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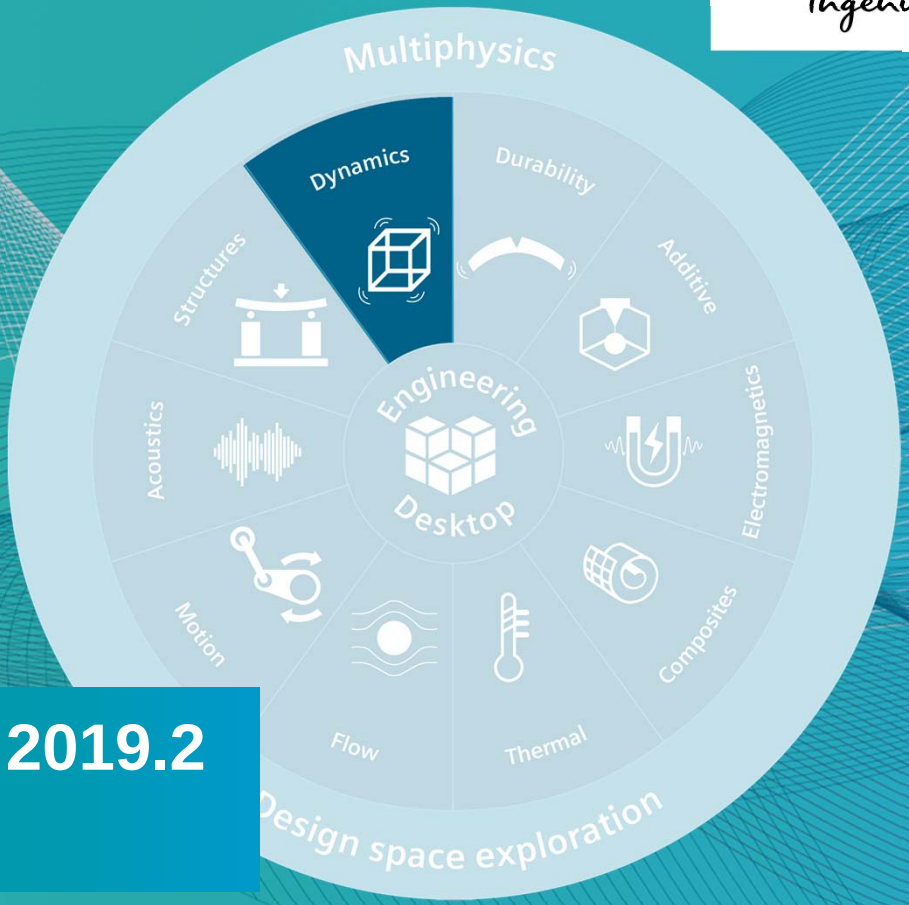

What's New in Simcenter 3D 2019.2
Dynamics

Realize innovation.

Simcenter 3D Response Dynamics
User Defined Names

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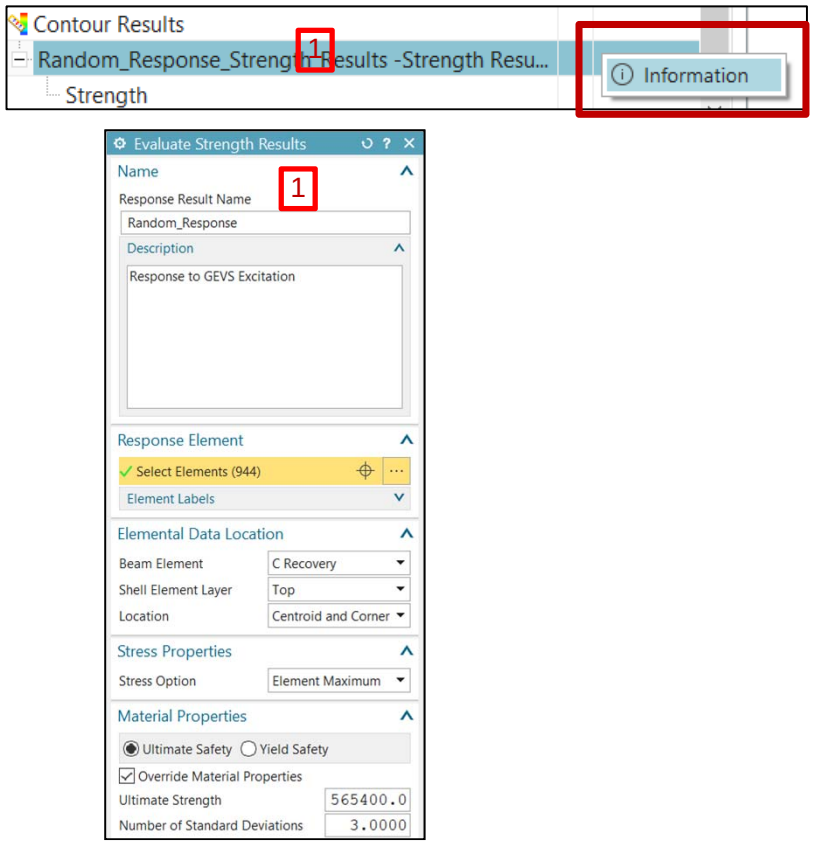

Challenge

- Hard to distinguish contour results for the same event
- Unless user took notes, results did not reveal the nature of the solution

Solution

- “Response Name” is now user definable. Navigator entry derives name from user specified string
- Applies to “Response”, “Strength”, “Peak”, “RMS” and “LCR”

Benefits

- Capture the event details in the name and associated description field
- Allows user to distinguish between two events of the same type

Simcenter 3D Response Dynamics Principal Stress Support

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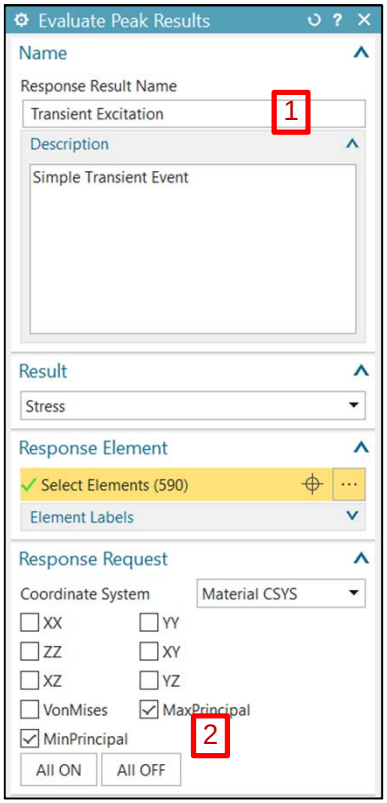

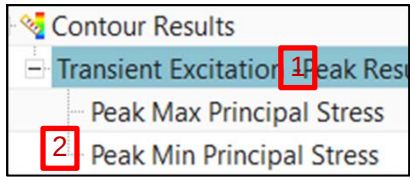

Challenge

- Min Max principal stresses were not available for transient events

Solution

- “Min” and “Max” are now available in 2019.2

Benefits

- Ability to look at principal stress components in addition to component stresses

Simcenter 3D Response Dynamics
Fix for Shock Response Spectrum

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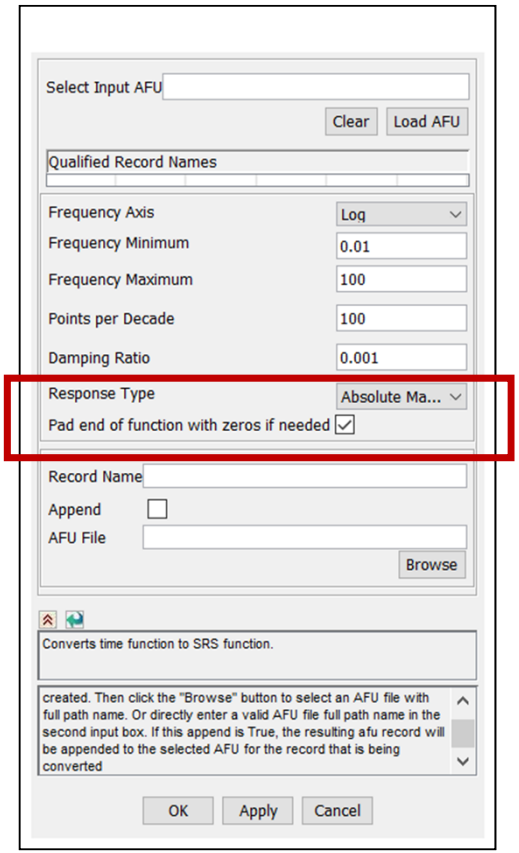

Challenge

- Wrong shock response spectra generated if time pulse ended in non-zero value. That is, manifests as large zero frequency response in the shock response spectra (SRS) function

Solution

- Option now added to automatically pad additional points – zero accelerations pulse signals
- User warning if pulse signals end in a non-zero value

Benefits

- Generation of correct shock response spectra

Simcenter 3D Response Dynamics Performance Enhancements

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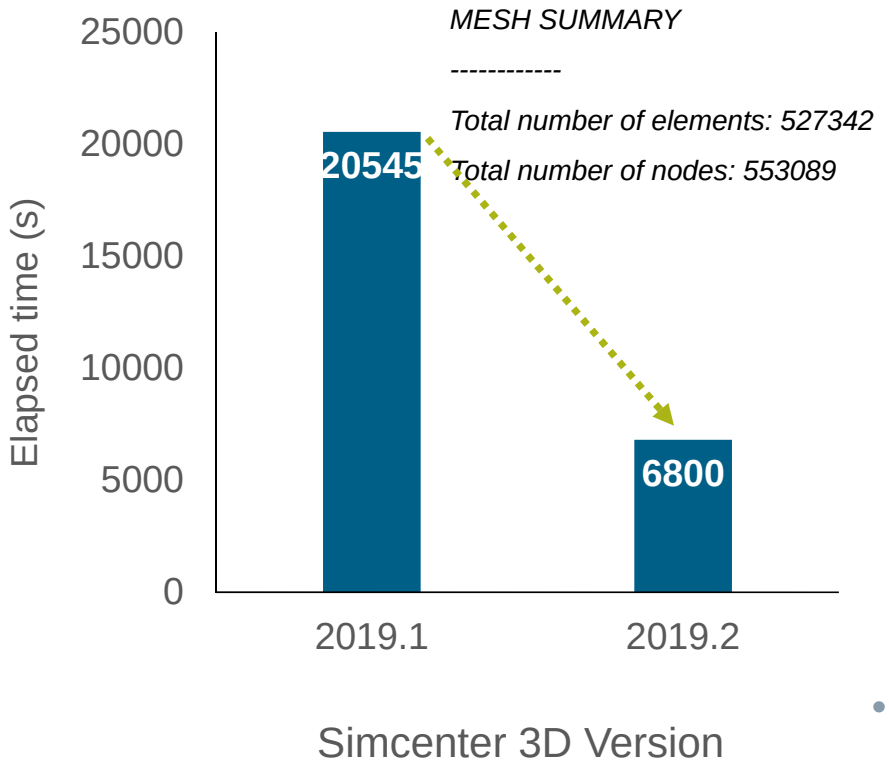


Challenge

- Performance of Response Dynamics is slow when computing elemental responses when large number of elements are present

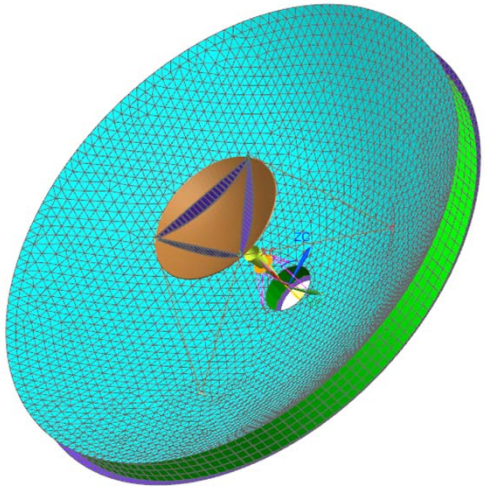
Solution

- Performance enhancements made in 2019.2 release

Benefits

- Shorter run time
- Productivity gains

- **3X Performance gains**



Simcenter Nastran
Modal Frequency Response Performance

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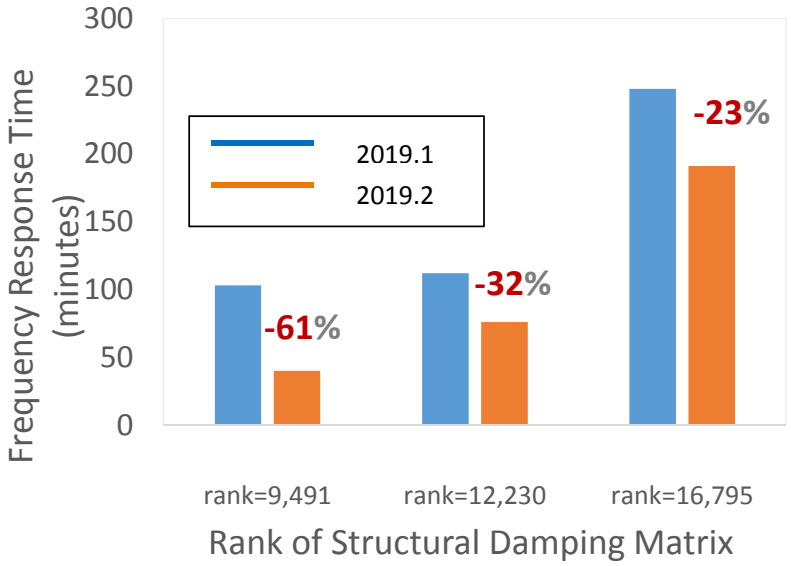

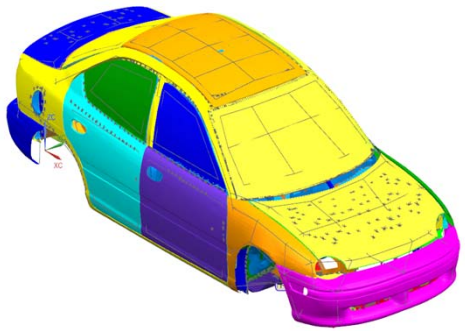

Challenge

- Large number of structural modes (10,000 – 25,000) modes
- Large number of fluid modes (5,000 – 15,000)
- Modal projection of structural damping matrix results for such models in coupled equations.
- If significant portion of the model has structural damping specified, this will result in so-called large rank structural damping matrix

Solution

- Performance enhancements

Benefit

- Boosts productivity

Up to 60% speed-up on largest (16.8K) rank model, at SMP=16

Simcenter Nastran
Direct Frequency Response Performance
(Un-symmetric Matrix Performance Improvements)

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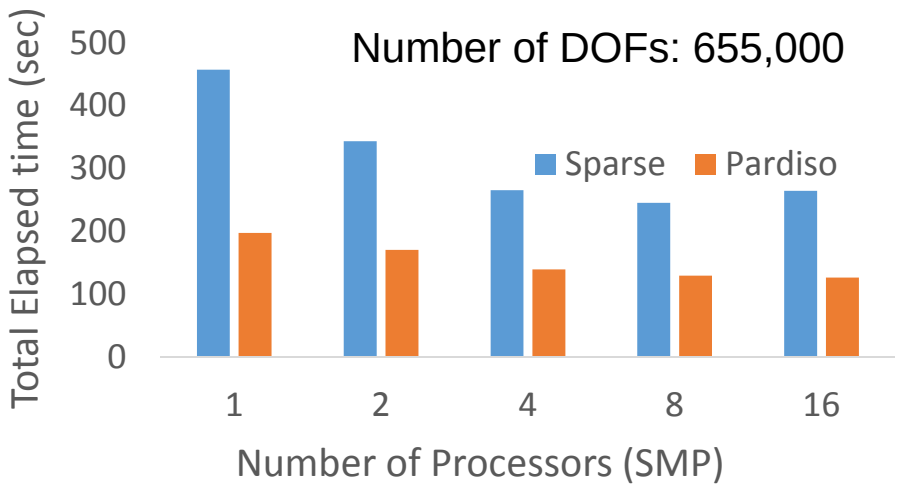


Challenge

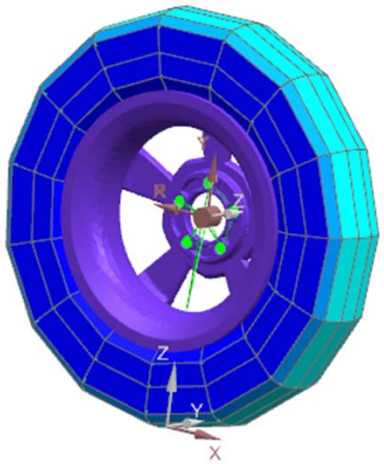
- Unsymmetric matrix results when contact and friction are included in the model
- Often included as direct matrix input (DMIG)

Solution

- New PARDISO solver now available to improve performance

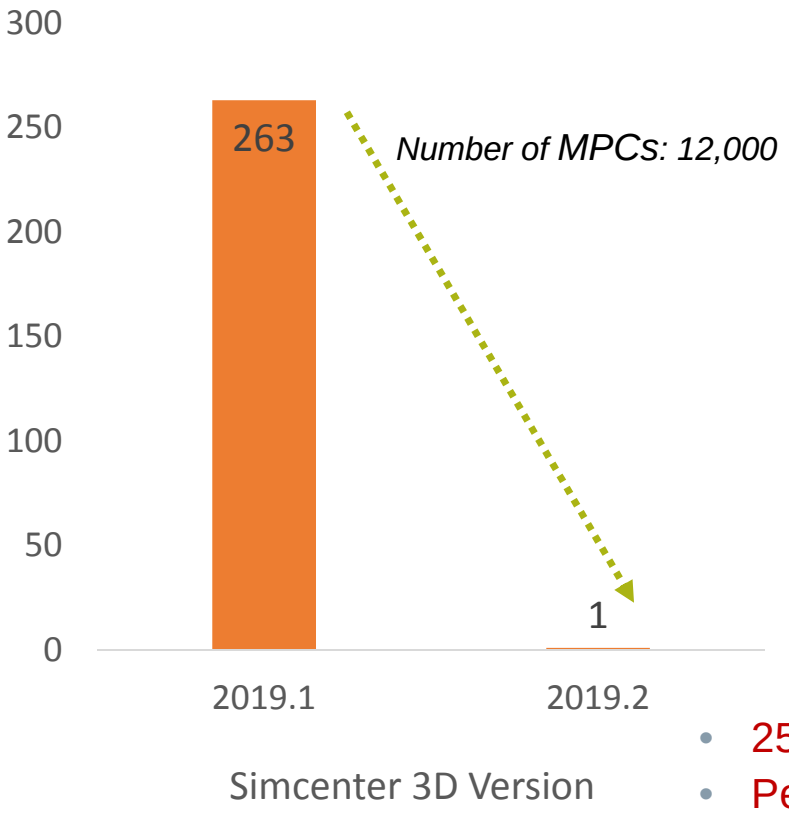
Benefit

- Productivity gains



- **Pardiso is up to 3X faster compared to Sparse solver, both in serial and SMP=16**
- **On larger problems (4,870,000 DOF) model, 4X performance improvement over sparse solver**

Simcenter Nastran Constraints Processing



Challenge

- Large number of MPCs results from
  - Mesh mating conditions
  - Modal representation of a model. MPCs here define relationship between physical and modal DOFs

Solution

- Improved performance in 2019.2 release

Benefit

- Shorter run time
- Productivity gains

- 250X Performance Improvements processing MPC equations
- Performance more pronounced when large number of MPCs are present

Transfer Path Analysis Support

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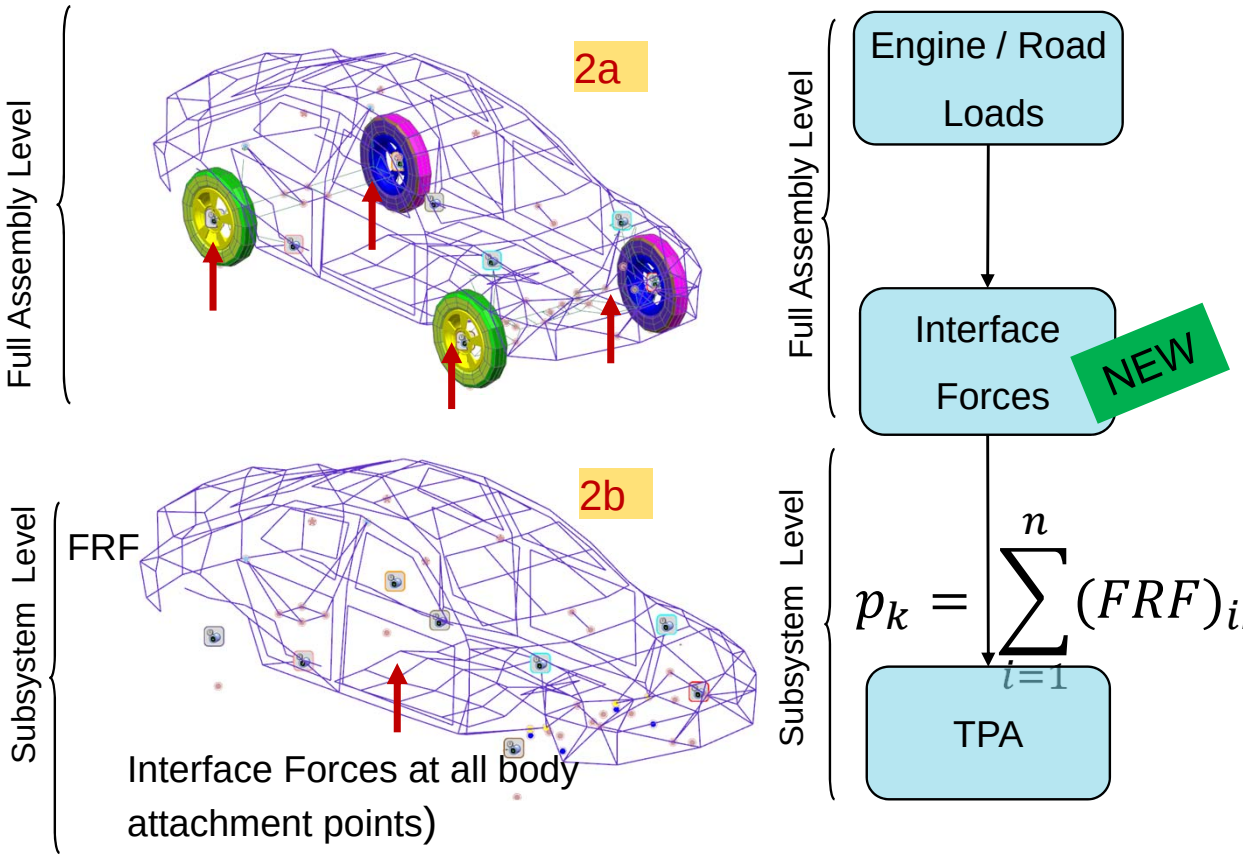

- Step 1 – Compute FRFs for the passive side (body)
- Step 2a – Compute equivalent connection forces connecting active and passive sides – operating load conditions
- Step 2b – Replace active side by equivalent forces. Contribution of of path “k” is given by.
- Load recipe supports spring/damper and bushing elements

Simcenter Noise & Vibration Modeling
Miscellaneous Improvements

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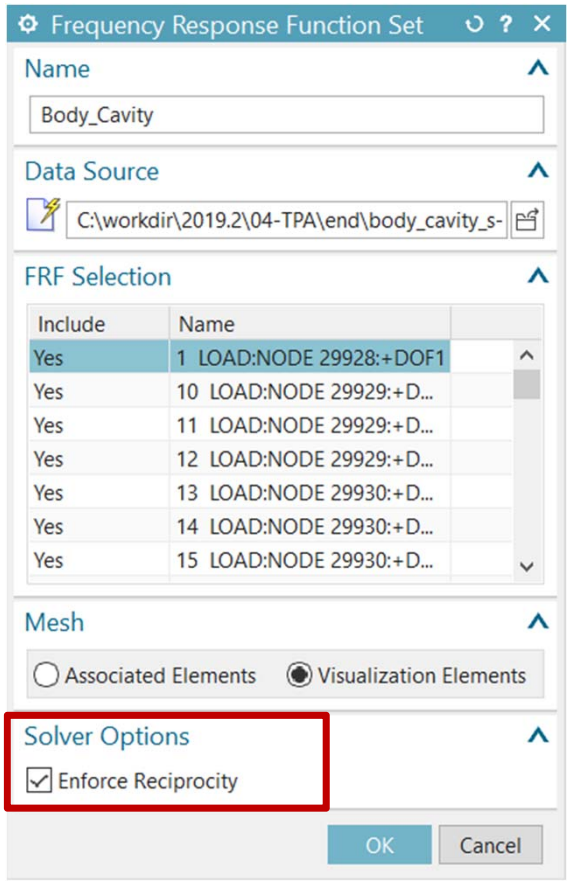

- Support for un-symmetric FRFs – typically from test measurements.
- When reciprocity enforced, FRFs are averaged on amplitude/phase

- Post processing support for MSC/Nastran panel, modal and grid contributions, i.e. support MSC/Nastran for NVH post-processing

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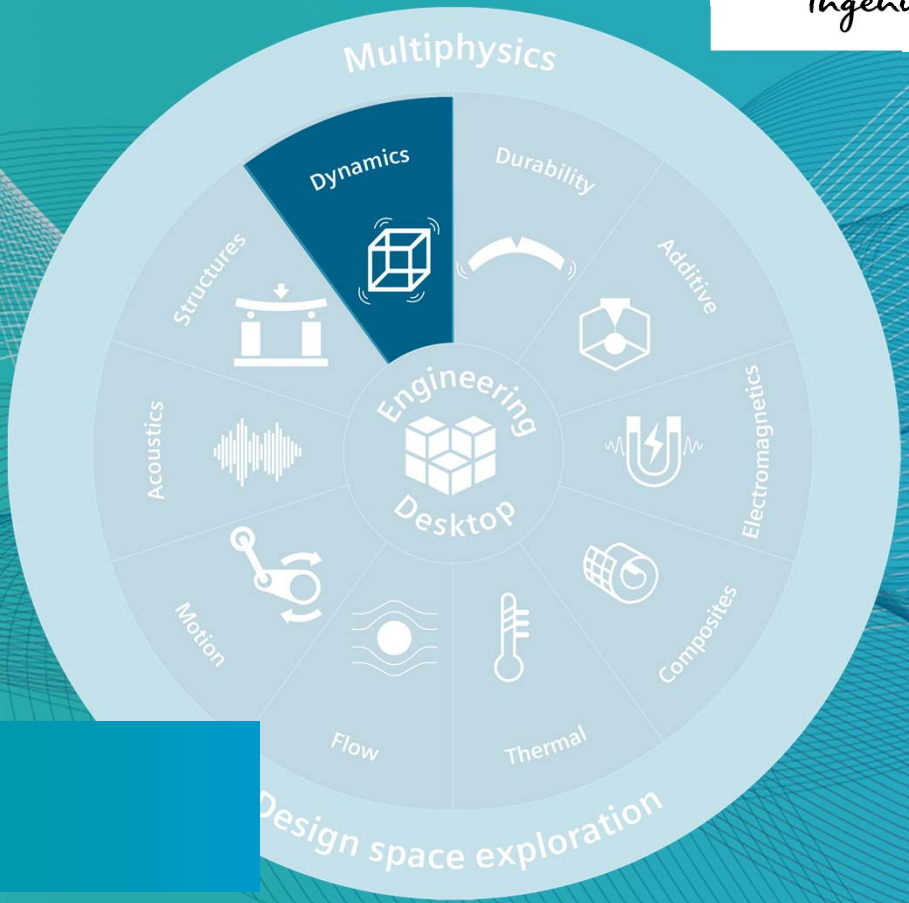

Thank You!

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