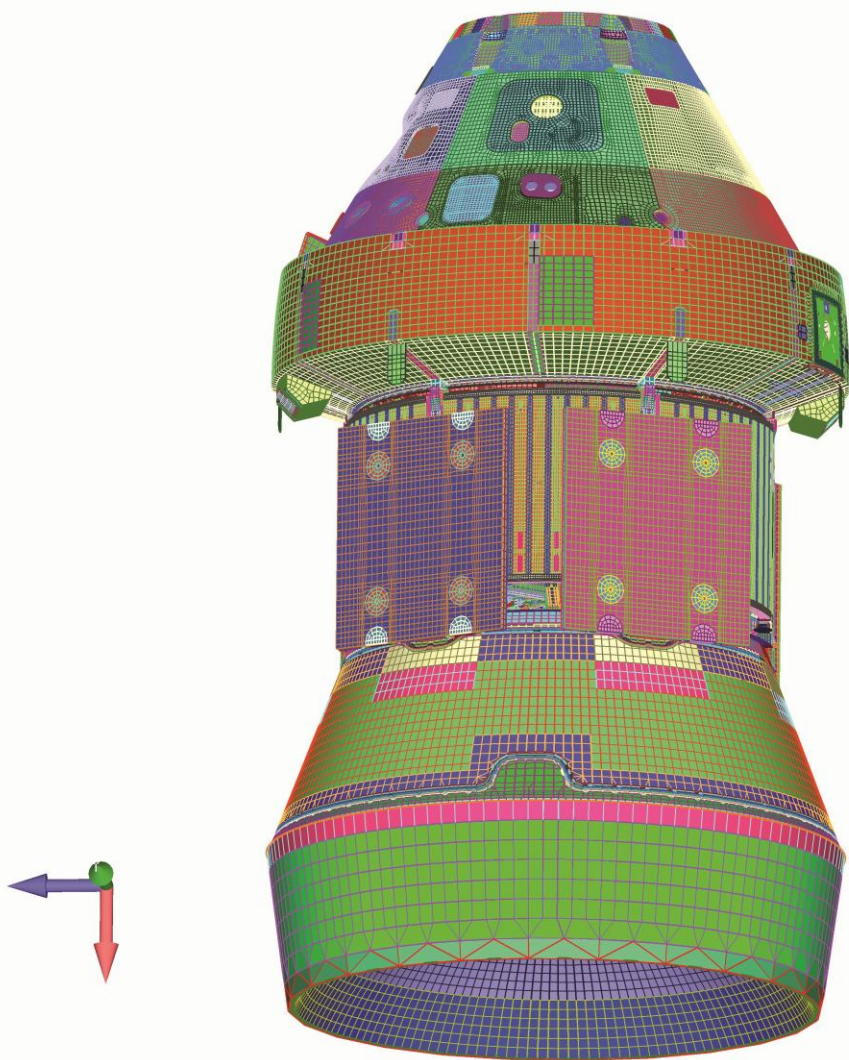


Simcenter FEMAP

What's new in 2512?



Lockheed Martin Space Systems

60-analyst team uses the integrated solver, pre- and post-processor to optimize the design of the successor to the Space Shuttle

“We’re able to run several iterations each day, on models with approximately one million elements, and we’re able to perform some fairly complicated trade studies in just two to three weeks.”

Eric Lewis
Stress Analyst and Senior Staff Engineer
Lockheed Martin Space Systems

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Model the complexity
Delivering insights



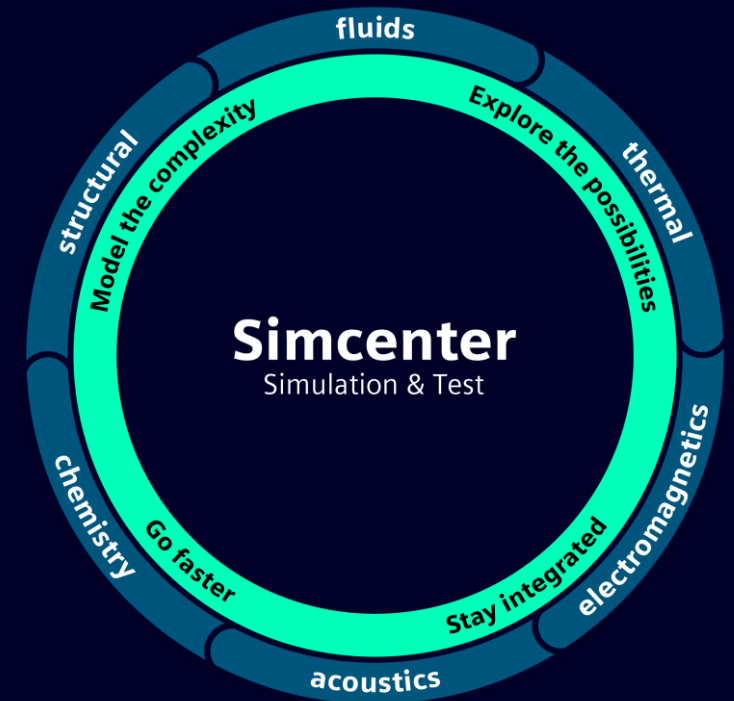
Explore the possibilities
Empowering decision confidence



Go faster
Increasing throughput



Stay integrated
Ensuring alignment



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Delivering insights



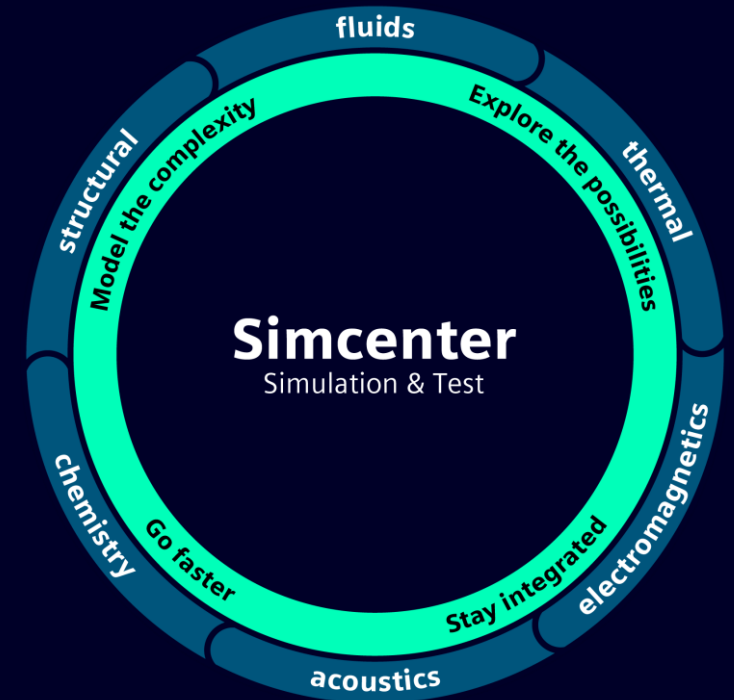
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Empowering decision confidence



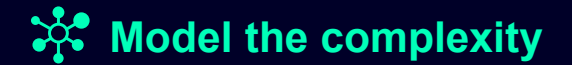
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ZONA ZAERO Trim Analysis Pre- and Post-Processing



Challenge

Model the complex interactions of a flexible structure with aerodynamic forces and damping

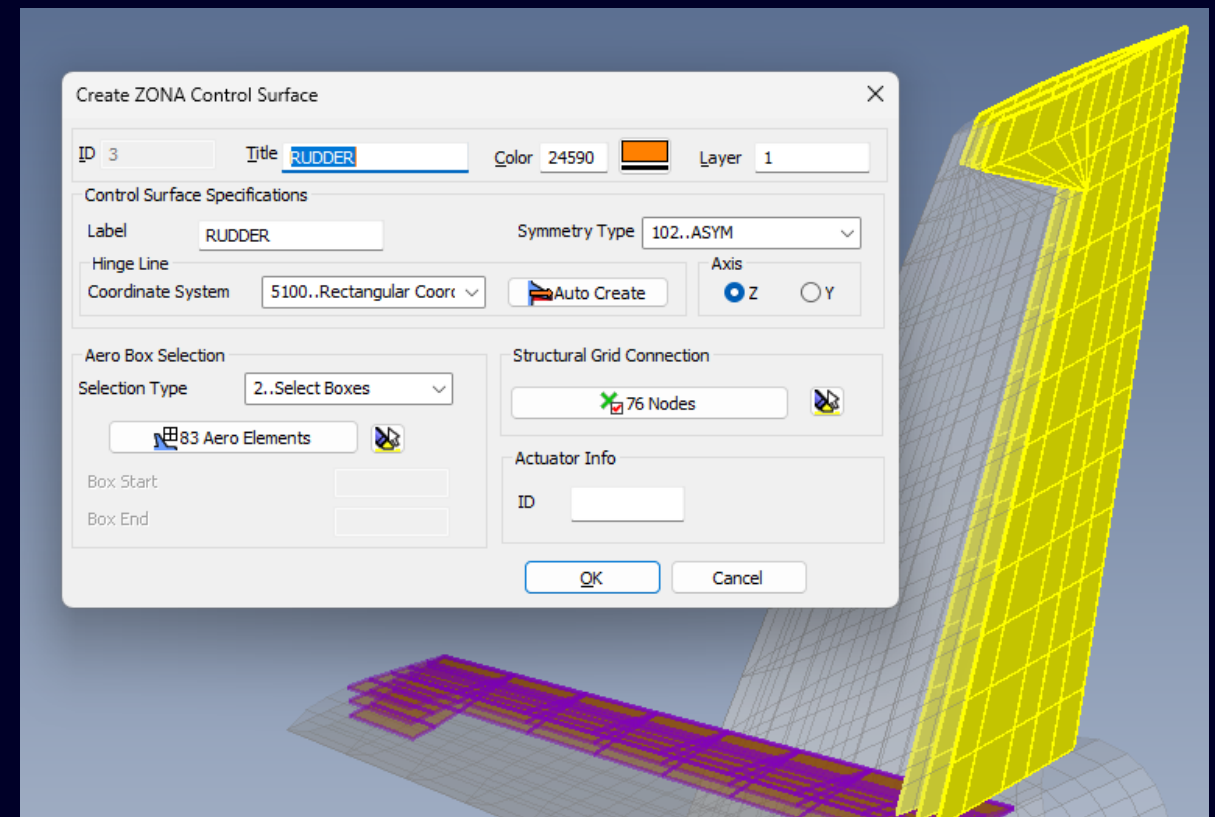
Solution

FEMAP GUI setup of ZAERO Trim Input, Analysis Run Set-Up and Post-Processing

Benefits

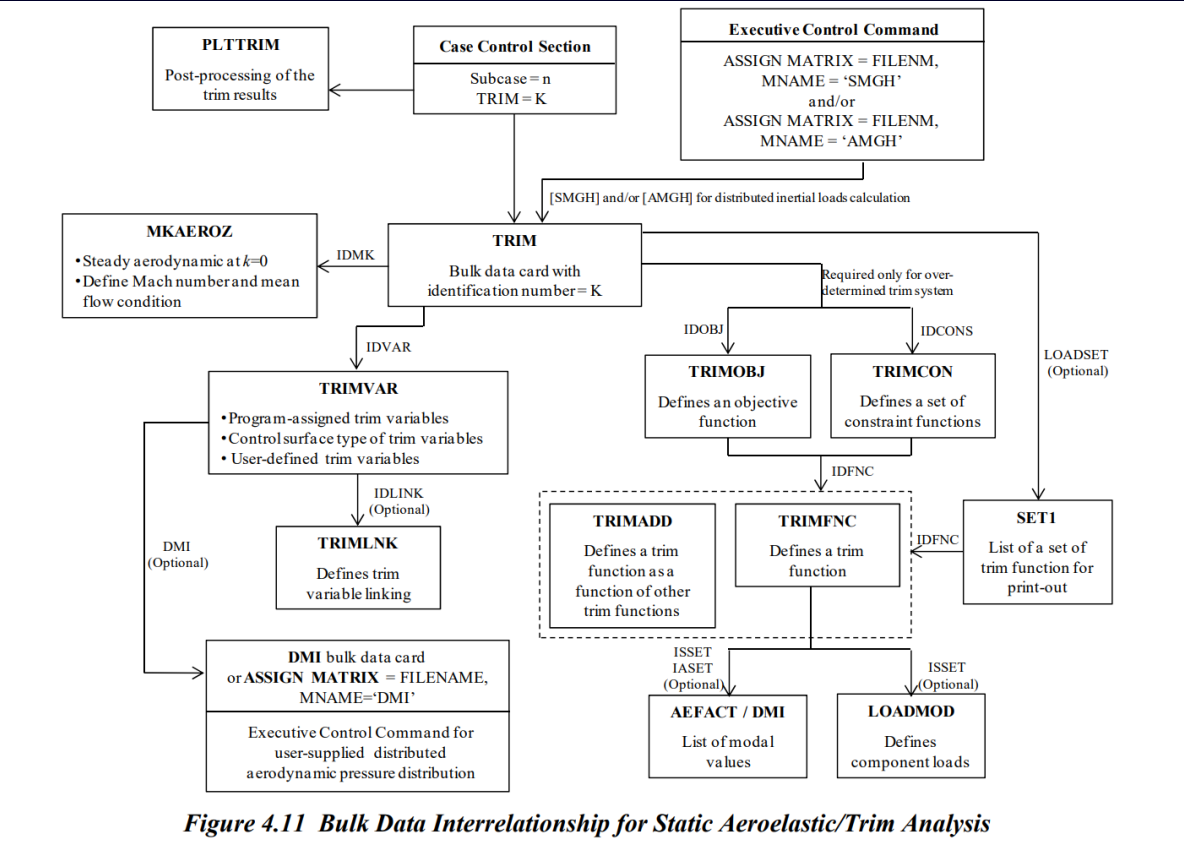
- Confirm aircraft stability
- Understand aircraft flight control effectiveness
- Recover accurate loads for structural certification

ZAERO TRIM Results Applied to NASTRAN Structural Model



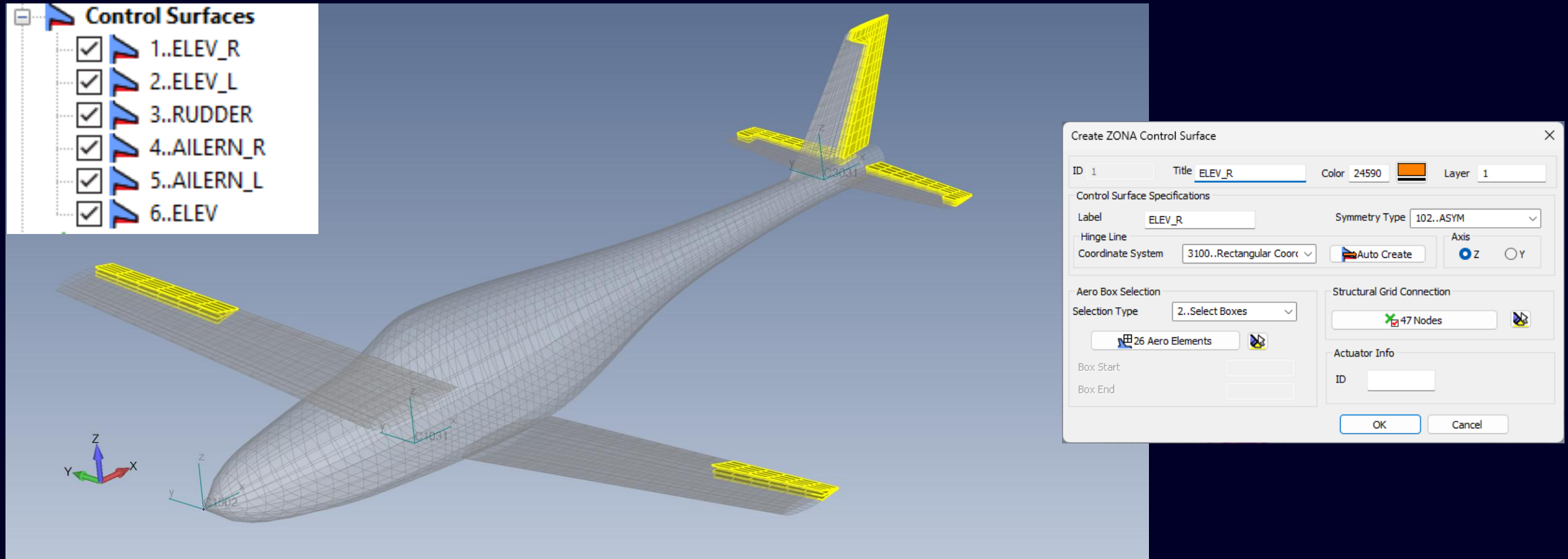
ZONA ZAERO Trim Analysis Pre- and Post-Processing

Setting up a ZAERO Trim Analysis is very complex...



ZONA ZAERO Trim Analysis Pre- and Post-Processing

Simcenter FEMAP 2512 Adds GUI Hosted Pre- and Post-Processing to Streamline Model Setup



ZONA ZAERO Trim Analysis Pre- and Post-Processing

Simcenter FEMAP 2512 Adds GUI Hosted Pre- and Post-Processing to Streamline Model Setup

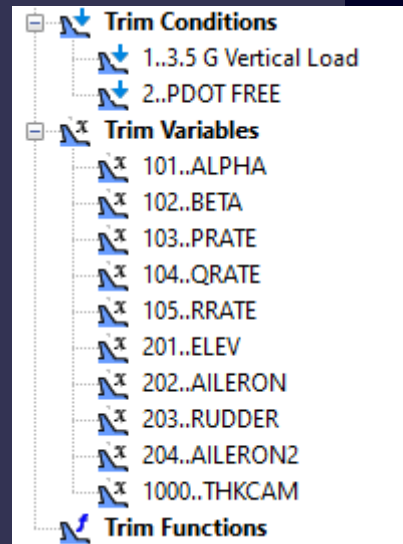
And the required -

Trim Conditions

Trim Variables

Trim Functions

Trim Analysis Setup



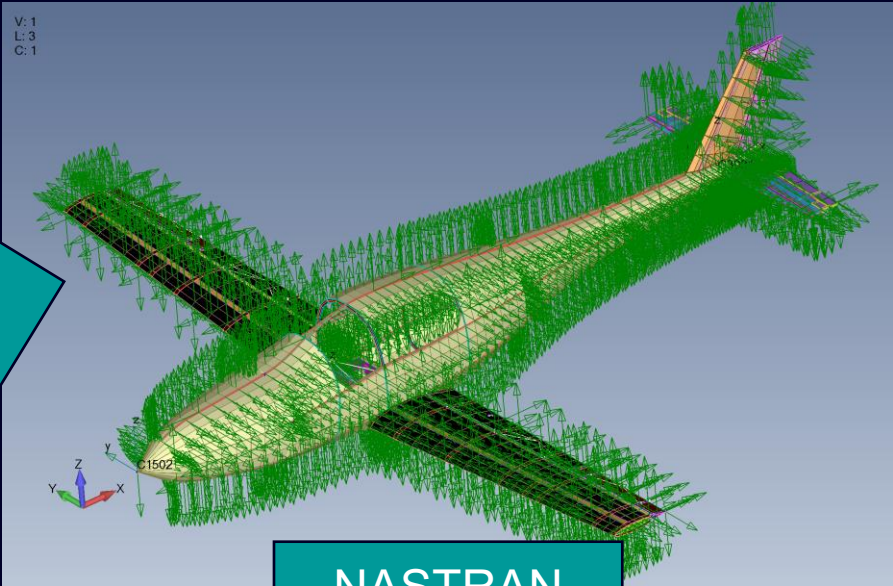
A screenshot of the 'ZONA TRIM Variables' dialog box. The dialog has a title bar with a close button. Inside, there are several fields and sections. The 'ID' field contains '103' and the 'Title' field contains 'PRATE'. The 'Variable Type' is set to '3..Roll Rate (PRATE)' with a dropdown arrow. The 'Control Surface' field is empty with a dropdown arrow. The 'LABEL' field contains 'PRATE'. The 'Variable Limits' section has 'Lower' set to '-1.E+30' and 'Upper' set to '1.E+30'. There is an 'Initial Value' checkbox which is unchecked, with a value of '0.' next to it. The 'TRIMLNK ID' and 'Matrix Name' fields are empty. The 'SYM Option' is set to a dropdown menu. There is a 'Stability Derivatives' button. At the bottom, there are 'OK' and 'Cancel' buttons.

ZONA ZAERO Trim Analysis Pre- and Post-Processing

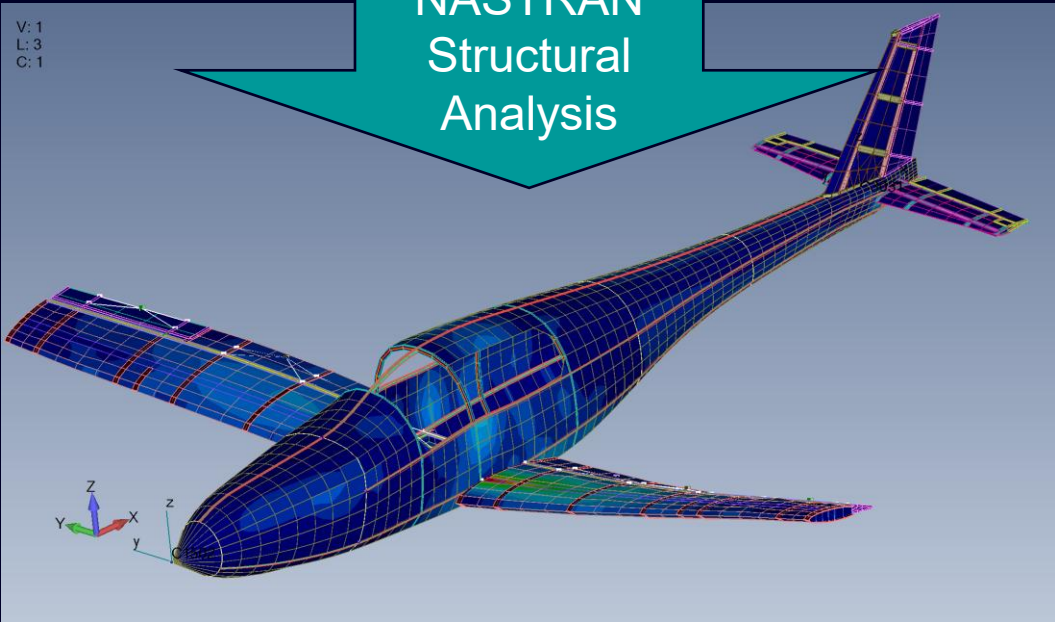
End result – ZAERO Ready to Run Trim Input File

```
$ *****
$ Executive Control Section
$ *****
ASSIGN FEM=trim_2-0005.f06, FORM=NX, BOUNDARY=ASYM, SUPORT=-123456/10608
ASSIGN MATRIX=mass_matrix.mgg ,MNAME=MGG
DIAG 1
CEND
  TITLE = TRIM_1104_457
  ECHO = NONE
SUBCASE = 3
SUBTITLE = ROLL MANEUVER
  LABEL = ROLL RATE + ACCEL UNKNOWN GIVEN AILERON DEFLECTION
  TRIM = 3
BEGIN BULK
$ *****
$   Written by : Femap
$   Version   : 2512.0
$   Translator : ZONA
$   From Model : C:\Trim\Trim_2.modfem
$   Date      : Tue Nov  4 17:15:10 2025
$   Output To  : C:\Trim\
$ *****
$
$ Femap Aero Property 1601 : Aero Property
PAFOIL7 1601 1 2 3 4 5 6 7
AEFACT 1 0. .02 .05 .1 .15 .2 .3+
+ .5 .7 1. 2. 3. 4. 5. 7.5+
+ 10. 12.5 15. 17.5 20. 22.5 25. 27.5+
+ 30. 32.5 35. 37.5 40. 42.5 45. 47.5+
+ 50. 52.5 55. 57.5 60. 62.5 65. 67.5+
+ 70. 72.5 75. 77.5 80. 82.5 85. 87.5+
+ 90. 92.5 95. 96. 97. 98. 99. 100.
AEFACT 2 0. .0162 .0404 .0808 .1212 .1616 .2425+
+ .4041 .5657 .8082 1.6164 2.4246 3.2328 4.0394 4.7181+
+ 5.3968 6.0755 6.7355 7.0842 7.433 7.7817 8.1305 8.3053+
+ 8.4788 8.618 8.7392 8.8127 8.7971 8.7815 8.7659 8.7503+
+ 8.7347 8.7093 8.3672 8.0168 7.6664 7.3161 6.9657 6.6153+
+ 6.0996 5.5414 4.9831 4.4249 3.8667 3.3085 2.7911 2.3259+
+ 1.8607 1.3955 .9304 .7443 .5582 .3721 .1861 0.
```

NASTRAN Forces and Moments



NASTRAN Structural Analysis



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Delivering insights



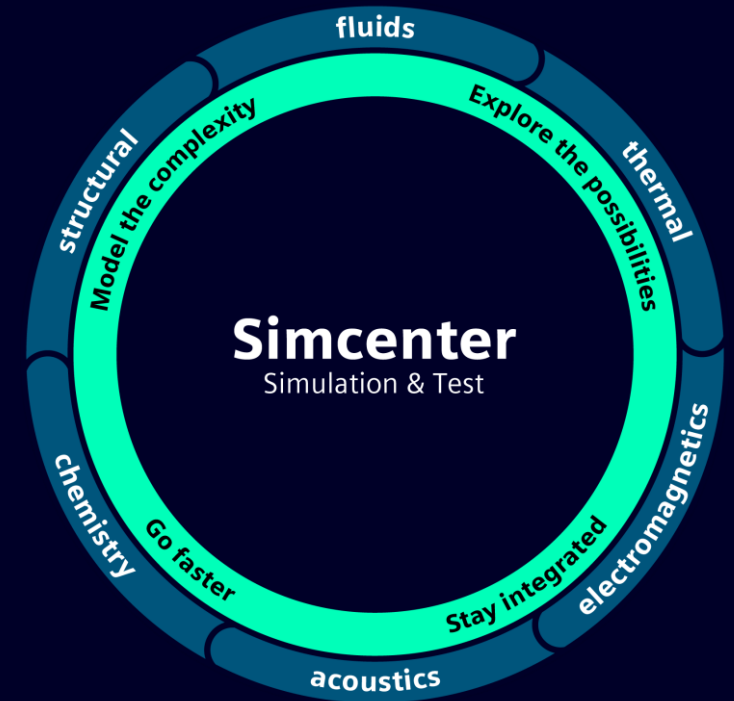
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Ensuring alignment



Organizing Results Data

🔍 Explore the possibilities

Challenge

Identifying the critical data in the terabytes of results common in Finite Element Analysis

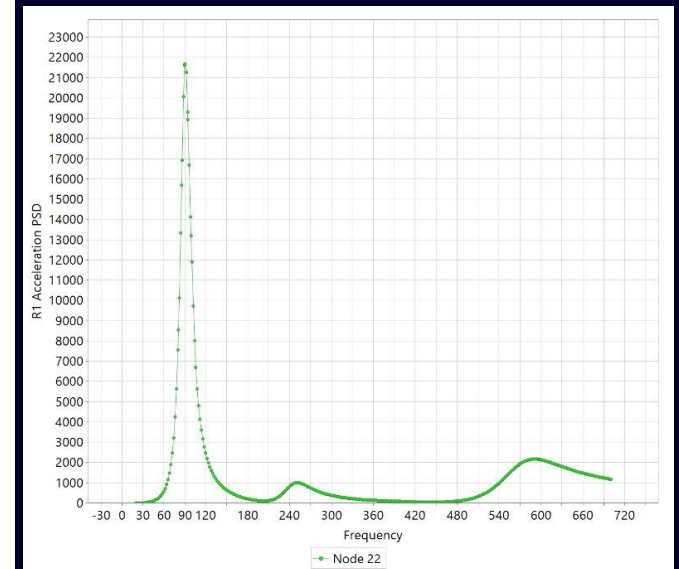
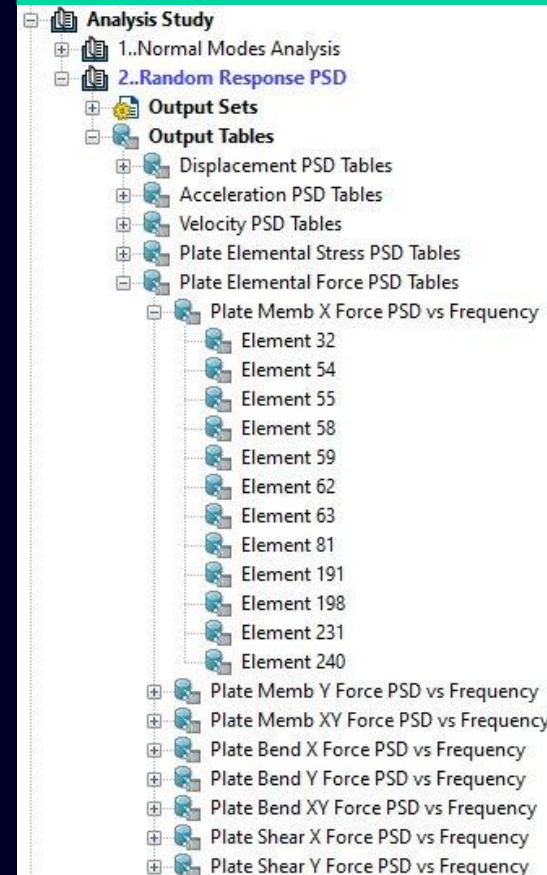
Solution

FEMAP Output Tables organizes Tabular Data to more effectively impact design

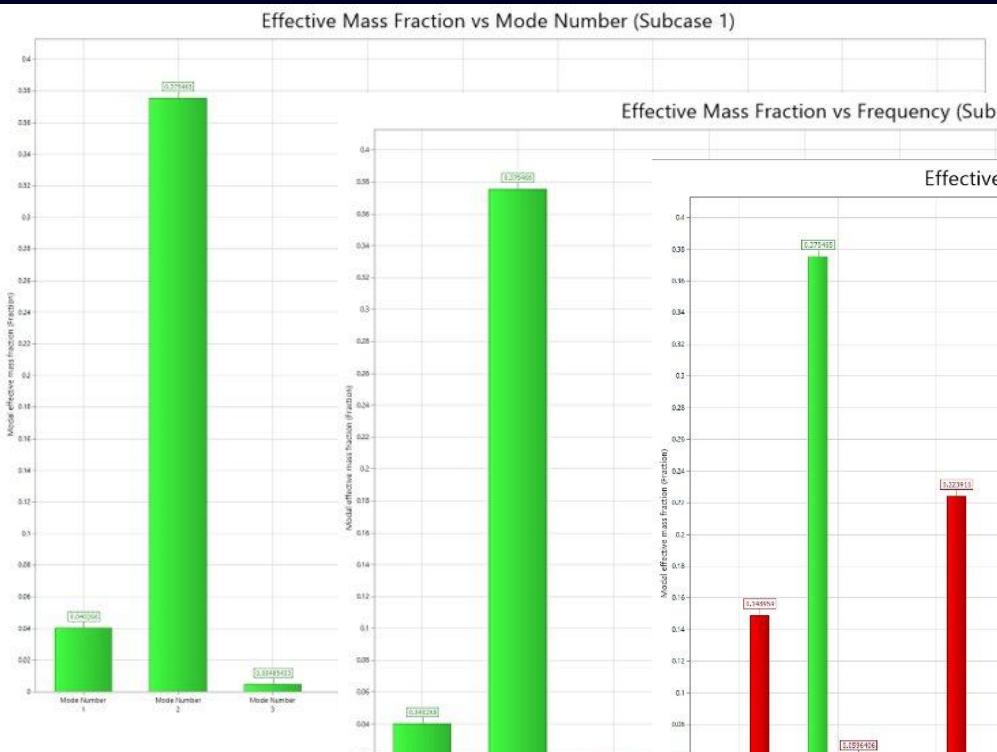
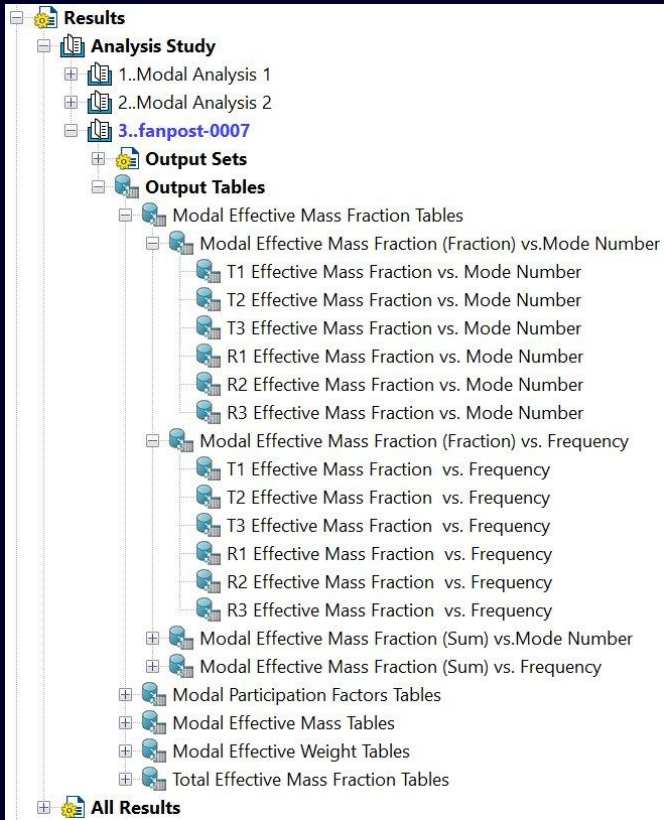
Benefits

- Tabular Data now stored together with traditional Nodal and Elemental Data in Analysis Studies
- Traceability – all data from a single NASTRAN run is co-located in the FEMAP GUI
- Immediate Right-Click access to querying the pertinent data

Random Response Results in Output Tables

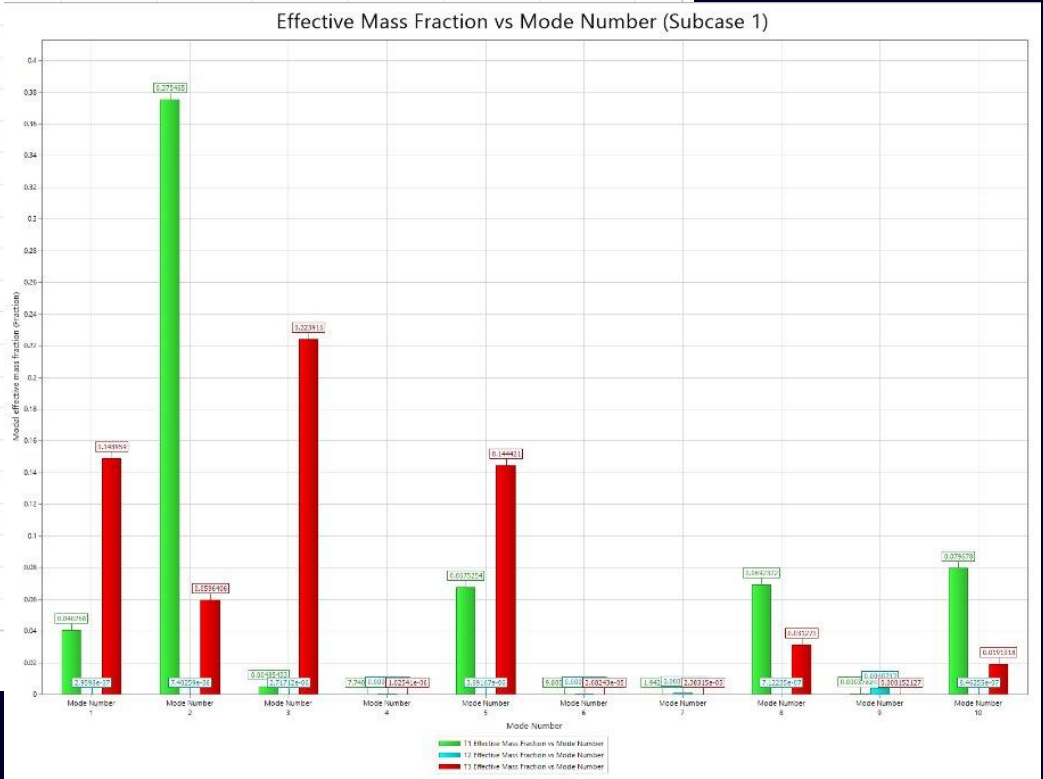


FEMAP 2512 – Output Table Modal Mass Data Enhancements



vs. Mode Number

vs. Frequency



And with Multi-Axis Support

Modal Mass Data moved to Output Tables in FEMAP v2506

Bar Charts added in v2512

FEMAP 2512 – Output Table Modal Mass Data Enhancements

Results

Analysis Study

1..Modal Analysis 1

2..Modal Analysis 2

3..fanpost-0007

Output Sets

Output Tables

Modal Effective Mass Fraction Tables

Modal Effective Mass Fraction (Fraction) vs.Mode Number

T1 Effective Mass Fraction vs. Mode Number

T2 Effective Mass Fraction vs. Mode Number

T3 Effective Mass Fraction vs. Mode Number

R1 Effective Mass Fraction vs. Mode Number

R2 Effective Mass Fraction vs. Mode Number

R3 Effective Mass Fraction vs. Mode Number

Modal Effective Mass Fraction (Fraction) vs. Frequency

T1 Effective Mass Fraction vs. Frequency

T2 Effective Mass Fraction vs. Frequency

T3 Effective Mass Fraction vs. Frequency

R1 Effective Mass Fraction vs. Frequency

R2 Effective Mass Fraction vs. Frequency

R3 Effective Mass Fraction vs. Frequency

Modal Effective Mass Fraction (Sum) vs.Mode Number

Modal Effective Mass Fraction (Sum) vs. Frequency

Modal Participation Factors Tables

Modal Effective Mass Tables

Modal Effective Weight Tables

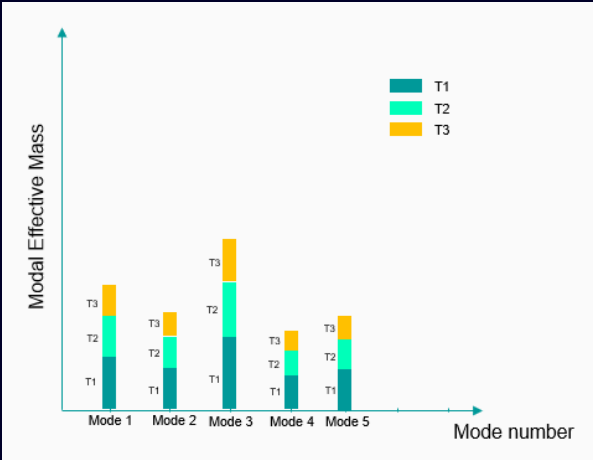
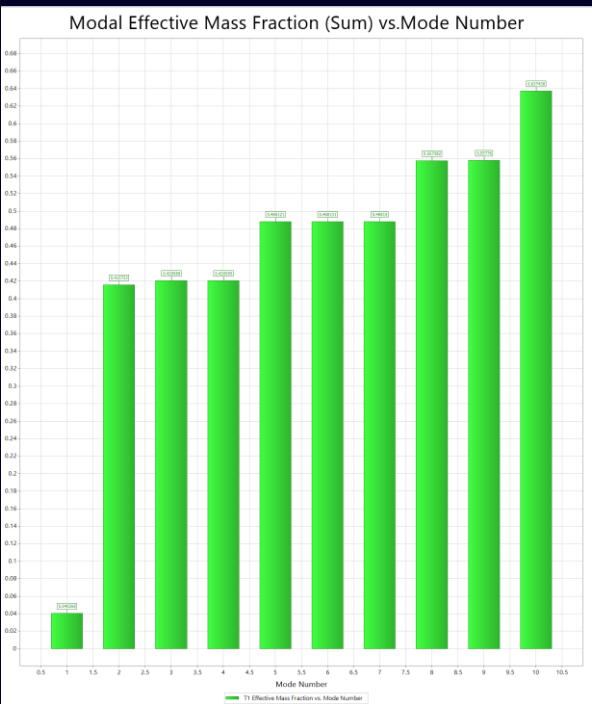
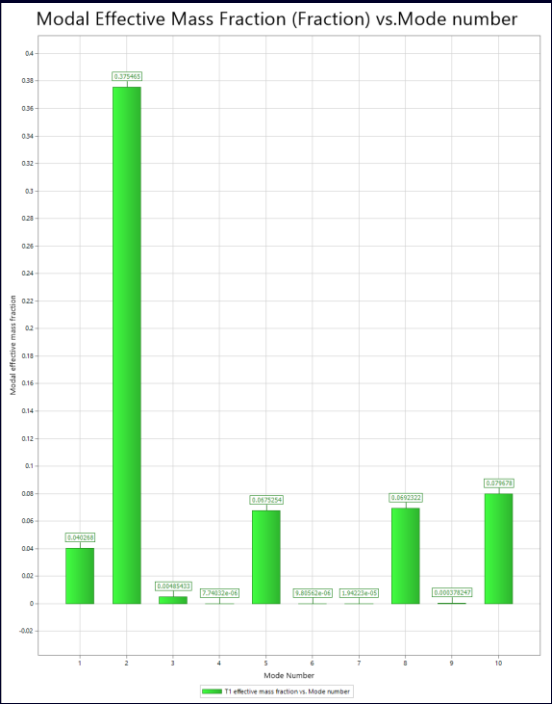
Total Effective Mass Fraction Tables

All Results

X-Axis data clearly labelled at the Output Table level

X-Axis data clearly labelled at the data series level

Y-Axis data clearly labelled



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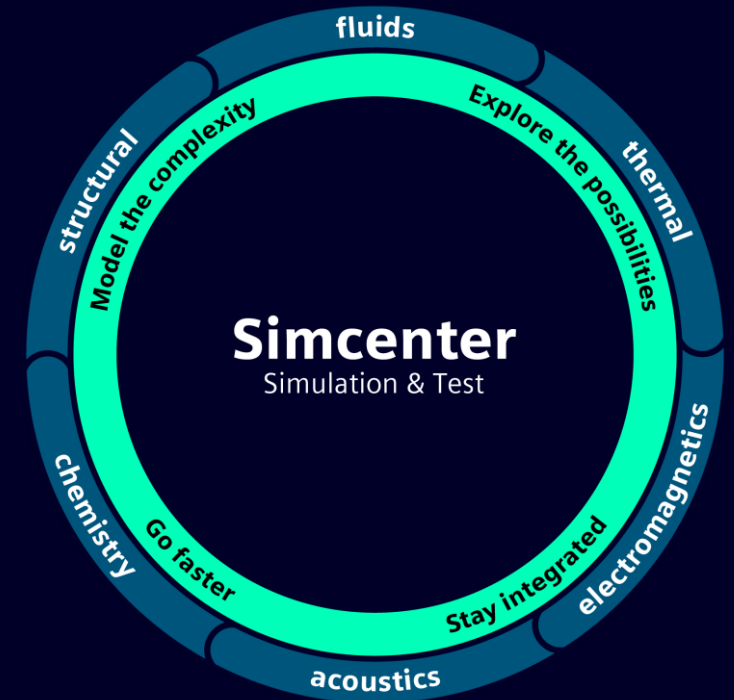
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Unified Graphics Architecture



Challenge

Effective displaying Finite Element Data of larger and more complex models

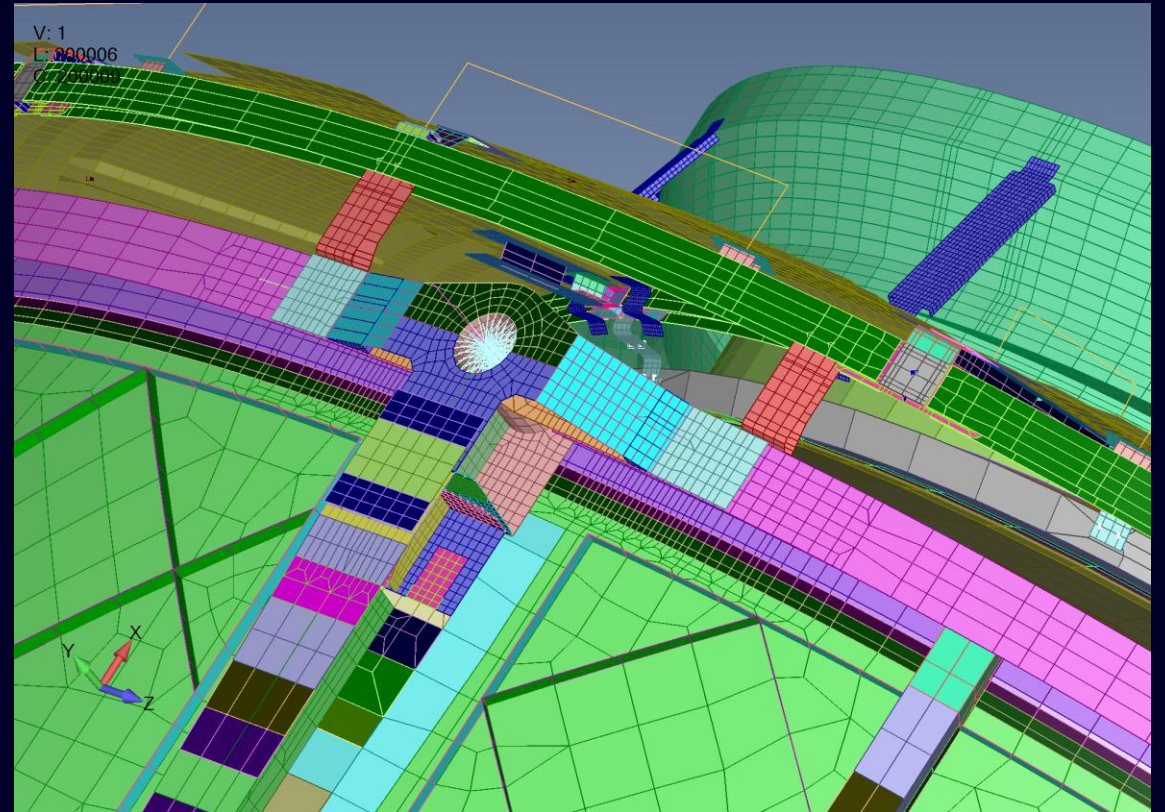
Solution

Unified Graphics Architecture – new highly optimized code leveraging the latest GPUs

Benefits

- Enhanced efficiency of FEA Modeling and Post-Processing through faster redraws
- Better organized for long term maintenance, extensions, and more performance enhancements

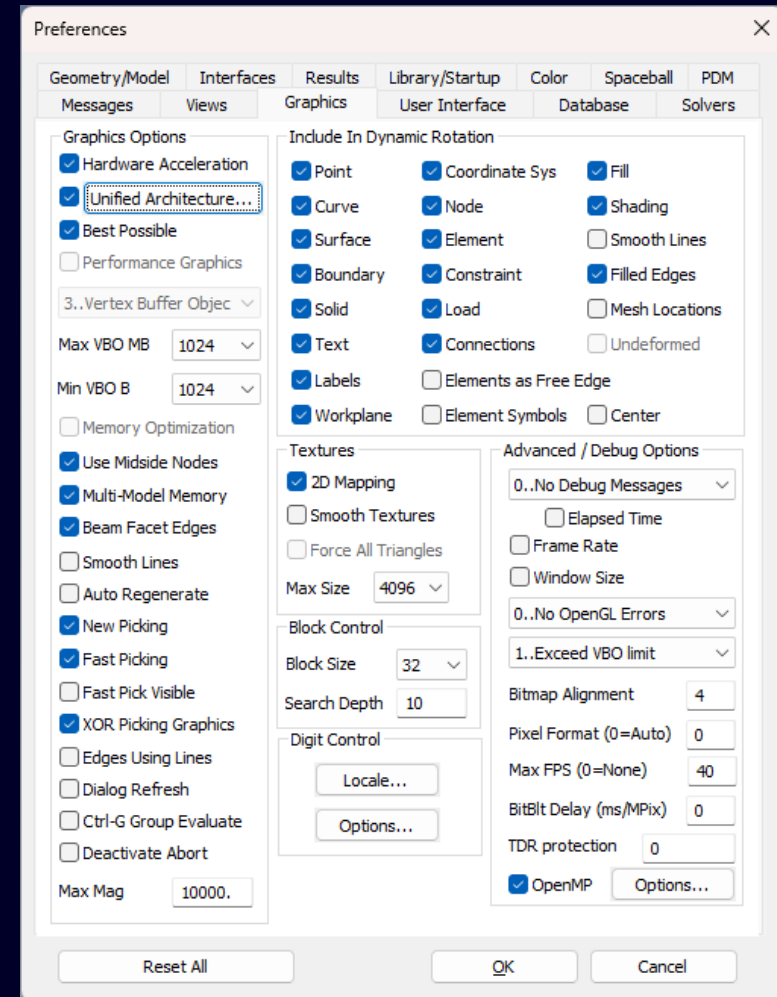
Unified Graphics Architecture



FEMAP 2512 Unified Graphics Architecture

Development started in Simcenter FEMAP v2301, the following entities have been added into the UGA Pipeline

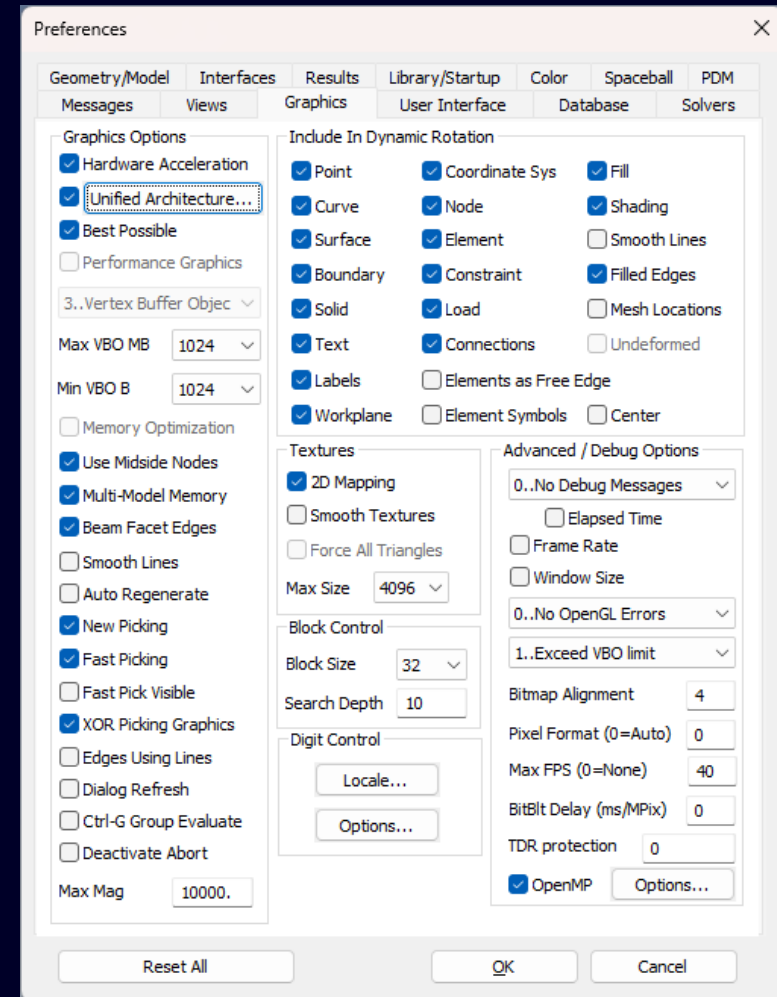
- Coordinate Systems
- Geometric Entities – Points, Mesh Points, Curves, Composite Curves, Surfaces, Boundary Surfaces, and Solids
- Geometry-based Loads and Constraints
- Nodes
- Beam and Solid Mesh entities – FEMAP v2512
- IsoSurface/Cutting Plane/IsoLine/Streamline – FEMAP v2512



FEMAP 2512 Unified Graphics Architecture

What's Next – v2606

- Shell/Plate elements
- Contact
- Text objects
- 2D screen entities (View/Post Titles, Contour Legend, ViewAxes, Origin)
- GFX and User Defined
- OGL_Mesh and interactive Mesh Splitting
- Aero entities
- Beam Section Cut



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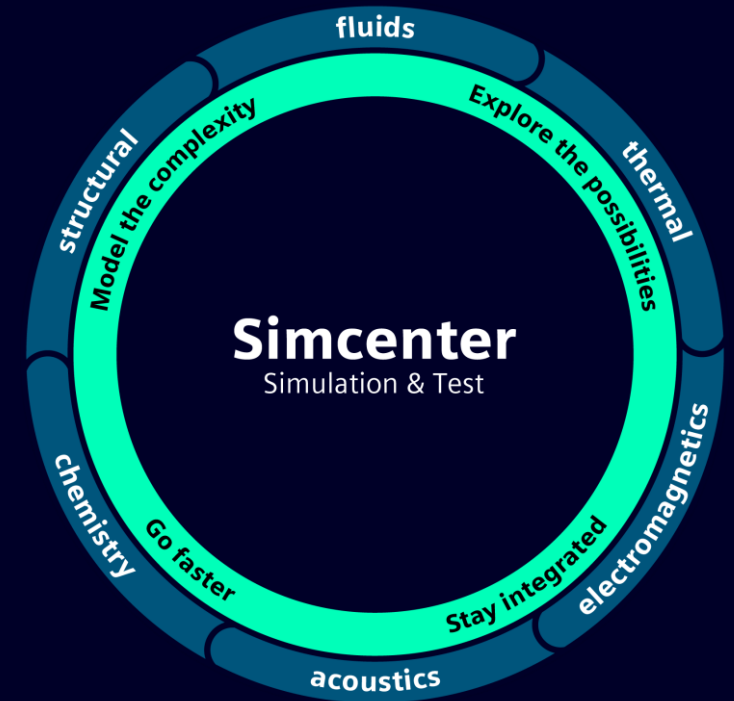
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FEMAP 2512 Rollover Licensing



Challenge

Ease access to FEMAP Licenses with multiple possible licensing sources

Solution

Rollover Licensing – user can now specify multiple licensing sources and order of preference

Benefits

- Given the number of ways FEMAP can be licensed, Dongle, Legacy Float, SALT Float, Simcenter X, and SC12504 Combo SC3D/FEMAP – user always gets a license if one is available through multiple paths

Rollover Licensing

FMP

License Rollover and Retry Configuration

☒ Activate License Rollover

Configuration

Status	Priority	License Type	Server
	Primary	Siemens License Server	29000@orw-femap-lic.wv.mentorg.com
	1	FlexLM License Server	@di2us5
	2	Dongle	-
	3	Demo	-

FEMAP 2512 Stay Integrated/User Requests

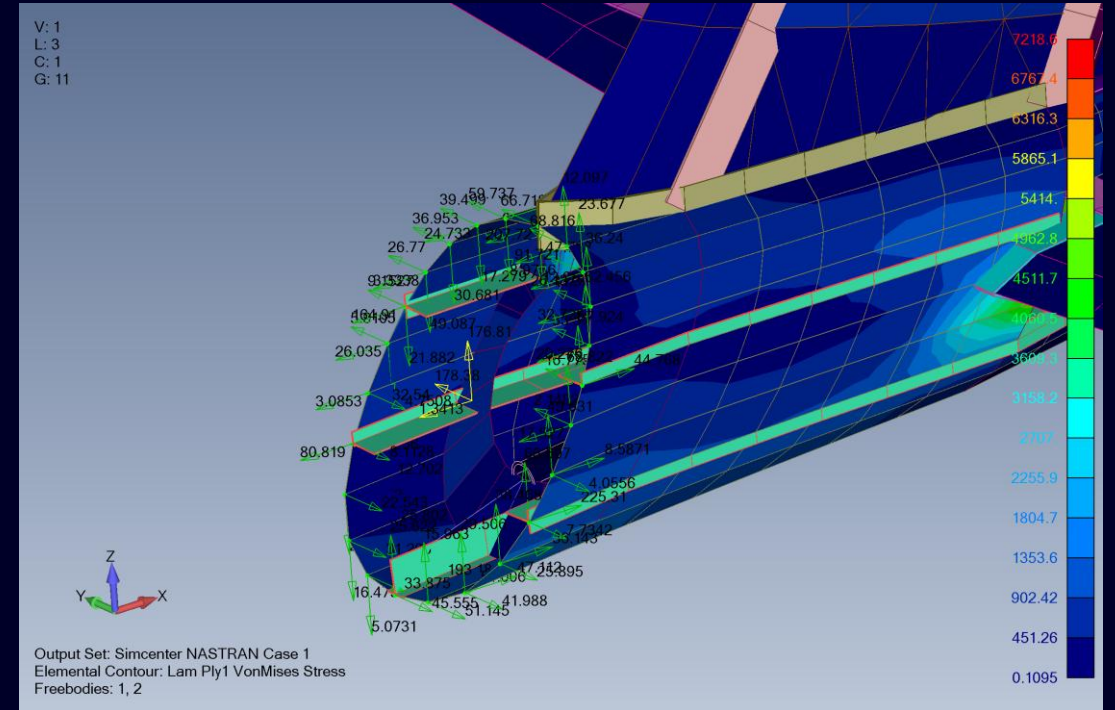
Teamcenter Integration – added management for ZAERO files through FEMAP's Teamcenter connection

Updated CAD Translators to latest versions

Pick Front now the default in new Models

Separated Plate Thickness/Beam Cross Section visualization, both can be controlled on their own

Added Edge Fade of solid meshes when zoomed way out – cleaner display



Beam Thickness On/Plate Thickness Off

Simcenter FEMAP <release version number>

Top new features



Model the complexity
ZAERO Trim



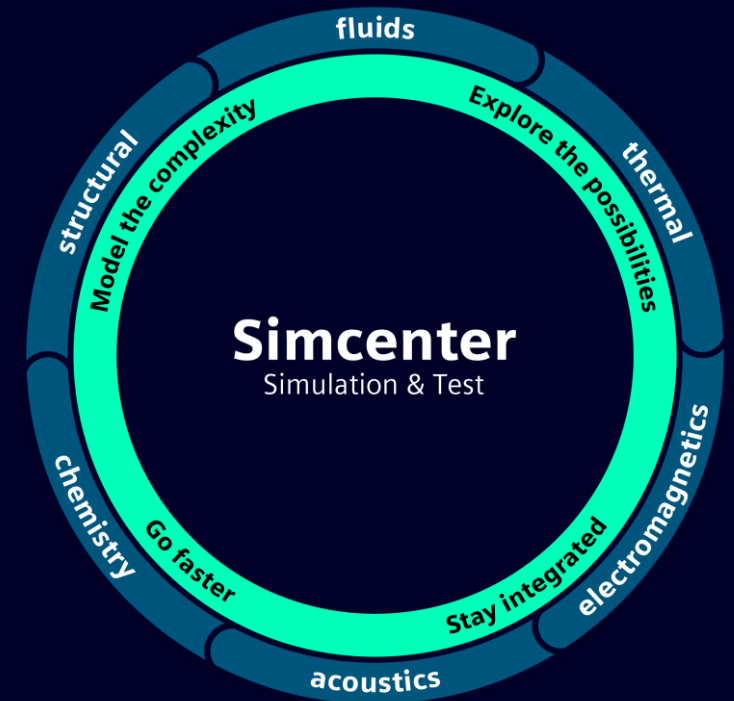
Explore the possibilities
Output Tables



Go faster
Unified Graphics



Stay integrated
ZAERO Teamcenter Support



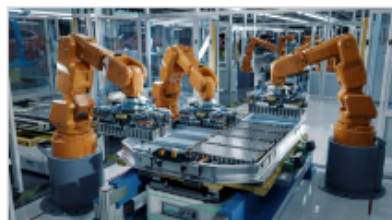
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3

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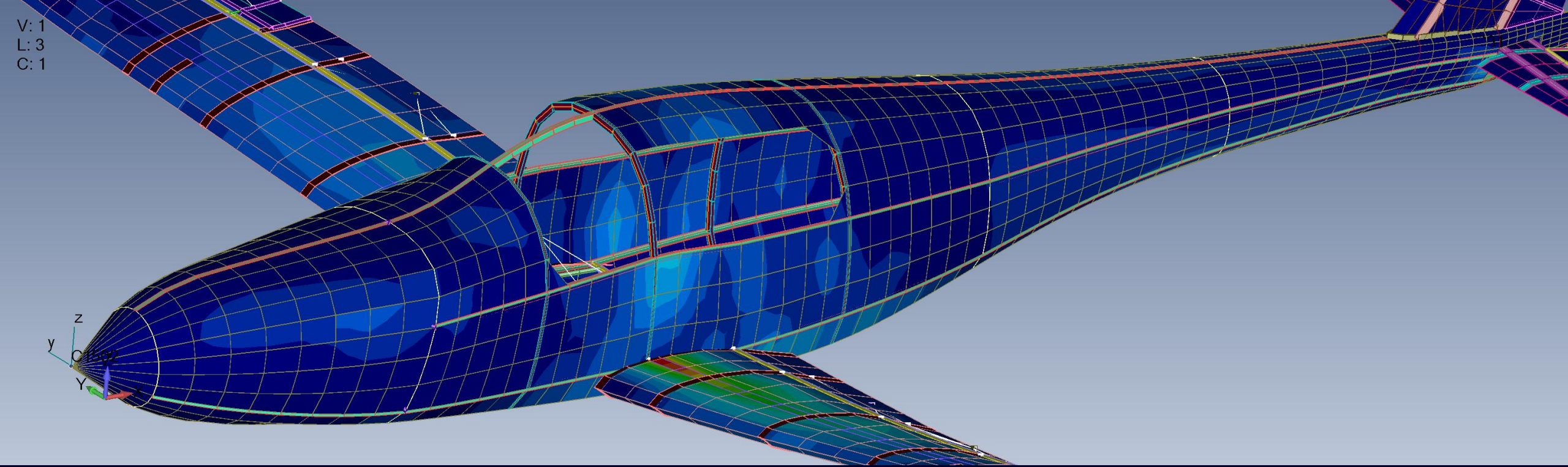
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What's new in 2512