VIBES.technology

Improving sound & vibration engineering

SOURCE

Software for source characterization and component TPA using Blocked Forces

ACCURATE CHARACTERIZATION OF **ACTIVE SOURCES**

Source Characterization and Transfer Path Analysis (TPA) are two highly popular topics in sound & vibration engineering. They enable a modular NVH approach that combines well with dynamic substructuring. Accurate characterization of active sources, typically by Blocked Forces, requires a clear and robust workflow with quality checks at each and every step.

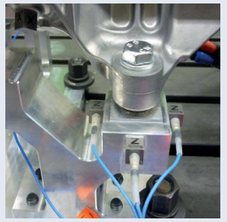
SOURCE is the software application that enables you to do all of this. SOURCE lets you easily import and combine data from popular data acquisition systems. All variants of source characterization and TPA have been implemented in one intuitive application, designed from a clear vision towards high-quality and traceable source and TPA calculations.

> SOURCE implements the entire TPA framework as a powerful and user-friendly application.
>
> – Maarten van der Seijs, CTO **VIBES.technology** –

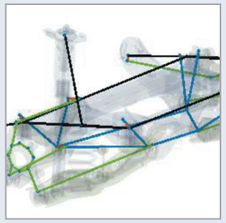
EXAMPLES

BLOCKED FORCES FROM TEST BENCH

Independent source descriptions (blocked forces) of tonal and broadband noise sources, can be acquired on component test benches. For accurate predictions, the **transferability** (from bench to vehicle) of the source description is key. SOURCE assists the engineer to monitor the calculations for the highest quality possible. This clear process improves the collaboration between supplier and OEM.



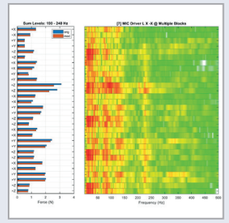
RESPONSE-ONLY ANALYSIS



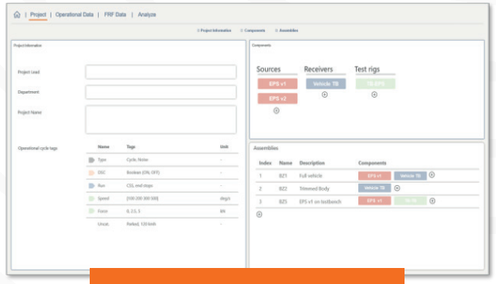
Operational deflection shape (ODS) analysis and **Operational TPA** on response-only data-analysis. These analyses will provide valuable in-sights in the interaction between sub-component and the vehicle. SOURCE allows to obtain these analyses within seconds into the data such that the engineer can focus on improving the product.

INNOVATIVE PATH-RANKING TOOLS

SOURCE allows the user to **combine various TPA methods** with ease. For example, the conversion from component to classical TPA is made easy and intuitive. Together with new contribution analysis methods, new engineering insights are created in all phases of the vehicle development.



WORKFLOW **SOURCE**



SOURCE features a **unique project management workflow**, which lays out the basic organization for your project.

PROJECT DEFINITIONS

Components & Assemblies
Test assemblies are organized from combinations of components, such as full-vehicle assemblies, test-bench set-ups and active component variants. This way, SOURCE automatically understands which types of TPA to apply based on the available data.

Tags
Manage your operational conditions with custom tags, e.g. for load cases, speeds and on/off states. This way, SOURCE helps you to easily label and find the relevant data sections in larger projects.

Channel mapping
Channels from different datasets quickly become ambiguous and numerous. SOURCE handles channels in an innovative way by keeping a unique list of master channels. By assigning roles such as indicator, active/passive-side or on-board validation, relevant TPA methods are unlocked whenever possible.

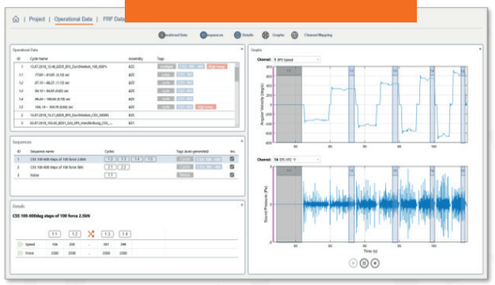
DATA HANDLING

Data import
Operational and FRF data is imported from popular data acquisition systems using ASAM-ODS (ATFX), or from **DIRAC**, MATLAB and Universal file format (UFF).

Powerful bulk data processing
SOURCE is optimized for handling large data batches. A quick analysis on a few datasets is computed with the same ease and performance as an extensive analysis over several tracking parameters.

Data quality checks
SOURCE comprises innovative tools to assess data integrity, such as the matrix viewer for FRF data, and Operational Deflection Shape (ODS) animations for operational measurements.

SOURCE is designed for **smart and intuitive data handling** and works with data from all popular data acquisition systems.



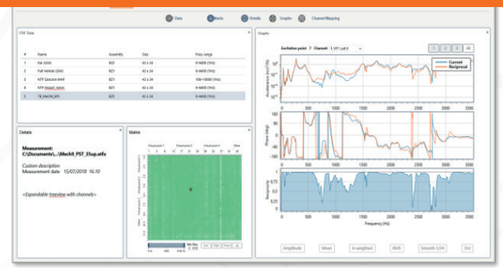
SOURCE CHARACTERIZATION

Blocked and interface forces
Combine several source descriptions, such as interface forces and blocked forces from a rigid test bench or in-situ measurement. Depending on available data, blocked forces can be converted into interface forces and vice-versa.

Advanced calculations
Employ mathematical techniques, such as regularization and truncation for matrix inversion. SOURCE uses optional noise and calibration measurements to automatically suggest optimal settings.

ISO-standard compliant
SOURCE, in combination with **DIRAC**, are the perfect software solutions for implementing standardized workflows as described in ISO/NWIP 21955 and ISO/CD 20270.

With all definitions and data in place, the calculation of the forces is a simple next step. **SOURCE supports different workflows**, think blocked & interface forces, two ISO standards and automatic & manual settings for the matrix inversion.



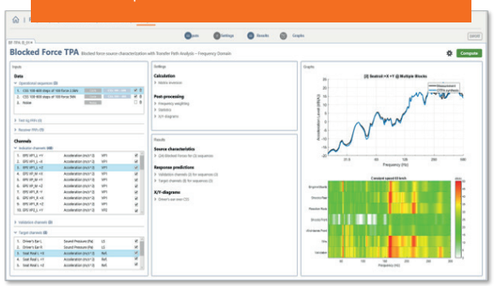
PREDICTION & AURALIZATION

Data Visualization
Use the advanced graphing capabilities to compare different settings, validate results or build your preferred personal evaluation dashboard.

Prediction & Optimization
Combine the obtained source descriptions with vehicle NTFs to make predictions of the interior noise. Optimize by changing NTFs or adjusting rubber bushing stiffnesses.

Auralization
Auralize the results to play back audio over your speakers or headphone. Export audio files to be shared with others or for playback in advanced sound evaluation studios.

Operational data and FRFs are combined to calculate blocked and interface forces. Combine the forces with (virtual-point transformed) FRFs and NTFs to make **TPA predictions** and evaluate different transfer paths.



EXCITED ABOUT **SOURCE**? GET IN TOUCH FOR **A DEMO**

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