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HyperWorks

Altair HyperGraph 2D 2019 Tutorials

HG-3010: Working with Complex Plots

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HG-3010: Working with Complex Plots

In this tutorial you will learn how to:

- Create complex plots from a data file
- Add and edit complex data curves by using mathematical functions

Tools

The **Build Plots** panel can be accessed in one of the following ways:

- Click the ***Build Plots*** icon from the toolbar

Or

- From the menu bar select ***Curves > Build Plots***

The **Build Plots** panel constructs multiple curves and plots from a single data file. Curves can be overlaid in a single window or each curve can be assigned to a new window. Individual curves are edited using the **Define Curves** panel.

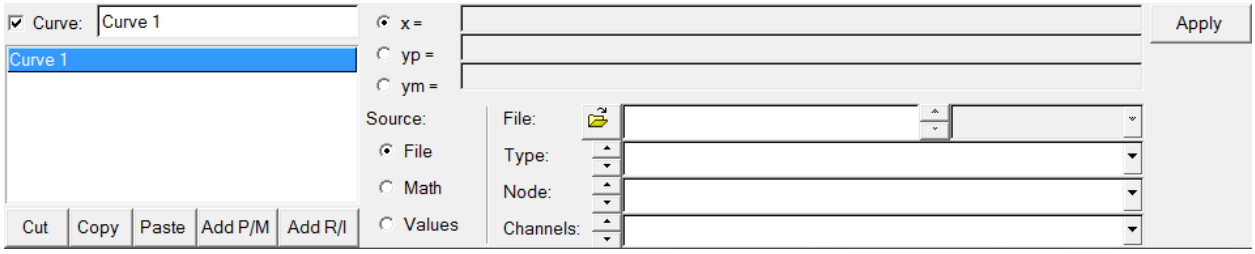
The **Define Curves** panel can be accessed in one of the following ways:

- Click the ***Define Curves*** panel icon, , from the toolbar

Or

- From the menu bar select ***Curves > Define Curves***

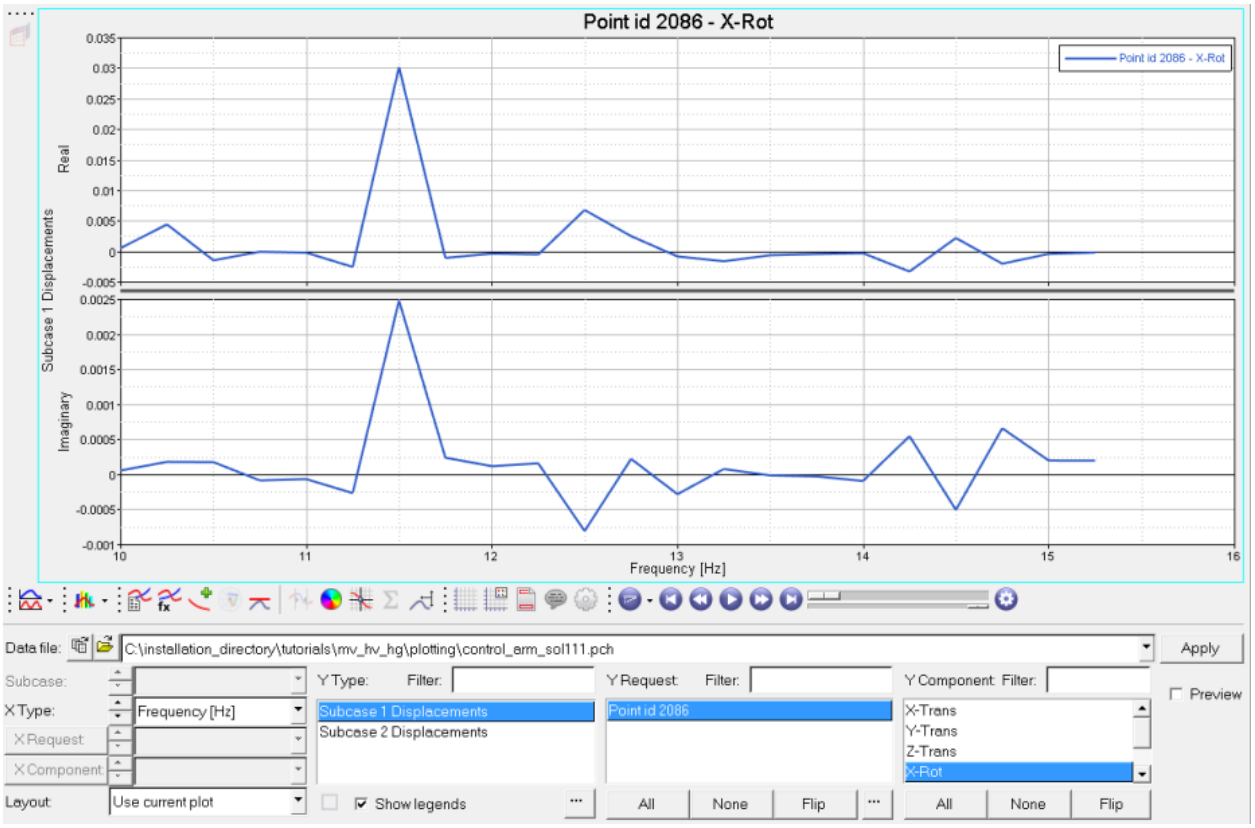
Existing curves can be edited individually, and new curves can be added to the current plot using the **Define Curves** panel. The **Define Curves** panel also provides access to the program's curve calculator.



Exercise: Plot Complex Data and Apply Math Functions

Step 1: Build a complex data curve from a data file.

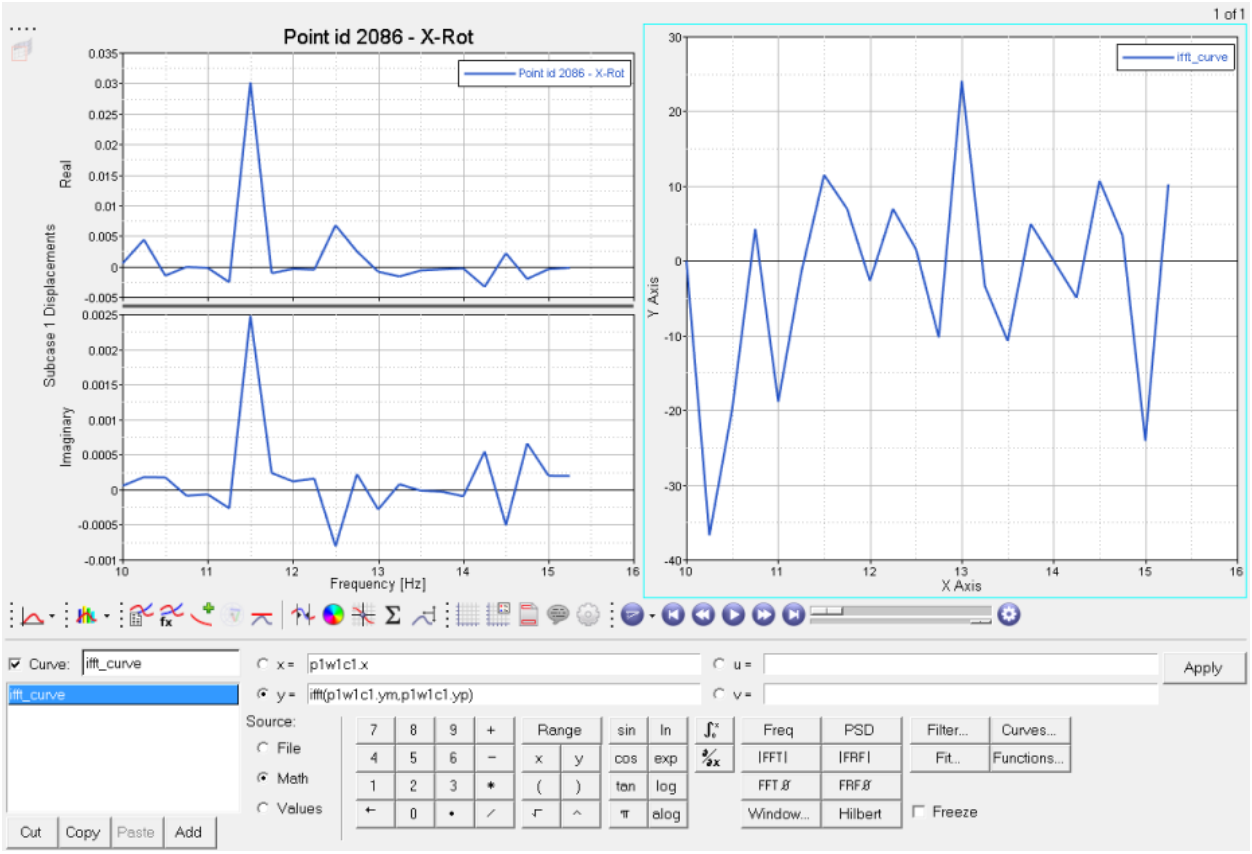
1. From the menu bar select ***File > New > Session*** to clear the contents of the session.
2. From the plot type menu, select **Complex Plot,** .
3. Enter the **Build Plots** panel, .
4. Use the file browser button to open the `control_arm_sol111.pch` file, located in the `plotting` folder.
5. Leave the **X type:** set to ***Frequency [hz]***.
6. In the **Y type:** column, select ***Subcase 1 Displacements***.
7. In the **Y Request:** column, select ***Point id 2086.***
8. In the **Y Component:** column, select ***X-Rot.***
9. Click ***Apply*** to create the complex curves.



Step 2: Apply the Inverse Fast Fourier Transform (ifft) math function to the complex data curve.

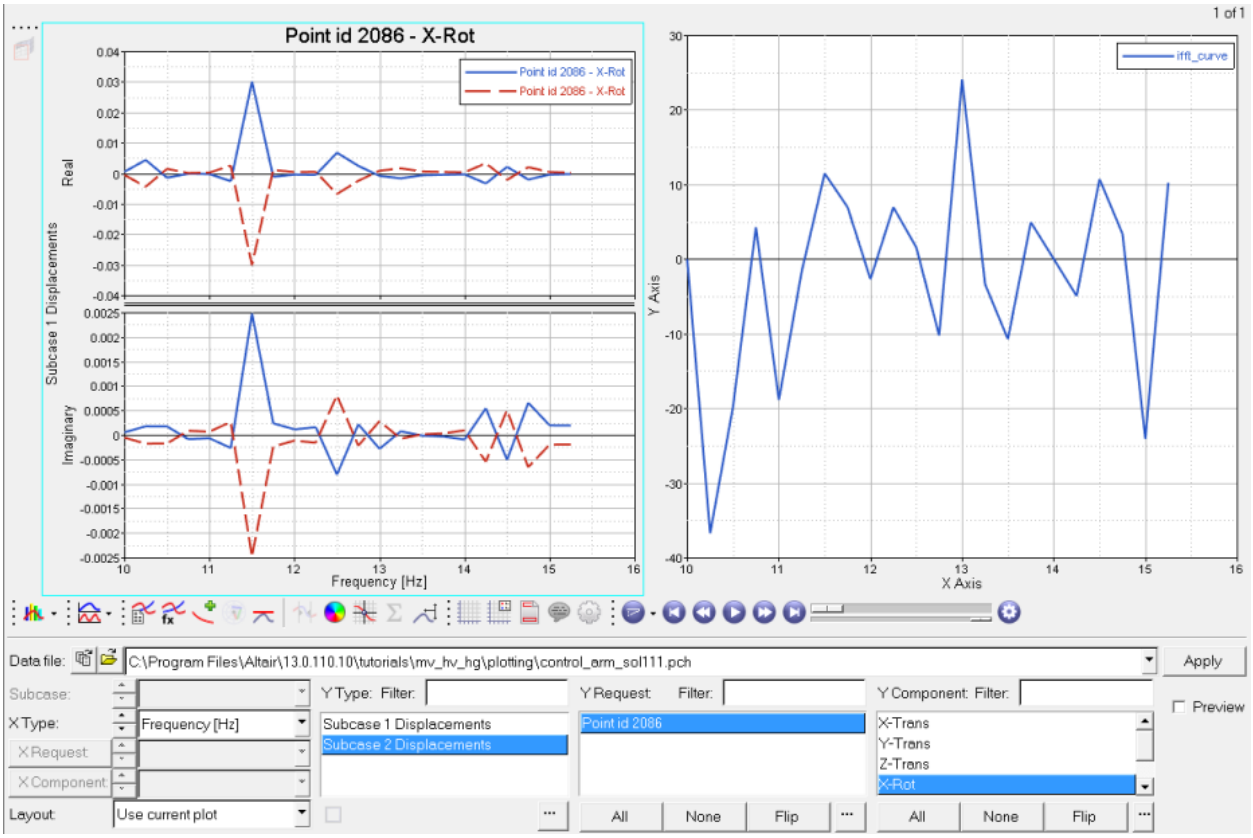
1. Change the current window layout of page 1 to a two-window layout .
2. Activate the window on the right side.

   New plot windows are set to the xy plot type by default.
3. Set the plot type for the window on the right side to ***XY Plot***.
4. Enter the **Define Curves** panel, .
5. ***Add*** a new XY plot curve named `Curve 1`.
6. Rename **Curve 1** to `ifft_curve`.
7. Under **Source**, select ***Math***.
8. In the **x:** field, enter `p1w1c1.x`.
9. In the **y:** field, enter `ifft(p1w1c1.ym,p1w1c1.yp)`.
10. Click ***Apply*** to create the XY data curve.



Step 3: Create a complex data curve of frequency versus displacement for Subcase two, node 2086, x-rotation.

1. Activate window 1 (the left window).
2. Enter the **Build Plots** panel .
3. In the **Y type:** column, select ***Subcase 2 Displacements.***
4. In the **Y Request:** column, select ***Point id 2086.***
5. In the **Y Component**: column, select ***X-Rot.***
6. Click ***Apply*** to create the complex curves.



Step 4: Subtract the Subcase two curve from the Subcase one curve.

1. Change the current window layout for page 1 to a three-window layout, .
2. Make the new, blank plot window active.
3. From the plot type menu, select ***Complex Plot***.
4. Enter the ***Define Curves*** panel.
5. Click ***Add P/M*** to create a new complex curve.
6. Rename **Curve 1** to `sub_disp`.
7. Under **Source**, select ***Math***.
8. In the **x:** field, enter `p1w1c1.x`.
9. In the **yp:** field, enter `p1w1c2.yp - p1w1c1.yp`.
10. In the **ym:** field, enter `p1w1c2.ym - p1w1c1.ym`.
11. Click ***Apply*** to create the complex curve.