

# stmplots package description

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

## Contents

<b>1. Usage - in the preamble</b>	<b>1</b>
1.1. Load the whole <code>stmplots</code> package . . . . .	1
1.1.1. Description . . . . .	1
1.1.2. Options . . . . .	1
1.2. <code>stmplotslibraries</code> . . . . .	3
1.3. <code>stmplotsstyles</code> . . . . .	3
<b>2. Test</b>	<b>3</b>
<b>A. The code</b>	<b>4</b>
A.1. <code>stmplots.sty</code> . . . . .	4
A.2. <code>stmplotslibraries.sty</code> . . . . .	7
A.3. <code>stmplotsstyles.sty</code> . . . . .	9

## 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

- `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 *globaleexternalization*** 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[globaleexternalization=true|false]{stmplots}
```

`globaleexternalization=false` is the default. It is used in case `globaleexternalization=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.

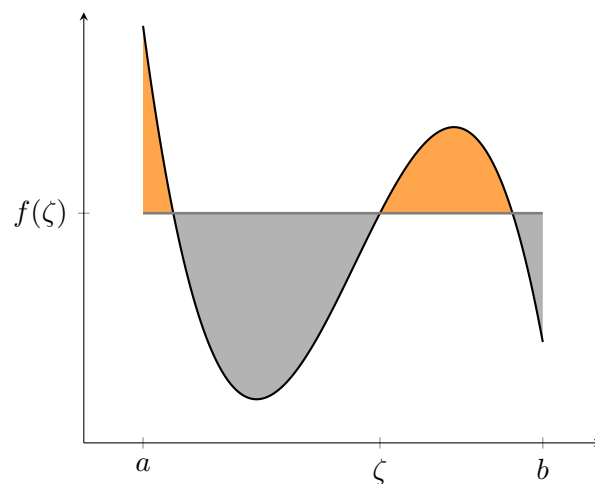
## 1.3. `stmplotsstyles`

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 % - Premble:
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 Composite Structures and Adaptive Systems
18 %
19 %               __/|__
20 %               /_/_/_/_/
21 %               www.dlr.de/fa/en      || DLR
22 %
23 % Copyright (C) 2019-... DLR Composite Structures and
24 %               Adaptive Systems
25 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
26 % Content %
27 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
28
29 % Declare that this style file requires at least LaTeX
30 %   version 2e.
31 \NeedsTeXFormat{LaTeX2e}
32
33 % Provide the name of your page, the date it was last updated
34 %   , and a comment about what it's used for
35 \ProvidesPackage{stmplots}[2019/10/27 STMs custom LaTeX plot
36 %   definitions]
37
38 % -----
39 % Package
```

```

37 % -----
38
39 \@ifpackageloaded{pgfplots}{}{\RequirePackage{pgfplots}}%
40 \@ifpackageloaded{pgfplotstable}{}{\RequirePackage{
    pgfplotstable}}%
41 \@ifpackageloaded{kvoptions}{}{\RequirePackage{kvoptions}}%
42
43 % -----
44 % Options
45 % -----
46
47 \SetupKeyvalOptions{%
48     family=stmplots,%
49     prefix=stmplots@,%
50     setkeys=\kvsetkeys,%
51 }
52
53 % Output folder
54 \DeclareStringOption[newest]{compat}
55
56 % Libraries
57 \DeclareBoolOption[true]{libraries}
58
59 % Styles
60 \DeclareBoolOption[true]{styles}
61
62 % Externalization
63 \DeclareBoolOption[true]{externalization}
64
65 % Global externalization
66 \DeclareBoolOption[false]{globaleexternalization}
67
68 % Output folder
69 \DeclareStringOption[ZZZ_TikZ]{externalizationoutputfolder}
70
71 % Process options
72 \ProcessKeyvalOptions{stmplots}
73
74 % -----
75 % Pgf version
76 % -----
77
78 \pgfplotsset{compat=\stmplots@compat}
79

```

```

80 % -----
81 % Modules
82 % -----
83
84 % Libraries
85 \ifstmplots@libraries
86   \RequirePackage{stmplotslibraries}
87 \fi
88
89 % Styles
90 \ifstmplots@styles
91   \RequirePackage{stmplotsstyles}
92 \fi
93
94 % Externalization
95 \ifstmplots@externalization
96   \@ifpackageloaded{stmtikzexternalization}{}{
97     \RequirePackage[%
98       outputfolder=\stmplots@externalizationoutputfolder,%
99       global={\ifstmplots@globalexternalization true\else
100         false\fi}%
101     ]{stmtikzexternalization}
102   }
103 \fi
104 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
105 % That's it %
106 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
107
108 % Finally, we'll use \endinput to indicate that LaTeX can
109 % stop reading this file. LaTeX will ignore anything after
110 % this line.
111 \endinput

```

## A.2. 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 Composite Structures and Adaptive Systems
18 %
19 %               --/|--
20 %               /_/_/_/_/
21 %               www.dlr.de/fa/en   // DLR
22 %
23 % Copyright (C) 2019-... DLR Composite Structures and
24 %               Adaptive Systems
25 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
26 % Content %
27 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
28
29 % Declare that this style file requires at least LaTeX
30 %   version 2e.
31 \NeedsTeXFormat{LaTeX2e}
32
33 % Provide the name of your page, the date it was last updated
34 %   , and a comment about what it's used for
35 \ProvidesPackage{stmplotslibraries}[2019/10/27 STMs custom
36 %   LaTeX pgfplots library definitions]
37
38 % -----
39 % Package
40 % -----
```

```

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
54 % stop reading this file. LaTeX will ignore anything after
55 % this line.
56 \endinput

```



### A.3. 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 Composite Structures and Adaptive Systems
18 %
19 %               --/|--
20 %               /_/_/_/_/
21 %               www.dlr.de/fa/en      // DLR
22 %
23 % Copyright (C) 2019-... DLR Composite Structures and
24 %               Adaptive Systems
25 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
26 % Content %
27 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
28
29 % Declare that this style file requires at least LaTeX
30 %   version 2e.
31 \NeedsTeXFormat{LaTeX2e}
32
33 % Provide the name of your page, the date it was last updated
34 %   , and a comment about what it's used for
35 \ProvidesPackage{stmplotsstyles}[2019/10/27 STMs custom LaTeX
36 %   plot styles definitions]
37
38 % -----
39 % Package
40 % -----

```

```

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
98         zeros
99         /pgf/number format/precision=#1,    % Nr of decimal
100         digits
101     },
102     numberformatfixed/.default={2}
103 }
104
105 %~~~~~ Colorbar axis ~~~~~~
106
107 \pgfplotsset{
108     basecolorbaraxis style/.style={
109         hide axis,
110         scale only axis,
111         colormap/bluered,           % Colormap
112         preset
113         colorbar sampled,           % Steps in
114         colorbar
115     }
116 }
117
118 %~~~~~ Colorbar ~~~~~~
119
120 \pgfplotsset{
121     abaqusdiscrete12colorbar style/.style={
122         separate axis lines,
123         samples=13,                 % Number of
124         steps+1
125     }
126 }

```

```

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 this file. LaTeX will ignore anything after
    this line.
149 \endinput

```