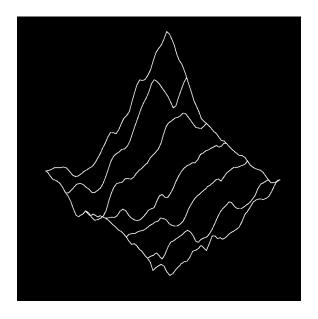
# **MPL Plotter Documentation**

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# MPL Plotter 5.0.1

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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!



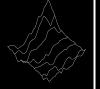
**CHAPTER** 

ONE

**2D** 

# 1.1 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_background_color()
    method_workspace_style()
class attributes
    Bases: object
    method_cb()
    method_legend()
    method_title()
    method_axis_labels()
```



```
method_spines()
    method_ticks()
        Defaults

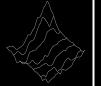
class adjustments
    Bases: object
    method_resize_axes()
    method_subplots_adjust()

class plot
    Bases: canvas, attributes, adjustments
    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), bound\_upper\_x=None, bound\_lower\_x=None, bound\_upper\_y=None, bound\_lower\_y=None, bounds\_x=None, bounds\_y=None, pad\_demo=False, pad\_upper\_x=0, pad\_lower\_x=0, pad\_upper\_y=0, pad\_lower\_y=0, grid=True, grid\_color='lightgrey', grid\_lines='-.', title=None, title\_size=12, title\_pos\_y=1.025, title\_weight=None, title\_font=None, title\_color=None, label\_x=None, label\_size\_x=12, label\_pad\_x=10, label\_rotation\_x=None, label weight x=None, label y=None, label size y=12, label pad y=10, *label\_rotation\_y=None*, *label\_weight\_y=None*, *tick\_number\_x=5*, *tick\_number\_y=5*, label\_coords\_x=None, label\_coords\_y=None, tick\_color=None, tick\_label\_pad=5, ticks\_where=(1, 1, 0, 0), tick\_label\_size=10, tick\_label\_size\_x=None, tick\_label\_size\_y=None, tick\_locations\_fine=True, tick\_locations\_x=None, tick\_bounds\_x=None, tick\_locations\_y=None, tick bounds y=None, tick labels x=None, tick labels y=None, tick labels dates x=False, date\_format='%Y-%m-%d', tick\_label\_decimals=1, tick\_label\_decimals\_x=None, tick\_label\_decimals\_y=None, tick\_rotation\_x=None, tick\_rotation\_y=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\_title\_top\_x=0, cb\_title\_top\_y=1, cb\_title\_top\_pad=None, cb\_title\_side\_pad=10, cb\_title\_weight='normal', cb\_title\_top=True, cb\_title\_side=False, cb\_vmin=None, cb\_vmax=None, cb\_hard\_bounds=False, cb\_outline\_width=None, cb\_tick\_number=5, cb\_ticklabelsize=10, cb\_tick\_label\_decimals=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, top=0.93, bottom=0.105, left=0.165, right=0.87, hspace=0.2, wspace=0.2, filename=None, dpi=None, *suppress=True*)

```
Bases: plot
plot()
mock()
```



class scatter (x=None, y=None, scatter\_size=5, scatter\_marker='o', scatter\_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), bound\_upper\_x=None, bound\_lower\_x=None, bound\_upper\_y=None, bound\_lower\_y=None, bounds\_x=None, bounds\_y=None, pad\_demo=False, pad\_upper\_x=0, pad\_lower\_x=0, pad\_upper\_y=0, pad\_lower\_y=0, grid=True, grid\_color='lightgrey', grid\_lines='-.', title=None, title\_size=12, title\_pos\_y=1.025, title\_weight=None, title\_font=None, title\_color=None, label\_x=None, label size x=12, label pad x=10, label rotation x=None, label weight x=None, label\_y=None, label\_size\_y=12, label\_pad\_y=10, label\_rotation\_y=None, label\_weight\_y=None, tick\_number\_x=5, tick\_number\_y=5, label\_coords\_x=None, label\_coords\_y=None, tick\_color=None, tick\_label\_pad=5, ticks\_where=(1, 1, 0, 0), tick\_label\_size=10, tick\_label\_size\_x=None, tick\_label\_size\_y=None, tick\_locations\_fine=True, tick\_locations\_x=None, tick\_bounds\_x=None, tick\_locations\_y=None, tick\_bounds\_y=None, tick\_labels\_x=None, tick\_labels\_y=None, tick\_labels\_dates\_x=False, date\_format='\%Y-\%m-\%d', tick\_label\_decimals=1, tick\_label\_decimals\_x=None, tick\_label\_decimals\_y=None, tick\_rotation\_x=None, tick\_rotation\_y=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\_title\_top\_x=0, cb\_title\_top\_y=1, cb\_title\_top\_pad=None, cb\_title\_side\_pad=10, *cb\_title\_weight='normal'*, *cb\_title\_top=True*, *cb\_title\_side=False*, *cb\_vmin=None*, cb\_vmax=None, cb\_hard\_bounds=False, cb\_outline\_width=None, cb\_tick\_number=5, cb\_ticklabelsize=10, cb\_tick\_label\_decimals=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, top=0.93, bottom=0.105, left=0.165, right=0.87, hspace=0.2, wspace=0.2, filename=None, dpi=None, suppress=True)

Bases: plot
plot()

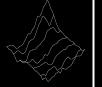
mock()



class heatmap (x=None, y=None, z=None, heatmap\_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), bound\_upper\_x=None, bound\_lower\_x=None, bound\_upper\_y=None, bound\_lower\_y=None, bounds\_x=None, bounds\_y=None, pad\_demo=False, pad\_upper\_x=0, pad\_lower\_x=0, pad\_upper\_y=0, pad\_lower\_y=0, grid=True, grid\_color='lightgrey', grid\_lines='-.', title=None, title\_size=12, title\_pos\_y=1.025, title\_weight=None, title\_font=None, title\_color=None, label\_x=None, label size x=12, label pad x=10, label rotation x=None, label weight x=None, label\_y=None, label\_size\_y=12, label\_pad\_y=10, label\_rotation\_y=None, label\_weight\_y=None, tick\_number\_x=5, tick\_number\_y=5, label\_coords\_x=None, label\_coords\_y=None, tick\_color=None, tick\_label\_pad=5, ticks\_where=(1, 1, 0, 0), tick\_label\_size=10, tick\_label\_size\_x=None, tick\_label\_size\_y=None, tick\_locations\_fine=True, tick\_locations\_x=None, tick\_bounds\_x=None, tick\_locations\_y=None, tick\_bounds\_y=None, tick\_labels\_x=None, tick\_labels\_y=None, tick\_labels\_dates\_x=False, date\_format='\%Y-\%m-\%d', tick\_label\_decimals=1, tick\_label\_decimals\_x=None, tick\_label\_decimals\_y=None, tick\_rotation\_x=None, tick\_rotation\_y=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\_title\_top\_x=0, cb\_title\_top\_y=1, cb\_title\_top\_pad=None, cb\_title\_side\_pad=10, *cb\_title\_weight='normal'*, *cb\_title\_top=True*, *cb\_title\_side=False*, *cb\_vmin=None*, cb\_vmax=None, cb\_hard\_bounds=False, cb\_outline\_width=None, cb\_tick\_number=5, cb\_ticklabelsize=10, cb\_tick\_label\_decimals=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, top=0.93, bottom=0.105, left=0.165, right=0.87, hspace=0.2, wspace=0.2, filename=None, dpi=None, suppress=True)

Bases: plot
plot()

mock()



**class quiver** (*x*=*None*, *y*=*None*, *u*=*None*, *v*=*None*, *quiver*\_rule=*None*, *quiver*\_custom\_rule=*None*, quiver\_vector\_width=0.01, quiver\_vector\_min\_shaft=2, quiver\_vector\_length\_threshold=0.1, 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,  $spine\_color=None, spines\_removed=(0, 0, 1, 1), bound\_upper\_x=None,$ bound\_lower\_x=None, bound\_upper\_y=None, bound\_lower\_y=None, bounds\_x=None, bounds\_y=None, pad\_demo=False, pad\_upper\_x=0, pad\_lower\_x=0, pad\_upper\_y=0, pad\_lower\_y=0, grid=True, grid\_color='lightgrey', grid\_lines='-.', title=None, title\_size=12, title pos y=1.025, title weight=None, title font=None, title color=None, label x=None, label\_size\_x=12, label\_pad\_x=10, label\_rotation\_x=None, label\_weight\_x=None, label\_y=None, label\_size\_y=12, label\_pad\_y=10, label\_rotation\_y=None, *label\_weight\_y=None*, *tick\_number\_x=5*, *tick\_number\_y=5*, *label\_coords\_x=None*, label\_coords\_y=None, tick\_color=None, tick\_label\_pad=5, ticks\_where=(1, 1, 0, 0), tick\_label\_size=10, tick\_label\_size\_x=None, tick\_label\_size\_y=None, tick\_locations\_fine=True, tick\_locations\_x=None, tick\_bounds\_x=None, tick\_locations\_y=None, tick\_bounds\_y=None, tick\_labels\_x=None, tick\_labels\_y=None, tick\_labels\_dates\_x=False, date\_format='\%Y-\%m-\%d', tick\_label\_decimals=1, tick\_label\_decimals\_x=None, tick\_label\_decimals\_y=None, tick\_rotation\_x=None, tick\_rotation\_y=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\_title\_top\_x=0, cb\_title\_top\_y=1, cb\_title\_top\_pad=None, cb\_title\_side\_pad=10, *cb\_title\_weight='normal'*, *cb\_title\_top=True*, *cb\_title\_side=False*, *cb\_vmin=None*, cb\_vmax=None, cb\_hard\_bounds=False, cb\_outline\_width=None, cb\_tick\_number=5, cb\_ticklabelsize=10, cb\_tick\_label\_decimals=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, top=0.93, bottom=0.105, left=0.165, right=0.87, hspace=0.2, wspace=0.2, filename=None, dpi=None, suppress=True)

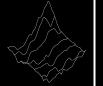
```
Bases: plot
plot()
mock()
method_rule()
```



class streamline (x=None, y=None, u=None, v=None, streamline\_line\_width=1, streamline\_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), bound\_upper\_x=None, bound\_lower\_x=None, bound\_upper\_y=None, bound\_lower\_y=None, bounds\_x=None, bounds\_y=None, pad\_demo=False, pad\_upper\_x=0, pad\_lower\_x=0, pad\_upper\_y=0, pad\_lower\_y=0, grid=True, grid\_color='lightgrey', grid lines='-.', title=None, title size=12, title pos y=1.025, title weight=None, title\_font=None, title\_color=None, label\_x=None, label\_size\_x=12, label\_pad\_x=10, label\_rotation\_x=None, label\_weight\_x=None, label\_y=None, label\_size\_y=12, label\_pad\_y=10, label\_rotation\_y=None, label\_weight\_y=None, tick\_number\_x=5, tick\_number\_y=5, label\_coords\_x=None, label\_coords\_y=None, tick\_color=None, tick\_label\_pad=5, ticks\_where=(1, 1, 0, 0), tick\_label\_size=10, tick\_label\_size\_x=None, tick\_label\_size\_y=None, tick\_locations\_fine=True, tick\_locations\_x=None, tick\_bounds\_x=None, tick\_locations\_y=None, tick\_bounds\_y=None, tick\_labels\_x=None, tick\_labels\_y=None, tick\_labels\_dates\_x=False, date\_format='%Y-%m-%d', tick\_label\_decimals=1, tick\_label\_decimals\_x=None, tick\_label\_decimals\_y=None, tick\_rotation\_x=None, tick\_rotation\_y=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\_title\_top\_x=0, cb\_title\_top\_y=1, cb\_title\_top\_pad=None, *cb\_title\_side\_pad=10*, *cb\_title\_weight='normal'*, *cb\_title\_top=True*, cb\_title\_side=False, cb\_vmin=None, cb\_vmax=None, cb\_hard\_bounds=False, *cb\_outline\_width=None*, *cb\_tick\_number=5*, *cb\_ticklabelsize=10*, cb\_tick\_label\_decimals=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, top=0.93, bottom=0.105, left=0.165, right=0.87, hspace=0.2,

wspace=0.2, filename=None, dpi=None, suppress=True)

```
Bases: plot
plot()
mock()
method_rule()
```



**class fill\_area** (x=None, y=None, z=None, fill\_area\_between=False, fill\_area\_below=False, fill\_area\_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), bound\_upper\_x=None, bound\_lower\_x=None, bound\_upper\_y=None, bound\_lower\_y=None, bounds\_x=None, bounds\_y=None, pad\_demo=False, pad\_upper\_x=0, pad\_lower\_x=0, pad\_upper\_y=0, pad\_lower\_y=0, grid=True, grid\_color='lightgrey', grid\_lines='-.', title=None, title size=12, title pos y=1.025, title weight=None, title font=None, title color=None, label\_x=None, label\_size\_x=12, label\_pad\_x=10, label\_rotation\_x=None, label\_weight\_x=None, label\_y=None, label\_size\_y=12, label\_pad\_y=10, *label\_rotation\_y=None*, *label\_weight\_y=None*, *tick\_number\_x=5*, *tick\_number\_y=5*, label\_coords\_x=None, label\_coords\_y=None, tick\_color=None, tick\_label\_pad=5, ticks\_where=(1, 1, 0, 0), tick\_label\_size=10, tick\_label\_size\_x=None, tick\_label\_size\_y=None, tick\_locations\_fine=True, tick\_locations\_x=None, tick\_bounds\_x=None, tick\_locations\_y=None, tick\_bounds\_y=None, tick\_labels\_x=None, tick\_labels\_y=None, tick\_labels\_dates\_x=False, date\_format='%Y-%m-%d', tick\_label\_decimals=1, tick\_label\_decimals\_x=None, tick\_label\_decimals\_y=None, tick\_rotation\_x=None, tick\_rotation\_y=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\_title\_top\_x=0, cb\_title\_top\_y=1, cb\_title\_top\_pad=None, cb\_title\_side\_pad=10, cb\_title\_weight='normal', cb\_title\_top=True, cb\_title\_side=False, cb\_vmin=None, cb\_vmax=None, cb\_hard\_bounds=False, cb\_outline\_width=None, cb\_tick\_number=5, cb\_ticklabelsize=10, cb\_tick\_label\_decimals=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, top=0.93, bottom=0.105, left=0.165, right=0.87, hspace=0.2, wspace=0.2, filename=None, dpi=None, suppress=True)

```
Bases: 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')
```

# 1.2 Composition: comparison

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

### **Data Input**

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

### **Argument Classification**

Arguments are internally classified as **figure**, **plural** 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 passed with any of the keywords accepted by all 2D plotters -that is, any keyword which does **not** start with the name of its plotting class-, in plural tense. These must be **lists** of length equal to the **number of curves**. Each element in the list is the value of the keyword argument for each curve (eg: passing colors=['red', 'green', 'blue'] to a 3-curve plot will set the color of the curves to 'red', 'green' and 'blue'.

• Curve

Curve-specific parameters (color, line width, plot label)

#### **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)
- **autocolor** (bool) Whether to automatically assign different colors to each curve
- **show** (bool) plt.show() after plotting (thereby finishing the plot)
- **top** (float) plt.subplots\_adjust parameter
- **bottom** (float) plt.subplots\_adjust parameter
- **left** (float) plt.subplots\_adjust parameter
- right (float) plt.subplots\_adjust parameter
- wspace (float) plt.subplots\_adjust parameter
- hspace (float) plt.subplots\_adjust parameter
- **kwargs** MPL Plotter plotting class keyword arguments for further customization

# 1.3 Composition: panes

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

### **Data Input**

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

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



Table 1.2: Valid input combinations.

X	У	Result	Notes
array	array	11	
array	[array, array]	12	Both y share x
[n*[array]]	[n*[array]]	1n	Each y has an x
array	[array, array]	21	Both y share x
[array, array]	[array, array]	21	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

### **Argument Classification**

Arguments are internally classified as figure, legend, plural and curve arguments, namely:

### · Figure arguments

Arguments which may be input only once in the plotting process, so as to avoid conflicts (eg: passing grid=True twice (plt.grid(...)) will result in no grid being drawn). These are removed from the keyword arguments and applied in the last comparison call.

#### · Legend arguments

These are plot\_label/s, which to avoid redundancy are applied in the last comparison. This is done only if the number of curves is the same across all panes, and equal to the number of provided plot\_labels.

### · Plural arguments

Arguments passed with any of the keywords accepted by all 2D plotters -that is, any keyword which does **not** start with the name of its plotting class-, in plural tense. These must be **lists** of length equal to the **number of panes**. Each element in the list is the value of the keyword argument for each pane (eg: tick\_labels\_x=[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

Arguments passed as plurals to the comparison function. These are once more **lists** containing the value of a keyword argument, passed in plural, for each curve following the convention shown above for data input, such that passing colors=[['red', 'blue'], ['green', 'red']] to a plot containing 2 panes with 2 curves each will color the curves in the first pane red and blue, and those in the second green and red.

#### **Parameters**

• x(list of list or list of np.ndarray or np.ndarray) - Data



- y(list of list or list of np.ndarray or np.ndarray) Data
- **f** (list of function or list of plot) List of plotting functions to use for each curve
- **fig** (matplotlib.figure.Figure) Figure object on which to plot
- figsize (tuple of float) Figure size
- **show** (bool) Whether to plt.show() after plotting (thereby finishing the plot)
- rows (int) Number of rows
- top (float) plt.subplots\_adjust parameter
- **bottom** (float) plt.subplots\_adjust parameter
- **left** (float) plt.subplots\_adjust parameter
- right (float) plt.subplots\_adjust parameter
- wspace (float) plt.subplots\_adjust parameter
- **hspace** (float) plt.subplots\_adjust parameter
- kwargs MPL Plotter plotting class keyword arguments for further customization

### 1.4 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



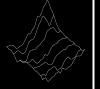
**CHAPTER** 

**TWO** 

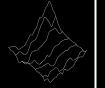
3D

# 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()
    method_background_color()
    method_workspace_style()
class attributes
    Bases: object
    method_legend()
    method_title()
    method_axis_labels()
    method_spines()
```



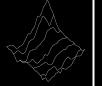
```
method_ticks()
class adjustments
    Bases: object
    method_resize_axes()
    method_subplots_adjust()
    method_remove_axes()
    method_scale()
class plot
    Bases: \ \textit{canvas}, \ \textit{attributes}, \ \textit{adjustments}
    init()
    run()
    main()
    finish()
    method_save()
    method_show()
class color
    Bases: object
    method_cb()
class surf
    Bases: color
    custom()
    method_lighting()
    method_edges_to_rgba()
```



class line (x=None, y=None, z=None, line\_width=5, line\_alpha=1, color='darkred', cmap='RdBu\_r', scale\_x=None, scale\_y=None, scale\_z=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, bound\_upper\_x=None, bound\_lower\_x=None, bound\_upper\_y=None, bound\_lower\_y=None, bound\_upper\_z=None, bound\_lower\_z=None, bounds\_x=None, bounds\_y=None, bounds\_z=None, pad\_demo=False, pad\_upper\_x=0, pad\_lower\_x=0, pad\_upper\_y=0, pad\_lower\_y=0, pad\_upper\_z=0, pad lower z=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, label\_x='x', label\_weight\_x='normal', label\_size\_x=12, label\_pad\_x=7, label\_rotation\_x=None, label\_y='y', label\_weight\_y='normal', label\_size\_y=12, label\_pad\_y=7, label\_rotation\_y=None, label\_z='z', label\_weight\_z='normal', label\_size\_z=12, label\_pad\_z=7, label\_rotation\_z=None, tick\_color=None, tick\_number\_x=5, tick\_labels\_x=None, tick\_locations\_x=None, tick\_rotation\_x=None, tick\_number\_y=5, tick\_labels\_y=None, tick\_locations\_y=None, tick\_rotation\_y=None, tick\_number\_z=5, tick\_labels\_z=None, tick\_locations\_z=None, tick\_rotation\_z=None, tick\_label\_size=10, tick\_label\_decimals=1, tick\_label\_pad\_x=4, tick\_label\_decimals\_x=None, tick\_label\_size\_x=None, tick\_label\_pad\_y=4, tick\_label\_decimals\_y=None, tick\_label\_size\_y=None, tick\_label\_pad\_z=4, tick\_label\_decimals\_z=None, tick\_label\_size\_z=None, plot\_label=None, legend=False, legend\_loc='upper right', legend\_size=13, legend\_weight='normal', legend\_style='normal', legend\_handleheight=None, legend\_columns=1, show=False, top=0.975, bottom=0.085, left=0.14, right=0.945, hspace=0.2, wspace=0.2, filename=None, dpi=None, *suppress=True*)

Bases: plot plot ()

mock()



class scatter (x=None, y=None, z=None, scatter\_size=30, scatter\_marker='o', scatter\_facecolors=None, color\_rule=None, scatter\_alpha=1, color='darkred', cmap='RdBu\_r', color\_bar=False, cb\_orientation='vertical', shrink=0.75, extend='neither', cb\_vmin=None, cb\_vmax=None, cb\_bounds\_hard=False, cb\_pad=0.1, cb\_outline\_width=None, cb\_tick\_number=5, cb\_tick\_label\_decimals=5, cb\_tick\_label\_size=10, cb\_tick\_label\_pad=10, cb\_title=None, cb\_title\_top=True, cb\_title\_y=False, cb\_title\_top\_x=0, cb\_title\_top\_y=1, cb\_title\_pad=10, cb\_title\_weight='normal', cb\_title\_rotation=None, cb\_title\_style='normal', cb\_title\_size=10, scale\_x=None, scale\_y=None, scale\_z=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, bound\_upper\_x=None, bound\_lower\_x=None, bound\_upper\_y=None, bound\_lower\_y=None, bound\_upper\_z=None, bound\_lower\_z=None, bounds\_x=None, bounds\_y=None, bounds\_z=None, pad\_demo=False, pad\_upper\_x=0, pad\_lower\_x=0, pad\_upper\_y=0, pad\_lower\_y=0, pad\_upper\_z=0, pad\_lower\_z=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, label\_x='x', label\_weight\_x='normal', label\_size\_x=12, label\_pad\_x=7, label\_rotation\_x=None, label\_y='y', label\_weight\_y='normal', label\_size\_y=12, label\_pad\_y=7, label\_rotation\_y=None, label\_z='z', label\_weight\_z='normal', label\_size\_z=12, label\_pad\_z=7, label\_rotation\_z=None, tick\_color=None, tick\_number\_x=5, tick\_labels\_x=None, tick\_locations\_x=None, tick\_rotation\_x=None, tick\_number\_y=5, tick\_labels\_y=None, tick\_locations\_y=None, tick\_rotation\_y=None, tick\_number\_z=5, tick\_labels\_z=None, tick\_locations\_z=None, tick\_rotation\_z=None, tick\_label\_size=10, tick\_label\_decimals=1, tick\_label\_pad\_x=4, tick\_label\_decimals\_x=None, tick\_label\_size\_x=None, tick\_label\_pad\_y=4, tick\_label\_decimals\_y=None, tick\_label\_size\_y=None, tick\_label\_pad\_z=4, tick\_label\_decimals\_z=None, tick\_label\_size\_z=None, plot\_label=None, legend=False, legend\_loc='upper right', legend\_size=13, legend\_weight='normal', legend\_style='normal', legend\_handleheight=None, legend\_columns=1, show=False, top=0.975, bottom=0.085, left=0.14, right=0.945, hspace=0.2, wspace=0.2, filename=None, dpi=None, *suppress=True*)

```
Bases: plot, color
plot()
mock()
```



class surface (x=None, y=None, z=None, surface\_rstride=1, surface\_cstride=1, surface\_wire\_width=0.1, surface\_lighting=False, surface\_antialiased=False, surface\_shade=False, surface\_alpha=1, surface\_cmap\_lighting=None, surface\_norm=None, surface\_edge\_color='black', surface\_edges\_to\_rgba=False, cmap='RdBu\_r', color=None, color\_rule=None, color\_bar=False, cb\_orientation='vertical', shrink=0.75, extend='neither', cb\_vmin=None, *cb\_vmax=None*, *cb\_bounds\_hard=False*, *cb\_pad=0.1*, *cb\_outline\_width=None*, cb\_tick\_number=5, cb\_tick\_label\_decimals=5, cb\_tick\_label\_size=10, cb\_tick\_label\_pad=10, cb\_title=None, cb\_title\_top=True, cb\_title\_y=False, cb\_title\_top\_x=0, cb\_title\_top\_y=1, cb\_title\_pad=10, cb\_title\_weight='normal', cb\_title\_rotation=None, cb\_title\_style='normal', cb\_title\_size=10, scale\_x=None, scale\_y=None, scale\_z=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, bound\_upper\_x=None, bound\_lower\_x=None, bound\_upper\_y=None, bound\_lower\_y=None, bound\_upper\_z=None, bound\_lower\_z=None, bounds\_x=None, bounds\_y=None,  $bounds\_z = None, pad\_demo = False, pad\_upper\_x = 0, pad\_lower\_x = 0, pad\_upper\_y = 0,$ pad\_lower\_y=0, pad\_upper\_z=0, pad\_lower\_z=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, label\_x='x', label\_weight\_x='normal',  $label\_size\_x=12$ ,  $label\_pad\_x=7$ ,  $label\_rotation\_x=None$ ,  $label\_y='y'$ , label\_weight\_y='normal', label\_size\_y=12, label\_pad\_y=7, label\_rotation\_y=None, label\_z='z', label\_weight\_z='normal', label\_size\_z=12, label\_pad\_z=7, label\_rotation\_z=None, tick\_color=None, tick\_number\_x=5, tick\_labels\_x=None, tick\_locations\_x=None, tick\_rotation\_x=None, tick\_number\_y=5, tick\_labels\_y=None, tick\_locations\_y=None, tick\_rotation\_y=None, tick\_number\_z=5, tick\_labels\_z=None, tick\_locations\_z=None, tick\_rotation\_z=None, tick\_label\_size=10, tick\_label\_decimals=1, tick\_label\_pad\_x=4, tick\_label\_decimals\_x=None, tick\_label\_size\_x=None, tick\_label\_pad\_y=4, tick\_label\_decimals\_y=None, tick\_label\_size\_y=None, tick\_label\_pad\_z=4, tick\_label\_decimals\_z=None, tick\_label\_size\_z=None, plot\_label=None, legend=False, legend\_loc='upper right', legend\_size=13, legend\_weight='normal', legend\_style='normal', legend\_handleheight=None, legend\_columns=1, show=False, top=0.975, bottom=0.085, left=0.14, right=0.945, hspace=0.2, wspace=0.2, filename=None, dpi=None, suppress=True)

```
Bases: plot, 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** 

### **PRESETS**

### 3.1 Preset

```
class preset (plotter=None, dim=None, _dict=None)
     Bases: object
     Preset object class
     save (file)
          Save MPL Plotter preset in TOML format
     classmethod load(file)
          Load MPL Plotter preset from TOML file
class two_d(preset)
     Bases: object
     2D preset plotting methods
     class line(x=None, y=None, **kwargs)
          Bases: line
     class scatter(x=None, y=None, **kwargs)
          Bases: scatter
     class heatmap(x=None, y=None, z=None, **kwargs)
          Bases: heatmap
     class quiver (x=None, y=None, u=None, v=None, **kwargs)
          Bases: quiver
     class streamline (x=None, y=None, u=None, v=None, **kwargs)
          Bases: streamline
     class fill_area(x=None, y=None, z=None, **kwargs)
          Bases: fill_area
```

```
class three_d (preset)
    Bases: object

3D preset plotting methods

class line (x=None, y=None, z=None, **kwargs)
    Bases: line

class scatter (x=None, y=None, z=None, **kwargs)
    Bases: scatter

class surface (x=None, y=None, z=None, **kwargs)
    Bases: surface
```

# 3.2 Precision

### 3.3 Publication

# MPL Plotter 5.0.1



**CHAPTER** 

**FOUR** 

### **COLORS**

# 4.1 Color Maps

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

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. Linear Segmented Color map

### 4.2 Color Schemes

```
colorscheme_one()
```

### 4.3 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.



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