Mid-High Frequency Modelling of Vehicle Noise and Vibration

Fact Sheet

Project Information

MHIVEC
Grant agreement ID: 612237
Funded under FP7-PEOPLE
Project website
Overall budget € 1 944 975,26
Status Closed project
EU contribution € 1 944 975,26
Start date 1 September 2013
End date 31 August 2017
Coordination by THE NOTTINGHAM TRENT UNIVERSITY
United Kingdom

Objective

The control (and avoidance) of vehicle noise and vibration (NV) provides a crucial competitive advantage for car manufacturers due to the drive for lower noise pollution levels and enhanced driving comfort. NV issues can seriously detract from the reputation of a vehicle with a knock-on detrimental effect for the entire brand.

As the automotive industry moves towards virtual prototyping, the simulation and modelling of vehicle NV is becoming increasingly important. Providing accurate numerical predictions in this area is an extremely challenging task. A detailed analysis of the structural vibrations on very fine scales is required, and small parameter changes can lead to large shifts in the frequency response function for a given vehicle. The wide range of materials and intricate couplings between different components provide enormous challenges for the NV simulation of a full vehicle, especially in the range of frequencies above 500Hz. Robust and efficient NV modelling techniques are, however, urgently needed by vehicle manufacturers for
cutting costs by removing the need to develop expensive physical prototypes.

The range of existing techniques addressing NV issues as part of the Computer Aided Engineering (CAE) toolkit is not adequate. The methods are not robust for frequencies over 500Hz and do not naturally fit into the simulation environment of CAE, where structural data are provided via mesh specifications. Only recently have these problems been overcome through new solution techniques developed and tested by the academic members of this project. Together with two specialized SMEs and the car manufacturer Jaguar Land Rover, this interdisciplinary and inter-sectoral consortium will develop the first black-box and mesh based tool for the vibro-acoustic analysis of a full vehicle body. This will catapult noise and vibration analysis from the research and development stage to a fast and reliable everyday tool for the engineering practitioner.

Field of science

/natural sciences/earth and related environmental sciences/environmental sciences/pollution

Programme(s)

Topic(s)

Call for proposal

FP7-PEOPLE-2013-IAPP

Funding Scheme

MC-IAPP - Industry-Academia Partnerships and Pathways (IAPP)

Coordinator

THE NOTTINGHAM TRENT UNIVERSITY

Address
50 Shakespeare Street
NG1 4FQ Nottingham
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Activity type
Higher or Secondary Education Establishments

EU contribution
€ 480 342,72

Website

Contact the organisation

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<th>EU Contribution</th>
<th>Address</th>
<th>Activity Type</th>
<th>Website</th>
<th>Administrative Contact</th>
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<tbody>
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CDH AG

Germany

EU contribution

€ 49,514.04

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Activity type
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Last update: 8 January 2018
Record number: 109993

Permalink: https://cordis.europa.eu/project/id/612237/

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