



Component-based transfer path analysis and virtual prototyping

MASTER CLASS | June 11-12-13, 2024 | Leuven, Belgium

The component-based TPA and virtual prototyping master class is a 3-day live training. It brings the NVH community together in the [NVH facility](#) in Leuven, Belgium, for lectures and insights from industry experts, OEMs and suppliers. Supported by live demonstrations, interactive sessions, four hands-on workshops, and an expert panel discussion, it offers insights and best practices for going from physical prototype troubleshooting to virtual prototype prediction.

Targeting the test & CAE NVH community

The component-based TPA and virtual prototyping master class aims to strengthen your network and create an inspiring environment where innovation happens. It is designed for NVH managers, experts, and engineers at both OEMs and automotive suppliers who want to reduce physical prototype iterations and orchestrate smoother usage of data between independent development teams within or even outside the organization, get inspired by new methodologies for NVH engineering and how to combine test and CAE models in assemblies, learn how to predict system behavior after integration, and skill-up your measurement work as well as how to use CAE data can be used in virtual assemblies.

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Agenda

Tuesday, June 11

The essentials behind virtual prototyping for NVH: From physical prototype troubleshooting to virtual prototype prediction

The theory behind component-based TPA & in-situ TPA:

- Methods for obtaining reliable invariant structural loads, such as blocked forces
- Addressing airborne loads
- Coupling sources towards receiving structures, using frequency-based substructuring

Putting the theory into practice:

- How to do instrumentation for in-situ TPA
- What are virtual points and why are they important (with practical examples)
- Invariant source characterization on tire, auxiliaries and powertrain case studies



Customer contribution:

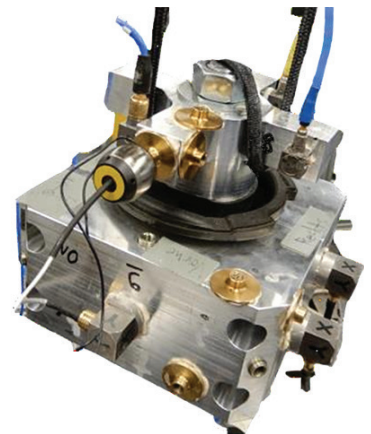
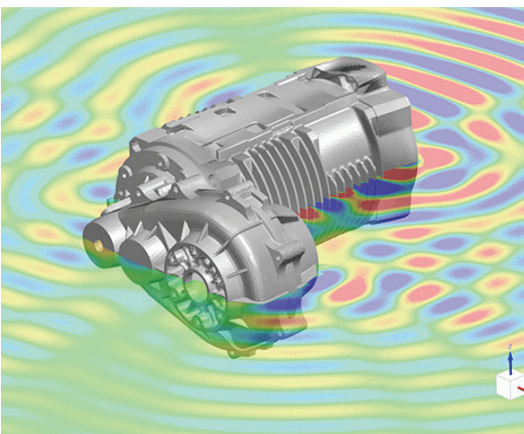
American Axle – Blocked force characterization on beam axles

Bryce Ziegman

Senior NVH Project Engineer

Component-based TPA case studies: Presenting cases to give insight into typical (step-by-step) method validation & adoption for different applications, such as e-powertrain integration, road noise, and exterior noise

Free evening



Wednesday, June 12

Component modeling and virtual prototyping as a company process: In this session, we explain how to take the technology discussed so far, toward an implementation across the full NVH development:

- Creating test or CAE-based component models for more easy and fail-safe coupling into virtual assemblies, using data from different stakeholders
- Examples of prediction and analysis virtual prototypes for different NVH applications
- Typical pitfalls when implementing this process in larger teams and how to overcome those
- Examples of how to manage component models throughout the company and maximize their usage in NVH engineering



Customer contribution:

Vision and process implementation of Virtual Prototyping at Renault

Philippe Mordillat

CAE NVH – S&D Expert



Customer contribution:

Component-based TPA and electrical drivetrain acoustics at BMW

Dr. Arthur Hülsmann

Referent NVH Elektrischer Fahrzeugantriebe

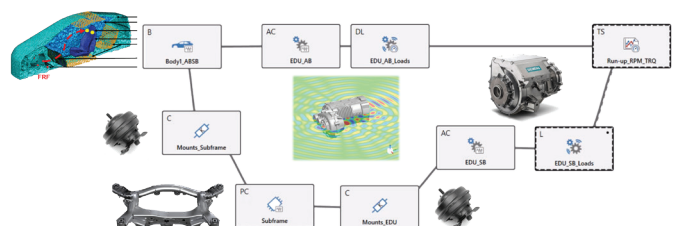
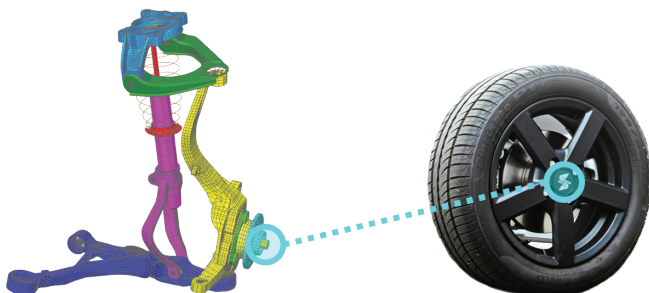
FRF data collection techniques: From impact hammer towards shakers. Considerations on different measurement techniques for FRF data collection:

- Different approaches when using an impact hammer
- Shaker-based data collection
- Examples

Rotating workshops in small groups – part 1/2:

- Collecting data for blocked force characterization on a tire
- Data collection on a receiving structure
- Calculating blocked forces and preparation of components that can be used throughout the organization
- Combining test & CAE data into virtual prototypes

Dinner & Networking



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Thursday, June 13

Auralizing virtual assemblies:

- Evaluate virtual prototypes subjectively using NVH simulators
- Examples of how to predict KPIs, such as articulation index, loudness, ... from virtual prototypes

Application examples from Siemens STS Practice (Engineering Services):

- Mount stiffness matrix characterization for higher frequency
- Powertrain integration examples
- Blocked force characterization of a rolling tire (versus static tire)
- Decoupling methods/techniques



Customer contribution:
**Industry innovation introduction –
BOSCH's Award Winning predictiveVIA**
Michael (Michi) Sturm
NVH Specialist / VIA Co- Inventor



Alastair (Al) Deane
Virtualization Projects

Rotating workshops in small groups – part 2/2:

- Collecting data for blocked force characterization on a tire
- Data collection on a receiving structure
- Calculating blocked forces and preparation of components that can be used throughout the organization
- Combining test & CAE data into virtual prototypes

Research on virtual prototyping

Q&A session with a panel of experts



[Register now](#)

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