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HyperWorks

Altair HyperGraph 2D 2019 Tutorials

HG-2000: Evaluating Curve Data

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In this tutorial you will learn how to:

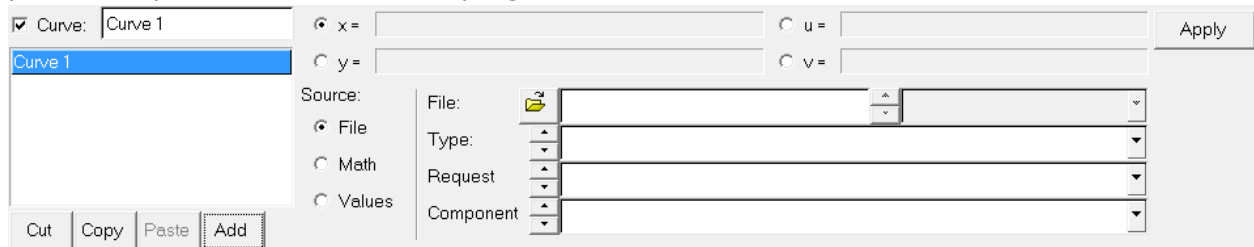
- Reference curves
- Create curves using math expressions
- Create curves by using pre-defined functions
- Use the freeze option

Tools

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

- Click the **Define Curves** icon, 
- Or
- From the menu bar select **Curves > Define Curves**.

This panel allows you to edit existing curves and create new ones. The **Define Curves** panel also provides access to the program's curve calculator.



Referencing Curve Vectors in HyperGraph

X and Y vector expressions can reference any curve vector in the session. A curve vector reference defines the x or y vector (values) by page, window, and curve number. An example of a curve vector reference is **p2w3c4.x**, where:

p2	is page 2
w3	is window 3
c4	is curve 4
x	is the vector

There are two common methods to specify curve vector references:

Pick a curve in a plot window	For the x = input field	SHIFT and pick the curve to get the curve x vector reference
		SHIFT + CTRL and pick the curve to get the curve y vector reference
	for y = input field	SHIFT and pick the curve to get the curve y vector reference
		SHIFT + CTRL and pick the curve to get the curve x vector reference

Select a curve vector reference from the **Curves...** dialog, which is accessed from the **Define Curves** panel.

Freeze Option

The **Freeze** option is available when a vector's source is **Math**. This option allows you to break the association of the dependent curve(s) from their parent curve, which allows modifications to the parent curve without updating the dependent curve(s).

Curve Dependencies browser




To access the browser, right-click a curve and select **View Dependencies**. The selected curve displays from the context menu.

Exercise: Creating XY Curves by Referencing Existing Curve Vectors

Step 1: Open Session File `democ2.mvw`.

1. From the **File** menu, click **Open > Session**.
2. Select the `democ2.mvw` file, located in the `plotting` folder, and click **Open**.

Step 2: Practice referencing curve vectors by selecting curves from the plot window.

1. Make window 3 (lower left window) on page 2 active by clicking on it.
2. Expand window 3 by clicking the **Expand Window** button, .
3. Go to the **Define Curves** panel, .
The **Curve** list displays the names of the four curves in window 3.
4. Click **Add** under the curve list.
5. Verify the **x =** radio button is selected.
6. Select **Math** under **Source** of the curve to be created.
This defines the x vector of the new curve to be a math function. In this case, it will simply be set equal to the x vector of an existing curve.
7. Hold the SHIFT key and pick the dark red curve (**Req/5 Curve 5**).
The **x =** curve reference is `p2w3c2.x`. This defines the page 2, window 3, curve 2, x vector.
8. Clear the entry in the **x =** field.
9. With the **x =** field still active, hold the SHIFT + CTRL keys and pick the same curve.
The **x =** curve reference is `p2w3c2.y`. This defines the page 2, window 3, curve 2, y vector.
10. From the curve list, select **Curve1** and click **Cut**.
11. Return to the page's original layout by clicking .

Step 3: Create a new curve with a math expression for its y vector.

1. Click **Add** to create a new curve named **Curve2**.

2. Verify the **x =** radio button is selected.

3. Select **Math** for the **Source**.

4. Click **Curves...** to open its dialog.

– Select **p2: Plot 2**.

– Select **w3: Plot**.

– Select **c2: Req/5 Curve 5**.

5. Click **Select** to complete the selection

The result is the same as when the curve was picked from the graphics area; the x curve reference is **p2w3c2.x**.

6. Click the **y =** radio button.

7. Hold the SHIFT key and pick any curve in window 3.

Notice in the **y =** field is the reference for the y vector of the picked curve.

8. Append the character **+** to the string in the **y =** field.

9. Hold the SHIFT key and select any other curve in window 3.

Notice the **y =** field now has two y vectors separated by the + sign.

10. Click **Apply** to create the new curve.

The new curve appears in window 3 and is the sum of the two y vectors.