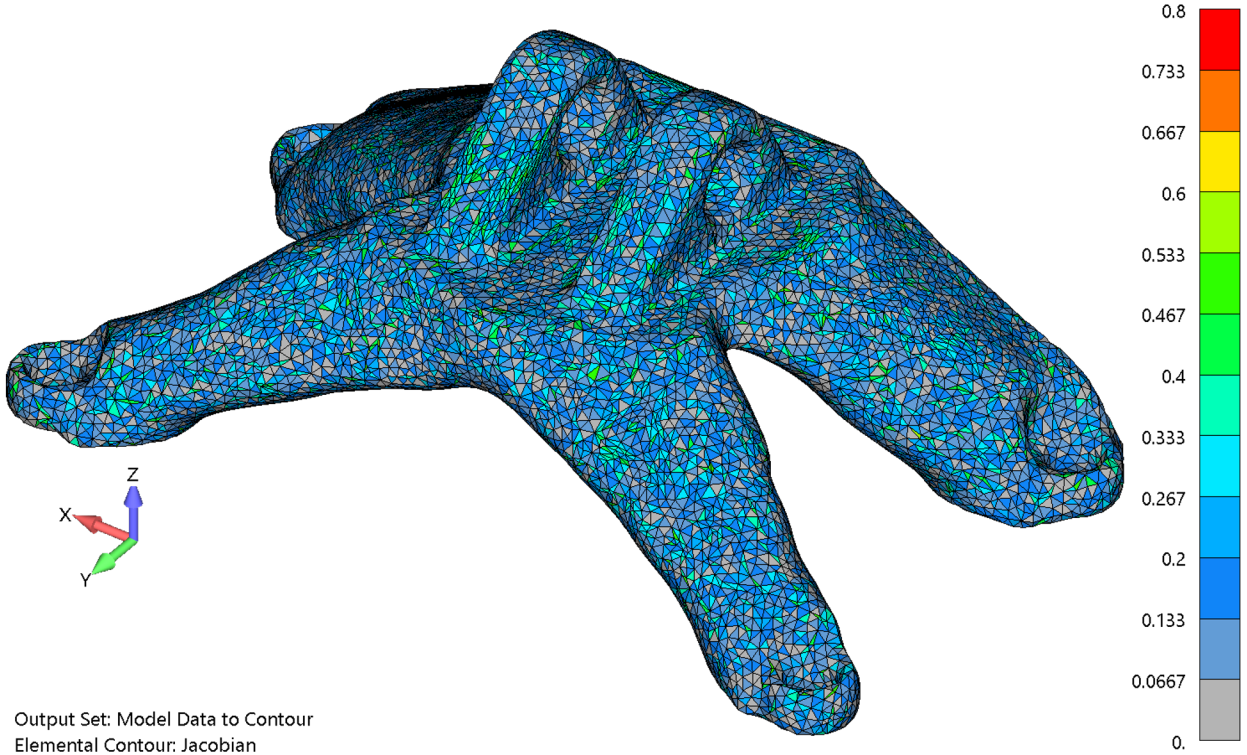
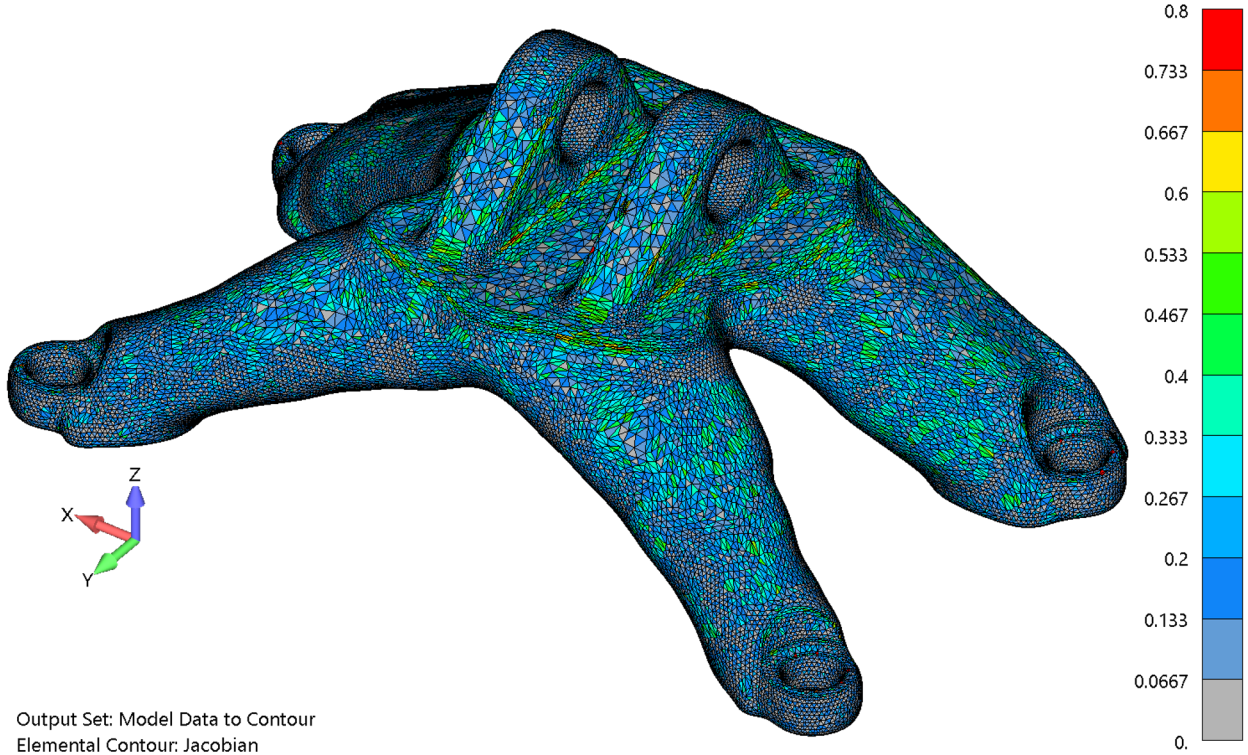
Body Mesher

- 70 seconds, 257k nodes



Geometry Preparation

- 285 seconds, 611k nodes



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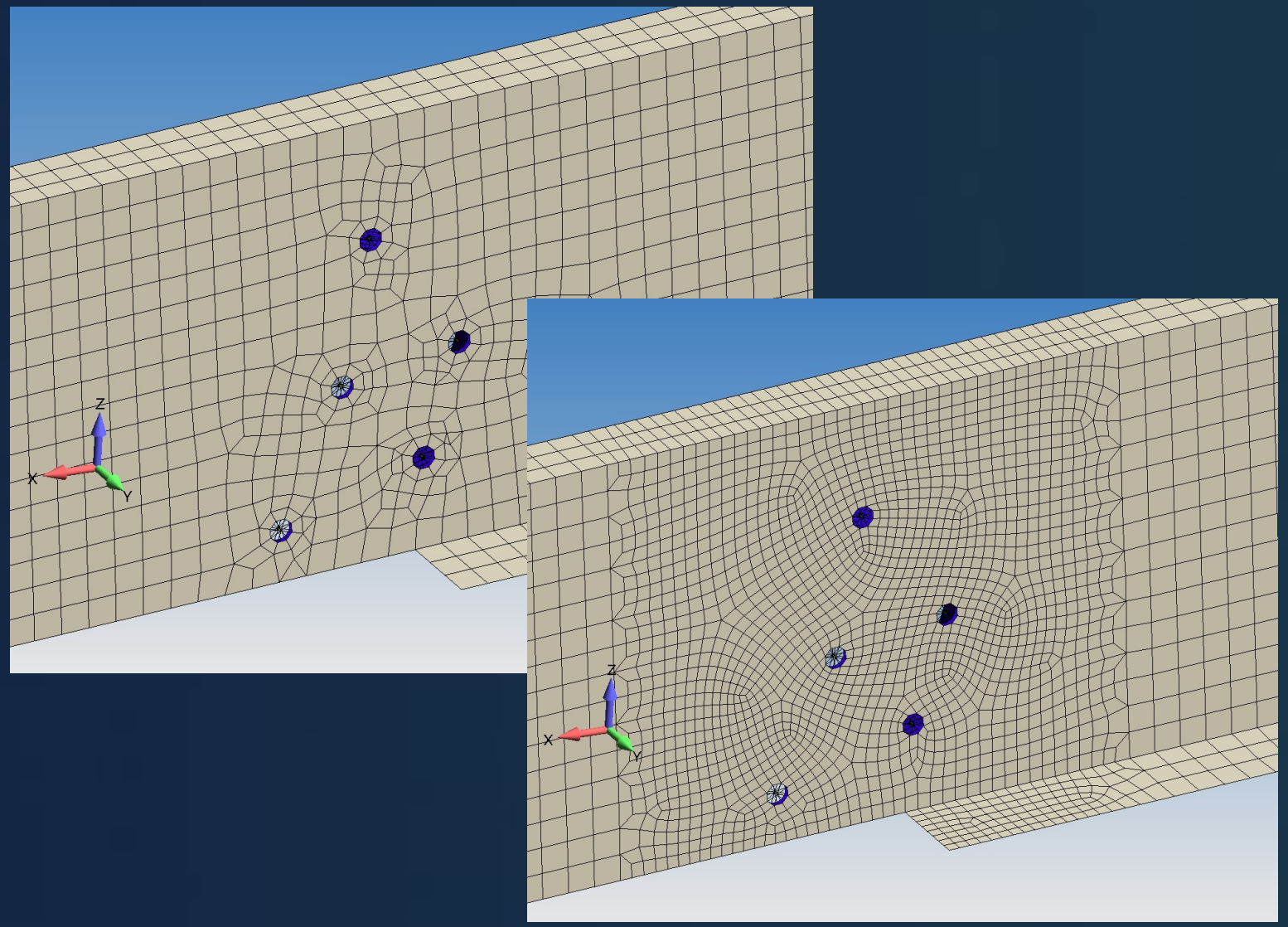
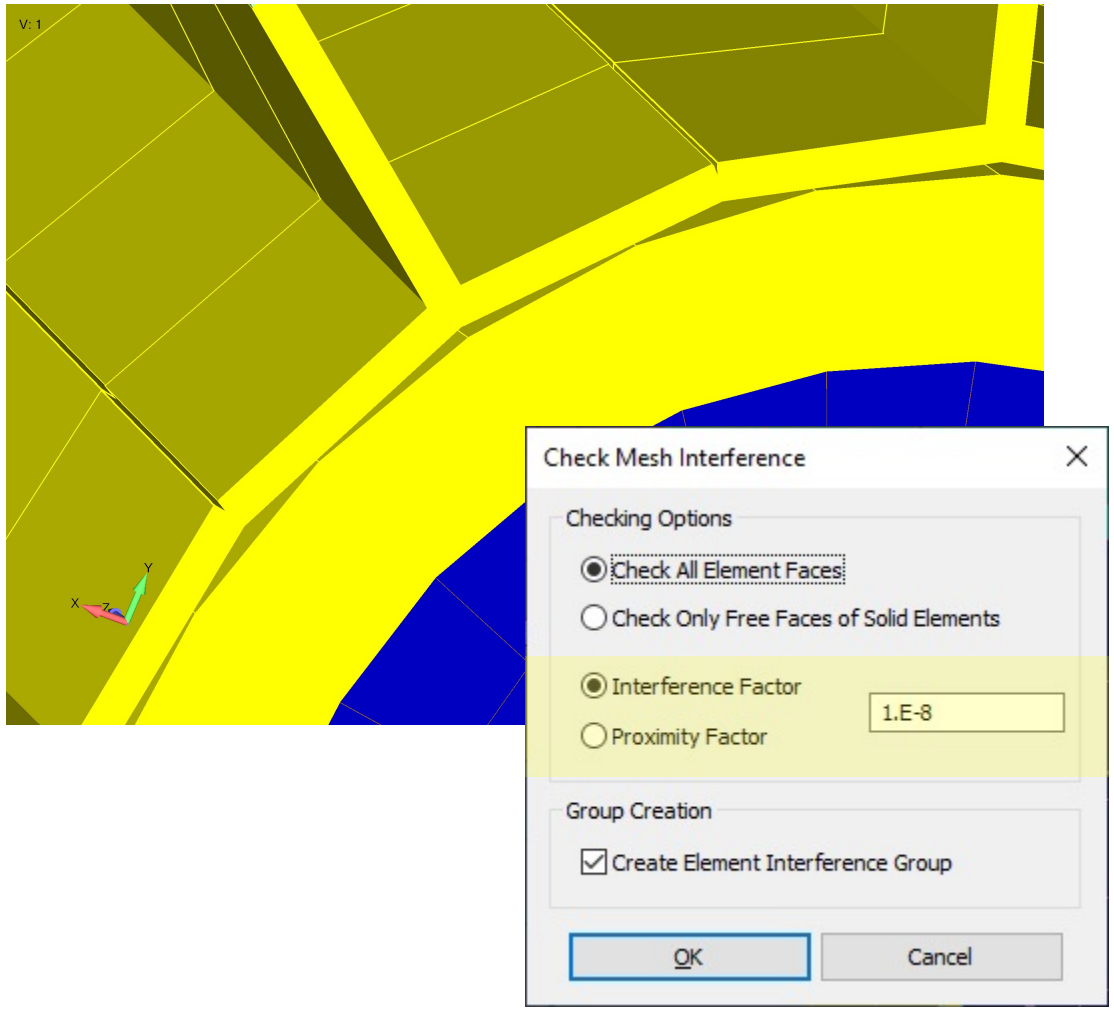
Mesh on Mesh

- Convert any triangulation generated from an existing mesh into a high-quality triangle or quadrilateral-dominant mesh
- Specify mesh sizing and surface curvature/proximity options
- Retain selected features of original mesh
- Create elements which attempt to satisfy user-defined element quality criteria



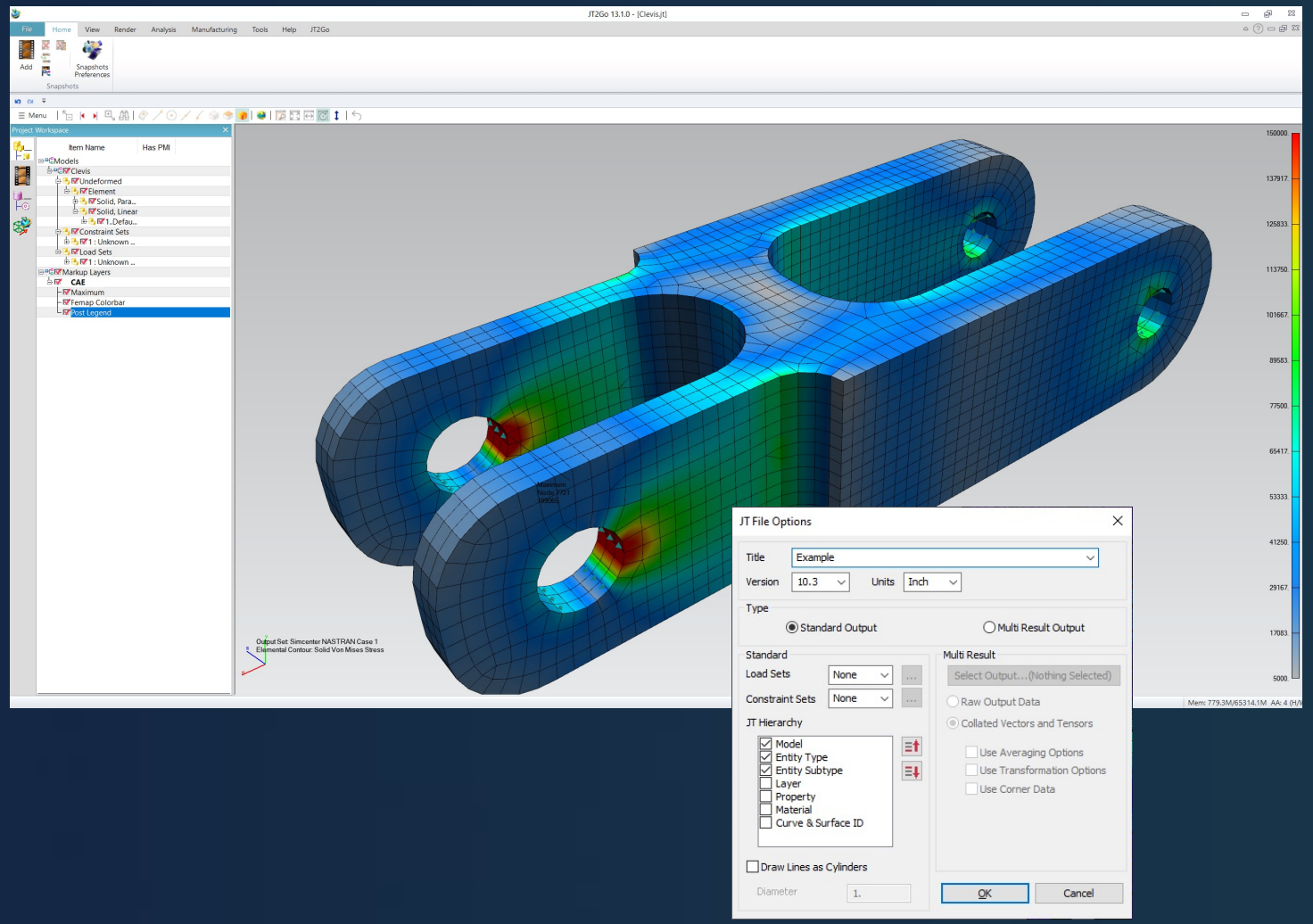
Mesh Interference Check



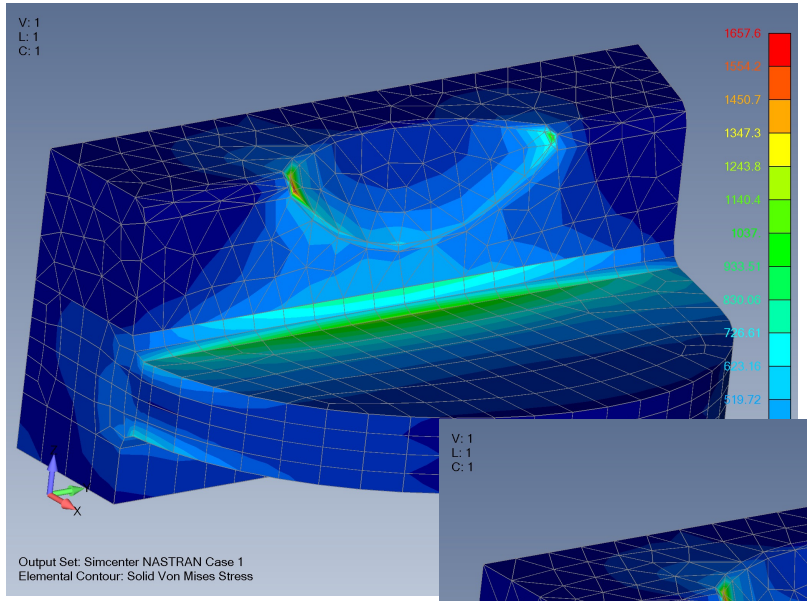
- Interference Factor shrinks the mesh by the value entered. Enter 0.0 for no shrink.
  - Makes it possible to ignore small amounts of interference to find real problems
- Proximity Factor grows the mesh, to help find cases where the mesh is very close, but not really overlapping
- New option to Create Element Interference Group containing the interfering elements

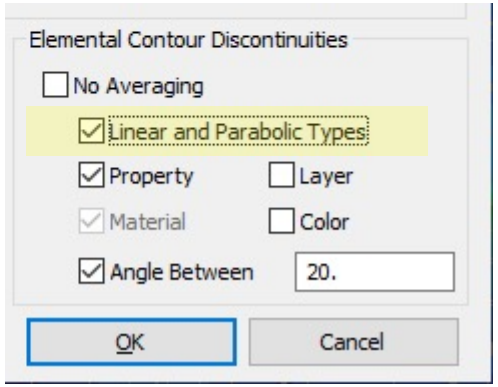
JT Files

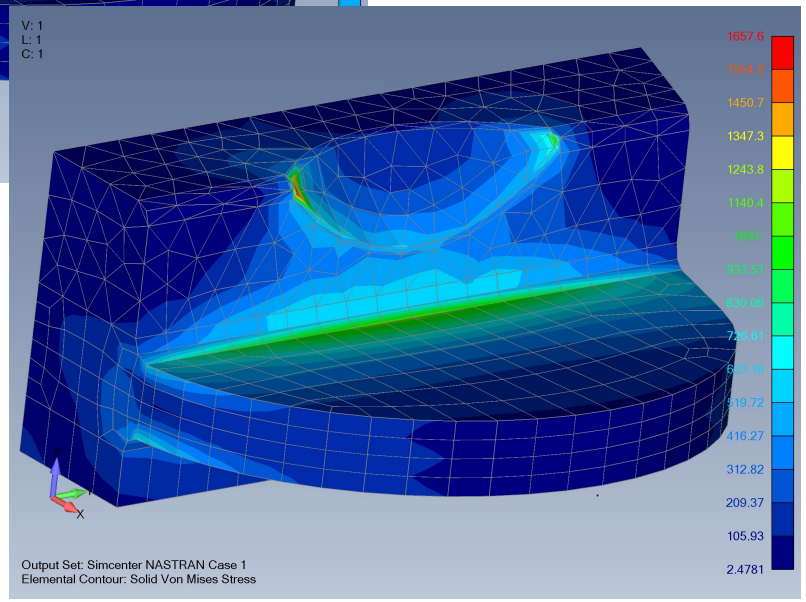
- Download JT2Go for Free
- Export of JT visualization files for use in the Teamcenter for Simulation (TC4Sim) environment or other JT collaboration tools has been available for many years. These files are used to visualize model data and review results without the need to open an instance of Femap
- JT visualization files can now be exported using “Type” set to “Standard Output” or “Multi Result Output”.
- For “Standard Output”, an exported file may now contain:
- Loads and/or Constraints in Active, Visible, All, or any number of Selected Load Sets and/or Constraint Sets
- Any Line Element in the file displayed as a Cylinder using specified diameter.



Solid Element Stress Contour Option







- Added option to control averaging of stresses across boundaries between linear and parabolic solid elements
- Necessary because of recent additions to Femap that are used to create a mix of Hex (Brick), Wedge, Pyramid, and Tetrahedral meshes with different orders

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Applied CAx Technical Seminars

- Model Organization, Working with Views and Presentation Graphics
  - https://appliedcax.com/resources/library-of-femap-online-seminars/femap-model-organization-working-with-views-and-presentation-graphics
- Model Flow and Model Organization - FEMAP User Guide
  - https://appliedcax.com/resources/library-of-femap-online-seminars/model-flow-and-model-organization-femap-user-guide
- Simcenter Femap Best Practices: Analysis Workflows
  - https://appliedcax.com/resources/library-of-femap-online-seminars/on-demand-webinar-simcenter-femap-best-practices-analysis-workflows
- Simcenter Femap On-demand Webinar: Surface Modeling and Plate Meshing
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