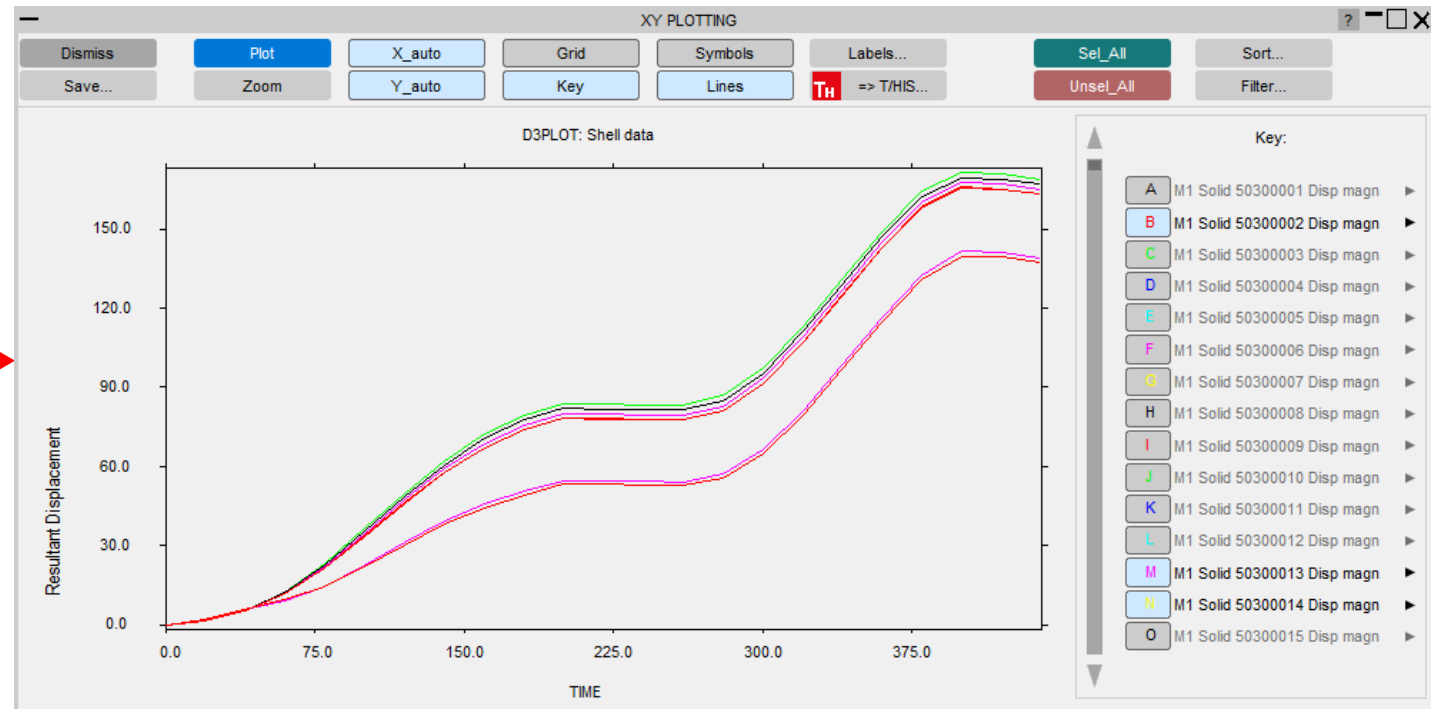
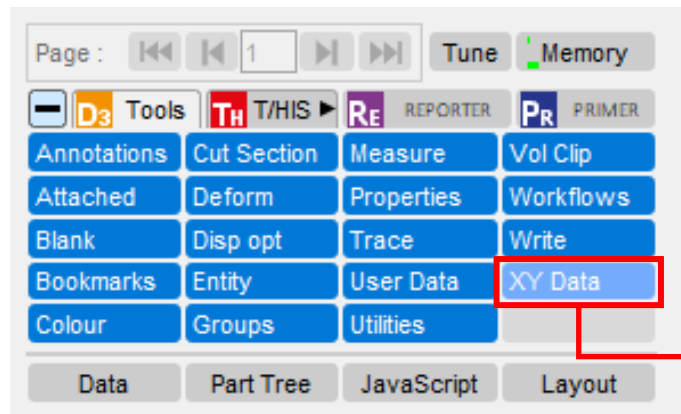


XY Data



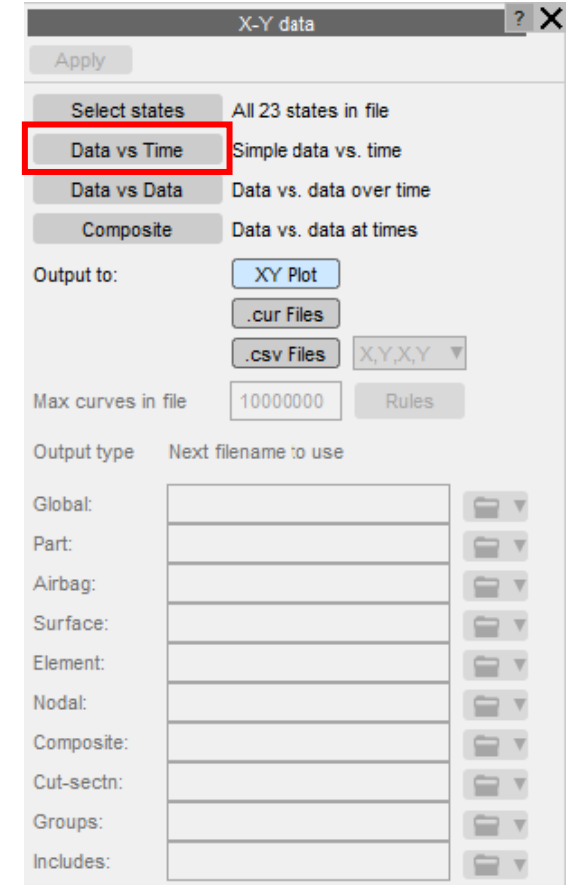
About XY Data

- Firstly, the **XY Data** tool in D3PLOT allows users to plot data, such as plotting data components against time. This makes it easier to analyse via a visual representation of the data.
- Secondly, the **XY Data** tool can be used to extract the time history data available in the D3PLOT (.ptf) file. This is useful if further data is required which is not in the output T/HIS (.thf and binout) files.



Data vs. Time – Worked Example

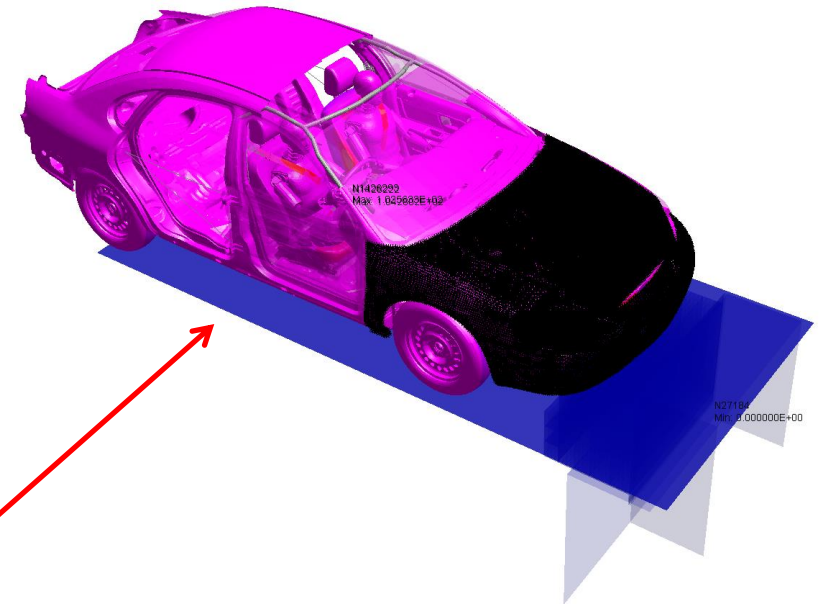
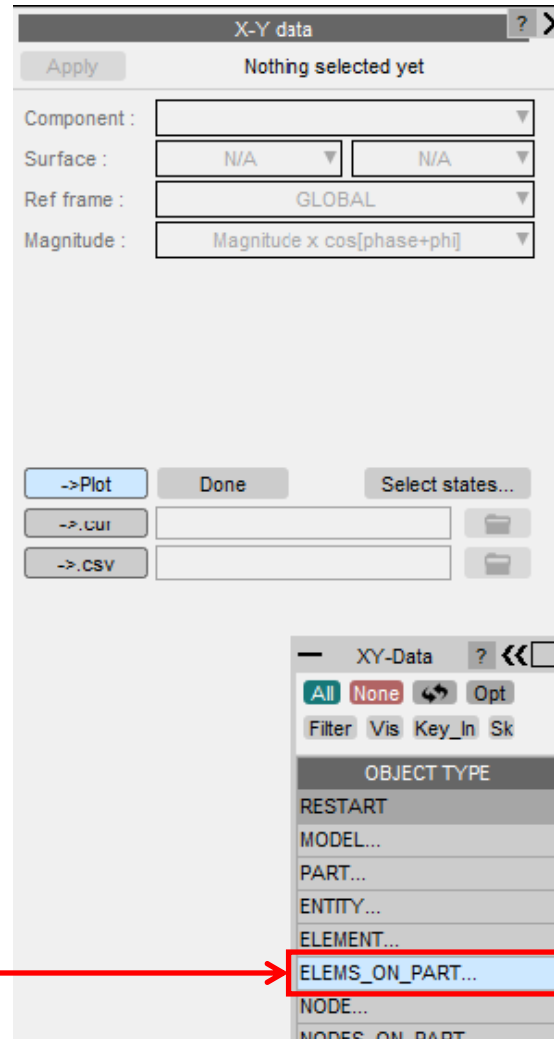
- The **Data vs Time** option within the **XY Data** menu plots time history (using D3PLOT data) for model entities such as nodes and elements. For example, displacement vs. time for three shells.
- The data can be output to screen and/or a file.



Data vs. Time – Worked Example

(1) Select objects for which data is to be plotted.

Either by selecting from the object menu, or, as in this example, screen-picking by dragging out an area, or picking each object separately, or by using Key_In to enter the ID.

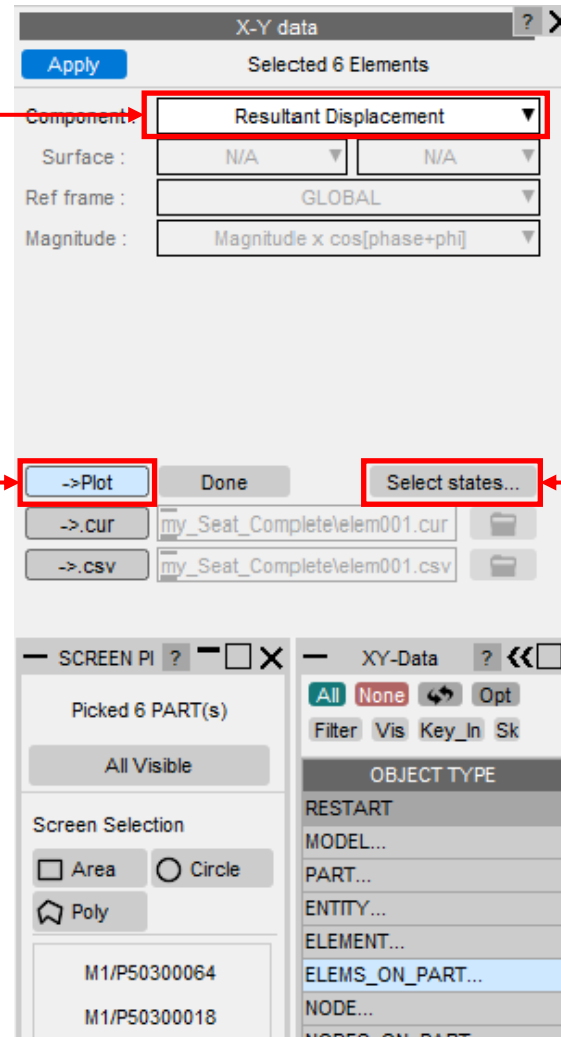


Data vs. Time – Worked Example

(2) Select the data component required to plot.

To display on screen: ensure that the **->Plot** button is highlighted.

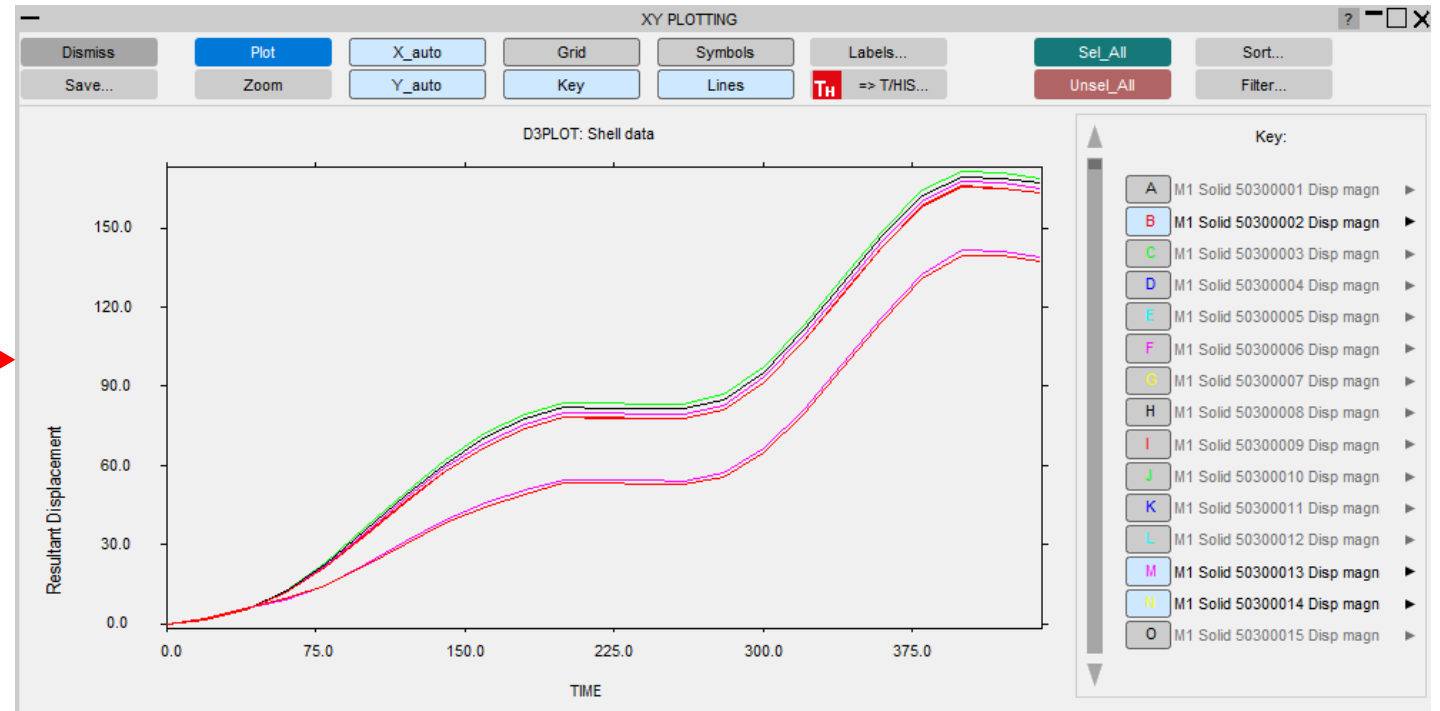
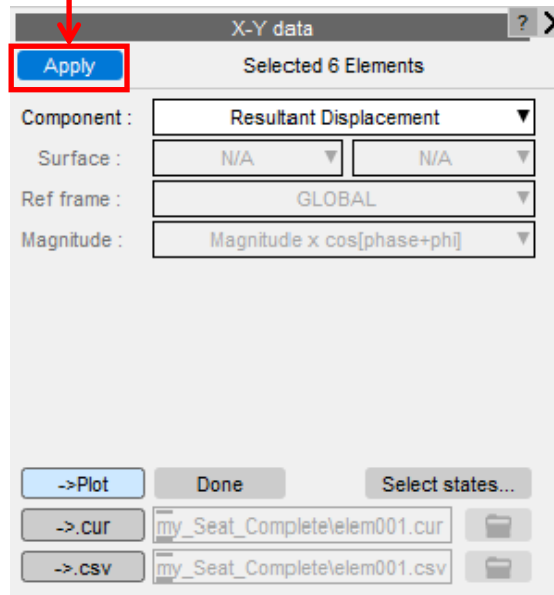
To output a file: ensure that the **->.cur** or **->.csv** buttons are highlighted.



Optionally select time states for output.

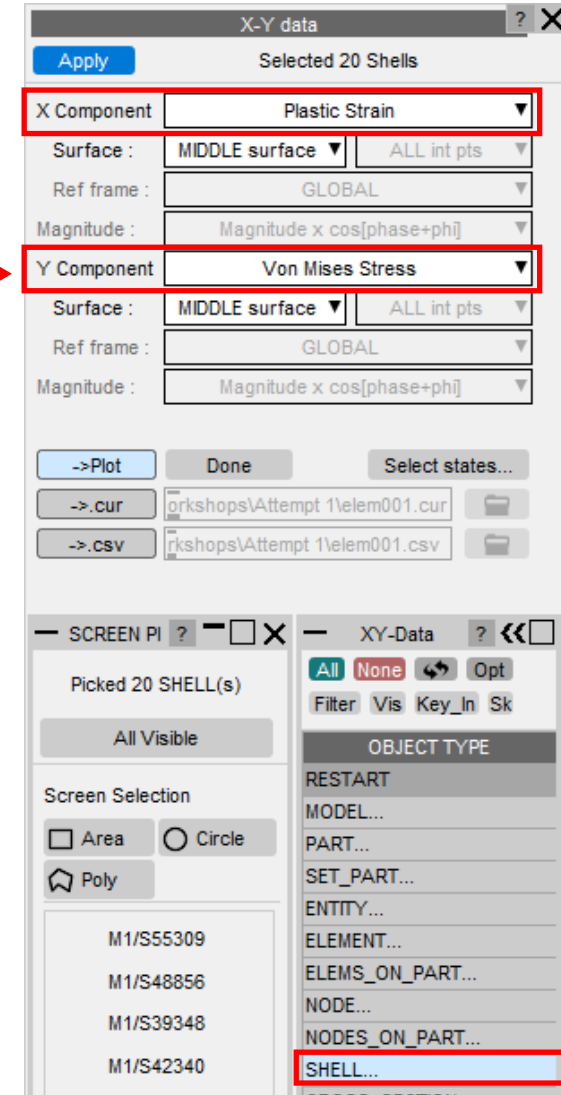
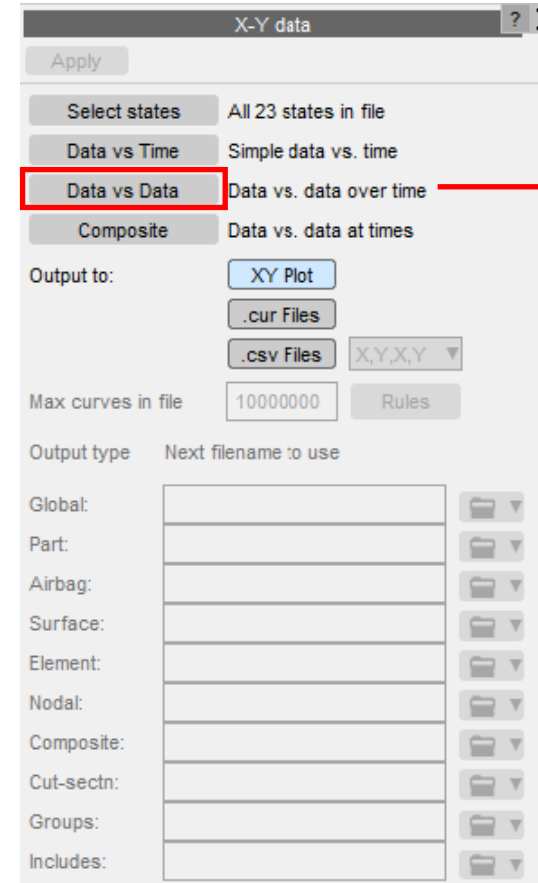
Data vs. Time – Worked Example

(3) Click the **Apply** button to display the graph.



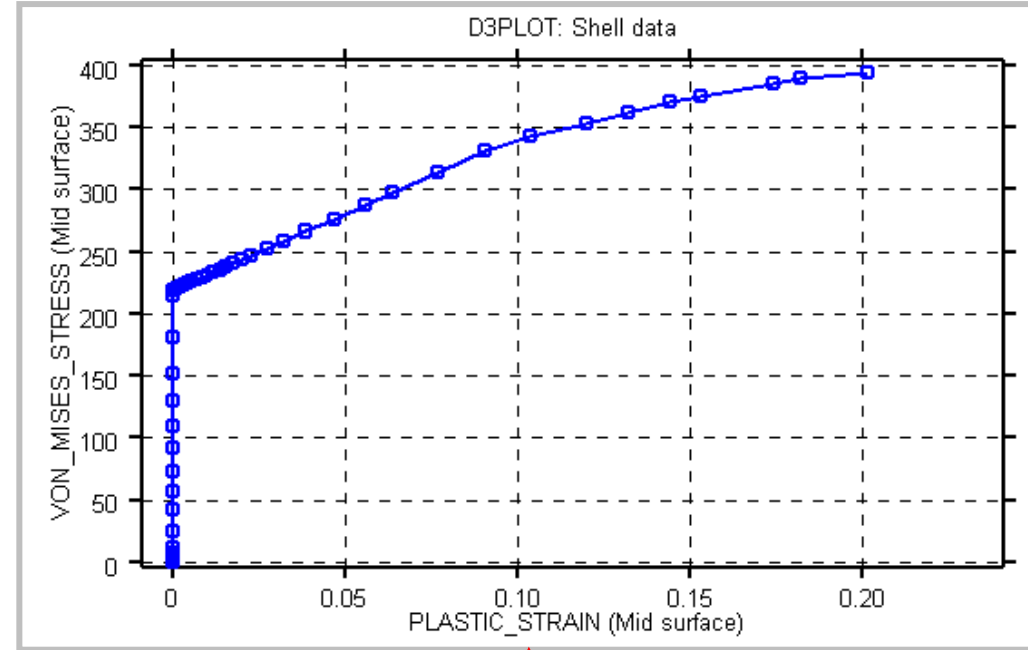
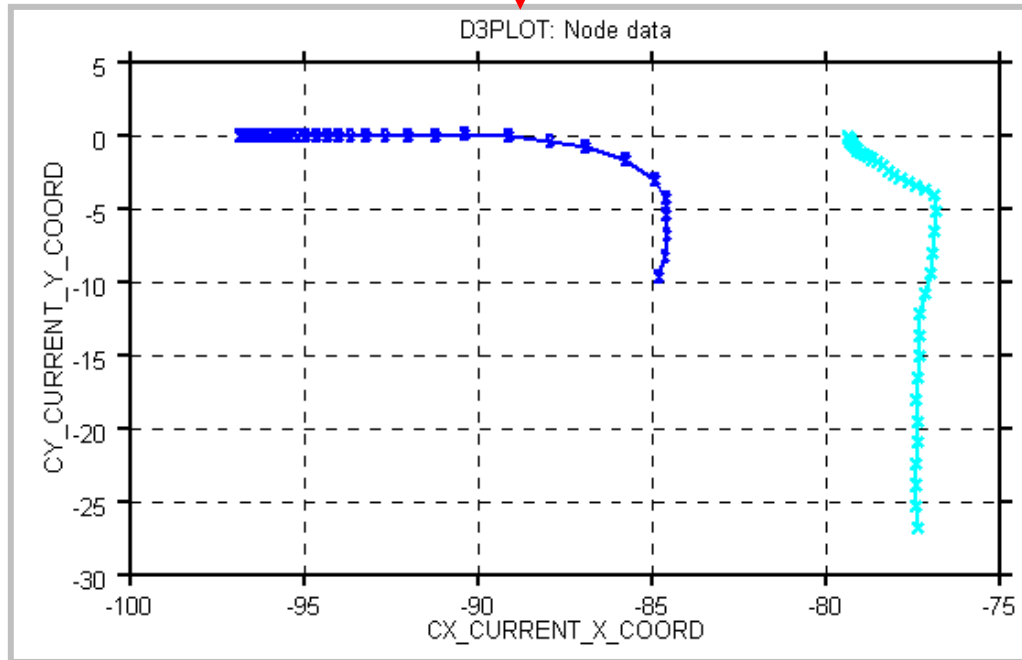
Data vs. Data

- The **Data vs Data** option within the **XY Data** menu allows two data components to be plotted against each other over time, such as Von Mises Stress vs. Plastic Strain.
- A curve is written for each selected entity (node, element, etc), with each point on a curve representing one time state.



Data vs. Data - Examples

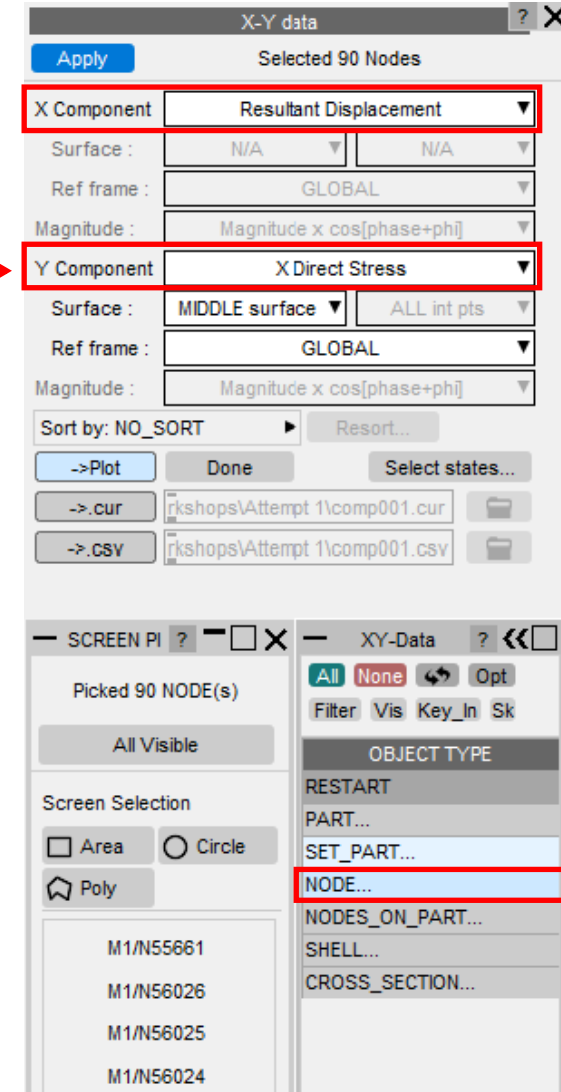
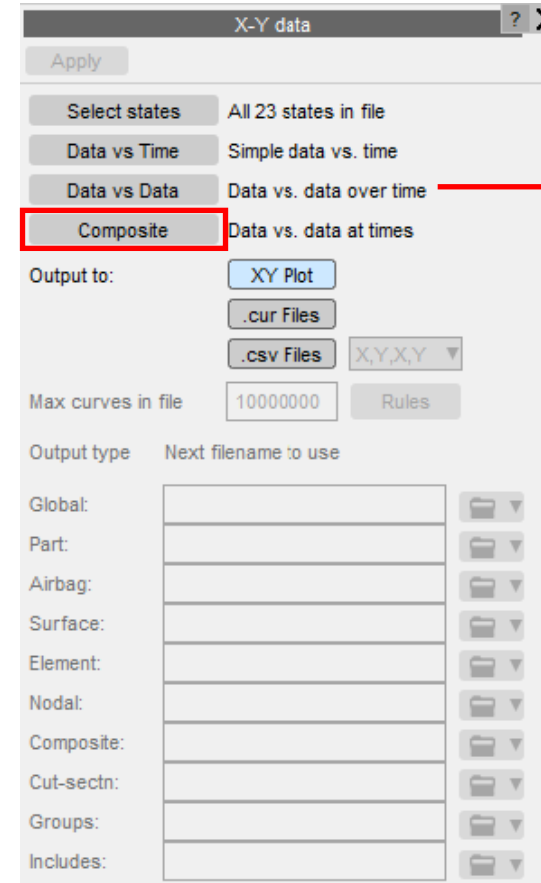
Trajectory of nodes



Von Mises Stress vs. Plastic Strain

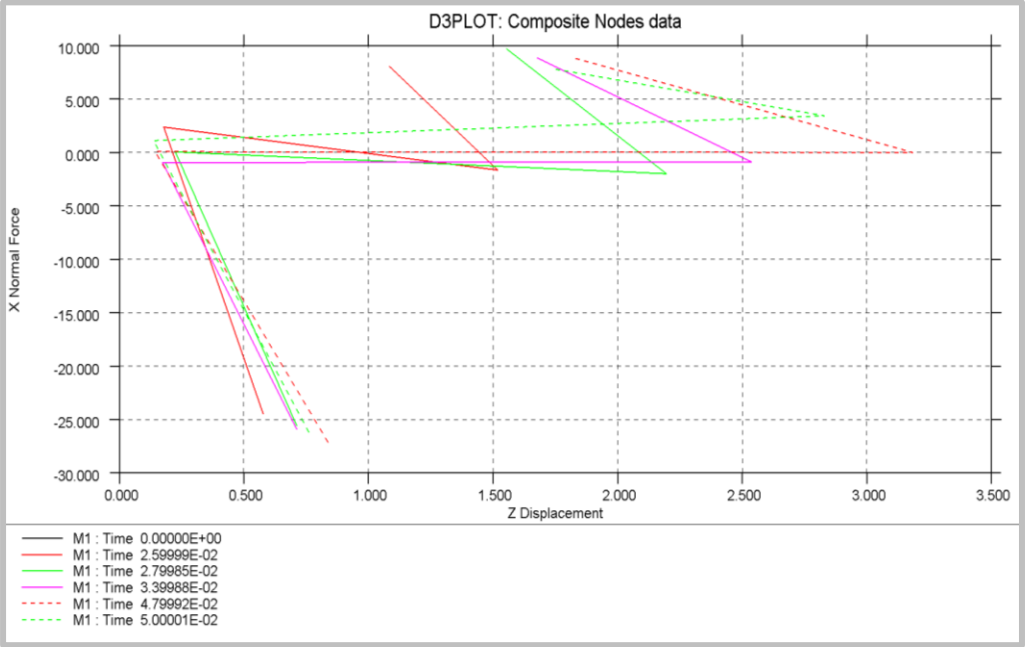
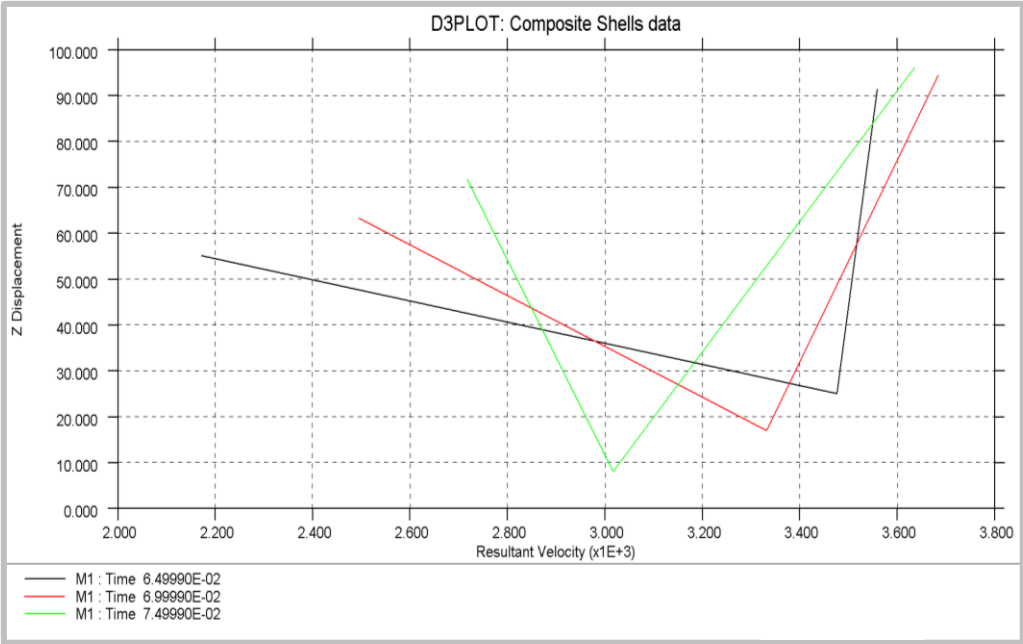
Composite

- The **Composite** option, within the **XY Data** menu, allows two data components to be plotted against each other, with one curve for each time state and one point on each curve for each selected entity.
- The order in which the entities are selected is important, and can be sorted, see later slide.



Composite - Examples

Velocity vs. Displacement for shells

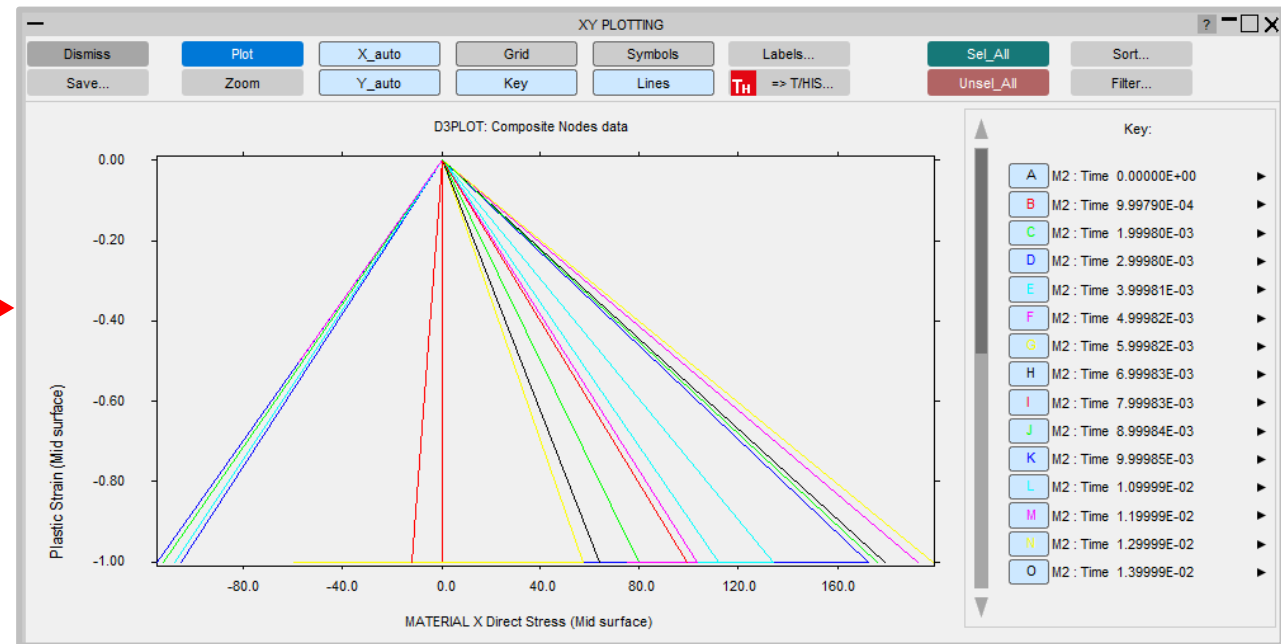
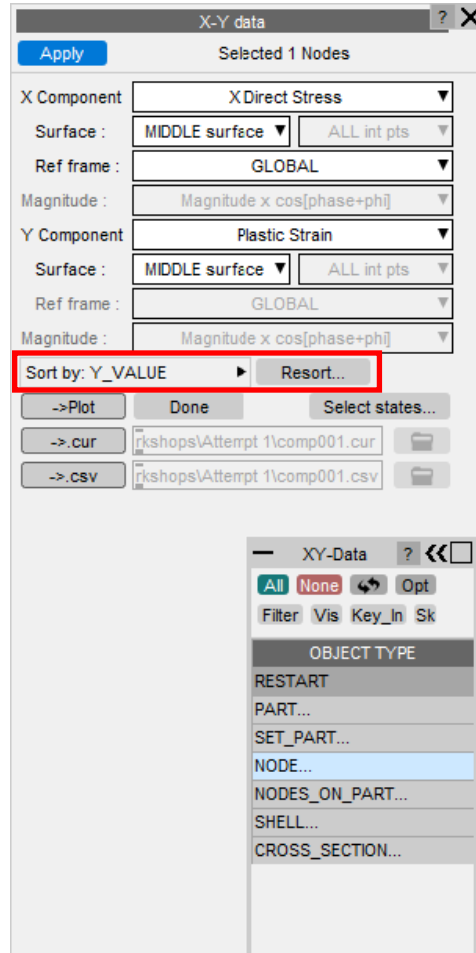


Force vs. Displacement for nodes



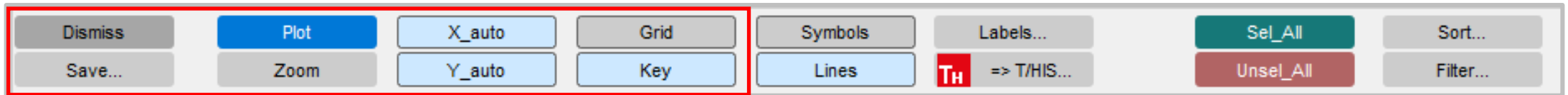
Composite – Resort function

- By default, no sorting takes place of the XY Data points displayed on the graph. The **Resort** function allows the data points to be sorted in a variety of ways, e.g. by y-value.



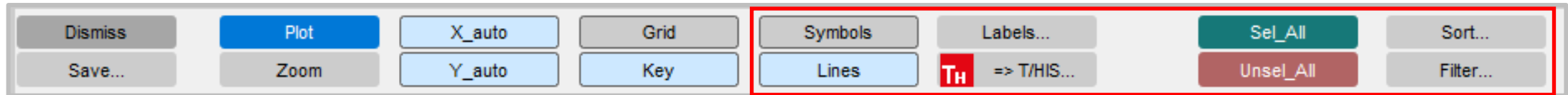
XY Plotting Functions

- **Dismiss** – closes the XY plotting window. Data is left unchanged on backing store.
- **Save** – writes the currently selected curves to 'curve' or 'csv' files.
- **Plot** – redraws the current graph with the curves selected for plotting (can also be considered as a refresh button to update the graphics on the graph).
- **Zoom** – uses the mouse cursor to zoom in on an area. Both X and Y scales become set explicitly (taken out of automatic mode).
- **X_auto** – switch auto scaling for the X axis on/off.
- **Y_auto** - switch auto scaling for the Y axis on/off.
- **Grid** – toggle the grid at the tick marks on/off.
- **Key** – toggle the curve labels labelled “Key” (situated to the right of the graph) on/off.



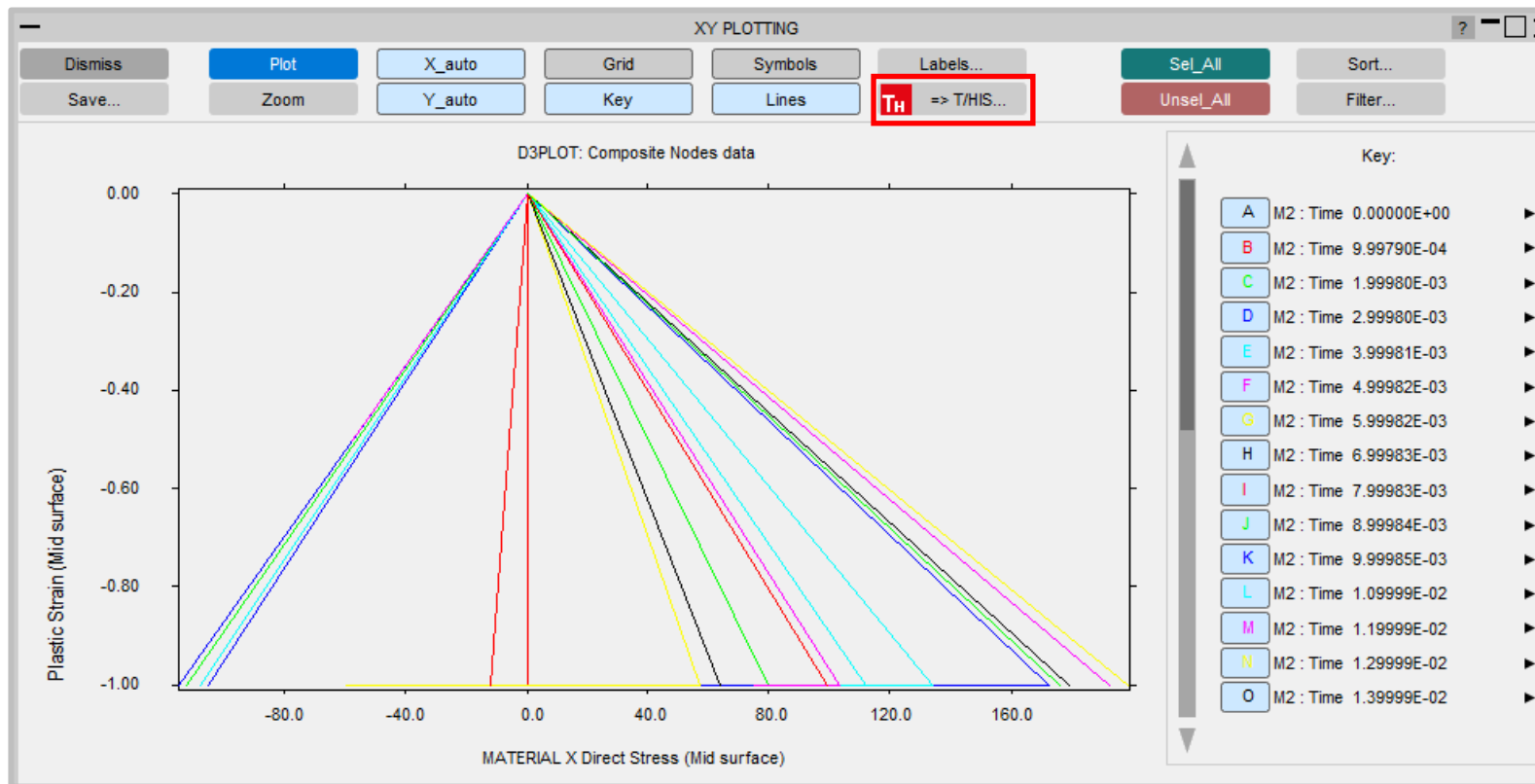
XY Plotting Functions

- **Symbols** – toggle the display of symbols (letters) at points on/off.
- **Lines** – toggle the lines between points on/off.
- **Labels** – edit the graph title and axis titles.
- **=> T/HIS** – copies selected curves to T/HIS using the T/HIS link within D3PLOT. See following slides for more detail.
- **Sel_All** – selects all curves for plotting.
- **Unsel_All** – deselects all curves for plotting.
- **Sort** – choose the order of appearance of the curves listed in the 'Key' (situated to the right of the graph) from a range of predefined options.
- **Filter** – filter the curves by colour and/or letter.



Exporting to T/HIS

- Curves can be exported to T/HIS for further processing. This can be done either by writing curve files and reading into a separate session of T/HIS, or starting the T/HIS link directly from the XY plotting panel by pressing the '**=> T/HIS**' button. The option is then given to either export all curves or only selected curves.



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