MPL Plotter Documentation

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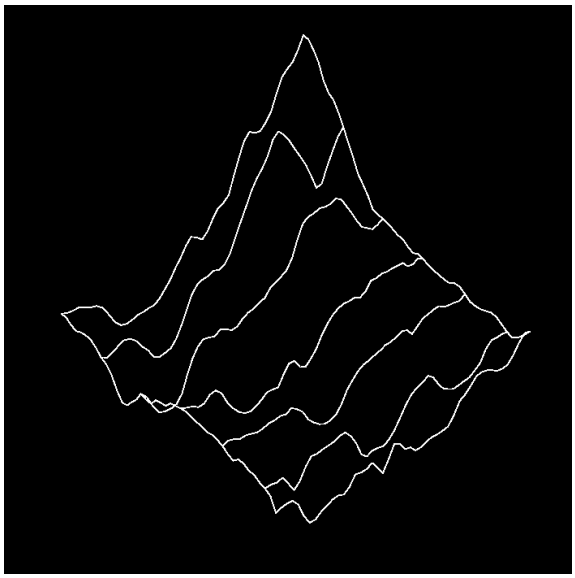

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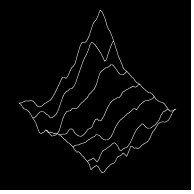

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Making plots for technical documents can be a time sink. MPL Plotter aims to reduce that overhead by allowing you to effortlessly and concisely

- Generate publication quality figures with a single call
- Compare data by plotting different curves in a single plot
- Visualize different kinds of data in figures with many plots

It is opinionated but built with flexibility in mind, which practically means that no default can't be changed, and any and all further customization with Matplotlib is compatible. From ticks to legends to extra axes to whatever suits your needs. There's two ways to use MPL Plotter:

- Calls to the 2D and 3D plotting functions
- Using presets, either those shipped with the library, or custom ones

It does the job for me and I expand it when it can't. Hope you find some use in it!

CHAPTER

ONE

2D

1.1 Comparisons

comparison (*x*, *y*, *f=None*, *show=False*, *autocolor=True*, *top=None*, *bottom=None*, *left=None*, *right=None*, *wspace=None*, *hspace=None*, ***kwargs*)

Inputs

The table below displays the supported numerical input combinations, where:

- array: List or NumPy array with numerical values
- […]: List containing …
- result: <curves>

Table 1.1: Valid input combinations.

x	y	Result	Notes
array	array	1	
array	[array, array]	2	Both *y`s share a single `x*
[array, array]	[array, array]	2	Both *x`s share a single `y*
[n*[array]]	[n*[array]]	n	Each *y* has an *x*

Arguments

Arguments are internally classified as FIGURE arguments, AXIS arguments, PLURAL arguments and CURVE arguments, namely:

- Figure Select few arguments which may be input only once in the plotting process, so as to avoid conflicts. Ieg: passing *grid=True* twice (*plt.grid(…)*) will result in no grid being drawn. These are removed from the keyword arguments and used in the last *comparison* call.
- Plural Arguments with a keyword equal to any of the arguments which can be passed to the

  line

2D plotter, in plural tense. The line plotter is chosen as it shares all general arguments with the other 2D plotter functions. The plural arguments are assumed to be

lists of length equal to the number of curves

and thus modify each curve. Ieg: colors=['red', 'green', 'blue'] will set the color of each curve to 'red', 'green' and 'blue' respectively in a 3-curve plot.

Defaults

The limits of the plot will be adjusted to the upper and lower limits of all `x`s and `y`s.

Parameters

- **x** (*list of list or list of np.ndarray*) – Domains.
- **y** (*list of list or list of np.ndarray*) – Values.
- **f** (*list of plot*) – Functions used to plot y(x)
- **kwargs** – MPL Plotter plotting class keyword arguments for further customization

1.2 Plotting Methods

class canvas

Bases: object

method_backend()

method_fonts()

Fonts

Reference:

- https://matplotlib.org/2.0.2/users/customizing.html

Pyplot method: plt.rcParams['<category>.<item>'] = <>

method_setup()

method_figure()

method_grid()

class attributes

Bases: object

method_background_color()

method_workspace_style()

method_cb()

method_legend()

method_resize_axes()

method_title()

method_axis_labels()

method_spines()

method_ticks()

Defaults

class plot

Bases: *mpl_plotter.two_d.methods.canvas*, *mpl_plotter.two_d.methods.attributes*

init()

run()

main()

finish()

method_save()

method_show()

class line(*x=None*, *y=None*, *line_width=2*, *color='darkred'*, *cmap='RdBu_r'*, *alpha=None*, *norm=None*, *backend='Qt5Agg'*, *font='serif'*, *math_font='dejavuserif'*, *font_color='black'*, *font_size_increase=0*, *fig=None*, *ax=None*, *figsize=None*, *shape_and_position=111*, *resize_axes=True*, *scale=None*, *aspect=1*, *workspace_color=None*, *workspace_color2=None*, *background_color_figure='white'*, *background_color_plot='white'*, *background_alpha=1*, *style=None*, *light=None*, *dark=None*, *spine_color=None*, *spines_removed=(0, 0, 1, 1)*, *x_upper_bound=None*, *x_lower_bound=None*, *y_upper_bound=None*, *y_lower_bound=None*, *x_bounds=None*, *y_bounds=None*, *demo_pad_plot=False*, *x_upper_resize_pad=0*, *x_lower_resize_pad=0*, *y_upper_resize_pad=0*, *y_lower_resize_pad=0*, *grid=True*, *grid_color='lightgrey'*, *grid_lines='-.'*, *title=None*, *title_size=12*, *title_y=1.025*, *title_weight=None*, *title_font=None*, *title_color=None*, *x_label=None*, *x_label_size=12*, *x_label_pad=10*, *x_label_rotation=None*, *x_label_weight=None*, *y_label=None*, *y_label_size=12*, *y_label_pad=10*, *y_label_rotation=None*, *y_label_weight=None*, *x_tick_number=5*, *y_tick_number=5*, *x_label_coords=None*, *y_label_coords=None*, *tick_color=None*, *tick_label_pad=5*, *ticks_where=(1, 1, 0, 0)*, *tick_label_size=10*, *x_tick_label_size=None*, *y_tick_label_size=None*, *x_custom_tick_locations=None*, *y_custom_tick_locations=None*, *fine_tick_locations=True*, *x_custom_tick_labels=None*, *y_custom_tick_labels=None*, *x_date_tick_labels=False*, *date_format='%Y-%m-%d'*, *tick_ndecimals=1*, *x_tick_ndecimals=None*, *y_tick_ndecimals=None*, *x_tick_rotation=None*, *y_tick_rotation=None*, *tick_labels_where=(1, 1, 0, 0)*, *color_bar=False*, *cb_pad=0.2*, *cb_axis_labelpad=10*, *shrink=0.75*, *extend='neither'*, *cb_title=None*, *cb_orientation='vertical'*, *cb_title_rotation=None*, *cb_title_style='normal'*, *cb_title_size=10*, *cb_top_title_y=1*, *cb_ytitle_labelpad=10*, *cb_title_weight='normal'*, *cb_top_title=False*, *cb_y_title=False*, *cb_top_title_pad=None*, *x_cb_top_title=0*, *cb_vmin=None*, *cb_vmax=None*, *cb_hard_bounds=False*, *cb_outline_width=None*, *cb_tick_number=5*, *cb_ticklabelsize=10*, *cb_tick_ndecimals=None*, *plot_label=None*, *legend=False*, *legend_loc='upper right'*, *legend_bbox_to_anchor=None*, *legend_size=13*, *legend_weight='normal'*, *legend_style='normal'*, *legend_handleheight=None*, *legend_ncol=1*, *show=False*, *zorder=None*, *filename=None*, *dpi=None*, *suppress=True*)

Bases: *mpl_plotter.two_d.methods.plot*

plot()

mock()

class scatter(*x=None*, *y=None*, *point_size=5*, *marker='o'*, *facecolors=None*, *color='C0'*, *cmap='RdBu_r'*, *alpha=None*, *norm=None*, *backend='Qt5Agg'*, *font='serif'*, *math_font='dejavuserif'*, *font_color='black'*, *font_size_increase=0*, *fig=None*, *ax=None*, *figsize=None*, *shape_and_position=111*, *resize_axes=True*, *scale=None*, *aspect=1*, *workspace_color=None*, *workspace_color2=None*, *background_color_figure='white'*, *background_color_plot='white'*, *background_alpha=1*, *style=None*, *light=None*, *dark=None*, *spine_color=None*, *spines_removed=(0, 0, 1, 1)*, *x_upper_bound=None*, *x_lower_bound=None*, *y_upper_bound=None*, *y_lower_bound=None*, *x_bounds=None*, *y_bounds=None*, *demo_pad_plot=False*, *x_upper_resize_pad=0*, *x_lower_resize_pad=0*, *y_upper_resize_pad=0*, *y_lower_resize_pad=0*, *grid=True*, *grid_color='lightgrey'*, *grid_lines='-.'*, *title=None*, *title_size=12*, *title_y=1.025*, *title_weight=None*, *title_font=None*, *title_color=None*, *x_label=None*, *x_label_size=12*, *x_label_pad=10*, *x_label_rotation=None*, *x_label_weight=None*, *y_label=None*, *y_label_size=12*, *y_label_pad=10*, *y_label_rotation=None*, *y_label_weight=None*, *x_tick_number=5*, *y_tick_number=5*, *x_label_coords=None*, *y_label_coords=None*, *tick_color=None*, *tick_label_pad=5*, *ticks_where=(1, 1, 0, 0)*, *tick_label_size=10*, *x_tick_label_size=None*, *y_tick_label_size=None*, *x_custom_tick_locations=None*, *y_custom_tick_locations=None*, *fine_tick_locations=True*, *x_custom_tick_labels=None*, *y_custom_tick_labels=None*, *x_date_tick_labels=False*, *date_format='%Y-%m-%d'*, *tick_ndecimals=1*, *x_tick_ndecimals=None*, *y_tick_ndecimals=None*, *x_tick_rotation=None*, *y_tick_rotation=None*, *tick_labels_where=(1, 1, 0, 0)*, *color_bar=False*, *cb_pad=0.2*, *cb_axis_labelpad=10*, *shrink=0.75*, *extend='neither'*, *cb_title=None*, *cb_orientation='vertical'*, *cb_title_rotation=None*, *cb_title_style='normal'*, *cb_title_size=10*, *cb_top_title_y=1*, *cb_ytitle_labelpad=10*, *cb_title_weight='normal'*, *cb_top_title=False*, *cb_y_title=False*, *cb_top_title_pad=None*, *x_cb_top_title=0*, *cb_vmin=None*, *cb_vmax=None*, *cb_hard_bounds=False*, *cb_outline_width=None*, *cb_tick_number=5*, *cb_ticklabelsize=10*, *cb_tick_ndecimals=None*, *plot_label=None*, *legend=False*, *legend_loc='upper right'*, *legend_bbox_to_anchor=None*, *legend_size=13*, *legend_weight='normal'*, *legend_style='normal'*, *legend_handleheight=None*, *legend_ncol=1*, *show=False*, *zorder=None*, *filename=None*, *dpi=None*, *suppress=True*)

Bases: *mpl_plotter.two_d.methods.plot*

plot()

mock()

class heatmap(*x=None*, *y=None*, *z=None*, *normvariant='SymLog'*, *color=None*, *cmap='RdBu_r'*, *alpha=None*, *norm=None*, *backend='Qt5Agg'*, *font='serif'*, *math_font='dejavuserif'*, *font_color='black'*, *font_size_increase=0*, *fig=None*, *ax=None*, *figsize=None*, *shape_and_position=111*, *resize_axes=True*, *scale=None*, *aspect=1*, *workspace_color=None*, *workspace_color2=None*, *background_color_figure='white'*, *background_color_plot='white'*, *background_alpha=1*, *style=None*, *light=None*, *dark=None*, *spine_color=None*, *spines_removed=(0, 0, 1, 1)*, *x_upper_bound=None*, *x_lower_bound=None*, *y_upper_bound=None*, *y_lower_bound=None*, *x_bounds=None*, *y_bounds=None*, *demo_pad_plot=False*, *x_upper_resize_pad=0*, *x_lower_resize_pad=0*, *y_upper_resize_pad=0*, *y_lower_resize_pad=0*, *grid=True*, *grid_color='lightgrey'*, *grid_lines='-.'*, *title=None*, *title_size=12*, *title_y=1.025*, *title_weight=None*, *title_font=None*, *title_color=None*, *x_label=None*, *x_label_size=12*, *x_label_pad=10*, *x_label_rotation=None*, *x_label_weight=None*, *y_label=None*, *y_label_size=12*, *y_label_pad=10*, *y_label_rotation=None*, *y_label_weight=None*, *x_tick_number=5*, *y_tick_number=5*, *x_label_coords=None*, *y_label_coords=None*, *tick_color=None*, *tick_label_pad=5*, *ticks_where=(1, 1, 0, 0)*, *tick_label_size=10*, *x_tick_label_size=None*, *y_tick_label_size=None*, *x_custom_tick_locations=None*, *y_custom_tick_locations=None*, *fine_tick_locations=True*, *x_custom_tick_labels=None*, *y_custom_tick_labels=None*, *x_date_tick_labels=False*, *date_format='%Y-%m-%d'*, *tick_ndecimals=1*, *x_tick_ndecimals=None*, *y_tick_ndecimals=None*, *x_tick_rotation=None*, *y_tick_rotation=None*, *tick_labels_where=(1, 1, 0, 0)*, *color_bar=False*, *cb_pad=0.2*, *cb_axis_labelpad=10*, *shrink=0.75*, *extend='neither'*, *cb_title=None*, *cb_orientation='vertical'*, *cb_title_rotation=None*, *cb_title_style='normal'*, *cb_title_size=10*, *cb_top_title_y=1*, *cb_ytitle_labelpad=10*, *cb_title_weight='normal'*, *cb_top_title=False*, *cb_y_title=False*, *cb_top_title_pad=None*, *x_cb_top_title=0*, *cb_vmin=None*, *cb_vmax=None*, *cb_hard_bounds=False*, *cb_outline_width=None*, *cb_tick_number=5*, *cb_ticklabelsize=10*, *cb_tick_ndecimals=None*, *plot_label=None*, *legend=False*, *legend_loc='upper right'*, *legend_bbox_to_anchor=None*, *legend_size=13*, *legend_weight='normal'*, *legend_style='normal'*, *legend_handleheight=None*, *legend_ncol=1*, *show=False*, *zorder=None*, *filename=None*, *dpi=None*, *suppress=True*)

Bases: *mpl_plotter.two_d.methods.plot*

plot()

mock()

class quiver(*x=None*, *y=None*, *u=None*, *v=None*, *color=None*, *cmap='RdBu_r'*, *alpha=None*, *norm=None*, *rule=None*, *custom_rule=None*, *vector_width=0.01*, *vector_min_shaft=2*, *vector_length_threshold=0.1*, *backend='Qt5Agg'*, *font='serif'*, *math_font='dejavuserif'*, *font_color='black'*, *font_size_increase=0*, *fig=None*, *ax=None*, *figsize=None*, *shape_and_position=111*, *resize_axes=True*, *scale=None*, *aspect=1*, *workspace_color=None*, *workspace_color2=None*, *background_color_figure='white'*, *background_color_plot='white'*, *background_alpha=1*, *style=None*, *light=None*, *dark=None*, *spine_color=None*, *spines_removed=(0, 0, 1, 1)*, *x_upper_bound=None*, *x_lower_bound=None*, *y_upper_bound=None*, *y_lower_bound=None*, *x_bounds=None*, *y_bounds=None*, *demo_pad_plot=False*, *x_upper_resize_pad=0*, *x_lower_resize_pad=0*, *y_upper_resize_pad=0*, *y_lower_resize_pad=0*, *grid=True*, *grid_color='lightgrey'*, *grid_lines='-.'*, *title=None*, *title_size=12*, *title_y=1.025*, *title_weight=None*, *title_font=None*, *title_color=None*, *x_label=None*, *x_label_size=12*, *x_label_pad=10*, *x_label_rotation=None*, *x_label_weight=None*, *y_label=None*, *y_label_size=12*, *y_label_pad=10*, *y_label_rotation=None*, *y_label_weight=None*, *x_tick_number=5*, *y_tick_number=5*, *x_label_coords=None*, *y_label_coords=None*, *tick_color=None*, *tick_label_pad=5*, *ticks_where=(1, 1, 0, 0)*, *tick_label_size=10*, *x_tick_label_size=None*, *y_tick_label_size=None*, *x_custom_tick_locations=None*, *y_custom_tick_locations=None*, *fine_tick_locations=True*, *x_custom_tick_labels=None*, *y_custom_tick_labels=None*, *x_date_tick_labels=False*, *date_format='%Y-%m-%d'*, *tick_ndecimals=1*, *x_tick_ndecimals=None*, *y_tick_ndecimals=None*, *x_tick_rotation=None*, *y_tick_rotation=None*, *tick_labels_where=(1, 1, 0, 0)*, *color_bar=False*, *cb_pad=0.2*, *cb_axis_labelpad=10*, *shrink=0.75*, *extend='neither'*, *cb_title=None*, *cb_orientation='vertical'*, *cb_title_rotation=None*, *cb_title_style='normal'*, *cb_title_size=10*, *cb_top_title_y=1*, *cb_ytitle_labelpad=10*, *cb_title_weight='normal'*, *cb_top_title=False*, *cb_y_title=False*, *cb_top_title_pad=None*, *x_cb_top_title=0*, *cb_vmin=None*, *cb_vmax=None*, *cb_hard_bounds=False*, *cb_outline_width=None*, *cb_tick_number=5*, *cb_ticklabelsize=10*, *cb_tick_ndecimals=None*, *plot_label=None*, *legend=False*, *legend_loc='upper right'*, *legend_bbox_to_anchor=None*, *legend_size=13*, *legend_weight='normal'*, *legend_style='normal'*, *legend_handleheight=None*, *legend_ncol=1*, *show=False*, *zorder=None*, *filename=None*, *dpi=None*, *suppress=True*)

Bases: *mpl_plotter.two_d.methods.plot*

plot()

mock()

method_rule()

class streamline(*x=None*, *y=None*, *u=None*, *v=None*, *line_width=1*, *line_density=2*, *color=None*, *cmap='RdBu_r'*, *alpha=None*, *norm=None*, *backend='Qt5Agg'*, *font='serif'*, *math_font='dejavuserif'*, *font_color='black'*, *font_size_increase=0*, *fig=None*, *ax=None*, *figsize=None*, *shape_and_position=111*, *resize_axes=True*, *scale=None*, *aspect=1*, *workspace_color=None*, *workspace_color2=None*, *background_color_figure='white'*, *background_color_plot='white'*, *background_alpha=1*, *style=None*, *light=None*, *dark=None*, *spine_color=None*, *spines_removed=(0, 0, 1, 1)*, *x_upper_bound=None*, *x_lower_bound=None*, *y_upper_bound=None*, *y_lower_bound=None*, *x_bounds=None*, *y_bounds=None*, *demo_pad_plot=False*, *x_upper_resize_pad=0*, *x_lower_resize_pad=0*, *y_upper_resize_pad=0*, *y_lower_resize_pad=0*, *grid=True*, *grid_color='lightgrey'*, *grid_lines='-.'*, *title=None*, *title_size=12*, *title_y=1.025*, *title_weight=None*, *title_font=None*, *title_color=None*, *x_label=None*, *x_label_size=12*, *x_label_pad=10*, *x_label_rotation=None*, *x_label_weight=None*, *y_label=None*, *y_label_size=12*, *y_label_pad=10*, *y_label_rotation=None*, *y_label_weight=None*, *x_tick_number=5*, *y_tick_number=5*, *x_label_coords=None*, *y_label_coords=None*, *tick_color=None*, *tick_label_pad=5*, *ticks_where=(1, 1, 0, 0)*, *tick_label_size=10*, *x_tick_label_size=None*, *y_tick_label_size=None*, *x_custom_tick_locations=None*, *y_custom_tick_locations=None*, *fine_tick_locations=True*, *x_custom_tick_labels=None*, *y_custom_tick_labels=None*, *x_date_tick_labels=False*, *date_format='%Y-%m-%d'*, *tick_ndecimals=1*, *x_tick_ndecimals=None*, *y_tick_ndecimals=None*, *x_tick_rotation=None*, *y_tick_rotation=None*, *tick_labels_where=(1, 1, 0, 0)*, *color_bar=False*, *cb_pad=0.2*, *cb_axis_labelpad=10*, *shrink=0.75*, *extend='neither'*, *cb_title=None*, *cb_orientation='vertical'*, *cb_title_rotation=None*, *cb_title_style='normal'*, *cb_title_size=10*, *cb_top_title_y=1*, *cb_ytitle_labelpad=10*, *cb_title_weight='normal'*, *cb_top_title=False*, *cb_y_title=False*, *cb_top_title_pad=None*, *x_cb_top_title=0*, *cb_vmin=None*, *cb_vmax=None*, *cb_hard_bounds=False*, *cb_outline_width=None*, *cb_tick_number=5*, *cb_ticklabelsize=10*, *cb_tick_ndecimals=None*, *plot_label=None*, *legend=False*, *legend_loc='upper right'*, *legend_bbox_to_anchor=None*, *legend_size=13*, *legend_weight='normal'*, *legend_style='normal'*, *legend_handleheight=None*, *legend_ncol=1*, *show=False*, *zorder=None*, *filename=None*, *dpi=None*, *suppress=True*)

Bases: *mpl_plotter.two_d.methods.plot*

plot()

mock()

method_rule()

class fill_area(*x=None*, *y=None*, *z=None*, *between=False*, *below=False*, *above=False*, *color=None*, *cmap='RdBu_r'*, *alpha=None*, *norm=None*, *backend='Qt5Agg'*, *font='serif'*, *math_font='dejavuserif'*, *font_color='black'*, *font_size_increase=0*, *fig=None*, *ax=None*, *figsize=None*, *shape_and_position=111*, *resize_axes=True*, *scale=None*, *aspect=1*, *workspace_color=None*, *workspace_color2=None*, *background_color_figure='white'*, *background_color_plot='white'*, *background_alpha=1*, *style=None*, *light=None*, *dark=None*, *spine_color=None*, *spines_removed=(0, 0, 1, 1)*, *x_upper_bound=None*, *x_lower_bound=None*, *y_upper_bound=None*, *y_lower_bound=None*, *x_bounds=None*, *y_bounds=None*, *demo_pad_plot=False*, *x_upper_resize_pad=0*, *x_lower_resize_pad=0*, *y_upper_resize_pad=0*, *y_lower_resize_pad=0*, *grid=True*, *grid_color='lightgrey'*, *grid_lines='-.'*, *title=None*, *title_size=12*, *title_y=1.025*, *title_weight=None*, *title_font=None*, *title_color=None*, *x_label=None*, *x_label_size=12*, *x_label_pad=10*, *x_label_rotation=None*, *x_label_weight=None*, *y_label=None*, *y_label_size=12*, *y_label_pad=10*, *y_label_rotation=None*, *y_label_weight=None*, *x_tick_number=5*, *y_tick_number=5*, *x_label_coords=None*, *y_label_coords=None*, *tick_color=None*, *tick_label_pad=5*, *ticks_where=(1, 1, 0, 0)*, *tick_label_size=10*, *x_tick_label_size=None*, *y_tick_label_size=None*, *x_custom_tick_locations=None*, *y_custom_tick_locations=None*, *fine_tick_locations=True*, *x_custom_tick_labels=None*, *y_custom_tick_labels=None*, *x_date_tick_labels=False*, *date_format='%Y-%m-%d'*, *tick_ndecimals=1*, *x_tick_ndecimals=None*, *y_tick_ndecimals=None*, *x_tick_rotation=None*, *y_tick_rotation=None*, *tick_labels_where=(1, 1, 0, 0)*, *color_bar=False*, *cb_pad=0.2*, *cb_axis_labelpad=10*, *shrink=0.75*, *extend='neither'*, *cb_title=None*, *cb_orientation='vertical'*, *cb_title_rotation=None*, *cb_title_style='normal'*, *cb_title_size=10*, *cb_top_title_y=1*, *cb_ytitle_labelpad=10*, *cb_title_weight='normal'*, *cb_top_title=False*, *cb_y_title=False*, *cb_top_title_pad=None*, *x_cb_top_title=0*, *cb_vmin=None*, *cb_vmax=None*, *cb_hard_bounds=False*, *cb_outline_width=None*, *cb_tick_number=5*, *cb_ticklabelsize=10*, *cb_tick_ndecimals=None*, *plot_label=None*, *legend=False*, *legend_loc='upper right'*, *legend_bbox_to_anchor=None*, *legend_size=13*, *legend_weight='normal'*, *legend_style='normal'*, *legend_handleheight=None*, *legend_ncol=1*, *show=False*, *zorder=None*, *filename=None*, *dpi=None*, *suppress=True*)

Bases: *mpl_plotter.two_d.methods.plot*

plot()

Fill the region below the intersection of S and Z

i_below()

i_above()

intersection()

mock()

floating_text(*ax*, *text*, *font='serif'*, *x=0.5*, *y=0.5*, *size=20*, *weight='normal'*, *color='darkred'*)

1.3 Placeholders

class MockData

Bases: object

filled_julia(*xyz_2d=False*, *xyz_3d=False*, *df=False*)

spirograph()

sinewave()

waterdrop()

boltzman(*x*, *xmid*, *tau*)

Evaluate the boltzman function with midpoint xmid and time constant tau over x

1.4 Panes

panes(*x*, *y*, *f=None*, *fig=None*, *show=False*, *rows=1*, *top=None*, *bottom=None*, *left=None*, *right=None*, *wspace=None*, *hspace=None*, ***kwargs*)

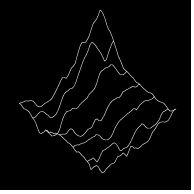
Inputs

The table below displays the supported numerical input combinations, where:

- array: List or NumPy array with numerical values
- […]: List containing …
- result: <panes><curves per pane>

Table 1.2: Valid input combinations.

x	y	Result	Notes
array	array	11	
array	[array, array]	12	Both *y`s share a single `x*
[array, array]	array	21	Both *x`s share a single `y*
[n*[array]]	[n*[array]]	1n	Each *y* has an *x*
array	[n*[array], n*[array]]	2n	All curves in all (2) panes share a single *x*
[array, array]	[n*[array], n*[array]]	2n	All curves in each pane share an *x*
[n*[array], n*[array]]	[n*[array], n*[array]]	2n	All curves in all (2) panes have their own *x*
[n*[array], … up to m]	[n*[array], … up to m]	mn	All curves in all panes have their own *x*



Arguments

Arguments are internally classified as FIGURE arguments, PLURAL arguments and CURVE arguments, namely:

- **Figure arguments** Select few arguments which may be input only once in the plotting process, so as to avoid conflicts. Ieg: passing *grid=True* twice (*plt.grid(…)*) will result in no grid being drawn. These are removed from the keyword arguments and used in the last *comparison* call.
- **Special arguments** Select few arguments (ieg: *plot_labels*), which satisfy the condition of being *lists with a length different to that of y* and which, for aesthetic purposes, must be applied only once. In the case of *plot_labels*, if *plot_labels* is a list of length different to that of *y*, it is assumed that the nth curve of each pane shares a label with the nth curve of all other panes and so a legend displaying the labels of the last pane will be displayed.
- **Plural arguments** Arguments with a keyword equal to any of the arguments which can be passed to the *line* 2D plotter, in plural tense. The line plotter is chosen as it shares all general arguments with the other 2D plotter functions. The plural arguments are assumed to be *lists of length equal to the number of panes* and thus modify each pane. Ieg: x_tick_labels=[1, 2, 3] will set the tick labels of the x axes to 1, 2 and 3 respectively in a 3-pane plot.
- **Curve arguments** Curve arguments are passed as plurals to the comparison function, as they are *lists with a length different to that of y* (thus they can't apply to each pane) and they are assumed to have a length equal to the number of curves in each plot.

CHAPTER

TWO

3D

2.1 Plotting Methods

class canvas

Bases: object

method_backend()

method_fonts()

Fonts Reference:

- https://matplotlib.org/2.0.2/users/customizing.html

Pyplot method: plt.rcParams['<category>.<item>'] = <>

method_figure()

method_setup()

method_grid()

method_pane_fill()

class attributes

Bases: object

method_background_color()

method_workspace_style()

method_legend()

method_resize_axes()

method_title()

method_axis_labels()

method_spines()

method_ticks()

method_remove_axes()

method_scale()

class plot

Bases: *mpl_plotter.three_d.methods.canvas*, *mpl_plotter.three_d.methods.attributes*

init()

run()

main()

finish()

method_save()

method_show()

class color

Bases: object

method_cb()

class surf

Bases: *mpl_plotter.three_d.methods.color*

custom()

method_lighting()

method_edges_to_rgba()

class line(*x=None*, *y=None*, *z=None*, *line_width=5*, *color='darkred'*, *cmap='RdBu_r'*, *alpha=1*, *x_scale=None*, *y_scale=None*, *z_scale=None*, *backend='Qt5Agg'*, *font='serif'*, *math_font='dejavuserif'*, *font_color='black'*, *font_size_increase=0*, *fig=None*, *ax=None*, *figsize=(5, 4)*, *shape_and_position=111*, *azim=- 138*, *elev=19*, *remove_axis=None*, *prune=None*, *resize_axes=True*, *aspect_equal=False*, *box_to_plot_pad=10*, *spines_juggled=(1, 0, 2)*, *spine_color=None*, *blend_edges=False*, *workspace_color=None*, *workspace_color2=None*, *background_color_figure='white'*, *background_color_plot='white'*, *background_alpha=1*, *style=None*, *light=None*, *dark=None*, *pane_fill=None*, *x_upper_bound=None*, *x_lower_bound=None*, *y_upper_bound=None*, *y_lower_bound=None*, *z_upper_bound=None*, *z_lower_bound=None*, *x_bounds=None*, *y_bounds=None*, *z_bounds=None*, *demo_pad_plot=False*, *x_upper_resize_pad=0*, *x_lower_resize_pad=0*, *y_upper_resize_pad=0*, *y_lower_resize_pad=0*, *z_upper_resize_pad=0*, *z_lower_resize_pad=0*, *show_axes=True*, *grid=True*, *grid_color='lightgrey'*, *grid_lines='-.'*, *title=None*, *title_weight='normal'*, *title_size=12*, *title_y=1.025*, *title_color=None*, *title_font=None*, *x_label='x'*, *x_label_weight='normal'*, *x_label_size=12*, *x_label_pad=7*, *x_label_rotation=None*, *y_label='y'*, *y_label_weight='normal'*, *y_label_size=12*, *y_label_pad=7*, *y_label_rotation=None*, *z_label='z'*, *z_label_weight='normal'*, *z_label_size=12*, *z_label_pad=7*, *z_label_rotation=None*, *x_tick_number=5*, *x_tick_labels=None*, *x_custom_tick_labels=None*, *x_custom_tick_locations=None*, *y_tick_number=5*, *y_tick_labels=None*, *y_custom_tick_labels=None*, *y_custom_tick_locations=None*, *z_tick_number=5*, *z_tick_labels=None*, *z_custom_tick_labels=None*, *z_custom_tick_locations=None*, *x_tick_rotation=None*, *y_tick_rotation=None*, *z_tick_rotation=None*, *tick_color=None*, *x_tick_label_pad=4*, *y_tick_label_pad=4*, *z_tick_label_pad=4*, *x_tick_ndecimals=1*, *y_tick_ndecimals=1*, *z_tick_ndecimals=1*, *tick_label_size=10*, *x_tick_label_size=None*, *y_tick_label_size=None*, *z_tick_label_size=None*, *plot_label=None*, *legend=False*, *legend_loc='upper right'*, *legend_size=13*, *legend_weight='normal'*, *legend_style='normal'*, *legend_handleheight=None*, *legend_ncol=1*, *show=False*, *newplot=False*, *filename=None*, *dpi=None*, *suppress=True*)

Bases: *mpl_plotter.three_d.methods.plot*

plot()

mock()

class scatter(*x=None*, *y=None*, *z=None*, *point_size=30*, *marker='o'*, *facecolors=None*, *alpha=1*, *color='darkred'*, *cmap='RdBu_r'*, *color_rule=None*, *color_bar=False*, *cb_pad=0.1*, *extend='neither'*, *cb_title=None*, *cb_orientation='vertical'*, *cb_axis_labelpad=10*, *cb_tick_number=5*, *cb_tick_ndecimals=5*, *shrink=0.75*, *cb_outline_width=None*, *cb_title_rotation=None*, *cb_title_style='normal'*, *cb_title_size=10*, *cb_top_title_y=1*, *cb_ytitle_labelpad=10*, *cb_title_weight='normal'*, *cb_top_title=False*, *cb_y_title=False*, *cb_top_title_pad=None*, *x_cb_top_title=0*, *cb_vmin=None*, *cb_vmax=None*, *cb_ticklabelsize=10*, *cb_hard_bounds=False*, *x_scale=None*, *y_scale=None*, *z_scale=None*, *backend='Qt5Agg'*, *font='serif'*, *math_font='dejavuserif'*, *font_color='black'*, *font_size_increase=0*, *fig=None*, *ax=None*, *figsize=(5, 4)*, *shape_and_position=111*, *azim=- 138*, *elev=19*, *remove_axis=None*, *prune=None*, *resize_axes=True*, *aspect_equal=False*, *box_to_plot_pad=10*, *spines_juggled=(1, 0, 2)*, *spine_color=None*, *blend_edges=False*, *workspace_color=None*, *workspace_color2=None*, *background_color_figure='white'*, *background_color_plot='white'*, *background_alpha=1*, *style=None*, *light=None*, *dark=None*, *pane_fill=None*, *x_upper_bound=None*, *x_lower_bound=None*, *y_upper_bound=None*, *y_lower_bound=None*, *z_upper_bound=None*, *z_lower_bound=None*, *x_bounds=None*, *y_bounds=None*, *z_bounds=None*, *demo_pad_plot=False*, *x_upper_resize_pad=0*, *x_lower_resize_pad=0*, *y_upper_resize_pad=0*, *y_lower_resize_pad=0*, *z_upper_resize_pad=0*, *z_lower_resize_pad=0*, *show_axes=True*, *grid=True*, *grid_color='lightgrey'*, *grid_lines='-.'*, *title=None*, *title_weight='normal'*, *title_size=12*, *title_y=1.025*, *title_color=None*, *title_font=None*, *x_label='x'*, *x_label_weight='normal'*, *x_label_size=12*, *x_label_pad=7*, *x_label_rotation=None*, *y_label='y'*, *y_label_weight='normal'*, *y_label_size=12*, *y_label_pad=7*, *y_label_rotation=None*, *z_label='z'*, *z_label_weight='normal'*, *z_label_size=12*, *z_label_pad=7*, *z_label_rotation=None*, *x_tick_number=5*, *x_tick_labels=None*, *x_custom_tick_labels=None*, *x_custom_tick_locations=None*, *y_tick_number=5*, *y_tick_labels=None*, *y_custom_tick_labels=None*, *y_custom_tick_locations=None*, *z_tick_number=5*, *z_tick_labels=None*, *z_custom_tick_labels=None*, *z_custom_tick_locations=None*, *x_tick_rotation=None*, *y_tick_rotation=None*, *z_tick_rotation=None*, *tick_color=None*, *x_tick_label_pad=4*, *y_tick_label_pad=4*, *z_tick_label_pad=4*, *x_tick_ndecimals=1*, *y_tick_ndecimals=1*, *z_tick_ndecimals=1*, *tick_label_size=10*, *x_tick_label_size=None*, *y_tick_label_size=None*, *z_tick_label_size=None*, *plot_label=None*, *legend=False*, *legend_loc='upper right'*, *legend_size=13*, *legend_weight='normal'*, *legend_style='normal'*, *legend_handleheight=None*, *legend_ncol=1*, *show=False*, *newplot=False*, *filename=None*, *dpi=None*, *suppress=True*)

Bases: *mpl_plotter.three_d.methods.plot*, *mpl_plotter.three_d.methods.color*

plot()

mock()

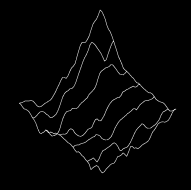
class surface(*x=None*, *y=None*, *z=None*, *rstride=1*, *cstride=1*, *line_width=0.1*, *lighting=False*, *antialiased=False*, *shade=False*, *cmap='RdBu_r'*, *cmap_lighting=None*, *color_rule=None*, *norm=None*, *color=None*, *color_bar=False*, *cb_pad=0.1*, *extend='neither'*, *cb_title=None*, *cb_orientation='vertical'*, *cb_axis_labelpad=10*, *cb_tick_number=5*, *cb_tick_ndecimals=5*, *shrink=0.75*, *cb_outline_width=None*, *cb_title_rotation=None*, *cb_title_style='normal'*, *cb_title_size=10*, *cb_top_title_y=1*, *cb_ytitle_labelpad=10*, *cb_title_weight='normal'*, *cb_top_title=False*, *cb_y_title=False*, *cb_top_title_pad=None*, *x_cb_top_title=0*, *cb_vmin=None*, *cb_vmax=None*, *cb_ticklabelsize=10*, *cb_hard_bounds=False*, *alpha=1*, *edge_color='black'*, *edges_to_rgba=False*, *x_scale=None*, *y_scale=None*, *z_scale=None*, *backend='Qt5Agg'*, *font='serif'*, *math_font='dejavuserif'*, *font_color='black'*, *font_size_increase=0*, *fig=None*, *ax=None*, *figsize=(5, 4)*, *shape_and_position=111*, *azim=- 138*, *elev=19*, *remove_axis=None*, *prune=None*, *resize_axes=True*, *aspect_equal=False*, *box_to_plot_pad=10*, *spines_juggled=(1, 0, 2)*, *spine_color=None*, *blend_edges=False*, *workspace_color=None*, *workspace_color2=None*, *background_color_figure='white'*, *background_color_plot='white'*, *background_alpha=1*, *style=None*, *light=None*, *dark=None*, *pane_fill=None*, *x_upper_bound=None*, *x_lower_bound=None*, *y_upper_bound=None*, *y_lower_bound=None*, *z_upper_bound=None*, *z_lower_bound=None*, *x_bounds=None*, *y_bounds=None*, *z_bounds=None*, *demo_pad_plot=False*, *x_upper_resize_pad=0*, *x_lower_resize_pad=0*, *y_upper_resize_pad=0*, *y_lower_resize_pad=0*, *z_upper_resize_pad=0*, *z_lower_resize_pad=0*, *show_axes=True*, *grid=True*, *grid_color='lightgrey'*, *grid_lines='-.'*, *title=None*, *title_weight='normal'*, *title_size=12*, *title_y=1.025*, *title_color=None*, *title_font=None*, *x_label='x'*, *x_label_weight='normal'*, *x_label_size=12*, *x_label_pad=7*, *x_label_rotation=None*, *y_label='y'*, *y_label_weight='normal'*, *y_label_size=12*, *y_label_pad=7*, *y_label_rotation=None*, *z_label='z'*, *z_label_weight='normal'*, *z_label_size=12*, *z_label_pad=7*, *z_label_rotation=None*, *x_tick_number=5*, *x_tick_labels=None*, *x_custom_tick_labels=None*, *x_custom_tick_locations=None*, *y_tick_number=5*, *y_tick_labels=None*, *y_custom_tick_labels=None*, *y_custom_tick_locations=None*, *z_tick_number=5*, *z_tick_labels=None*, *z_custom_tick_labels=None*, *z_custom_tick_locations=None*, *x_tick_rotation=None*, *y_tick_rotation=None*, *z_tick_rotation=None*, *tick_color=None*, *x_tick_label_pad=4*, *y_tick_label_pad=4*, *z_tick_label_pad=4*, *x_tick_ndecimals=1*, *y_tick_ndecimals=1*, *z_tick_ndecimals=1*, *tick_label_size=10*, *x_tick_label_size=None*, *y_tick_label_size=None*, *z_tick_label_size=None*, *plot_label=None*, *legend=False*, *legend_loc='upper right'*, *legend_size=13*, *legend_weight='normal'*, *legend_style='normal'*, *legend_handleheight=None*, *legend_ncol=1*, *show=False*, *newplot=False*, *filename=None*, *dpi=None*, *suppress=True*)

Bases: *mpl_plotter.three_d.methods.plot*, *mpl_plotter.three_d.methods.surf*

plot()

mock()

floating_text(*ax*, *text*, *font*, *x*, *y*, *z*, *size=20*, *weight='normal'*, *color='darkred'*)



2.2 Placeholders

class MockData

Bases: object

waterdrop3d()

random3d()

hill()

CHAPTER

THREE

COLORS

3.1 Methods

complementary(*color*, *fmt='hex'*)
Return complementary of [R, G, B] or hex color.

Parameters **fmt** (*string*) – Output format: 'hex' or 'rgb'.

delta(*color*, *factor*, *fmt='hex'*)
Darker or lighten the input color by a percentage of <factor> ([-1, 1]) of the color spectrum (0-255).

Parameters

- **fmt** (*string*) – Output format: 'hex' or 'rgb'.
- **factor** (*float*) – [-1, 1] Measure in which the color will be modified.

mapstack(*maps*, *fractions=None*, *ranges=None*)
Create a colormap stacking an arbitrary number of conventional Matplotlib colormaps.

Parameters

- **maps** (*list of str*) – List of colormap NAMES
- **fractions** (*list of float*) – For each original colormap, the fraction it'll take of the merged colormap. [0<fr_0<1, …]
- **ranges** (*list of tuple*) – For each original colormap, the range taken. [(0=<min<1, 0<max<=1)_0, …]

Returns mpl.colors.LinearSegmentedColormap

3.2 Color Schemes

colorscheme_one()

custom(*red*, *green*, *blue*, *name='coolheat'*, *n=1024*)

Parameters

- **red** – List of (red fraction, y0, y1) tuples
- **green** – List of (red fraction, y0, y1)
- **blue** – List of (red fraction, y0, y1)
- **name** – Colormap name
- **n** – RBG quantization levels

Returns Colormap

CHAPTER

FOUR

PRESETS

4.1 Custom

class two_d(*preset=None*, *preset_dir=''*, *preset_name='preset_2d'*)
Bases: object

class line(*x=None*, *y=None*, ***kwargs*)
Bases: *mpl_plotter.two_d.methods.line*

class scatter(*x=None*, *y=None*, ***kwargs*)
Bases: *mpl_plotter.two_d.methods.scatter*

class heatmap(*x=None*, *y=None*, *z=None*, ***kwargs*)
Bases: *mpl_plotter.two_d.methods.heatmap*

class quiver(*x=None*, *y=None*, *u=None*, *v=None*, ***kwargs*)
Bases: *mpl_plotter.two_d.methods.quiver*

class streamline(*x=None*, *y=None*, *u=None*, *v=None*, ***kwargs*)
Bases: *mpl_plotter.two_d.methods.streamline*

class fill_area(*x=None*, *y=None*, *z=None*, ***kwargs*)
Bases: *mpl_plotter.two_d.methods.fill_area*

class three_d(*preset_dir=''*, *preset_name='preset_3d'*, *preset=None*)
Bases: object

class line(*x=None*, *y=None*, *z=None*, ***kwargs*)
Bases: *mpl_plotter.three_d.methods.line*

class scatter(*x=None*, *y=None*, *z=None*, ***kwargs*)
Bases: *mpl_plotter.three_d.methods.scatter*

class surface(*x=None*, *y=None*, *z=None*, ***kwargs*)
Bases: *mpl_plotter.three_d.methods.surface*

find_preset(*dest*, *preset_name*)

make_preset_directory(*preset_dest*, *preset_name*)

generate_preset_2d(*preset_dest=''*, *overwrite=False*, *disable_warning=False*, *preset_name='preset_2d'*)

Parameters

- **preset_dest** – Preset destination directory
- **overwrite** – Overwrite found presets automatically
- **disable_warning** – Disable overwriting warning
- **preset_name** – Name of preset to be created

Returns None

generate_preset_3d(*preset_dest=''*, *overwrite=False*, *disable_warning=False*, *preset_name='preset_3d'*)

Parameters

- **preset_dest** – Preset destination directory
- **overwrite** – Overwrite found presets automatically
- **disable_warning** – Disable overwriting warning
- **preset_name** – Name of preset to be created

Returns None

4.2 Precision

4.3 Publication

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