

What's New in Actran 2024.2

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Summary

Description

Hexagon is proud to announce the release of Actran 2024.2. The newest version of Actran offers an improved user experience, simplified external acoustic models, and many more features.

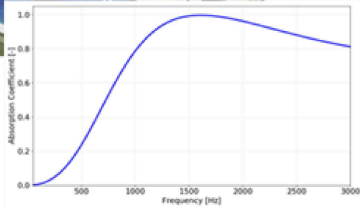
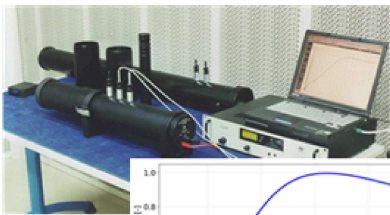
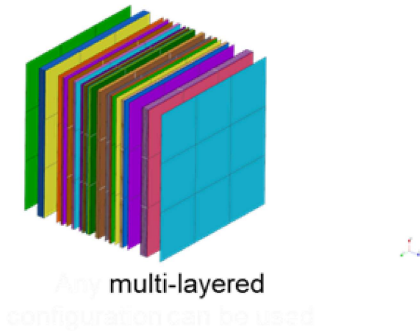
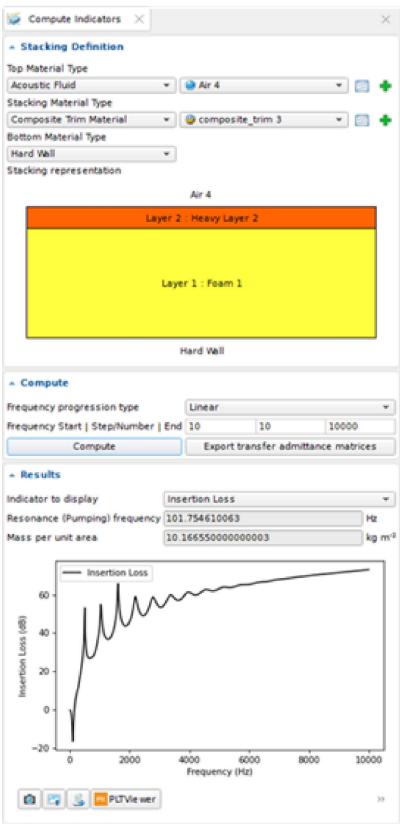
Release Highlights

Key highlights of of Actran 2024.2 include:

Faster Noise Reduction Assessments (TL, IL) for Trim Components

A new tool in ActranVI allows engineers to compute the Transmission Loss (TL), Insertion Loss (IL), and absorption coefficient analytically (based on normal incidence and displacements) and transfer the admittance matrix of any single or multi-layered material represented by a COMPOSITE_TRIM material or transfer admittance material. With these new capabilities, engineers will be able to:

- Quickly analyse the frequency behaviour of trims, with results equivalent to a Kundt's tube set-up.
- Compare the noise reduction potential of different trims before running an analysis on the full model.
- Design composite trims to reach a targeted noise reduction in each frequency range.

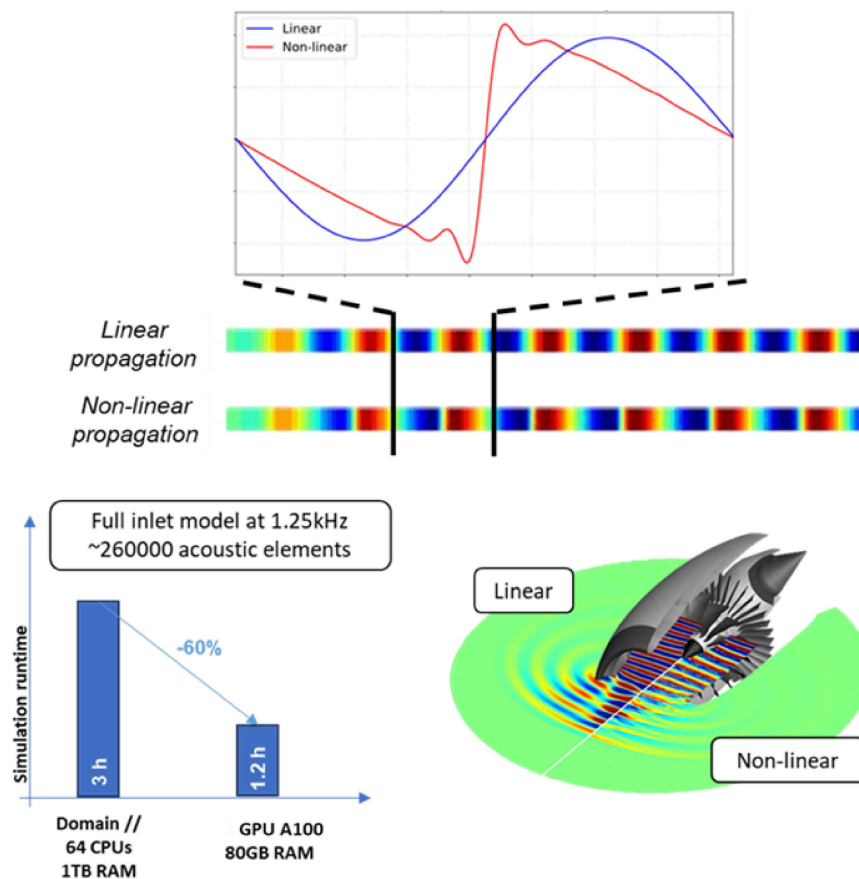


Results are equivalent to a Kundt's tube configuration

Nonlinear Acoustic Analysis in the Time Domain

Actran DGM 2024.2 introduces a new time-domain solver with nonlinear Euler equations. Nonlinear acoustics study sound waves when they interact with each other with a nonlinear medium, or when pressure fluctuations amplitudes are large enough. The soundwaves can present different types of behaviour such as harmonic generation, wave amplitude damping due to nonlinearity or new duct modes with a different azimuthal order. GPU acceleration in this release speeds up the process of solving these equations. With this new capability, engineers will be able to:

- Better handle cases like underwater acoustics, medical imaging, or acoustic wave propagation in turbomachinery where nonlinear phenomena are very likely to occur.
- Get more accurate noise levels and frequency spectrum predictions more quickly (tests show 30% to 60% reductions in the runtime compared to previous versions).
- Assess the validity of linear acoustic assumptions in use cases where nonlinear effects are likely to occur.

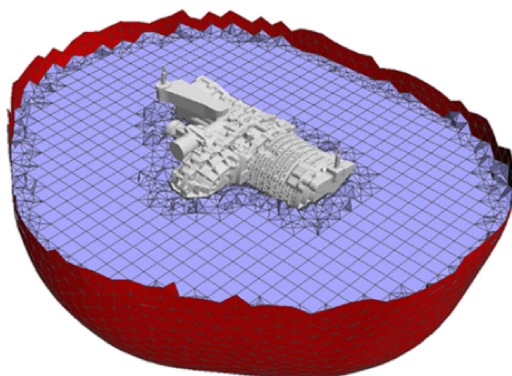


Exterior acoustic setup automation

Actran 2024.2 introduces a new AUTOMATIC mode for the EXTERIOR_ACOUSTICS component, which greatly simplifies exterior acoustic setup. Based on the domain size and interpolation, it automatically defines mesh properties such as the element size, number of elements by wavelengths, radiation volume thickness and non-reflecting boundary condition methods. All parameters are set to values reflecting typical best guidelines for exterior radiation simulations and can be modified for specific needs.

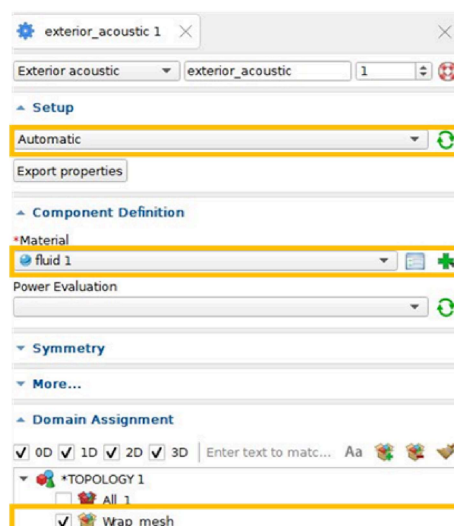
With this new capability, engineers will be able to:

- Get the right parameters for an accurate simulation on the first attempt.
- Save time during model set-up.
- Launch simulations without requiring a deep knowledge of adaptive meshing technology.



Typical model setup for free-field acoustic radiation

Number of inputs is reduced to 3

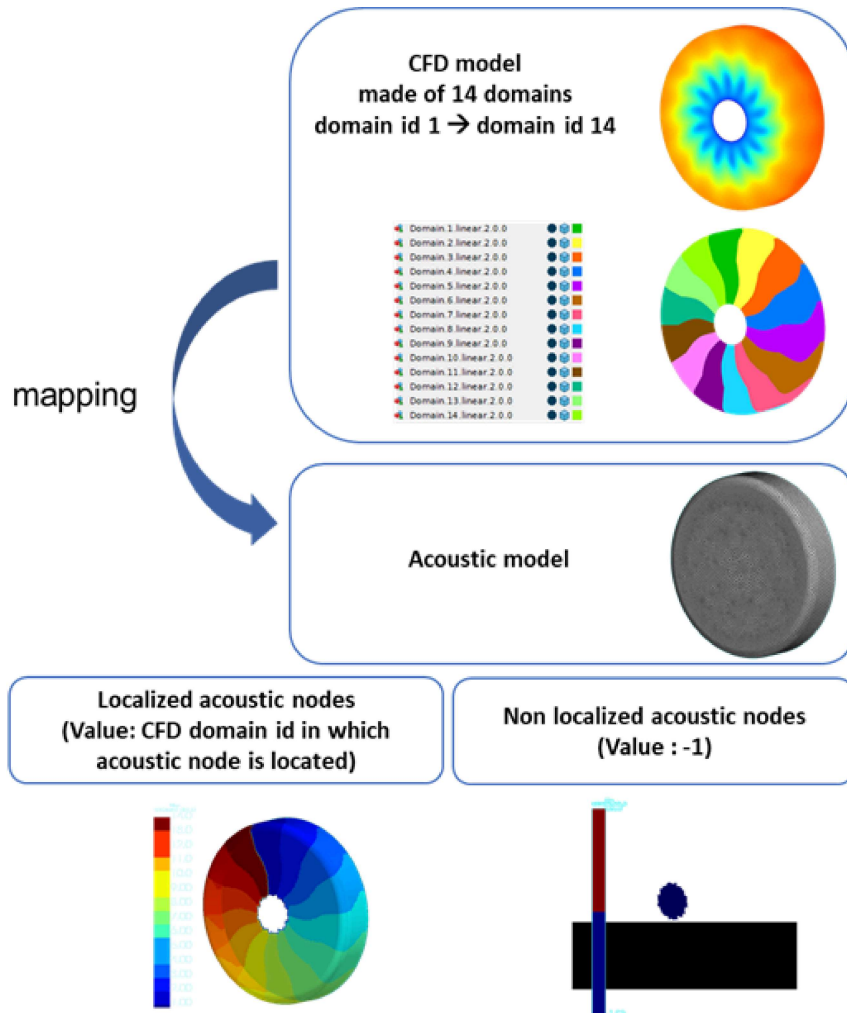


ICFD Projection Tool: CFD-Acoustic Coupling Check

A new EXPORT_LOCALIZATION keyword has been added in ICFD to analyse the placement of CFD cells in the acoustic cells. With this keyword, ICFD will output an NFF database data on the acoustic mesh containing all the necessary information to ensure localization is correct. Please note that the export_localization option can be used on the command line options to output this database and then stop the ICFD computation, allowing quicker iterations. Current supported CFD Formats: Star CD, Star CCM+, Fluent, Ensight-Gold, Fine Turbo, Cradle, Trace, OpenFoam, AcuSolve, ProLB and AVPB.

With this new capability, engineers will be able to:

- Automatically check and visualise the mapping between a CFD mesh and an acoustic mesh.
- Avoid launching expensive aeroacoustics runs where acoustic sources are not well accounted for.
- Get robust aeroacoustic data recovery.

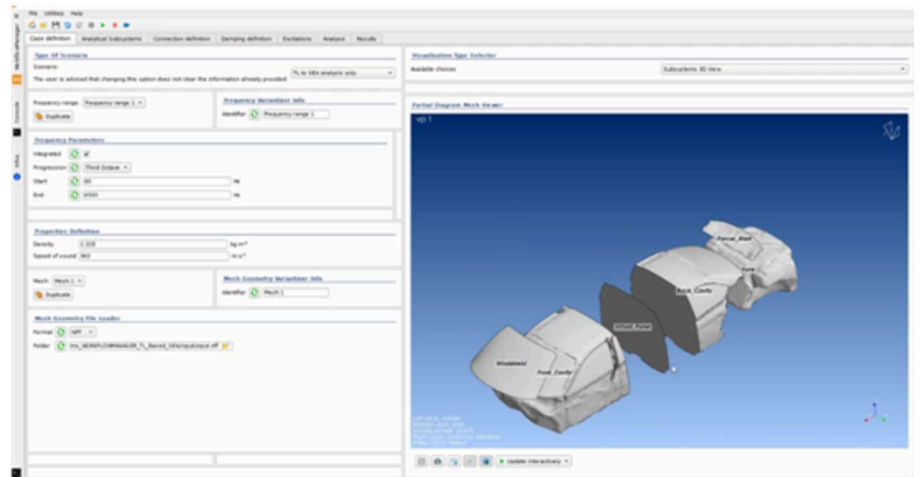
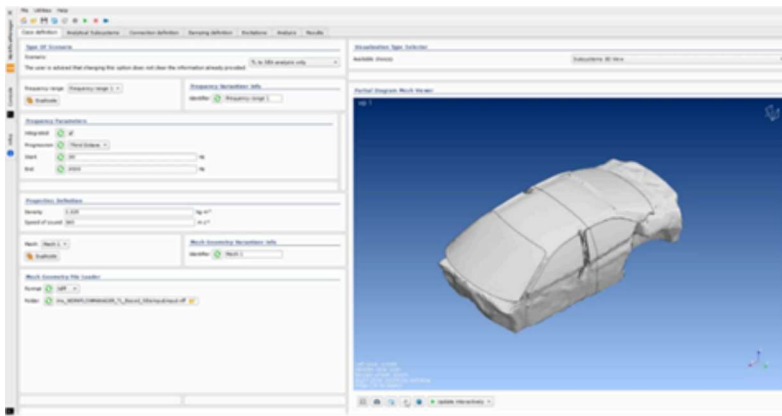


Graphics-based SEA Manager: 3D Visualisation

In addition to the existing subsystem's 2D schematic view, a 3D viewport has been added to the SEA Manager for much better model comprehension and interactivity. This enhancement is the first step towards a graphics-based SEA model setup.

With these new capabilities, engineers will be able to:

- Get a 3D view of the full model and its subsystem definition.
- Define the connections between the SEA subsystems more quickly.
- Better assess the energy transfer between subsystems and check plausibility.



Many More New Features

Several other new features are included in this version including:

- **Colour selections for materials:** ActranVI can now automatically assign colours or visibility states (opacity, wire mesh) to each material. These will be applied to all components that refer to those materials, allowing better model visibility based on materials. Clicking on a material will also highlight the parts of the model made of this material.
- **Support for arbitrary cross sections in iTM:** In addition to the canonical shapes (circular, annular and rectangular), iTM can now extract CFD data and apply it to the acoustic mode characteristics of any arbitrary shape. An acoustic modal extraction is done first on the given cross-section and the mode amplitude and phases are computed for the CFD based on those. Please note that arbitrary sections are only available with the SPPV method.
- **Virtual SEA performance improvements:** By automatically aligning the PID configuration of the model meshes with the subsystems, fewer matrices are computed and stored, leading to significant disk-usage gains (above 90%) and runtime gains (30 to 60%). As those matrices are computed based on bigger domains (subsystems), this can also increase the peak RAM consumption of the models (from 50 to 100%). If that is an issue, you can deactivate this by specifying DO_NOT_MERGE_PIDS 1 in the analysis parameters.
- **Load case management:** To ease pre- and post-processing of multi-load case Actran analysis, a "tag" mechanism has been implemented. Each load case has a unique set of tags (examples: boundary condition name, amplitude, radial order, user-defined tags, etc.). Those tags will then be carried over during the computation and present in the output files, allowing much easier load case identification during post-processing.