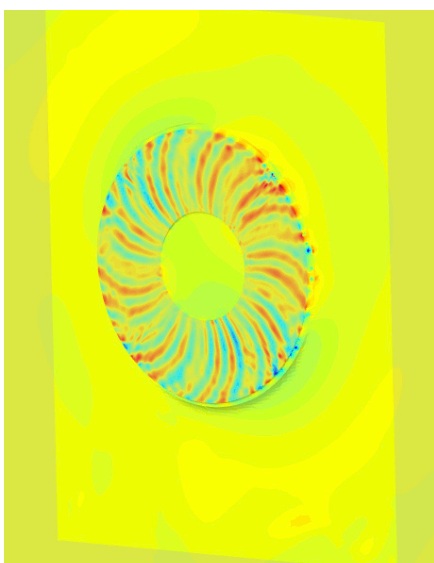


KEY FEATURES

- > All ACTRAN Acoustics features (see dedicated flyer)
- > Two-step aero-acoustic approach: transient CFD followed by acoustic radiation
- > Direct interface to most leading CFD codes using native CFD file formats
- > Direct and iterative solvers for fast CPU times
- > Available platforms: Windows 32 & 64 bits, Linux and most Unix platforms
- > Compatible with other ACTRAN modules for aero-vibro-acoustic simulations
- > Integration in ACTRAN VI

Target applications

- > Air conditioning modules (HVAC).
- > Side mirror noise.
- > Airframe noise (landing gear, trailing edge).
- > Air distribution systems.



Pressure level generated by an axial fan - Model courtesy of Trane™.



Product overview

Predicting the noise generated by complex flows

ACTRAN AeroAcoustics is a finite element based acoustic solver for predicting the noise generated by turbulent flows. ACTRAN AeroAcoustics recovers aerodynamic noise sources from flow simulations performed with commercial CFD codes such as Fluent™, Star-CD™, StarCCM+™ or Powerflow™.

The complete simulation procedure involves three steps:

1. An unsteady flow simulation is performed by the CFD code. At each time step, the CFD solution (velocity, density and pressure fields) is stored in its own native format or in the Ensight™ format.

2. ACTRAN AeroAcoustics computes the aero-acoustic noise sources from the CFD results produced in step 1. This involves translating results from the time to the frequency domain and interpolating them from the CFD to the acoustic mesh. Maps of the aero-acoustic sources produced at this stage are in themselves useful results which can be used to identify the most effective

sources.

3. The radiated acoustic field is then computed. This produces a wide set of relevant results: acoustic pressure, velocity or intensity maps, frequency response functions of various local (pressure) or global (power) quantities.

This multi-step strategy offers several advantages: (1) Each part of the work can be done independently by different engineers, departments or even companies with different responsibilities or skills. (2) A single CFD simulation can feed different acoustic simulations (e.g. with different acoustic treatments). (3) The acoustic mesh does not need to be refined where the aerodynamic structures are small (for instance in the boundary layers).

ACTRAN AeroAcoustics offers high performance solvers and parallel processing features and is fully integrated in ACTRAN VI.

ACTRAN AeroAcoustics can be combined with ACTRAN VibroAcoustics in order to address aero-vibro-acoustic challenges.

ACTRAN AeroAcoustics

THE ACTRAN SOFTWARE SUITE

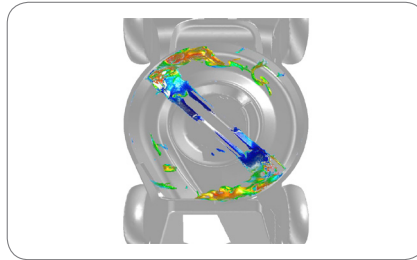
ACTRAN is the most complete acoustic, vibro-acoustic and aero-acoustic CAE software suite. Under a common technological umbrella provided by the finite and infinite element method, ACTRAN provides a rich library of elements, material properties, boundary conditions, solution schemes and solvers. ACTRAN is a high performance, high productivity, high accuracy modeling environment suiting the needs of the most demanding engineers, researchers and teachers and empowering them with the tool they need for solving the most challenging acoustic problems.

FREE FIELD TECHNOLOGIES

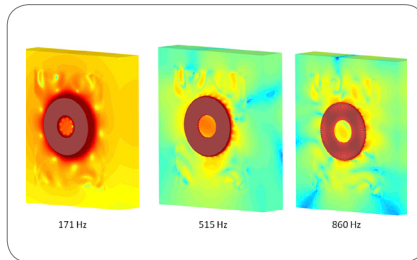
Free Field Technologies develops, maintains, supports and sells the ACTRAN acoustic CAE software suite. The company also provides related support, technology transfer, engineering, technical support, training and customization services.

FFT operates from its headquarters in Mont-Saint-Guibert (Belgium) and from local offices in Toulouse (France) and Tokyo (Japan). ACTRAN is distributed worldwide by a dense network of partners; please contact us for details of your nearest partner.

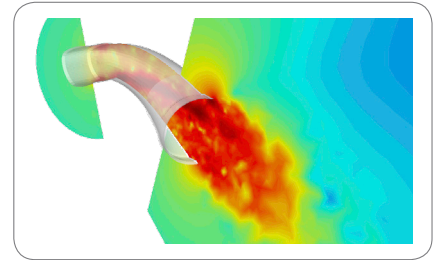
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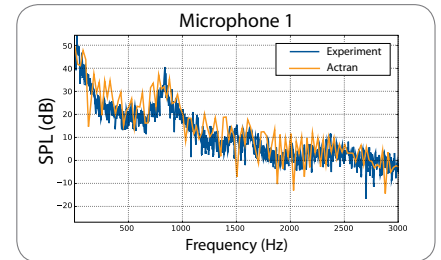
Aeroacoustic source term - Model courtesy of John Deere™.



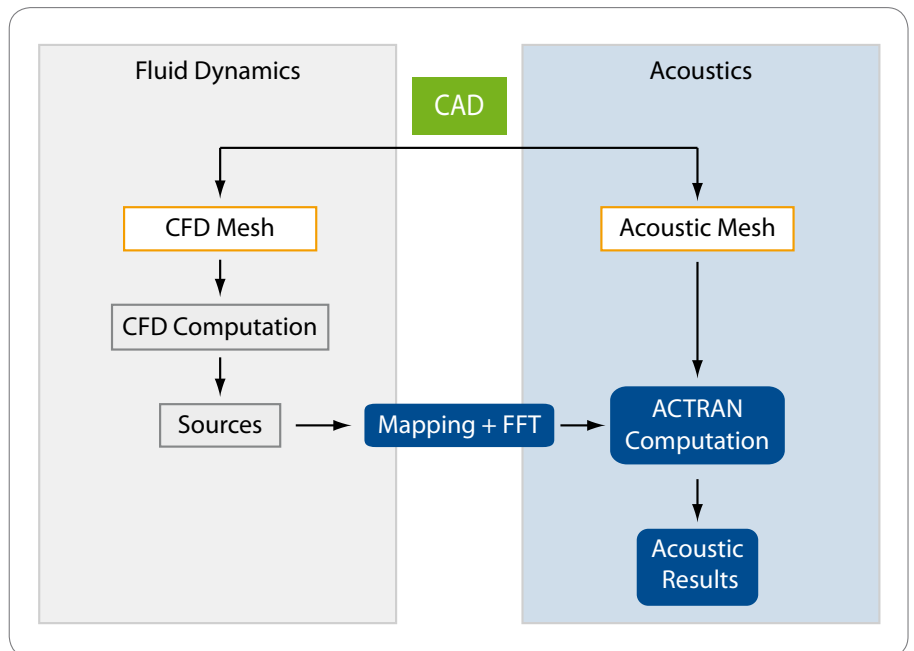
Pressure levels at different frequencies - Model courtesy of Trane™.



Sound pressure level distribution - Model courtesy of Visteon™.



Correlation between ACTRAN AeroAcoustics predictions and measurements - Model & results courtesy of Visteon™.



Computational process overview.

FREE FIELD TECHNOLOGIES

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