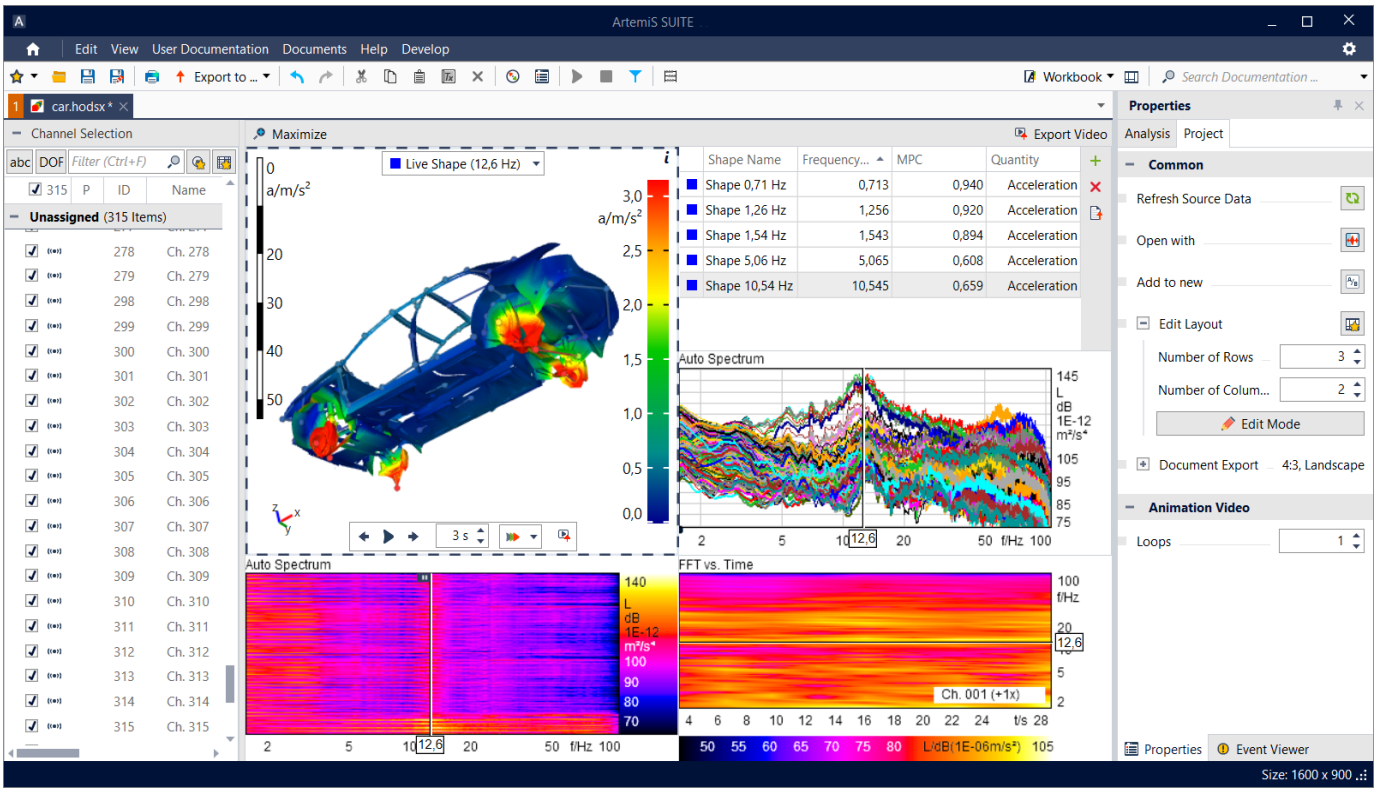
HEAD acoustics

DATA SHEET



ArtemiS SUITE
PRoject

Code 50400

APR 400
ODS Project

The ODS Project of ArtemiS SUITE enables users to combine vibration measurement results with 3D and CAD object data in order to conduct a detailed structural analysis of dynamic behavior.

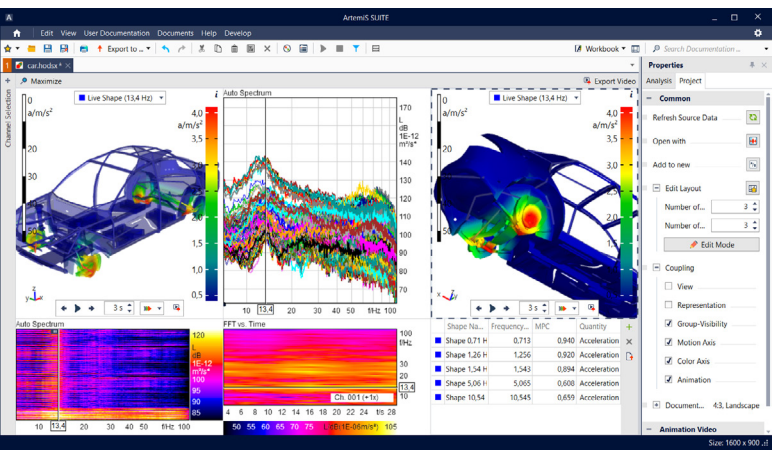
OVERVIEW

APR 400
ODS Project

Code 50400

The ODS Project (Operating Deflection Shape) is a part of the ArtemiS SUITE Structural Analysis Package. By utilizing real measurements and suitable Measurement Point Libraries, this process determines vibration patterns and presents them as animations in a designated operational state. Furthermore, the project provides the Time Domain Animation Project (TDA) for animating and analyzing deflections in a time-variant structure.

All information in one clean view. The project automatically calculates analyses and animations, allowing users to begin their evaluation without delay. Users can easily modify the selection of channels and frequencies, which will have an immediate impact on the animations and other analyses. Manual recalculation is unnecessary, making it easy to identify characteristics quickly and intuitively.



KEY FEATURES

Clearly arranged user interface for intuitive operation

Operating Deflection Shape Project (ODS)

- Auto Spectrum for displaying and evaluating selected channels in Color Band and 2D diagrams
- FFT (vs. Time, vs. RPM, Average) diagrams for additionally recorded airborne channels
- Shape Table for storing and selecting shapes for the animation
- Automatically calculated MPC value (Modal Phase Collinearity)

Time Domain Animation Project (TDA)

- Animation and analysis of time-variant motions
- Displaying time signals in Color Band and 2D diagrams
- FFT (vs. Time, vs. RPM, Average) diagrams

Interactive 3D or 2D animation with setting options

- Export as AVI, PPT, PDF, and image

Channel Selection for sorting, filtering, activating, and deactivating of channel

APPLICATIONS

Identification, analysis, comparison, and animation of relevant deflection shapes in a defined stationary operating status (ODS)

Evaluation of transient dynamic behavior (TDA)

Detailed detection of patterns and problematic frequency ranges

DETAILS

ODS AND TDA PROJECTS

Required files

To perform an ODS analysis, a Measurement Point Library (HMPL file) and one or more matching measurement files (HDF files) are required. The project checks the compatibility and, after this, the analysis can be started immediately.

For a TDA project, only one matching measurement file (HDF file) can be used for each Measurement Point Library.

Operating concept

The project combines a clear, intuitive user interface with a high level of functionality. All necessary sections are embedded in the interface, so that users can keep an eye on their analyses at any time. Manual adjustments, such as frequency and channel selection via the Value Cursor in the Auto Spectrum or via the color coding of the animation, have direct effects on the current representation. It is also possible to switch between individual shapes with a mouse click during the animation. With measured input data, such as acceleration, the analysis can be continued in acceleration or switched to velocity or displacement based on the user's preference

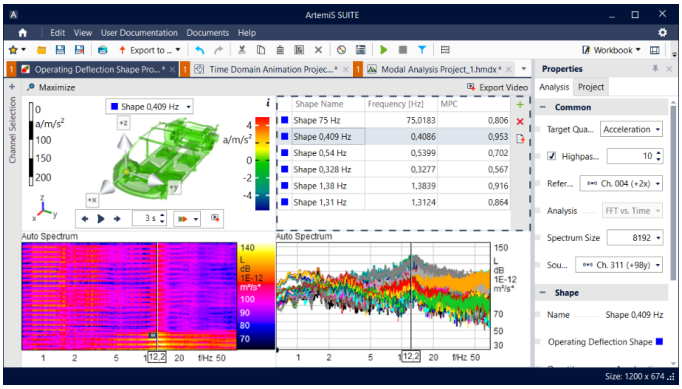
Individual editing

In the Edit Mode, users individually select the number, the size, and the position of the elements visible during the analysis as well as the corresponding contents.

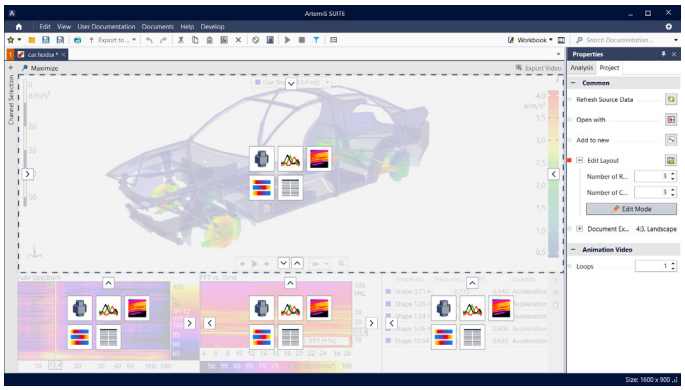
Channel Selection

The channel list enables users to select the acceleration, vibration velocity, and displacement channels to be used, while airborne channels (if available) are listed below in a separate area.

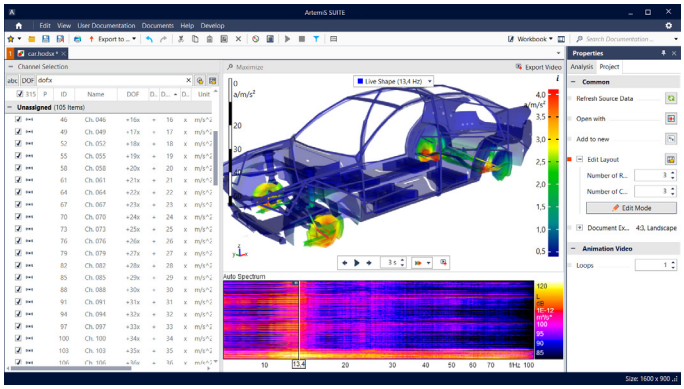
The tabular arrangement of the channels as well as additional information, such as the channel name, DOF, and sampling frequency facilitate sorting and selection.



Operating concept: Users can keep an eye on all operating, analysis, and animation sections while evaluating the data, which greatly increases the usability. Optionally, users can maximize one section at a time.



Edit Mode: The number and contents of the elements can be individually configured and one element selected can be maximized.



Channel Selection: The Channel Selection allows filtering the channel list via the input field. Selected channels can be activated or deactivated by means of multiple selection. In addition, the column headings can be used for sorting.

3D or 2D animation

During 3D live animation, deflections can be easily studied from every perspective. Users have various options on how to visualize the data. A combination of motion and color, for example, changes both representations during animation in accordance with the deflections. With it, interesting patterns and the courses of movement can be quickly identified.

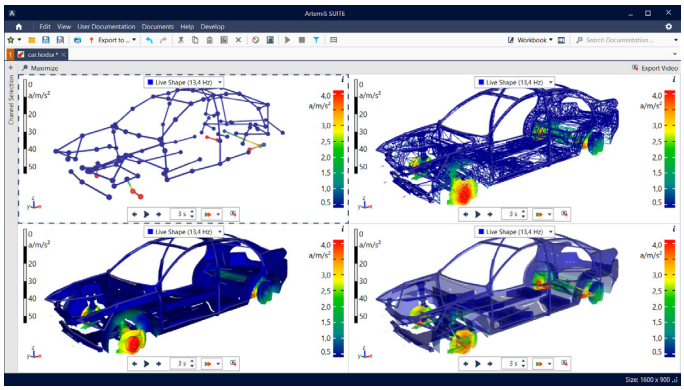
During the animation, users select whether

› only the positions of the measurement points are animated in order to observe deflection shapes quickly and reliably,

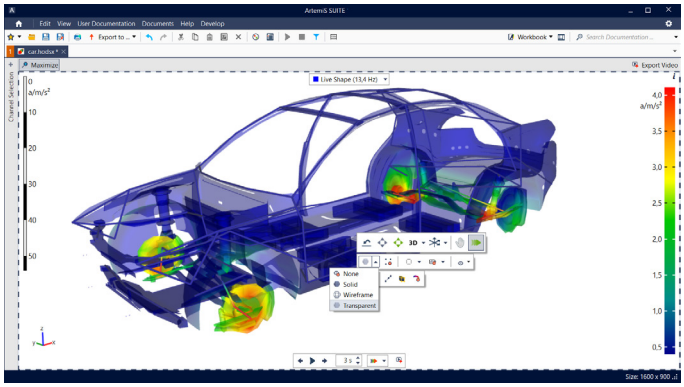
› only the colors are animated in order to detect possible exceedings of tolerances immediately,

› both, positions of the measurement points and colors are animated.

In order to highlight interesting areas, the Trace Tool is available. During the animation, the Trace Tool visualizes the movements of each measurement point in the form of a fading trace, thus making movement paths visible.



Performing an ODS project, all animations can be activated and operated globally or groupwise.



The deflection of the shape can be adjusted using both scales, movement on the left side and color on the right side. The animation speed can be adjusted via the loop duration input field.

ODS PROJECT

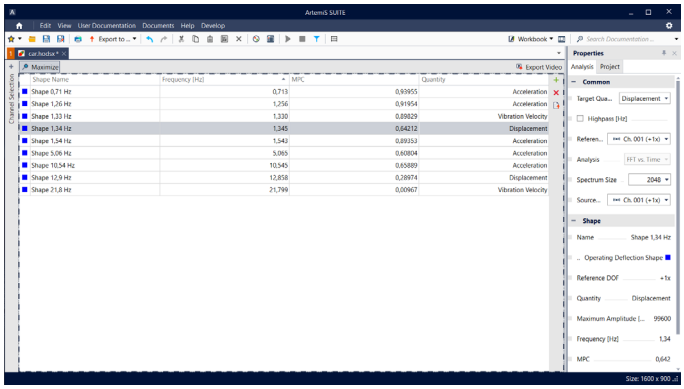
An ODS Project offers the analysis of vibration patterns of a test object in its operating state.

Special features

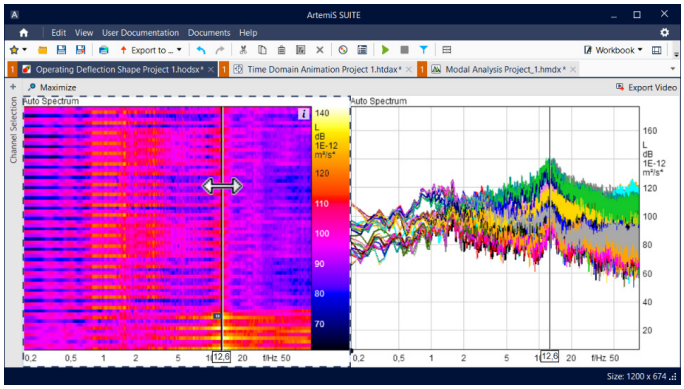
› Edit Mode: Users may customize the layout in the analysis area and display up to 16 sections with content of their choice at the same time.

› Shape Table: The Shape Table can be used to store and compare shapes in a structured way.
For each shape, the MPC value (Modal Phase Collinearity) and the corresponding frequency are displayed. The MPC value provides a meaningful evaluation of phases of the different shapes in terms of how measured points are aligned with one another.
With just one click, users can switch between shapes, allowing the instant animation and comparison of the different states.

› Auto spectrum in Color Band diagram: The Color Band diagram displays the auto spectra of all channels activated in the Channel Selection one below the other as individual color bands. Interesting patterns and frequencies can be quickly identified at a glance, such as locally active deformation areas.



The MPC index of each shape evaluates the collinearity of the modal phases of all channels. Small phase differences between the channels or a rotation by 180° result in good values of up to 1. The greater the phase differences, the more this value tends to 0.



In both auto spectra, users intuitively choose the frequency via the Value Cursor, whereupon the animation displays the selected frequency of all activated channels.

› Auto spectrum in 2D diagram: The 2D Auto spectrum primarily serves for the detection of peaks in order to identify critical or interesting frequencies.

› FFT vs. Time, vs. RPM in 3D diagram: In order to get a more detailed view of the recorded signal, the 3D diagram FFT vs. Time is available for a selected input channel. If the underlying HDF file contains at least one RPM or encoded channel, the FFT vs. RPM analysis can be used instead.

› Diagrams for analyzing additionally recorded airborne channels

  › FFT (Average): This 2D diagram shows the averaged FFT spectra of all airborne channels activated in the Channel Selection.

  › FFT vs. Time, vs. RPM: The first airborne channel selected in the Channel Selection is displayed in this 3D diagram. However, other airborne channels can also be selected via the context menu. Alternatively, the analysis FFT vs. RPM is available.

TDA PROJECT

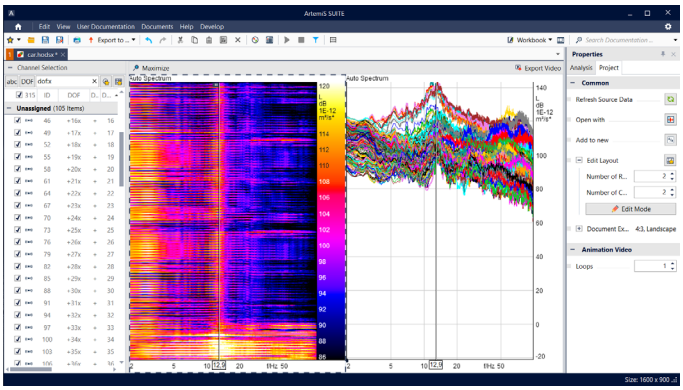
The Time Domain Animation Project enables visualization and animation of time-variant oscillation behavior of a test object.

Time data

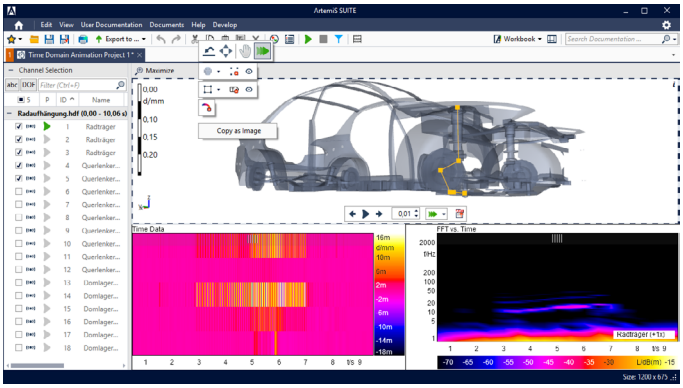
› Color Band diagram: The Color Band diagram is used for the recognition of events in order to identify critical or interesting time points in the behavior of a test object. On the Y-axis, the diagram shows the time signals of all channels activated in the Channel Selection one below the other as individual color bands. This allows interesting events to be quickly identified.

› 2D diagram: The 2D diagram simplifies the detection of patterns which are characterized by the fact that the curves of many channels overlap and have a similar course overall.
The diagram displays the displacement of all channels activated in the Channel Selection, too.

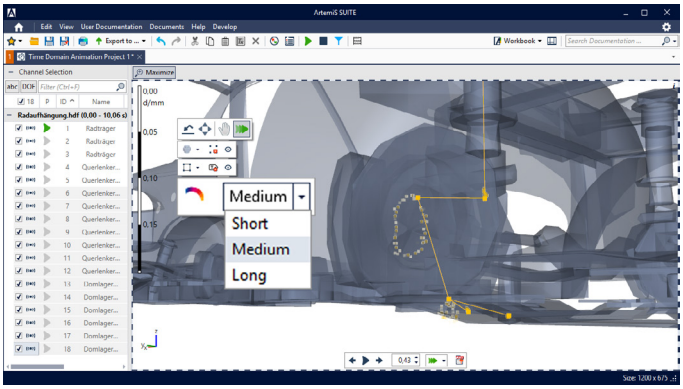
› FFT diagram: The analysis corresponding to the selected channel is displayed in the diagram FFT vs. Time or vs. RPM.



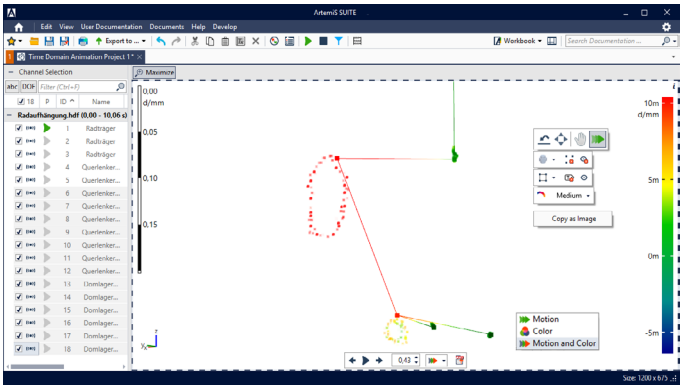
As in the auto spectra, the frequency to be used for the animation can also be determined in the 2D diagram (airborne channels) by double-clicking. Here, the Value Cursor can be moved horizontally with the mouse, too.



The work area of the TDA Project is initially divided into different sections: Channel Selection, Animation, and the analysis area with the two diagrams time data. Analog to the ODS Project, users may customize the layout from the analysis.



During the animation, the positions of the measurement points are altered according to the scale on the left. By means of the Trace Tool, the course of the movement of each measurement point can be clearly visualized in the form of a fading trace.



The option „Motion and Color" combines both representations so that the points change their positions as well as their colors.

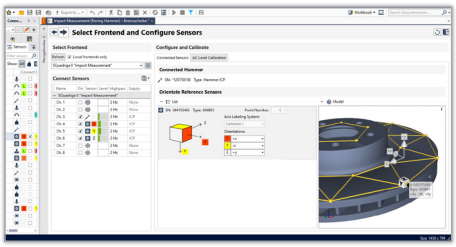
STRUCTURAL ANALYSIS

The ODS Project is a part of a powerful and perfectly matched ArtemiS SUITE Structural Analysis Package that enables users to intuitively examine and understand the complex relationship between stimulus and structure.

MEASURING / PREPARING

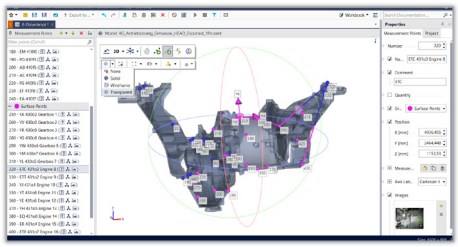
IMPACT MEASUREMENT (APR 430)

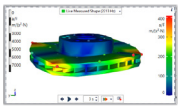
Impact Measurement enables structural analysis measurements using the methods Roving Hammer and Roving Accelerometer.



MEASUREMENT POINT LIBRARY (APR 000)

The Measurement Point Library can be used to create a 3D grid model and to import a corresponding CAD model very easy.

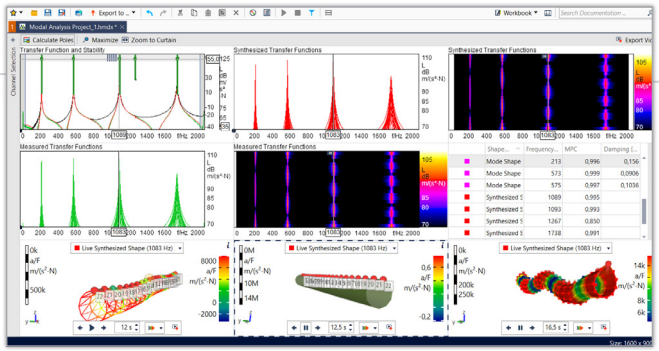




LIVE COUPLING (APR 430 & APR 420)

During the measurement, the analysis of the recorded data can be performed by means of live coupling in the Modal Analysis Project.

ANALYZING

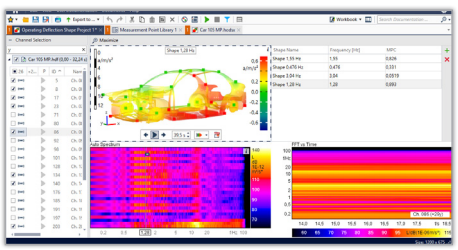


MODAL ANALYSIS PROJECT (APR 420)

The easy-to-use Modal Analysis Project enables easy recognition of interesting frequency ranges as well as the comparison, for example, with reference measurements. Alternatively, users can also validate simulation results in this way.

ODS PROJECT (APR 400)

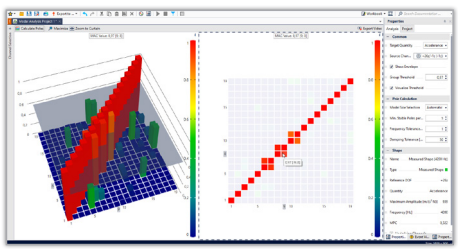
The ODS Project (Operating Deflection Shape) includes the Time Domain Animation Project (TDA) and can be used to animate and analyze structures in a defined stationary operating status as well as time-variant motions.



LIVE COUPLING OF A MAC MATRIX (APR 410 with APR 420 & APR 400)

SHAPE COMPARISON PROJECT (APR 410)

The Shape Comparison Project is used for analyzing and comparing deflection shapes.



REQUIREMENTS

- Measurement Point Library (*.hmpl) including measurement points
- Measurement file (*.hdf)

  Compatibility criteria:

  - Each degree of freedom definition may occur only once per file.
  - All channels must have the same sampling rate:
- Only for ODS projects when using more than one measurement file:
  - In order to determine the phase reference, at least one acceleration channel with an identical DOF must be contained in each file.

RECOMMENDED

- Modal Analysis Project (APR 420 is required)
- Impact Measurement (APR 430 is required)
- Shape Comparison Project (APR 410 is required)

Required: APR 000 Framework (Code 50000)

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