

# 2-D-Plots in the New SIMPACK Plot Module

The new SIMPACK Plot module is the first of a set of completely new SIMPACK graphical user interfaces (GUI). The Plot module was rewritten from scratch using state of the art object oriented technology. It comes with a completely re-designed user interaction scheme similar to standard office tools including such unique features as „multi edit“ for enabling simultaneous editing of multiple objects and a tightly integrated object oriented scripting language. The new Plot module also features a robust set of new functionality designed to simplify and speed up daily work. Among those features are drag-and-drop and Windows clipboard interoperability with desktop office tools, the ability to plot the results of multiple models in one session, diagrams with more than one x- and y-axis and many more.

## WORKING WITH SESSIONS AND PROJECTS

The new Plot module introduces projects to the SIMPACK world. A project is the data container for all information the user enters while creating plots. Multiple projects can simultaneously be loaded into one SIMPACK session. Each project is saved to its own SIMPACK Project File (.spf) which is an XML ASCII file format. Unlimited undos and redos are available for each project. The major entities defined in a SIMPACK session are visualized in the SIMPACK session tree. In this tree elements can be selected, renamed, edited, copied, pasted, removed and re-ordered.

## THE LAYOUT

Pages are grouped into so-called Page Sets similar to the Plot Cases known from the classic SIMPACK plot. Pages can be in portrait or landscape format and can have a user defined or standardized size, e.g. DIN A4. The page layout is „what you see is what you get“ (WYSIWYG) in a sense that when printing the pages or exporting them to vector graphics or bitmap format, everything appears exactly as it is seen within the SIMPACK plot.

A page can have an arbitrary number of diagrams which can be arranged on the page in any desired scheme. The diagrams are placed in so-called table cells. The cell layout can either be chosen from 16 pre-defined formats or can be created by splitting and/or merging existing cells. Additionally to diagrams, the cells of a page can also contain text boxes, e.g. for adding comments or bitmap graphics, such as a company logo.

## DEFINING CURVES WITH A SINGLE MOUSE CLICK

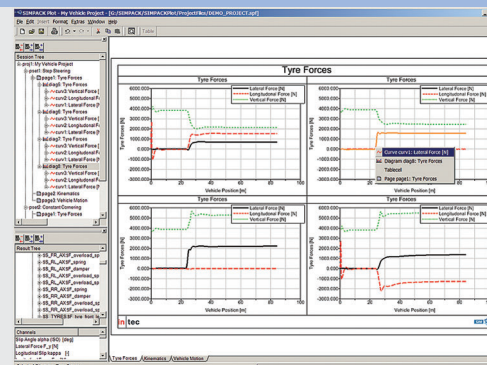
Curves are defined by dragging elements from the result tree into an existing diagram or into an empty cell on a page. Multiple elements can be dragged simultaneously enabling the user to define multiple curves with one mouse click. Once a curve is defined, its properties can be viewed and changed by either picking the curve in the graphics or in the session tree. Curves can be copied, cut and pasted between different diagrams. Curve data is directly accessed from model independent result files. Result files are typically SIMPACK Binary Result Files (.sbr) generated by the SIMPACK solver. Additionally any column oriented ASCII file can be loaded as a result file as well.

## DIAGRAMS WITH MULTIPLE AXES

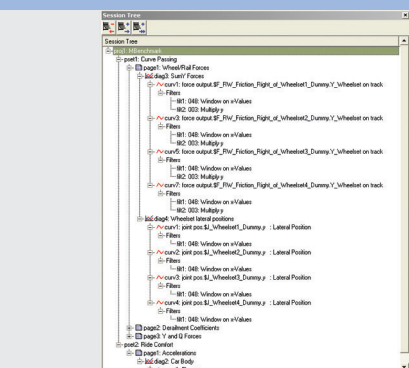
A standard diagram has one x- and one y-axis. However it is possible to define an unlimited number of additional x- and y-axes. Curves can then be moved between the different axes. The position, layout and size of the axes in a diagram are all user definable. Scaling of the axes can be performed by directly entering the values or by „box zooming“ the diagram. A box zoomed diagram can be navigated with the cursor up/down and left/right keys. The legend can be freely placed inside or outside the diagram and be switched off.

## FILTERING THE DATA

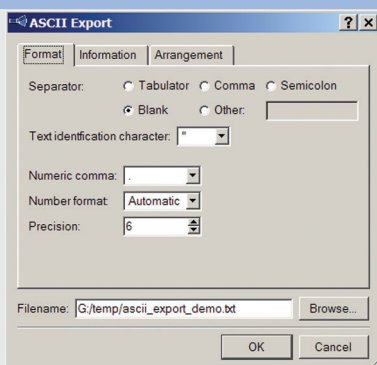
One or more filters can be applied to a curve. A large variety of filter types are available. User defined filters may



Full Plot



Session Tree



ASCII Export Config

also be easily incorporated. Once the filters are defined they can be re-ordered by simply dragging them to their desired position in the SIMPACK session tree. For greater efficiency, filters can be simultaneously added to multiple curves. Also filters or chains of filters can be cut, copied and pasted between curves.

### GOING EVEN FURTHER

Once a set of curves has been defined the user may wish to copy all those curves to a new Page Set and apply the results of a different result file to a curve. This is facilitated by the „Replace result file“ functionality which changes all result file references of the selected curves to the new result file. If reference result curves should be generated from a set of defined curves this can be achieved by utilizing the „Duplicate curves“ functionality which duplicates all curves in a diagram and lets them point to a new result file.

### PRINTING AND EXPORTING DATA

Plot pages can be exported in a variety of bitmap and vector formats such as .png, .bmp, .tif, .cgm, .ps and Enhanced Windows Meta File (.emf). Single or multiple pages can be sent to a printer. Curves can be exported in a configurable character separated ASCII file format.

### INTEROPERABILITY TO OFFICE TOOLS

Plot pages can be brought into office tools by simply dragging them from the SIMPACK plot GUI onto the receiving application. In addition to this drag and drop interface plot pages can be stored to the windows clipboard and accessed from there by the receiving application.

### TAKING THE USER INTERFACE BEYOND THE EXPECTED

Additionally to standard user interaction schemes the new SIMPACK plot offers some sophisticated interaction schemes designed to speed up daily work and eliminate tedious routine work. The most powerful of those features is the so called „multi-edit“

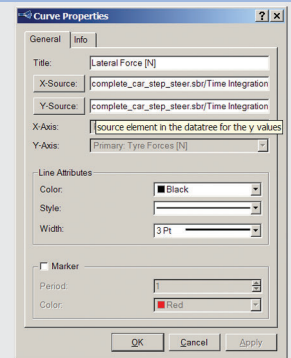
mode. Attributes of objects of the same type can simultaneously be edited in the multi-edit mode. A typical application for this would be if the user wants to change the x-axis scaling of multiple diagrams to the same min and max values. Instead of changing each diagram's min/max individually, „multi-edit“ allows these values to be edited in one go.

### SCRIPTING AND CUSTOMIZING

For process automation and GUI customisation QSA, an object oriented scripting language (similar to JavaScript) has been incorporated into the plot module. The scripting language can be used in three different ways:

- silent mode, e.g. to generate bitmap files of a plot configuration in batch mode,
- scripting console, for entering and executing script commands while the application GUI is up and running,
- GUI customizing, for customizing the GUI by adding new Menu buttons, input windows and even complete dialogs.

The first release of the new SIMPACK plot, due in July 2005 will cover the functionality of the General Plot module of the classic SIMPACK plotting environment. Subsequent releases will incorporate the State Plot and the Parameter Variation Plot functionality as well as advanced features such as 3D plotting and a Macro Recording utility.



Curve Properties Dialog

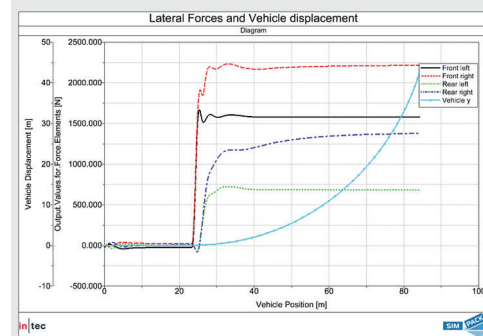
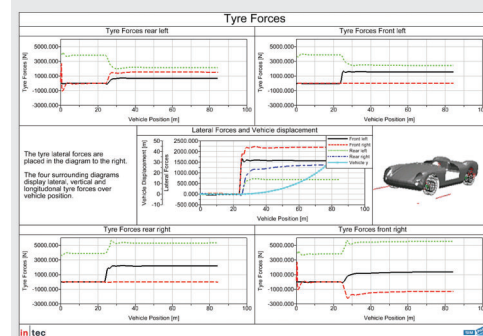


Diagram with more than one Y-Axis



Page with Arbitrary Diagram Set Up