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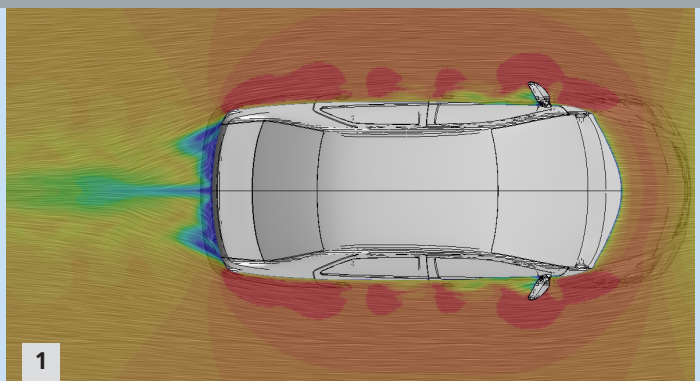
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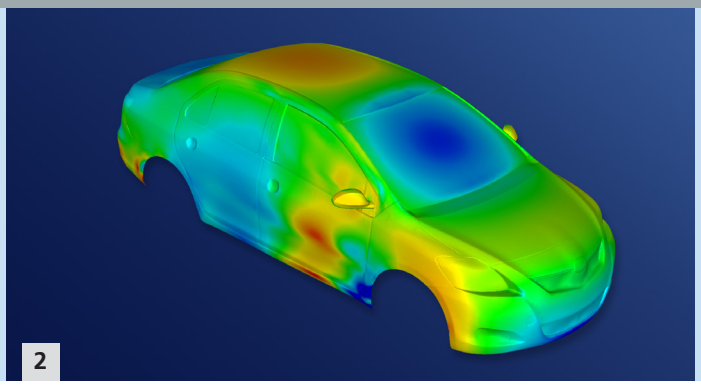
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1 *Aerodynamic simulation result in StarCCM+.*
2 *Frequency response analysis on a door using Nastran and CDH tools.*

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MpCCI
FSIMapper

AERODYNAMIC LOADS IN A FULL-VEHICLE NVH ANALYSIS

Aerodynamic Induced Noise

Many vibration and acoustic effects in full vehicles are caused by fluctuating aerodynamic loads. Related tasks in automotive development are

- analysis of underbody paneling and attachment to body,
- analysis of engine hood flatter,
- interior acoustic analysis with external aero-acoustic loads.

In order to perform realistic noise vibration harshness (NVH) analysis, the exciting aerodynamic forces have to be taken into account.

MpCCI FSIMapper

The tool MpCCI FSIMapper builds the link between the simulation of the vehicle's aerodynamics and the NVH-simulation. It transfers the pressure excitation from the CFD calculation to the (not necessarily matching) NVH-mesh.

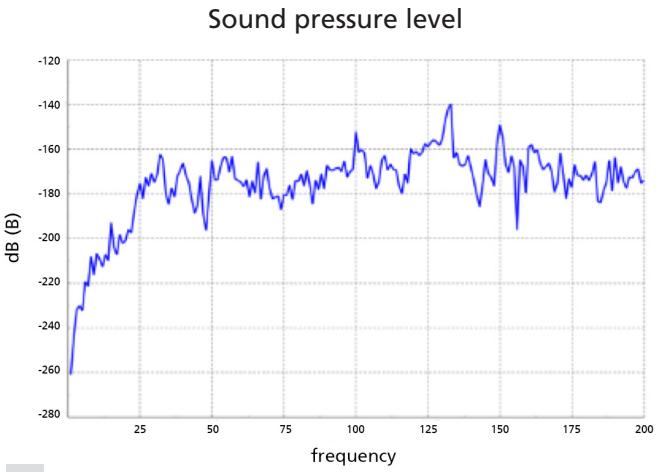
The transient pressure fluctuations on the vehicle's surface can be automatically transformed by a Fourier decomposition in order to create the frequency dependent loading for the vibration analysis.

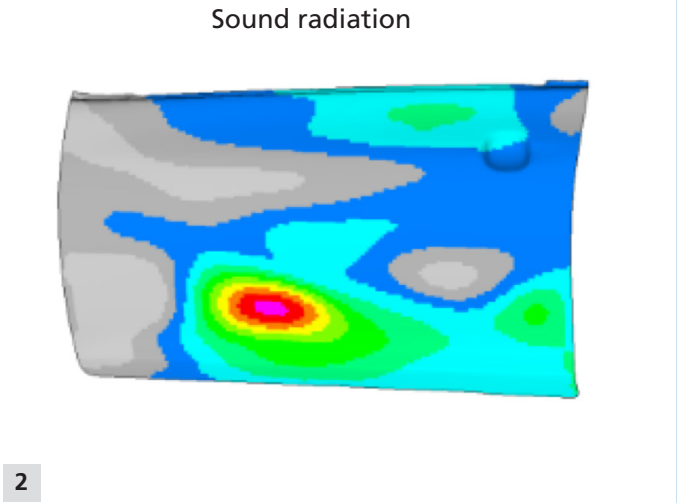
The tool offers features such as windowing, time range filtering and frequency truncation for the export.

For Nastran NVH analyses, the optimized export format "Rload1_Opt" is available for efficient simulations using CDH/AMLS.

Cooperation with CDH AG

In 2016, CDH AG has been granted marketing, sales and support rights to distribute MpCCI solutions in North America and Japan.





1+2 *Post-processing examples using GNS Animator & CDH/TPA.*

Software Solution

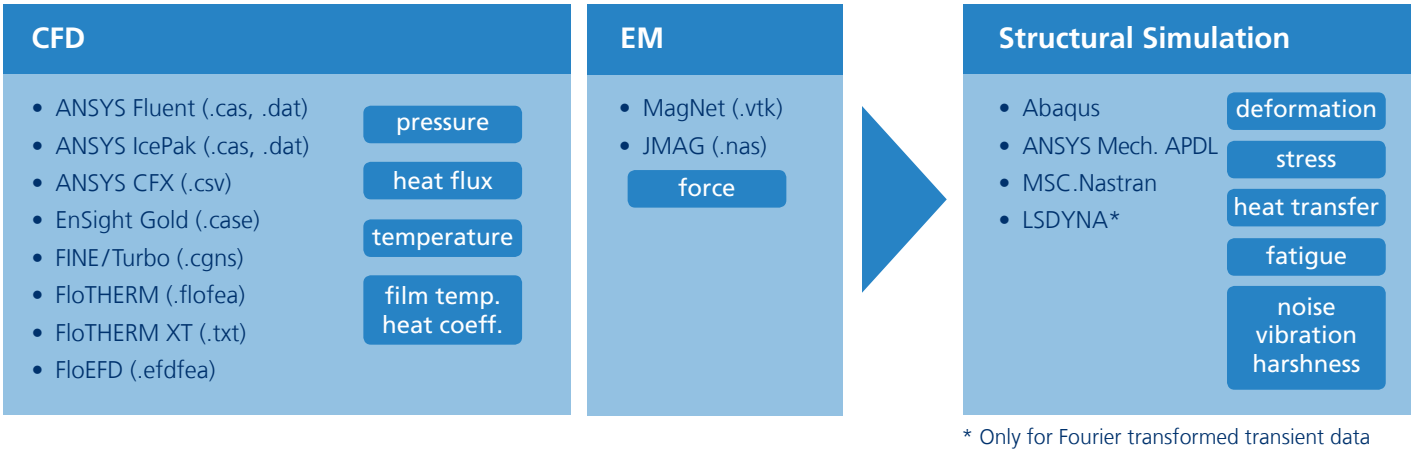
MpCCI FSIMapper is a vendor-neutral mapping software, building a unidirectional file-based interface between simulation tools. It offers different spatial interpolation algorithms in order to transfer simulation results to a structural simulation mesh. The mapping algorithms handle different source and target mesh discretizations, element types, geometries and unit systems. The tool is also available in batch mode.

MpCCI FSIMapper allows to read data of various CFD result formats as well as two EM result formats. The supported EnSight Gold format can be exported by diverse CFD tools which enlarges the practicability. The mapped data is exported into the native target simulation syntax.

Special Features

For NVH analyses, the tool offers a Fourier transformation of transient data. The data set can be thinned out and a window function can be applied. The maximal frequency to be exported can be set. If the target code is Nastran, the export can be controlled concerning the used bulk data entries.

MpCCI FSIMapper 4.5.1 will support the mapping from a symmetric CFD simulation to a full vehicle NVH analysis.



* Only for Fourier transformed transient data