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Altair HyperView 2019 Tutorials

HV-3090: Creating Envelope Loadsteps

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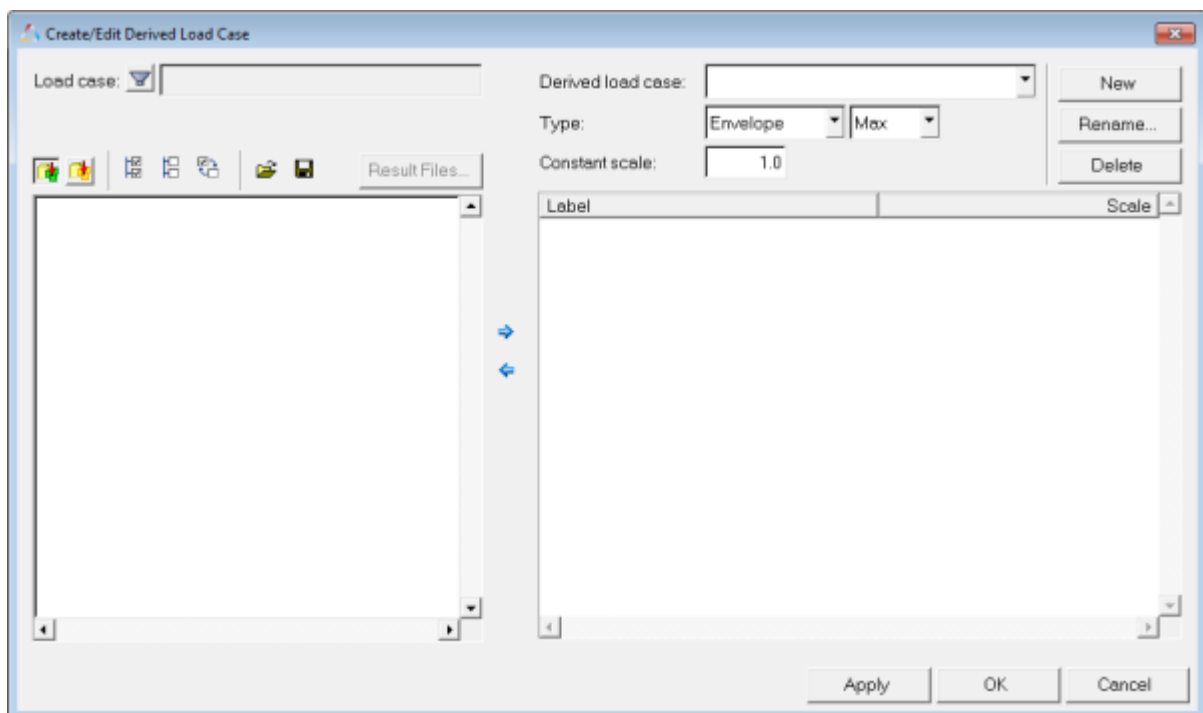
In this tutorial, you will learn how to:

- Create an envelope loadstep from existing loadsteps
- Contour an envelope loadstep

Tools

To access the envelope loadstep utility, you can use one of the following methods:

- Right-click in the **Results Browser** and select **Create > Derived Load Case > Envelope**.
OR
- Click the **Derived Load Cases** button  on the **Result** toolbar and set the **Type** to **Envelope**.
OR
- Select **Results > Create > Derived Load Steps** from the menu bar and set the **Type** to **Envelope**.



This utility allows you to create envelope loadsteps using existing loadsteps and their simulation steps. Envelope loadsteps are saved to the session file. Using this utility, you can also create derived loadsteps and linear superposition loadsteps.

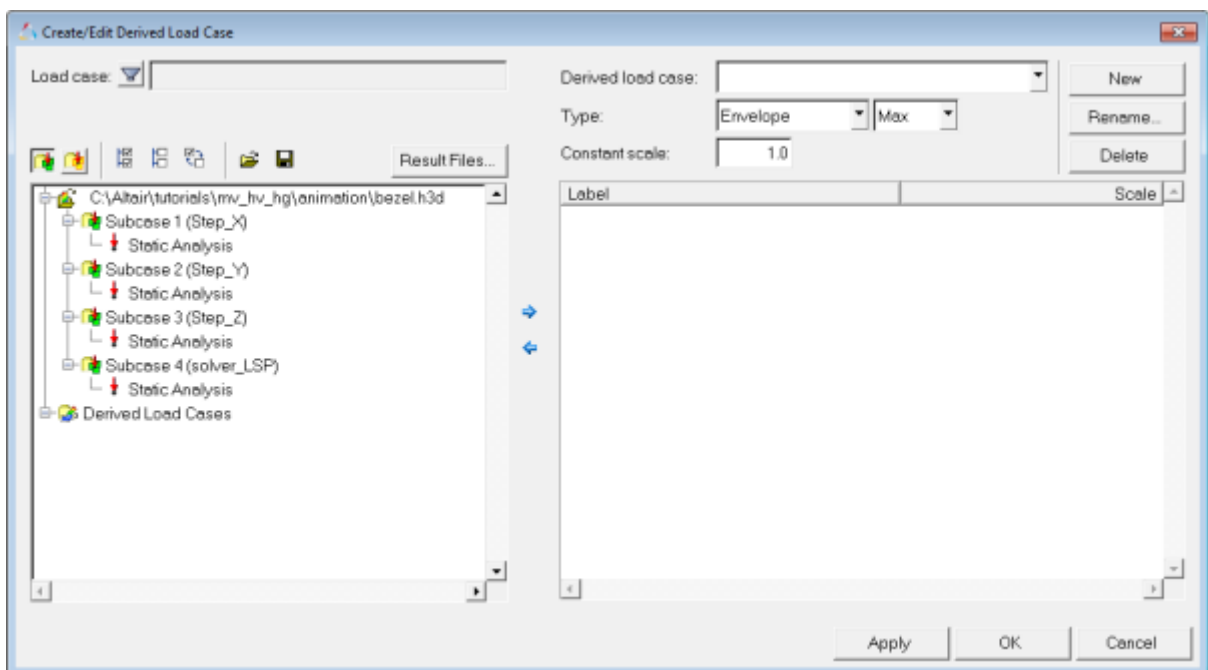
Exercise: Creating Envelope Loadsteps


This exercise uses the results files `bezel.h3d` and `bezel_iter2.h3d`.

Step 1: Create a derived loadstep.

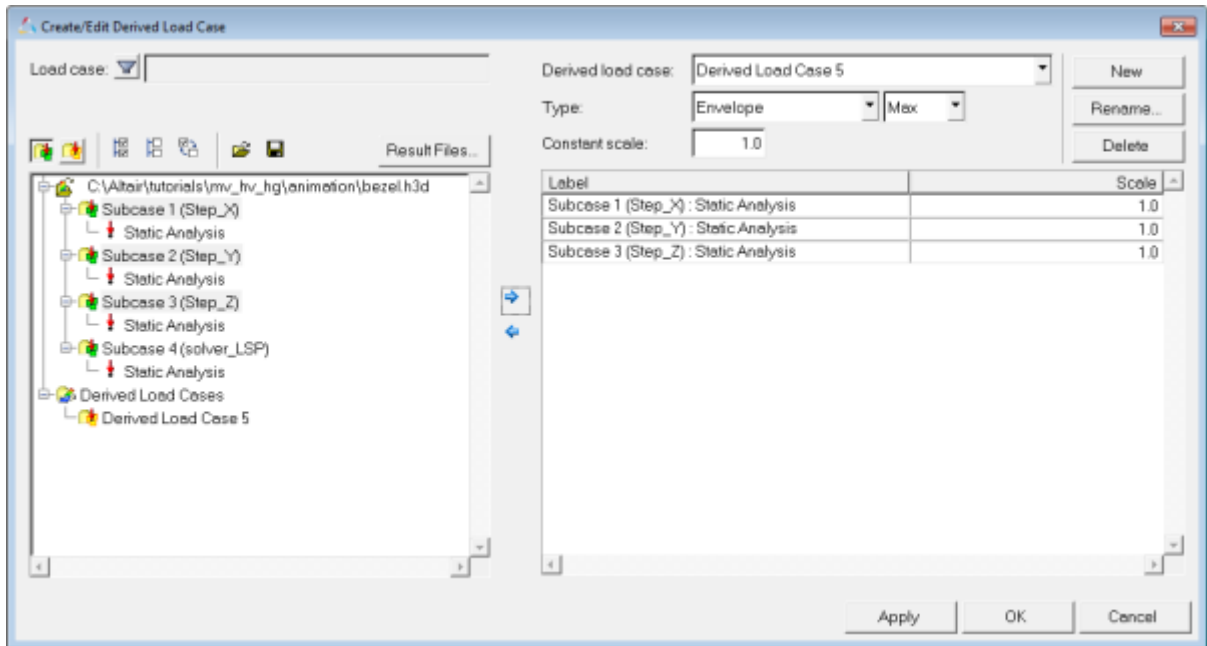
1. Load the `bezel.h3d` file, located in the `animation` folder, as both the model and results files.
2. From the **Results Browser**, right-click and select **Create > Derived Load Case > Envelope**.


All existing loadsteps and corresponding simulations are listed.




3. Select **Subcase 1 (Step_X)**, **Subcase 2 (Step_Y)**, and **Subcase 3 (Step_Z)** from the list of loadsteps on the left.
4. Click the right arrow button , to append the selected loadsteps to a new envelope loadstep.

- Leave the scale values for the selected loadsteps set to the default value of 1.0.
In this tutorial the results will not be scaled when creating the envelope loadstep.



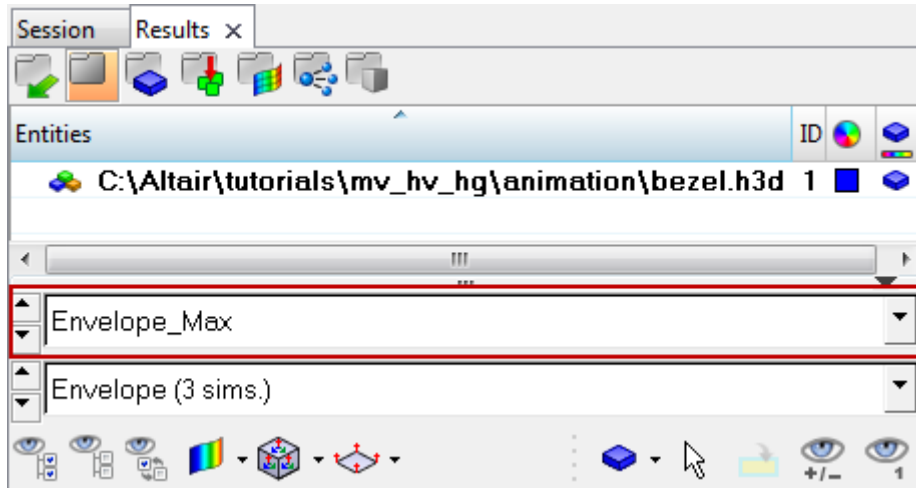
- Verify that the **Type** options are set to **Envelope** and **Max**.
- Click **Apply** to create the envelope loadstep.
- Click on the **Rename** button.
- Type `Envelope_Max` in the **Rename** dialog and click **OK**.
- Click on the  button, to view the envelope loadstep that was created.

If there is more than one Derived Load Case displayed in the list, you can click on a derived load case to display the loadsteps which were used to create that derived load case in the table area on the right.

- Click on the  button, to view the initial loadsteps in the results file.
- Click on the **New** button.
- Repeat steps 3 - 11, however this time select **Envelope** and **Min** as the **Type** options (instead of **Envelope** and **Max** previously selected in step 6) and also rename the envelope loadstep as `Envelope_Min` in step 9 (instead of **Envelope_Max**).
- Click **OK** to close the dialog.

Step 2: Contouring the envelope loadstep.

1. From the **Results Browser**, use the **Change load case** drop-down menu to set the load case to **Envelope_Max**.



Note The **Results Browser** can be turned on or off using the **Browsers > HyperView > Results** option located within the **View** pull-down menu.

The **Change load case** toolbar visibility can also be toggled on/off using the **Configure Browser** option (located in the **Results Browser** context menu).

3. Go to the **Contour** panel.
4. For **Result type**, select the **Element Stresses (2D & 3D) (t)** option.
5. Verify that the **vonMises** option is selected in the second **Result type** drop-down menu (located below **Element Stresses (2D & 3D) (t)**).
6. For **Entity with layers**, select **Max**.

Notice that **Min** option is not available for **Entity with layers**; this is because the current loadstep is set to a max envelope loadstep.

7. Click **Apply**, to apply the contour.

The maximum value of stress among all layers is contoured for each element among all three loadsteps used in the max envelope loadstep.

8. The **Envelope trace plot** option is now activated. Select **Subcase** from the drop-down menu, and then click **Apply**.

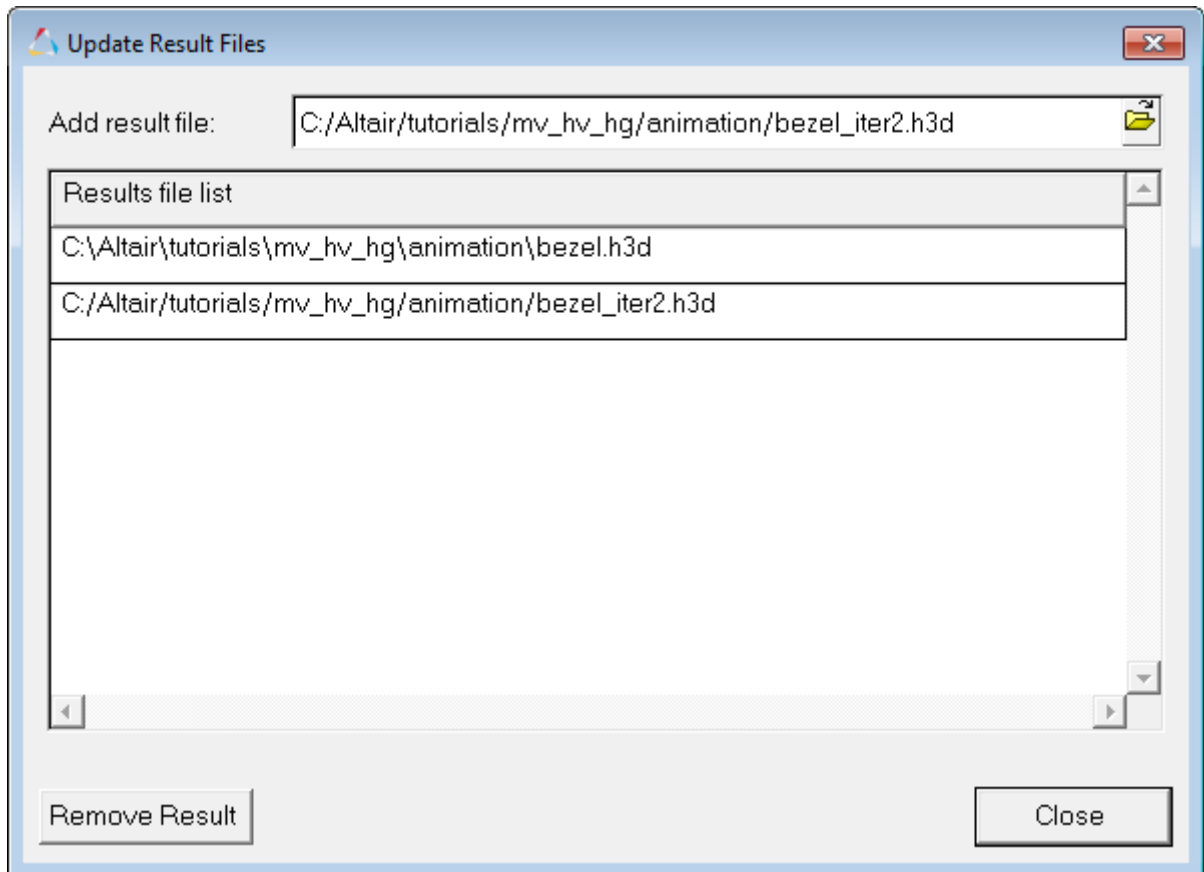
This option allows you to track the results from Envelope subcases or simulations.

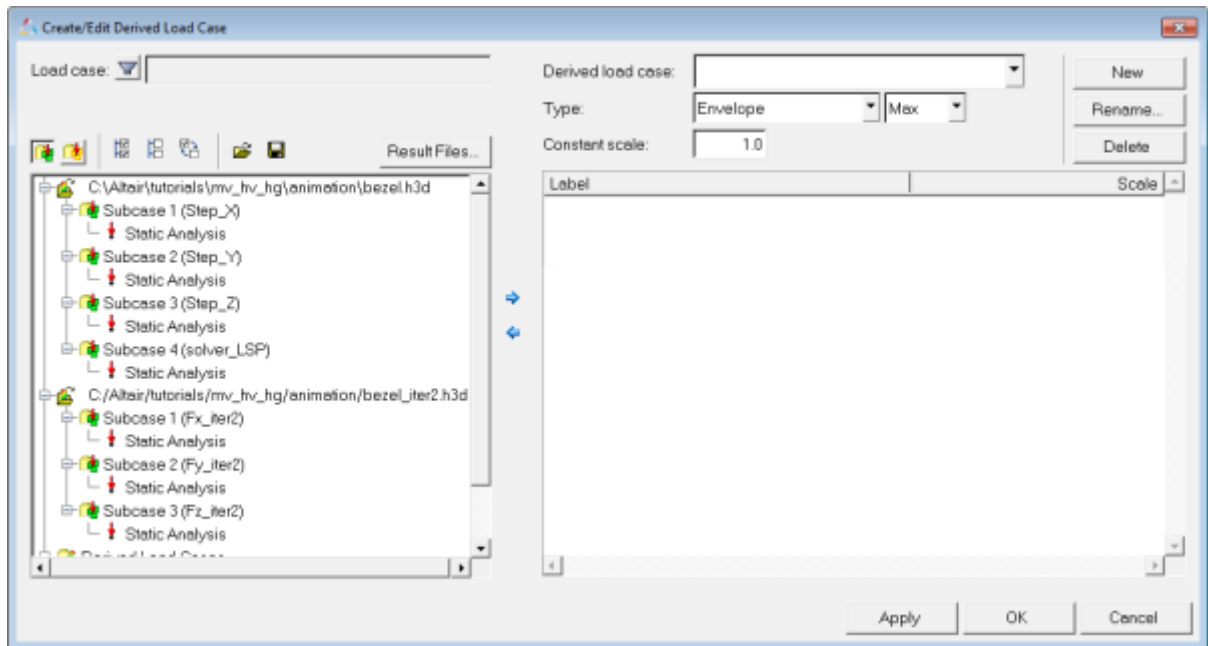
Observe how the legend is now only displaying values of **1**, **2**, and **3**. These values correspond to the subcases contained in the current loadstep.

9. From the **Envelope trace plot** drop-down menu select **None**, and then click **Apply** to return to the stress contour.
10. Click on the **Clear Contour** button.
11. Repeat steps 1 - 10, using **Envelope_Min** in step 2 (instead of **Envelope_Max**) and **Min** in step 7 (instead of **Max**).

Step 3: Adding simulation steps from another file.

1. From the **Results Browser**, expand the **Loadcases** and then the **Derived Loadcases** folders.
2. Right-click on **Envelope Max** and select **Edit** from the context menu.
3. Click on the **Result Files** button, to add loadsteps and simulations from another result file.
4. In the **Update Result Files** window, browse and select the result file **bezel_iter2.h3d**.



5. Click **Close**.

The loadsteps and simulations from the second results file will be added to the list of available loadsteps and simulations and can be used in creating derived loadsteps, linear superposition loadsteps, and envelope loadsteps.