AVL EXCITE™ Acoustics by AVL

Airborne Noise Calculation

EXCITE™ Acoustics is a tool for the calculation of sound radiation in free field from vibrating structures such as engines and power units using the Wave Based Technique (WBT). It seamlessly fits into the EXCITE™ structural dynamic analysis workflow as the final step of acoustic analysis, using the FE mesh of the structure and the surface velocity results as input. With interfaces to common FE tools for the import of the vibrating structure geometry and the surface velocity boundary condition, EXCITE™ Acoustics can also be used as a standalone EXCITE™ tool.

Product Highlights

- Starts from unmodified structural finite element mesh

- Automated generation of acoustic mesh with model preparation complete in just a few clicks

- Applies on model for the entire frequency range

- Subsequently definable post-processing

- Integrated with OptiStruct

Learn more:
altairhyperworks.com/partner/EXCITE-Acoustics

Benefits

Meshing of the acoustic model starts from unmodified FE mesh used for the structural vibration analysis
no need to close smaller openings, to change element types

Fully automated generation of the acoustic mesh with interactive 3D viewer
easy and fast preparation of the calculation model with a few clicks

Acoustic mesh is not frequency dependent
accurate results with one model for the whole frequency range, high computational performance due to small acoustic models

Audible results
direct assessment of noise characteristics by hearing comparisons

Short analysis lead times from model preparation till result evaluation

Fast and flexible post-processing
microphone positions and field point meshes can be added or modified without recalculation of the sound radiation

## Features

Meshing tool
for automated generation of the acoustic WBT mesh

Various interfaces to import geometry and surface velocity boundary conditions of the vibrating structure
geometry - EXCITETM (.meg), Abaqus® (.inp), ANSYS (.rst), MSC Nastran® / NX Nastran® (.bdf, .op2), OptiStruct® (.op2)
surface velocities - EXCITETM (.mer), Abaqus® (.odb), ANSYS (.rst), MSC Nastran®/ NX Nastran® (.pch, .op2), OptiStruct® (.op2)

3D pre-processing viewer
for visualization of the acoustic meshing
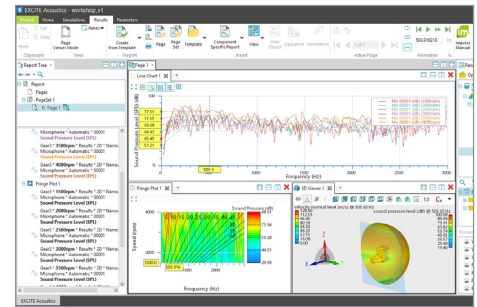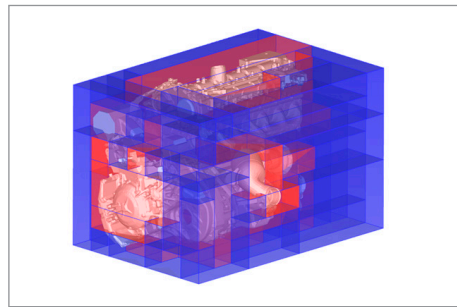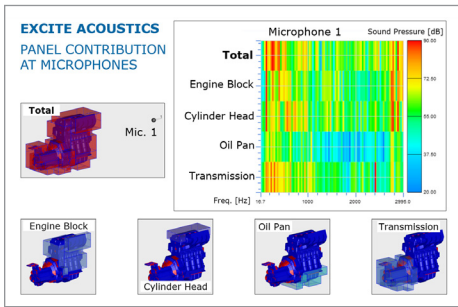
step results with interactive capabilities for optional mesh modifications

Optional constant or frequency dependent boundary conditions on selected structure parts (pressure, velocity or impedance)

Dynamic and fully automated mapping of structure boundary conditions and velocities on the acoustic mesh

OpenMP parallelized solver
for use of multiple CPU's for each frequency step

Default standard and user definable microphone positions

Field point mesh generator for 3D post-processing (plane and sphere)

integrated, interactive and synchronized 2D / 3D result evaluation of
active and reactive output power (on skin and/or arbitrary field point meshes)

Industry Applications

AVL EXCITE™ Acoustics is used for the sound radiation calculation for vibrating structures like engines, transmissions, entire powertrains, compressors, gensets and others.

About AVL List GmbH

AVL is the world's largest independent company for development, simulation and testing technology of powertrains (hybrid, combustion engines, transmission, electric drive, batteries and software) for passenger cars, trucks and large engines.

Scope of Business:
Development of Powertrain Systems -

AVL develops and improves all kinds of powertrain systems and is a competent partner to the engine and automotive industry. In addition AVL develops and markets the simulation methods which are necessary for the development work.

Engine Instrumentation and Test Systems - The products of this business area comprise all the instruments and systems required for engine and vehicle testing.

Advanced Simulation Technologies - The developed simulation software is focusing on design and optimization of powertrain systems and covers all phases of the development process.

About Altair Partner Alliance

Altair's HyperWorks platform applies a revolutionary subscription-based licensing model in which customers use floating licenses to access a broad suite of Altair-developed, as well as third-party, software applications on demand. The Altair Partner Alliance effectively extends the HyperWorks Platform from more than 20 internally developed solutions to upwards of 60 applications with the addition of new partner applications. Customers can invoke these third-party applications at no incremental cost using their existing HyperWorks licenses. Customers benefit from unmatched flexibility and access, resulting in maximum software utilization, productivity and ROI.

About Altair

Altair is focused on the development and broad application of simulation technology to synthesize and optimize designs, processes and decisions for improved business performance. Privately held and headquartered in Troy, Michigan, USA

the company operates globally to serve customers in a diverse range of industries including automotive, aerospace, defense, meteorology, architecture and construction, energy, electronics, and consumer goods.

"Our tools offer valuable capabilities that complement very well what Altair is supplying to their customers. We are convinced bringing these products together will help our mutual users achieve better solutions more efficiently."

Dr. Gotthard Ranier
Vice President
AVL Advanced Simulation Technologies