WE MechLoad Viewer

The Complete User Manual

Chapter 4: Comparing Datasets

One of the most powerful capabilities of the WE MechLoad Viewer is its ability to directly compare two different datasets. This is essential for tasks like validating simulation results against physical test data or evaluating the impact of a design change.

The application has two dedicated tabs for this purpose: "Compare Data" and "Compare Data (Part Loads)".

4.1 Loading a Comparison Dataset

Before you can use these tabs, you first need to load your primary dataset as described in Chapter 2. Then, you need to load a second dataset to compare it against.

Step-by-Step Guide to Loading Comparison Data:

1. Navigate to the **Compare Data** tab.
2. Click the button labeled **Select Data to Compare**.
3. A file dialog will open. Navigate to the folder containing the *second* dataset (the one you want to compare with) and select it.
4. A confirmation message will pop up indicating that the "Comparison data loaded successfully."

Important Note: The comparison dataset must have the same domain (TIME or FREQ) as your primary dataset. If you try to compare a time-domain file with a frequency-domain file, the application will show an error.

Once loaded, the dropdown menus in the comparison tabs will populate, and you can begin your analysis.

4.2 The "Compare Data" Tab: One-to-One Channel Comparison

This tab is for a direct, one-to-one comparison of a single data channel between your two loaded datasets.

How to Use It:

1. **Column Selector (Primary Data):** Use this dropdown to select the data channel from your **original** (primary) dataset that you want to plot.
2. **Column to Compare (Comparison Data):** This dropdown lists the channels available in your **second** (comparison) dataset. Typically, you will select the same channel as in the first dropdown to make a direct comparison.

3. **Plot Window:** The plot will display two lines:
   - One line for the channel from the primary dataset.
   - A second, differently colored line for the channel from the comparison dataset.
   - The legend will clearly label which line belongs to which dataset, making it easy to spot differences.

4.3 The "Compare Data (Part Loads)" Tab

This tab extends the comparison functionality to part loads, allowing you to compare grouped data between your two datasets.

Example Use Case: You've made a design change to the right-hand-side suspension. You can load the "old design" data as your primary set and the "new design" data as your comparison set. Then, using this tab, you can filter for "Side" = RHS and "Component" = Fz to see how the vertical forces across all RHS components have changed between the two designs.

How to Use It:

The controls on this tab work just like the "Part Loads" tab, but every action is performed on *both* datasets simultaneously.

1. **Side Filter Selector:** Select the side or group you want to compare.
2. **Component Filter Selector:** Select the load component you want to compare.
3. **Plot Window:** The plot will show all the filtered channels from your primary data, alongside all the filtered channels from your comparison data, allowing for a comprehensive side-by-side view.

Chapter 5: Reconstructing Time Data from Frequency Data

5.1 The "Time Domain Rep." Tab (Frequency Data Only)

This is a specialized analysis tab that will **only be visible if you have loaded frequency-domain data**.

What is it for?
Frequency-domain data tells you the magnitude and phase of a signal at many different frequencies. While this is great for vibration analysis, sometimes you want to know: "What would the simple, oscillating time-domain signal look like if it were vibrating at just one of these frequencies?" This tab answers that question. It takes the magnitude and phase from a single frequency point you choose and reconstructs a perfect sine wave that represents it in the time domain.
How to Use It:

1. **Data Point Selector (Dropdown Menu):** This dropdown is filled with all the unique frequency points from your dataset. Select the single frequency you want to investigate.
2. **Plot Window:** The plot will update to show a time-domain representation (a sine wave) of

the selected frequency point for all the data channels in your file. This shows you both the amplitude of the oscillation and its phase shift (where it starts in its cycle).

Feature: Extracting Reconstructed Data

This tab has a powerful export feature that lets you save the reconstructed time-domain data.

1. **Interval Selector:** Choose the angular interval (in degrees) at which you want to sample the data. A smaller interval means more data points and a smoother curve in your exported file.
2. **Extract Data Button:**
   - Click this button.
   - A file dialog will appear, allowing you to save the data as a .csv file.
   - This CSV file will contain a "Theta" (angle) column and a column for each data channel, with its calculated value at each angular step. This is useful for creating reports or for use in other analysis tools.