

Laplace

PIK

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Chapter 1

Laplace

1.1 plotter

- Laplace Manual ↔

----- Plotter -

5) The function plotter

Currently a simple plotter for functions of one or two variables is implemented. Only two dimensional functions are supported now, a second variable can be used for creating animated plots.

You can open as many plotter windows as you like; each window has it's local settings and can display an arbitrary number of functions.

The command `plot_new()` creates a new plotter without animation, whereas `plot_newanim()` makes a new animated plotter. These functions return a handle that is used to refer to the plotter in the other commands.

To open the plotter window use the `plot_open()` command. You can add and remove function to the window using the command `plot_addfunc()`, `plot_repfunc()` and `plot_delfunc()`.

- *
Description of the window
 - *
Description of the menu
 - *
Description of the toolbar
 - *
The settings window
 - *
Animated plots
-

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1.2 plotterwindow

- Laplace Manual ----- Description of the window - ↔

Description of the window

The plotter window is divided into three parts, a toolbar at the top, the plotting area and a status line at the bottom.

A single mouse click into the plotting area display the X/Y-position under the mouse pointer in the status line. A double click centers the visible area at this position. If you hold down the mouse button while moving the mouse pointer, you can specify a range to zoom into. This can be a rectangular box or only a X-intervall, depending on the state of auto scale.

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1.3 plottermenu

- Laplace Manual ----- Description of the menu -

Description of the menu

- Project
 - Export - Currently not implemented.
 - Print - Currently not implemented.
 - Settings - Open the settings window.
 - Load settings - Load the settings from a file.
 - Close - Close this plotter window.
- View
 - Zoom in - Magnifies the current view by 25%.
 - Zoom out - Shrinks the current view to 80%.
 - Move left - Move the visible area 50% to the left.
 - Move right - Move the visible area 50% to the right.
 - Move up - Move the visible area 50% up.
 - move down - Move the visible area 50% down.

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1.4 plottertoolbar

- Laplace Manual ----- Description of the toolbar -

Description of the toolbar

Each plotter window has a toolbar at the top.

- zoom in - Magnifies the current view by 25%.
- zoom out - Shrinks the current view to 80%.
- move left - Move the visible area 50% to the left.
- move right - Move the visible area 50% to the right.
- move up - Move the visible area 50% up.
- move down - Move the visible area 50% down.
- settings - Open the settings window.

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1.5 plottersettings

- Laplace Manual ----- The settings window -

The settings window

The settings window offers a lot of attributes to adjust the plot to your requirements.

The window is divided into five sections:

- Range
- Axis
- Functions
- Animation
- Color

When the settings window is opened, the current settings are backed up. By hitting Use the settings are applied to the plotter and the settings window is closed. Update just applies the settings, but the settings window remains open and the backed up settings are not changed. Cancel closes the settings window and restored the backed up settings.

The following functions are available in the menu:

- Restore - Restore the settings to the state when the settings window was opened.
- Load - Load the settings from a file.
- Save - Save the settings to a file.
- Save as... - Request a filename and save the settings to this file.
- Close - Same as hitting the Cancel button.

Range

Here you can specify the visible area. If auto scale is enabled, the Y-range is adjusted to the minimum and maximum of the displayed functions in the given X-range.

Axis

This section specifies the design of the X- and Y-axis.

- The type determines, whether you want the axis to be drawn as a cross and/or as a box around the area. The cross is centered to the origin, if it is visible.
- With the axis mode gadget, you can select for the X- and Y-axis, whether it should be drawn with a linear or logarithmic scale.
- big marks and small marks define the distances between the marks on each axis. Both types of marks can be disabled using the checkmark gadget. If the axis has a logarithmic scale, this distance refers to the first decade (1...10). A value of 5 means that marks are drawn at the positions ...0.01, 0.05, 0.1, 0.5, 1, 5, 10, 50, 100, 500,...
- raster 1 and raster 2 define the distance between the horizontal and vertical raster lines. There are two different raster, each one having it's own color. Both types of raster can be disabled using the checkmark gadget. Just like the marks, on a logarithmic scale the distance refers to the first decade.
- The distance between two numbers is adjusted by labels. If the numbers get too tight, some of them are automatically left out to avoid overlapping.

Functions

Each function that is displayed in the plotter window can have some local settings:

- The function can have it's own X-range. If you enable own range the graph of the function is limited to this range.
- Especially when you display an animated plot, the calculation of the function's value table might take some time. You can reduce this time by reducing the precision. A maximal precision means that the function's value is calculated for every pixel of the X-range, with minimal precision only every 16th value is calculated.
- And finally each function graph can have it's own color.

Animation

This section is only available, if the plotter is opened in animation mode. Every function has than a second variable (that you specified with `plot_addfunc()`). Here you specify the minimum and maximum value of the second variable and the step size by which it is incremented with every animation frame.

Color

Here you adjust the colors of the difference components of the plot.

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1.6 plotteranim

- Laplace Manual ----- Animated plots -

Animated plots

If you opened an animated plotter, a small window called Animation control is opened and the Animation section of the settings window is enabled.

The Animation control has five buttons to start and stop the animation. Before an animation is started, Laplace has to calculate the graphs for each frame (doing this in real-time would be too slow...). This calculation may take some time. You can speed this up by reducing the display precision of the function(s), but this reduces the quality of the graph.

frames per second specifies the speed of the animation. Up to 50 frames per second can be requested, but the real speed, which is display below, depends on the complexity and size of the graph and the speed of your computer.

At the bottom of the control window is the current value of the second parameter. You can change it to display single frames, without rendering the whole animation.

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