



Altair

HyperWorks

Altair HyperGraph 2D 2019 Tutorials

HG-3020: Working with Polar Plots

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In this tutorial, you will learn how to:

- Create polar plots from a data file.
- Add polar plots by using mathematical functions.

Tools

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

- Click the **Build Plots** button, , 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.



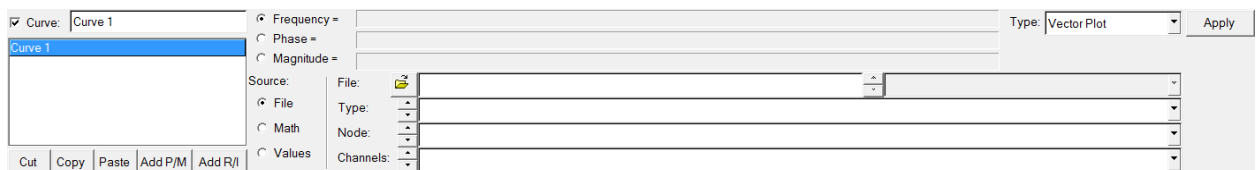
The **Define Curves** panel can be accessed in one of the following ways:

- Click the **Define Curves** button, , 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.

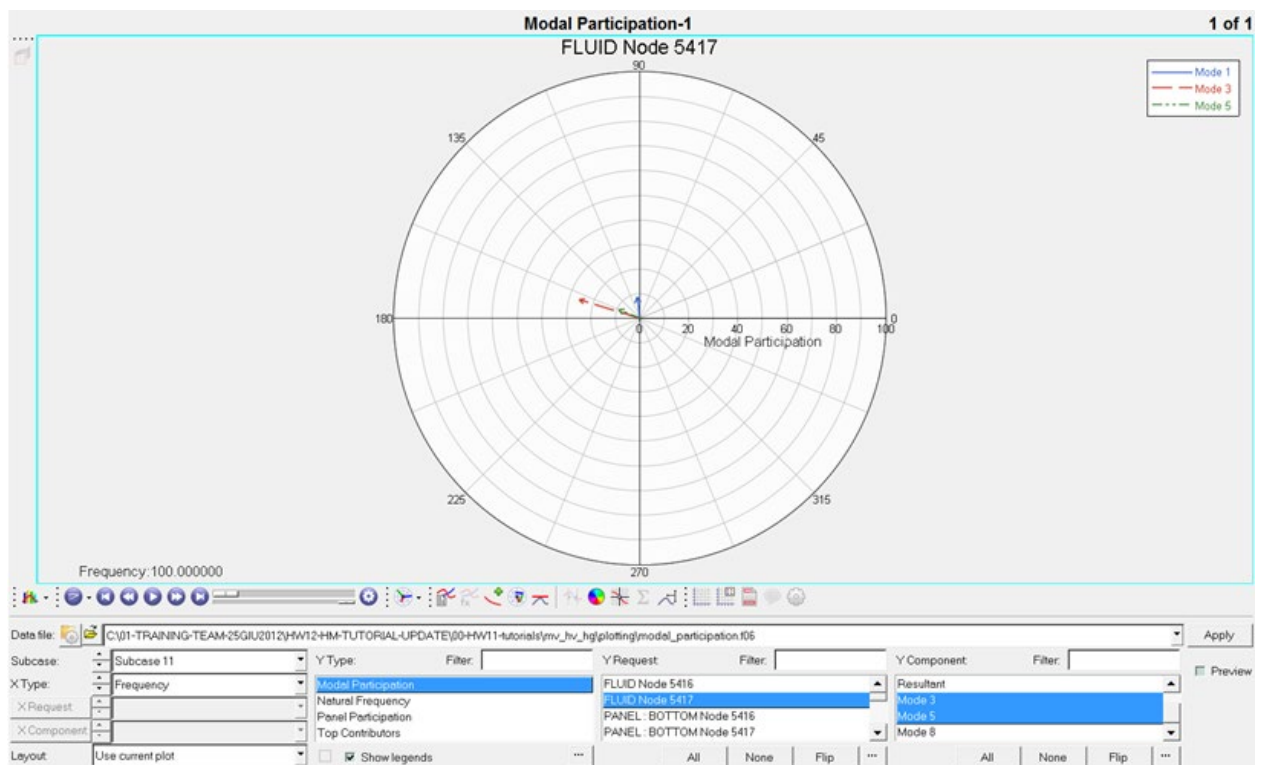


Exercise: Plot Polar Data and Add Plots

Step 1: Build a polar data plot 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 **Polar Plot**, .
3. Enter the **Build Plots** panel, .
4. Use the file browser button to open the `modal_participation.f06` file, located in the plotting folder.
5. Leave the **Subcase:** field set to **Subcase 11**.
6. Leave the **Data Type:** field set to **Frequency**.
7. From the **Type:** column, select **Modal Participation**.
8. From the **Request:** column, select **FLUID Node 5417**.
9. From the **Component:** column, select **Mode 1, Mode 3 and Mode 5**.
10. Click **Apply** to create the polar plots.

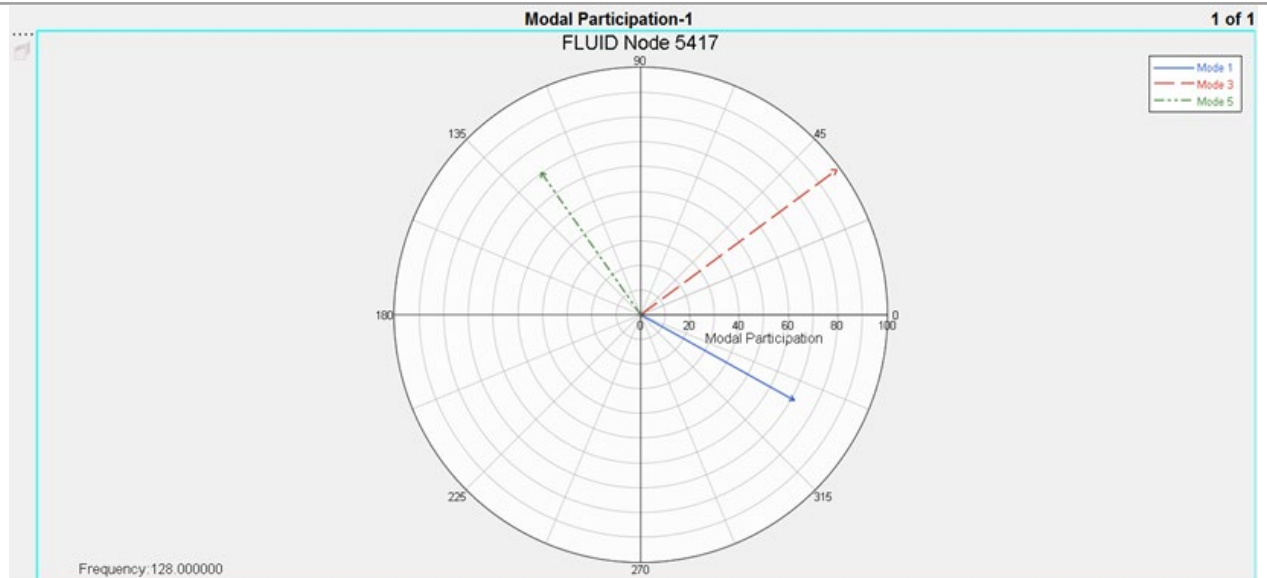
The vectors are plotted at a frequency of 100.0Hz.




11. Access the **Frequency** dialog by clicking the listed frequency value in the bottom left region of the plot area.

12. Select the **128.0Hz** frequency and click **OK**.

The vectors are plotted at 128Hz frequency.



Step 2: Add polar data.

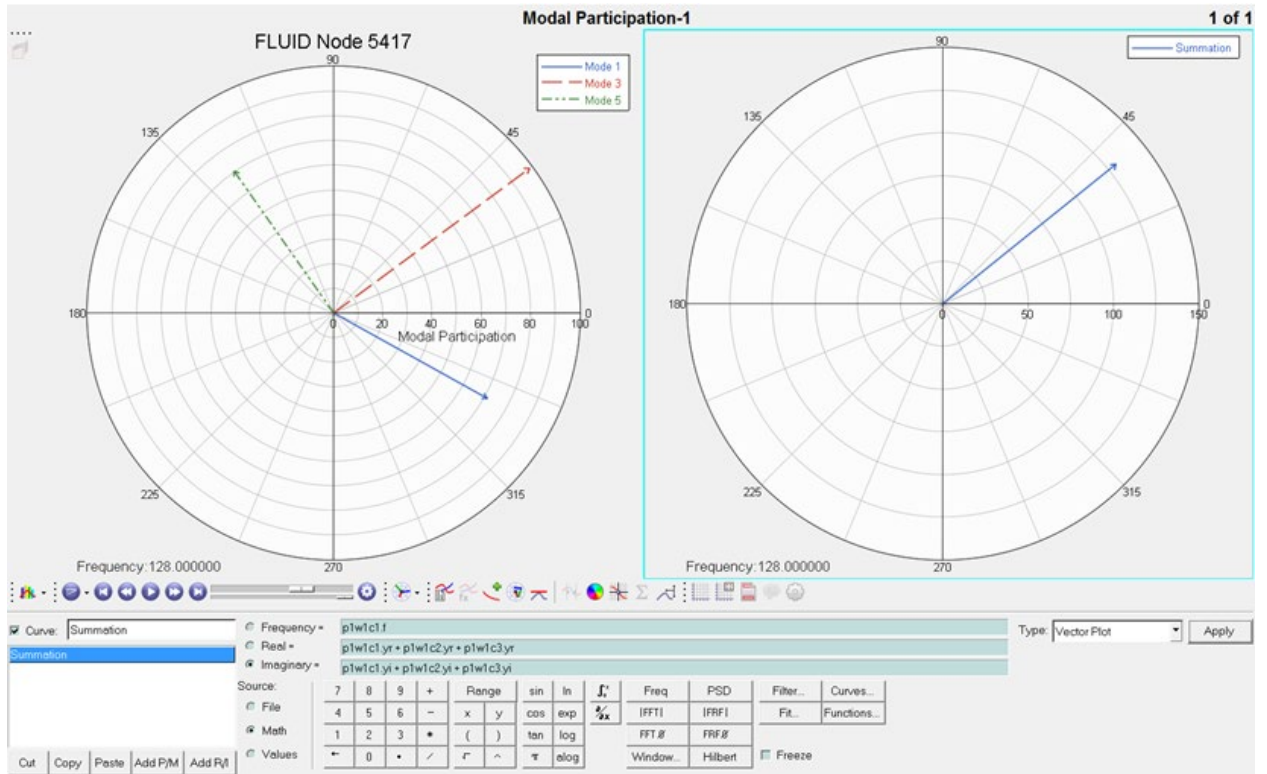
1. Use the **Page Layout** button, , to change the window layout of page 1 to a two-window layout.
2. Activate the window on the right side.
3. Change the plot type for the new window to **Polar Plot**.
4. Enter the **Define Curves** panel.
5. Add a new polar plot curve named `Curve 1` by selecting **Add R/I**.
6. Rename **Curve 1** to `Summation` by typing the new name in the **Curve:** field and pressing the ENTER key.
7. Under **Source**, select **Math**.
8. In the **Frequency=** field, enter `p1w1c1.f`.

A frequency field is specified to allow HyperGraph to compute the summation vector for every frequency. In this case, the summation vector can be animated or updated when a certain frequency is chosen.

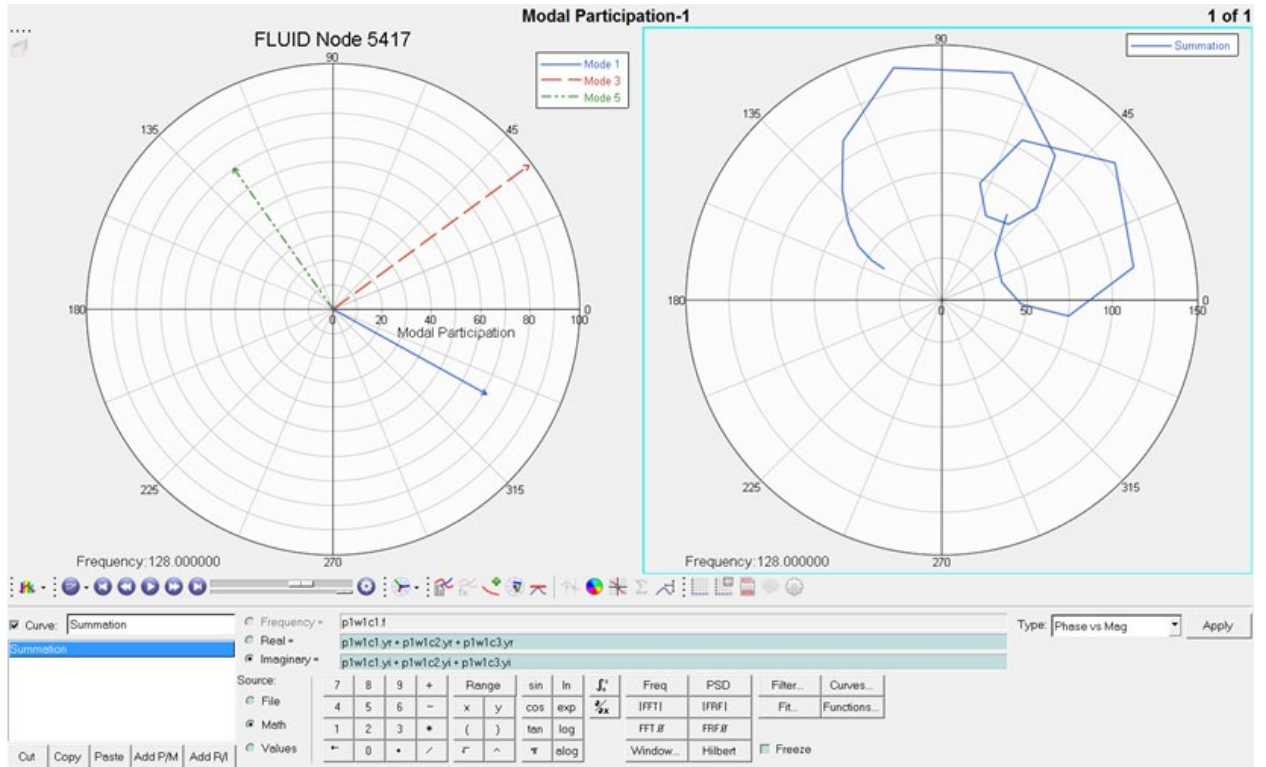
9. Select the **Real =** radio button and then select **Math** as the **Source**.
10. In the **Real =** field, enter `p1w1c1.yr + p1w1c2.yr + p1w1c3.yr`.
11. In the **Imaginary =** field, enter `p1w1c1.yi + p1w1c2.yi + p1w1c3.yi`.
12. Set the **Type:** field to **Vector Plot**.
13. Click **Apply** to create the polar plot.


14. Access the **Frequency** dialog by clicking the listed frequency value in the bottom left region of the right hand side of window 2.
15. Choose the **128.0Hz** frequency and click **OK**.

The summation vector is now plotted at 128Hz frequency.



16. Change the **Type:** field to **Phase vs Mag**. Notice how a Phase vs Magnitude curve for all frequencies is shown as a line connecting the tips of the vectors at different frequencies.



17. Click the start animation button, .

Notice how the summation of vectors is updated in the animation for each frequency value in the list.