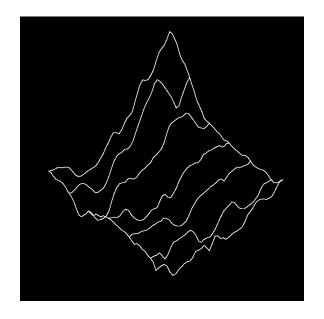
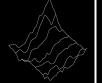
# **MPL Plotter Documentation**

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July 2022





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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** 

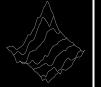
**ONE** 

**2D** 

## 1.1 Plotting Methods

## class plot

```
Bases: canvas, guides, framing, text
init()
run()
main()
finish()
```



class line (x=None, y=None, line\_width=2, color='darkred',  $cmap='RdBu_r'$ , alpha=None, norm=None, backend='Qt5Agg', font='serif', font\_math='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\_pad=10, 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\_bounds\_fit=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', font\_math='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\_pad=10, 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\_bounds\_fit=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

mock()

plot()



class heatmap (x=None, y=None, z=None, heatmap\_normvariant='SymLog', color=None, cmap='RdBu\_r', alpha=None, norm=None, backend='Qt5Agg', font='serif', font\_math='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\_pad=10, 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\_bounds\_fit=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)

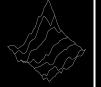
Bases: plot plot ()

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', font\_math='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 pad=10, 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\_bounds\_fit=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', font\_math='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 pad=10, 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\_bounds\_fit=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', font\_math='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 pad=10, 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\_bounds\_fit=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()

## 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

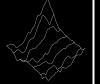
Arguments passed with any of the keywords accepted by all 2D plotters -that is, any keyword which does **not** start with the name of its plotting class-, in plural tense. These must be **lists** of length equal to the **number of panes**. Each element in the list is the value of the keyword argument 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 plot

```
Bases: canvas, guides, framing, text
init()
run()
main()
finish()
```



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', font\_math='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\_bounds\_x=None, tick\_rotation\_x=None, tick\_number\_y=5, tick\_labels\_y=None, tick\_bounds\_y=None, tick\_rotation\_y=None, tick\_number\_z=5, tick\_labels\_z=None, tick\_bounds\_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', font\_math='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\_bounds\_x=None, tick\_rotation\_x=None, tick\_number\_y=5, tick\_labels\_y=None, tick\_bounds\_y=None, tick\_rotation\_y=None, tick\_number\_z=5, tick\_labels\_z=None, tick\_bounds\_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 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', font\_math='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\_bounds\_x=None, tick\_rotation\_x=None, tick\_number\_y=5, tick\_labels\_y=None, tick\_bounds\_y=None, tick\_rotation\_y=None, tick\_number\_z=5, tick\_labels\_z=None, tick\_bounds\_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()
method_lighting()
method edges to rgba()
```

## 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



**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.LinearSegmentedColormap

## 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.



**CHAPTER** 

**FIVE** 

## **INTERNAL METHODS**

## 5.1 Common

```
method_backend(plot)
method_figure(plot)
method_fonts(plot)
```

For context, Matplotlib's typesetting works as follows.

- Five typeface families are defined: serif, cursive, sans-serif, monospace and fantasy.
- Each family has a **list of typefaces** associated with it.
- The user then chooses a family to typeset a plot, and the first typeface in the family's typeface list found in the user's system is used to do so.

Matplotlib allows users to modify the **lists of typefaces** of each family through its *runtime configuration* (*rc*) *dictionary*, "*matplotlib.rcParams*" <a href="https://matplotlib.org/stable/tutorials/introductory/customizing.html">https://matplotlib.org/stable/tutorials/introductory/customizing.html">https://matplotlib.org/stable/tutorials/introductory/customizing.html</a>.

MPL Plotter sets lists of its own for each of the typeface families, as well as choosing a *default* and *fallback* typeface for math.

The typesetting of text in MPL Plotter is defined by two parameters:

- font
- font\_math

Furthermore, MPL Plotter allows the user to set the default color for all text, including title, labels and floating text, with the parameter font\_color.

## font

If the font attribute of the plot is **one of these families**, rcParams font family entry will be set to plot font, thereby making the **first found typeface** of the plot font *family* typeface list the chosen typeface for text in your plot.



Otherwise, that is, if the font attribute of the plot is **not** one of the families, the provided font will be insert``ed to the \*serif\* family typeface list, and the ``rcParams font. family entry will be set to *serif*, thereby making the provided font the chosen typeface for text in the plot.

### font\_math

The font\_math attribute of the plot determines the typeface used for math through the rcParams 'mathtext.fontset entry, and it may take the following values:

- cm (Computer Modern)
- dejavusans
- dejavuserif
- stix
- stixsans

Lastly, Matplotlib allows users to choose the typeface of bold, calligraphic, italic and other highlight typefaces for rendered math. MPL Plotter does not provide an interface for this, but it can be done my manually setting the value of the following entries in rcParams:

- mathtext.bf
- mathtext.cal
- mathtext.it
- mathtext.rm
- mathtext.sf
- mathtext.tt

## font\_color

The default text color, set through the rcParams text.color and axis.labelcolor entries, may be overridden, and MPL Plotter offers the title\_color argument to that effect in the case of titles. To override the color of tick and axis labels or other text in a plot please consult the Matplotlib documentation. As long as you do **not** set show=True in the call to an MPL Plotter plotting class, you are free to continue customization afterwards, including but not limited to text color.

```
method_workspace_style (plot)

method_background_color (plot)

method_subplots_adjust (plot)

method_save (plot)

method_show (plot)
```



## 5.2 2D Methods

```
method_setup(plot)

method_spines(plot)

method_resize_axes(plot)

method_cb(plot)

method_grid(plot)

method_legend(plot)

method_tick_locs(plot)

method_tick_labels(plot)

method_title(plot)

method_title(plot)
```

## 5.3 3D Methods

```
method_setup(plot)

method_spines(plot)

method_pane_fill(plot)

method_remove_axes(plot)

method_scale(plot)

method_resize_axes(plot)

method_cb(plot)

method_grid(plot)

method_legend(plot)

method_tick_locs(plot)

method_tick_labels(plot)

method_title(plot)

method_axis_labels(plot)
```



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