Understanding Modal Analysis

Modal Data Selection

Once measurements have been collected, all saved data will appear in the Signal candidates for modal calculation tab. The tab can be filtered by the coordinate system used to define the testing location as well as filtering out for specific locations. The saved signals can be selected to view the FRF and response location on the geometric display. All saved data with the calculate modal check box enabled will be used in calculation of data.

For a more in depth view please see EMA Modal Data Selection

Band Selection

All signals selected for modal data calculation will be displayed within the Band Selection signal table. Within band selection you will select the desired mode indicator function as well as the frequency band used for data calculation.

For a more in depth view please see EMA Band Selection

Stability Diagram

The stability diagram allows the user to determine the modal order and estimation method used to determine the poles of the diagram. The user is also able to select the display method of the mode indicator function out of 4 available options: Multivariate MIF, Complex MIF, Real MIF, and Imaginary Sum. The user then selects the desired poles for calculating mode shapes and further analysis.

For a more in depth view please see EMA Stability Diagram

Animation

The animation tab gives the user the ability to select mode shapes to be enabled for animation. The animation parameters such as magnitude, speed, contour, and more can be controlled by the user. This page also displays modal parameters as well and Modal assurance criteria to better determine the validity of the selected data.

For a more in depth view please see EMA Animation

Synthesis

Synthesis is a data validation step. EMA will generate a theoretical FRF to match the selected modal parameters. The theoretical FRF is then overlaid with the measured data FRF. The system will also calculate an error and correlation term to define the accuracy of the track.

For a more in depth view please see EMA Synthesis

Operational Deflection Shape

ODS displays the same animation control capabilities which are found in the animation tab. Additionally, it allows you to control the animation based on the time through impact and response at which you are viewing the object.

For a more in depth view please see EMA Operational Deflection Shape (ODS)

Correlation

Correlation allows you to compare the test data to FEA analysis.

For a more in depth view please see EMA Correlation

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