

# stmplots package description

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v20230212

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These are the plots definitions for `stmlatex`. It is build upon the [pgfplots](#) package.

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## 1. Usage - in the preamble

### 1.1. Load the whole `stmplots` package

#### 1.1.1. Description

This is an interface package which loads `pgfplots` and definitions commonly required throughout document creation.

By default the package loads

- `stmplotsbase.sty`

- `stmplotslibraries.sty`
- `stmplotsstyles.sty`

See subsection 1.1.2 for options to change the default package behavior.

### 1.1.2. Options

**Option *compat*** This option expects a string input. Possible inputs are `pgfplots` version numbers, e.g.

```
\usepackage[compat=1.14]{stmplots}
```

`compat=newest` is the default. It is used in case `libraries=$VALUE$` is not set explicitly.

**Option *libraries*** This is a boolean option. Expected values are either `true` or `false`. It controls whether to load the standard libraries commonly required.

```
\usepackage[libraries=true|false]{stmplots}
```

`libraries=true` is the default. It is used in case `libraries=false` is not set explicitly.

**Option *styles*** This is a boolean option. Expected values are either `true` or `false`. It controls whether to load the predefined `pgfplots` styles.

```
\usepackage[styles=true|false]{stmplots}
```

`styles=true` is the default. It is used in case `styles=false` is not set explicitly.

**Option *externalization*** This is a boolean option. Expected values are either `true` or `false`. It enables and disables the possibilities for the externalization of `tikzpictures`.

```
\usepackage[externalization=true|false]{stmplots}
```

`externalization=true` is the default. It is used in case `externalization=false` is not set explicitly.

See the `stmtikz` package documentation for details.

**Option *externalizationoutputfolder*** This option expects a string input. Do not add a slash at the end of the string.

With this option it is possible to define a output folder for all externalized `tikzpictures` in case Option *externalization* has the value `true`. The folder location is set relative to the directory of the main `tex`-file.

```
\usepackage[externalizationoutputfolder=$FOLDERNAME$]{stmtikz}
```

The default is `externalizationoutputfolder=ZZZ_TikZ`.

**Option *globalexternalization*** This is a boolean option. Expected values are either `true` or `false`.

By default externalization is not enabled for `tikzpicture`s globally, meaning automatically activated for each `tikzpicture`. It has to be activated explicitly in the document with `\tikzexternalenable`.

It is possible to control this behavior with

```
\usepackage[globalexternalization=true|false]{stmplots}
```

`globalexternalization=false` is the default. It is used in case `globalexternalization=true` is not set explicitly.

Global externalization is active until the next `\tikzexternaldisable` in your document.

## 1.2. `stmplotslibraries`

This package contains standard libraries commonly required in the creation of plots.

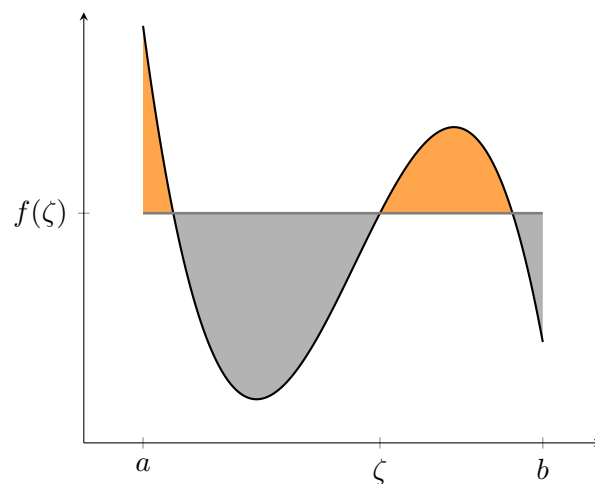
## 1.3. `stmplotsstyles`

This package contains styles commonly required in the creation of plots.

# 2. Test

This is a test. Code thankfully taken from

<http://pgfplots.net/tikz/examples/fill-between-plots/>



## A. The code

### A.1. stmplots.sty

```
1 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2 % Header %
3 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
4 %
5 % This is a interface to all stm pgfplots definitions
6 % Based upon the pgfplots package:
7 %   https://ctan.org/pkg/pgfplots
8 %
9 % Usage
10 % - Preamble:
11 %   - \usepackage{stmplots}
12 %
13 % Revisions: 2019-10-27 Martin Raedel <martin.raedel@dlr.de>
14 %               Initial draft
15 %
16 % Contact:   Martin Raedel, martin.raedel@dlr.de
17 %               DLR Lightweight Systems
18 %
19 %               _ _/|_ _
20 %               / _/ _/ _/
21 %               www.dlr.de/sy/en | / DLR
22 %
23 % Copyright (C) 2019-... DLR Lightweight Systems
24 %
25 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
26 % Content %
27 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
28
29 % Declare that this style file requires at least LaTeX version 2e.
30 \NeedsTeXFormat{LaTeX2e}
31
32 % Provide the name of your page, the date it was last updated, and a
33 %   comment about what it's used for
34
35 \ProvidesPackage{stmplots}[2023/02/12 STMs custom LaTeX plot definitions]
36
37 % -----
38 % Options
39 % -----
40
41 % For options
```

```

40 \@ifpackageloaded{kvoptions}{\RequirePackage{kvoptions}}%
41
42 % Option group
43 \SetupKeyvalOptions{%
44   family=stmplots,%
45   prefix=stmplots@,%
46   setkeys=\kvsetkeys,%
47 }
48
49 % Output folder
50 \DeclareStringOption[newest]{compat}
51
52 % Libraries
53 \DeclareBoolOption[true]{libraries}
54
55 % Styles
56 \DeclareBoolOption[true]{styles}
57
58 % Externalization
59 \DeclareBoolOption[true]{externalization}
60
61 % Global externalization
62 \DeclareBoolOption[false]{globalexternalization}
63
64 % Output folder
65 \DeclareStringOption[ZZZ_TikZ]{externalizationoutputfolder}
66
67 % Process options
68 \ProcessKeyvalOptions{stmplots}
69
70 % -----
71 % Modules
72 % -----
73
74 % Load the base package
75 \@ifpackageloaded{stmplotsbase}{\%
76   \RequirePackage{stmplotsbase}%
77 }%
78
79 % -----
80 % Pgf version
81 % -----
82
83 \pgfplotsset{compat=\stmplots@compat}

```

```

84
85 % -----
86 % Modules 2
87 % -----
88
89 % Libraries
90 \ifstmplots@libraries
91   \RequirePackage{stmplotslibraries}
92 \fi
93
94 % Styles
95 \ifstmplots@styles
96   \RequirePackage{stmplotsstyles}
97 \fi
98
99 % Externalization
100 \ifstmplots@externalization
101   \@ifpackageloaded{stmtikzexternalization}{%
102     \RequirePackage[%
103       outputfolder=\stmplots@externalizationoutputfolder,%
104       global={\ifstmplots@globalexternalization true\else false\fi}%
105     ]{stmtikzexternalization}
106   }
107 \fi
108
109 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
110 % That's it %
111 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
112
113 % Finally, we'll use \endinput to indicate that LaTeX can stop reading
114 % this file. LaTeX will ignore anything after this line.
115 \endinput

```

## A.2. stmplotsbase.sty

```

1 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2 % Header %
3 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
4 %
5 % This is a interface to all stm pgfplots definitions
6 % Based upon the pgfplots package:
7 %   https://ctan.org/pkg/pgfplots
8 %
9 % Usage

```

```

10 % - Preamble:
11 %   - \usepackage{stmplots}
12 %
13 % Revisions: 2019-10-27 Martin Raedel <martin.raedel@dlr.de>
14 %               Initial draft
15 %
16 % Contact:   Martin Raedel, martin.raedel@dlr.de
17 %           DLR Lightweight Systems
18 %
19 %               _ _/|_ _
20 %               / _/_/_/_/
21 %           www.dlr.de/sy/en   | / DLR
22 %
23 % Copyright (C) 2019-... DLR Lightweight Systems
24 %
25 %%%%%%%%%%%
26 % Content %
27 %%%%%%%%%%%
28
29 % Declare that this style file requires at least LaTeX version 2e.
30 \NeedsTeXFormat{LaTeX2e}
31
32 % Provide the name of your page, the date it was last updated, and a
   comment about what it's used for
33 \ProvidesPackage{stmplotsbase}[2023/02/12 STMs custom LaTeX plot
   definitions]
34
35 % -----
36 % Package
37 % -----
38
39 \@ifpackageloaded{pgfplots}{\RequirePackage{pgfplots}}%
40 \@ifpackageloaded{pgfplotstable}{\RequirePackage{pgfplotstable}}%
41
42 %%%%%%%%%%%
43 % That's it %
44 %%%%%%%%%%%
45
46 % Finally, we'll use \endinput to indicate that LaTeX can stop reading
   this file. LaTeX will ignore anything after this line.
47 \endinput

```

### A.3. stmplotslibraries.sty

```

1 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2 % Header %
3 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
4 %
5 % This file includes unit definitions.
6 % Based upon the pgfplots package:
7 %   https://ctan.org/pkg/pgfplots
8 %
9 % Usage
10 % - Preamble:
11 %   - \usepackage{stmplotslibraries}
12 %
13 % Revisions: 2019-10-27 Martin Raedel <martin.raedel@dlr.de>
14 %               Initial draft
15 %
16 % Contact:   Martin Raedel, martin.raedel@dlr.de
17 %               DLR Lightweight Systems
18 %
19 %               __/|__
20 %               /_/_/_/
21 %               www.dlr.de/sy/en   | / DLR
22 %
23 % Copyright (C) 2019-... DLR Lightweight Systems
24 %
25 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
26 % Content %
27 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
28
29 % Declare that this style file requires at least LaTeX version 2e.
30 \NeedsTeXFormat{LaTeX2e}
31
32 % Provide the name of your page, the date it was last updated, and a
33 %   comment about what it's used for
34 \ProvidesPackage{stmplotslibraries}[2023/02/12 STMs custom LaTeX pgfplots
35 % -----
36 % Package
37 % -----
38
39 \@ifpackageloaded{pgfplots}{}{\RequirePackage{pgfplots}}%
40
41 % -----
42 % Libraries

```



```

43 % -----
44
45 \usepgfplotslibrary{fillbetween}%
46 \usepgfplotslibrary{groupplots}%
47 \usepgfplotslibrary{patchplots}%
48
49 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
50 % That's it %
51 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
52
53 % Finally, we'll use \endinput to indicate that LaTeX can stop reading
    this file. LaTeX will ignore anything after this line.
54 \endinput

```

#### A.4. stmplotsstyles.sty

```

1 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
2 % Header %
3 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
4 %
5 % This is a interface to all stm pgfplots definitions
6 % Based upon the pgfplots package:
7 %   https://ctan.org/pkg/pgfplots
8 %
9 % Usage
10 % - Preamble:
11 %   - \usepackage{stmtikz}
12 %
13 % Revisions: 2019-10-27 Martin Raedel <martin.raedel@dlr.de>
14 %               Initial draft
15 %
16 % Contact:   Martin Raedel, martin.raedel@dlr.de
17 %               DLR Lightweight Systems
18 %
19 %               __/|__
20 %               /_/_/_/
21 %               www.dlr.de/sy/en   | / DLR
22 %
23 % Copyright (C) 2019-... DLR Lightweight Systems
24 %
25 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
26 % Content %
27 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
28

```

```

29 % Declare that this style file requires at least LaTeX version 2e.
30 \NeedsTeXFormat{LaTeX2e}
31
32 % Provide the name of your page, the date it was last updated, and a
    comment about what it's used for
33 \ProvidesPackage{stmplotsstyles}[2023/02/12 STMs custom LaTeX plot styles
    definitions]
34
35 % -----
36 % Package
37 % -----
38
39 \@ifpackageloaded{pgfplots}{%{%
40     \usepackage{pgfplots}%
41 }
42
43 % -----
44 % colormaps
45 % -----
46
47 \pgfplotsset{
48     colormap={abaqusblueredcolormap}{
49         rgb255( 0cm)=( 0, 0,255);
50         rgb255( 1cm)=( 0, 93,255);
51         rgb255( 2cm)=( 0,185,255);
52         rgb255( 3cm)=( 0,255,232);
53         rgb255( 4cm)=( 0,255,139);
54         rgb255( 5cm)=( 0,255,139);
55         rgb255( 6cm)=( 0,255, 46);
56         rgb255( 7cm)=( 46,255, 0);
57         rgb255( 8cm)=(139,255, 0);
58         rgb255( 9cm)=(232,255, 0);
59         rgb255(10cm)=(255,185, 0);
60         rgb255(11cm)=(255, 93, 0);
61         rgb255(12cm)=(255, 0, 0);
62     }
63 }
64
65 \pgfplotsset{
66     colormap={paraviewblueredcolormap}{
67         rgb255( 0cm)=( 0, 0,255);
68         rgb255( 1cm)=( 0, 93,255);
69         rgb255( 2cm)=( 0,185,255);
70         rgb255( 3cm)=( 0,255,232);

```

```

71     rgb255( 4cm)=( 0,255,139);
72     rgb255( 5cm)=( 0,255,139);
73     rgb255( 6cm)=( 0,255, 46);
74     rgb255( 7cm)=( 46,255, 0);
75     rgb255( 8cm)=(139,255, 0);
76     rgb255( 9cm)=(232,255, 0);
77     rgb255(10cm)=(255,185, 0);
78     rgb255(11cm)=(255, 93, 0);
79     rgb255(12cm)=(255, 0, 0);
80 }
81 }
82
83 \pgfplotsset{
84     colormap={whiteblack}{color(0cm)=(white);color(1cm)=(black)}
85 }
86
87 % -----
88 % pgfplotsset
89 % -----
90
91 %~~~~~ Number format ~~~~~
92
93 % call with e.g.: y tick label style={numberformatfixed={3}}
94 \pgfplotsset{
95     numberformatfixed/.style 2 args={
96         /pgf/number format/fixed,
97         /pgf/number format/fixed zerofill,% Allow trailing zeros
98         /pgf/number format/precision=#1,    % Nr of decimal digits
99     },
100     numberformatfixed/.default={2}
101 }
102
103 %~~~~~ Colorbar axis ~~~~~
104
105 \pgfplotsset{
106     basecolorbaraxis style/.style={
107         hide axis,
108         scale only axis,
109         colormap/bluered,                % Colormap preset
110         colorbar sampled,                % Steps in colorbar
111     }
112 }
113
114 %~~~~~ Colorbar ~~~~~

```

```

115
116 \pgfplotsset{
117     abaqusdiscrete12colorbar style/.style={
118         separate axis lines,
119         samples=13,                                % Number of steps+1
120     }
121 }
122
123 \pgfplotsset{
124     abaqusdiscrete256colorbar style/.style={
125         separate axis lines,
126         samples=256,                                % Number of steps+1
127     }
128 }
129
130 \pgfplotsset{
131     ansysdiscrete9colorbar style/.style={
132         separate axis lines,
133         samples=10,                                % Number of steps+1
134     }
135 }
136
137 \pgfplotsset{
138     paraviewdiscrete256colorbar style/.style={
139         separate axis lines,
140         samples=256,                                % Number of steps+1
141     }
142 }
143
144 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
145 % That's it %
146 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
147
148 % Finally, we'll use \endinput to indicate that LaTeX can stop reading
149 % this file. LaTeX will ignore anything after this line.
150 \endinput

```