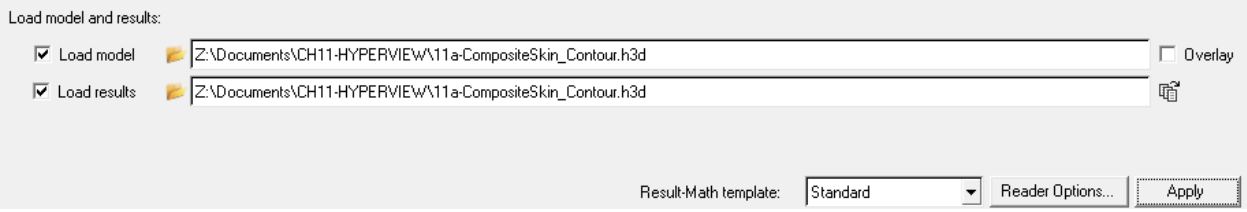
Exercise 12a - Post Processing for Stress/Strain Analysis

This tutorial will walk through some of the most basic features of HyperView.

Note: The model results used for this tutorial had an unrealistic, made-up loads applied to it. The purpose of this tutorial is to demonstrate some basic post processing capability; therefore the results themselves can be ignored.

Step 1: Load the model into HyperView.

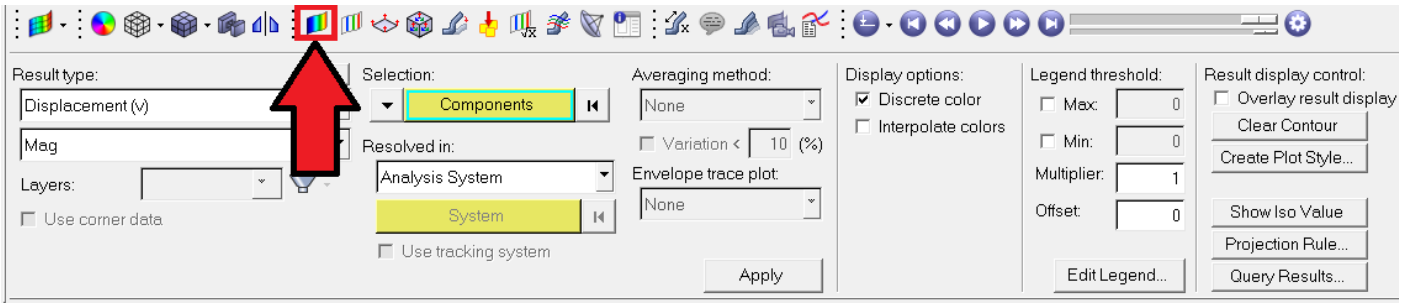
Open HyperView, and load the `12a-CompositeSkin_contour.h3d` as both the model and results file. To open a model, select from the menu bar by selecting ***File > Open > Model***.



Step 2: Apply a contour and iso surface on the model.

We are now going to look at the displacement contour of the composite skin, an iso surface of that contour, and then a contour of individual ply results.

1. Access the **Contour** panel by either clicking the icon (highlighted below) or from the menu bar by selecting ***Results > Plot > Contour***.



2. Now isolate the composite skin. Using the hotkey “i” (or the icon in the **Results Browser**) will activate the isolation feature. You can either click the component on the screen, or its name in the **Results Browser**, ***compositeSkin***.
3. Within the **Contour** panel, set the **Result type** to ***Displacement (v)*** and then click ***Apply***. This will give you the resultant vector magnitude of the three displacement components (x, y, z).

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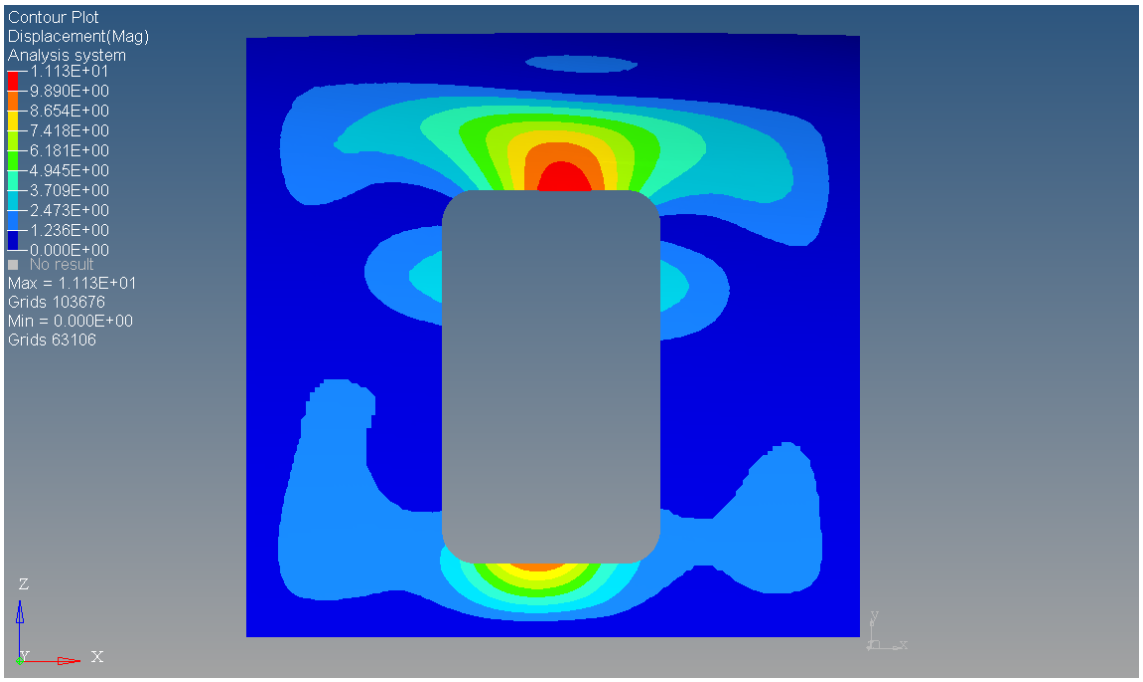
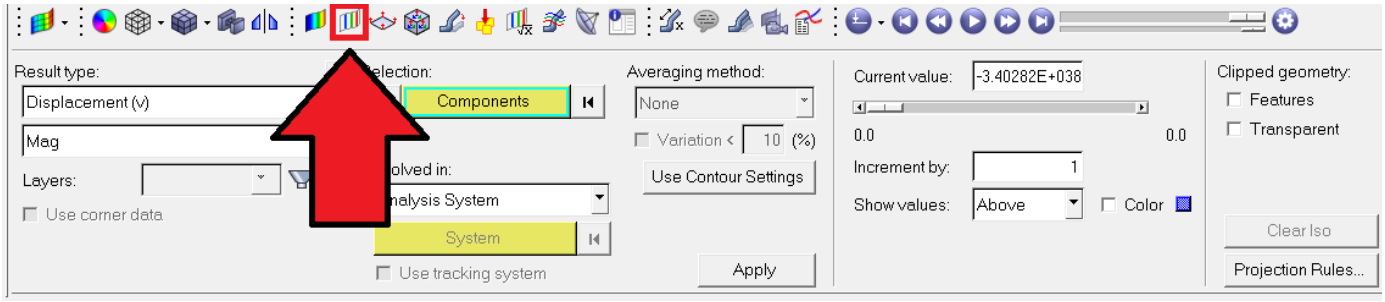


4. Now apply an iso surface to this contour. Navigate over to the **Iso** panel by either clicking the icon highlighted below or from the menu bar by selecting ***Results > Plot > Iso***.
5. Set the **Result type** to ***Displacement (v)*** and then click ***Apply***.
6. Use the scroll bar to move through the different iso surface values. You can choose to display the values **Above**, **Below**, or **Equal** to the current value through the **Show values** dropdown.



Note: An iso surface is a surface that represents points of a constant value.

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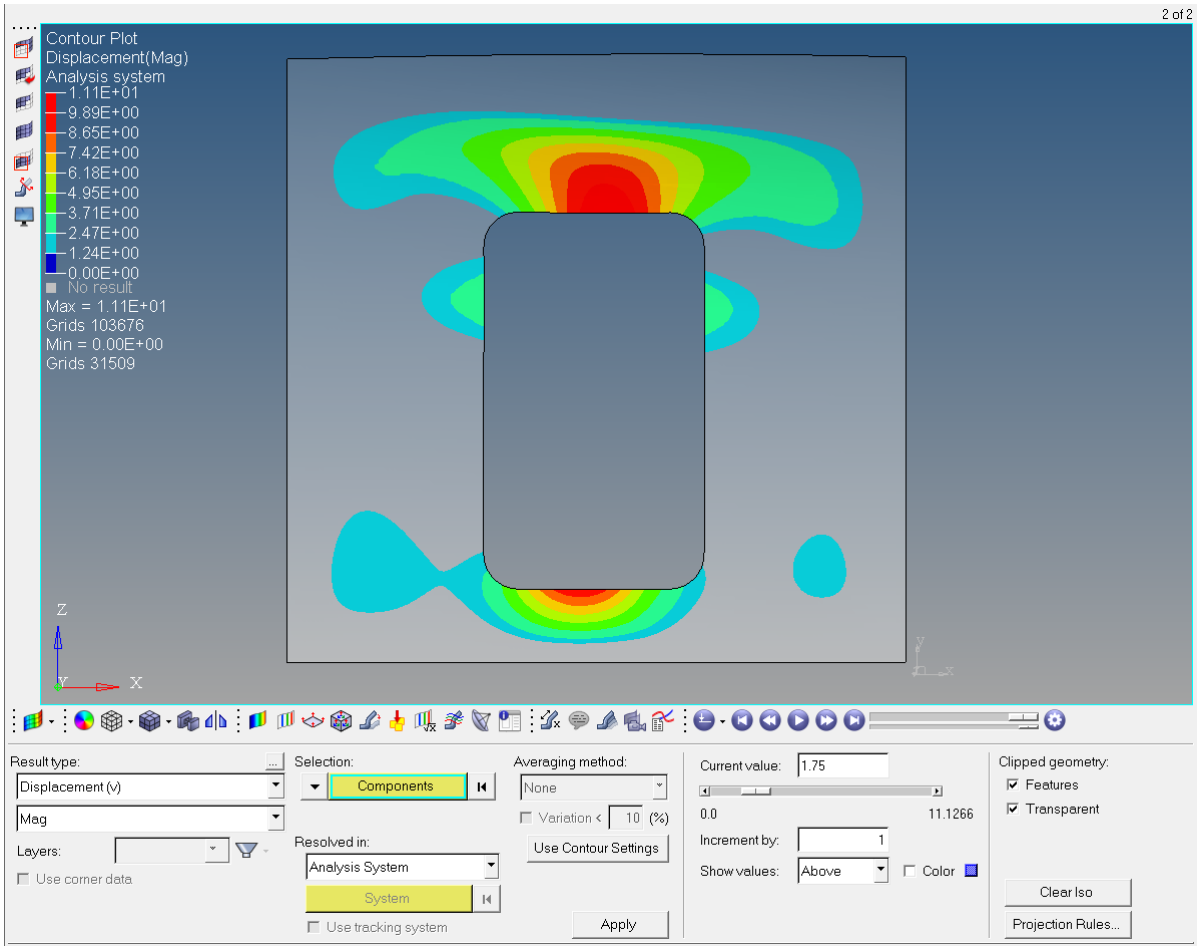
7. Press the hotkey “T” or use the options under the **Clipped geometry** to show a transparent model and the feature edges of the contour that isn’t currently displayed.



8. When you are done, clear the iso surface by selecting ***Clear Iso***.

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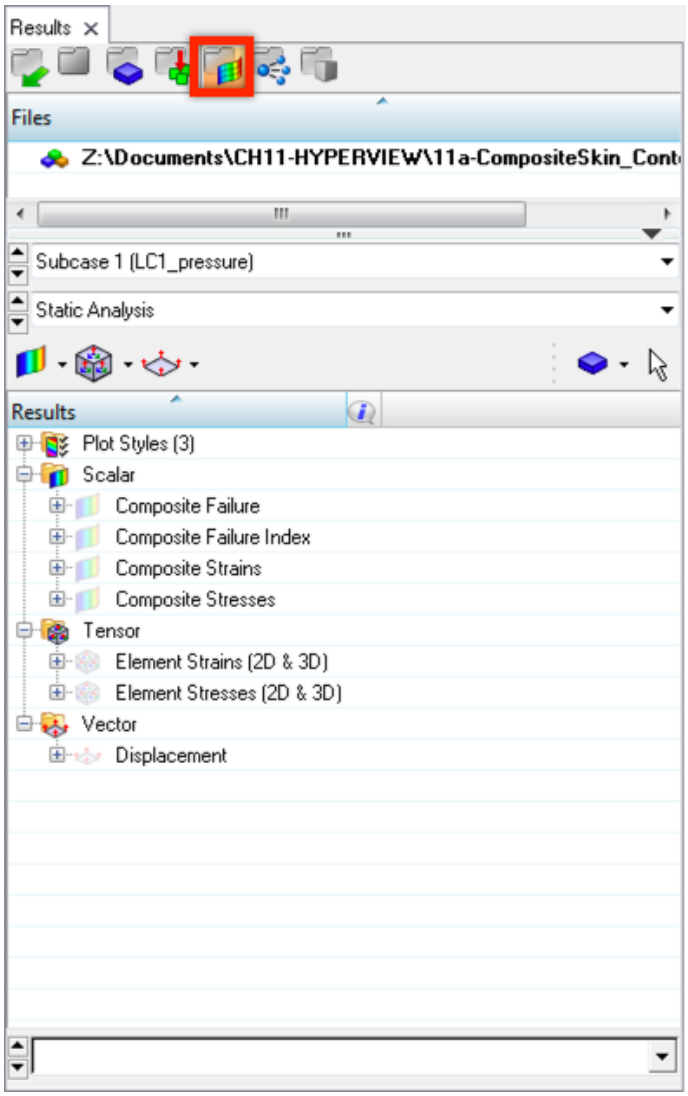
Step 3: Apply a contour on the model with Results View in the Results Browser.

1. Access the ***Results View*** within the **Results Browser**. This browser view allows you to see all of the results available for the current model with the active load case. Here you can find **Scalar**, **Vector**, and **Tensor** results as well as **Plot Style**. A plot style is a collection of predefined settings for a contour, vector, or tensor result plot type.



2. Expand the ***Scalar*** folder and click on the **+** next to **Composite Strains**.
3. Expand that branch and then click the icon next to **Maximum Shear Strain** to activate that specific contour.

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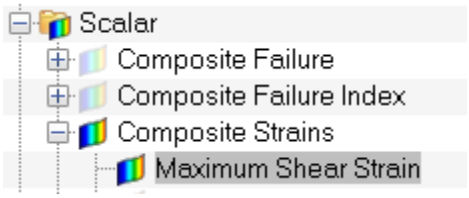
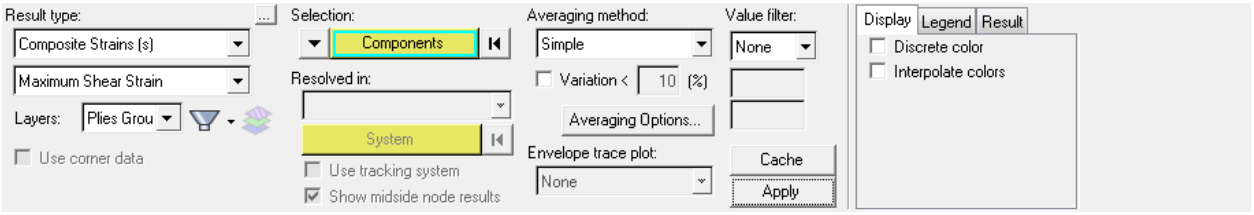


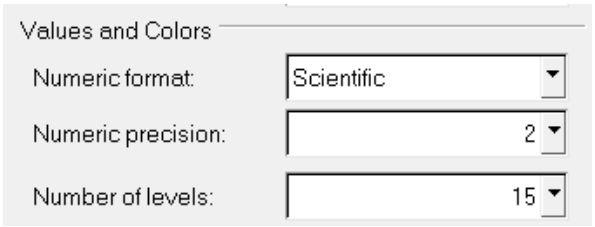
4. Click on the words ***Maximum Shear Strain*** this time instead of the icon before it. You will notice that once you do this it'll populate the **Layers** dropdown at the bottom of the **Results Browser**.

Scroll through the layers to look at the different contours. You will notice that after a few you will start seeing contours of individual ply shapes.

5. Scroll down until you arrive at ***Plies Group.1_PLY-11***.
6. Then go back to the **Contour** panel, uncheck the **Discrete color** option under the **Display** tab, and choose ***Simple*** as the **Averaging method**.



7. Then click ***Apply***. You should notice that the contour has changed.
8. Now click the ***Edit Legend*** button in the **Legend** tab and change the **Numeric format**, **Numeric precision** and **Number of levels** as shown in the following image:



9. Click ***Apply*** and then ***OK*** when you are done to close the window.
10. Now to save these new contour settings so we can apply them globally to any contour, we can make a **Plot Style**. Click on the ***Create Plot Style*** button under the **Result** tab.
11. In the **New plot style** field enter `Interpolate colors - Simple - 15levels`.

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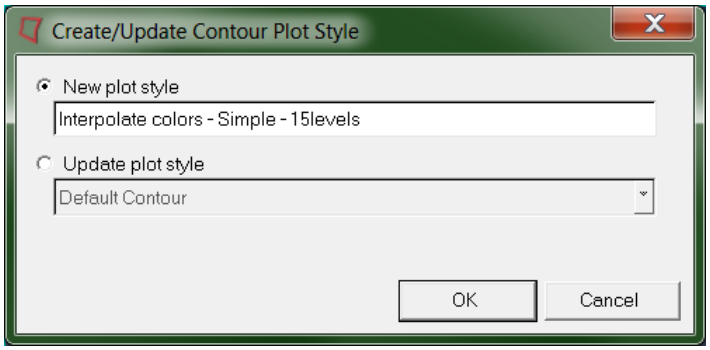
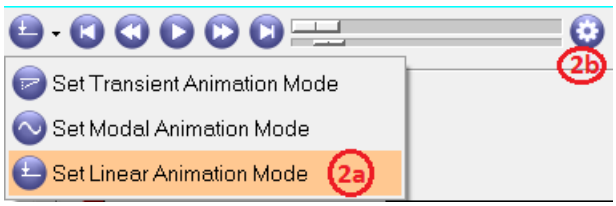


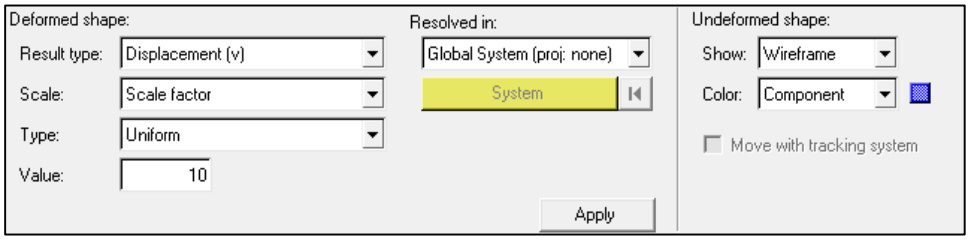
12. Expand the ***Plot Styles*** branch in the **Results Browser**, right click on the newly created plot style, and then select ***Make Current***. This will now be the default contour setting for all contours.
13. Click on the ***Maximum Shear Strain*** result again and now browse through some of the other ply results.

Step 4: Animate the results and then export a GIF.

14. Apply the displacement contour again.
15. Make sure the animation mode is set to **Linear Animation Mode** and then click the gear icon on the far right (shown in the image below).



16. Change the **Number of steps** to `10` and the **Max Frame Rate** to `20`. Then click the play button. You will notice some small deformation on the screen.
17. To exaggerate the deformation, go to the **Deformed** panel by selecting ***Results > Plot > Deformed***.
18. Set the scale factor **Value** from `1` to `10`.
19. Under the **Undeformed shape** section, play around with the settings to view the original undeformed shape.



20. Export the animation as a GIF. From the **Image Capture Toolbar**, click the ***Capture Graphics Area Video*** icon.

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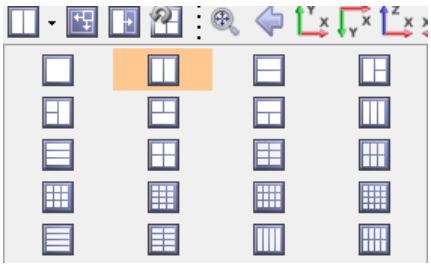
21. Choose a file name, export the GIF, and then watch the animated file in whatever viewer you have available. Typically Internet Explorer will work for this format.

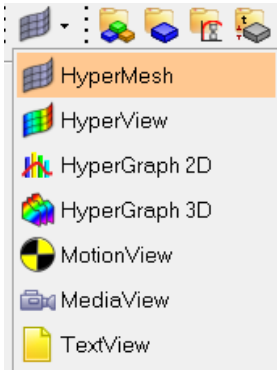
Step 5: Split the window layout, sync the pre/post, and save as a report template.

We are now going to open the original model we used to run this analysis. We are then going to split the page into two clients (HyperMesh and HyperView), and then visualize and synchronize the pre and post model side by side. Then we will save our work as a report template so we can apply the same settings to other result files in the future.

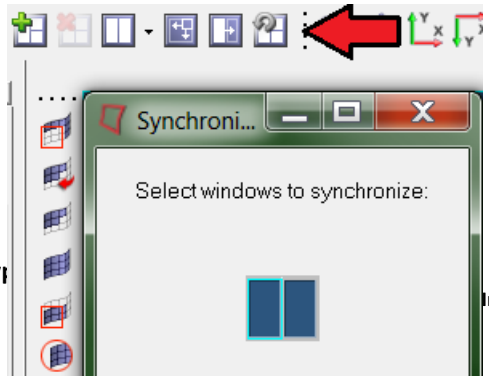
22. Split the page into two windows.



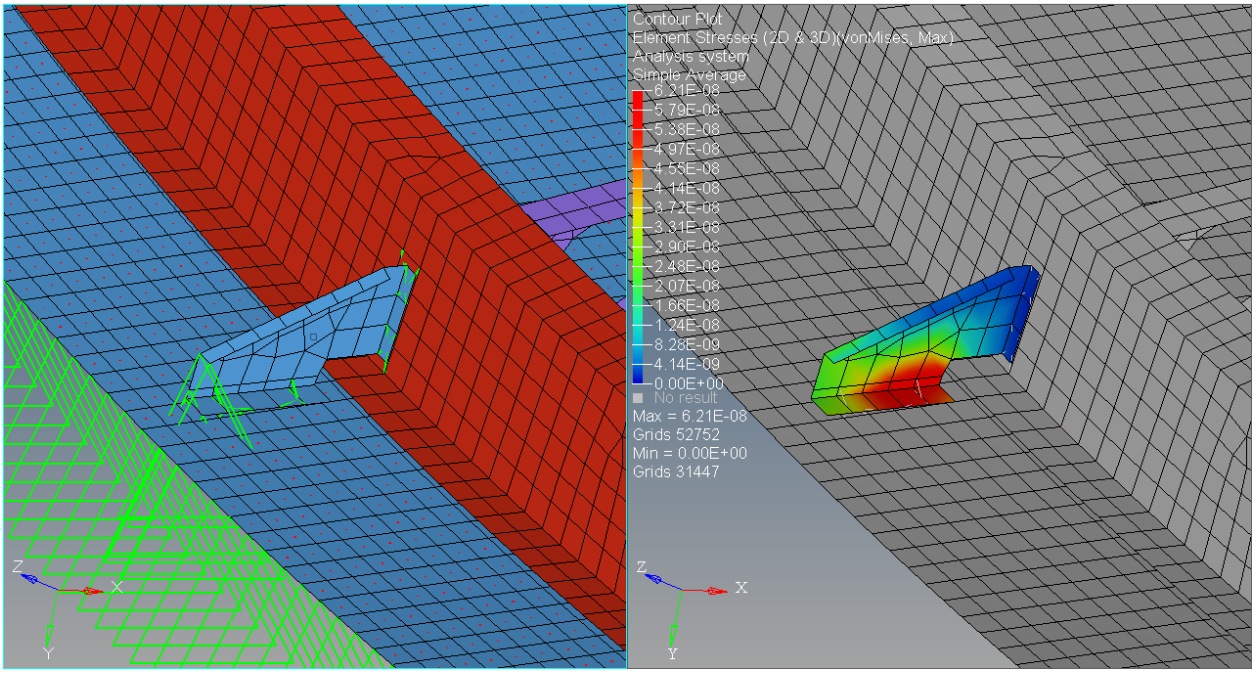
23. In the empty window, toggle the client to be HyperMesh.



24. Open the original HyperMesh model (*12a-CompositeSkin_Contour.hm*).
25. Click the ***Synchronize Windows*** icon, select the two windows, and then click ***OK***.



26. Now rotate, zoom, and pan one of the models around and you will see that both the results and the HyperMesh model move as one.



27. Save this session now as a report template. That way you can perform the same exact post processing steps that you applied to this model to future models just by opening the results with that template. To do this, select ***File > Save As > Report Template***.

    Once you have saved the report template, you can open it up again with some different results. When opening the template, it will prompt you for the files it requires.

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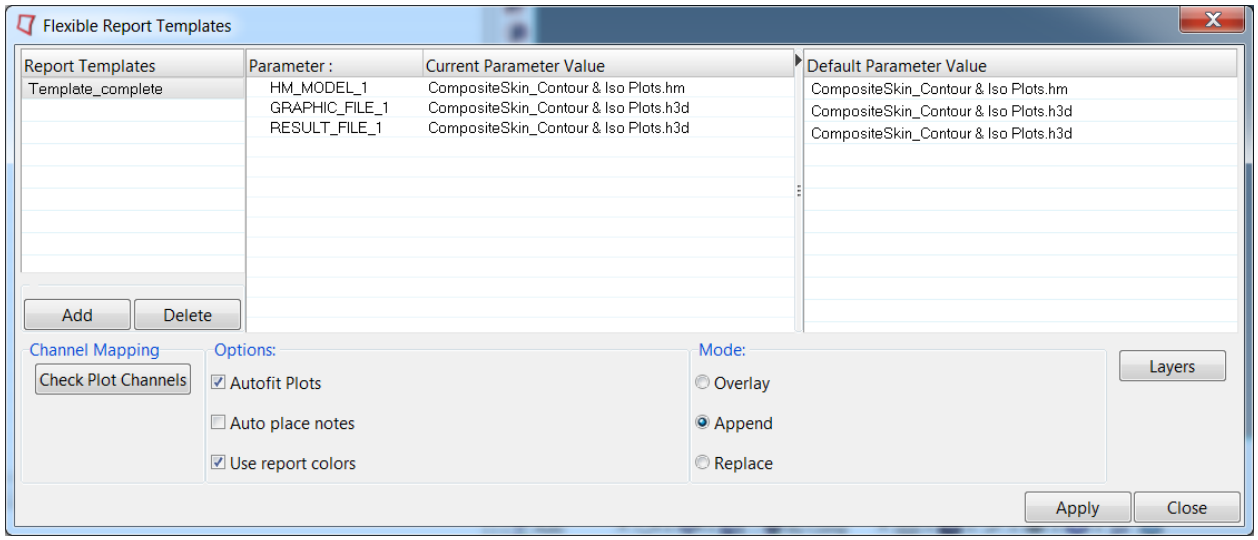
Flexible Report Templates
Report Templates
Template_complete
Parameter :
Current Parameter Value
Default Parameter Value
HM_MODEL_1
CompositeSkin_Contour & Iso Plots.hm
CompositeSkin_Contour & Iso Plots.hm
GRAPHIC_FILE_1
CompositeSkin_Contour & Iso Plots.h3d
CompositeSkin_Contour & Iso Plots.h3d
RESULT_FILE_1
CompositeSkin_Contour & Iso Plots.h3d
CompositeSkin_Contour & Iso Plots.h3d
Add
Delete
Channel Mapping
Check Plot Channels
Options:
Autofit Plots
Auto place notes
Use report colors
Mode:
Overlay
Append
Replace
Layers
Apply
Close