stmplots package description

Copyright © 2019 DLR FA STM
v20191210

Martin Rädel

December 10, 2019

These are the plots definitions for `stmlatex`. It is build upon the pgfplots package.

Contents

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`

1

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

See subsubsection 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 `tikzpicture`s.

`\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 `tikzpicture`s 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.
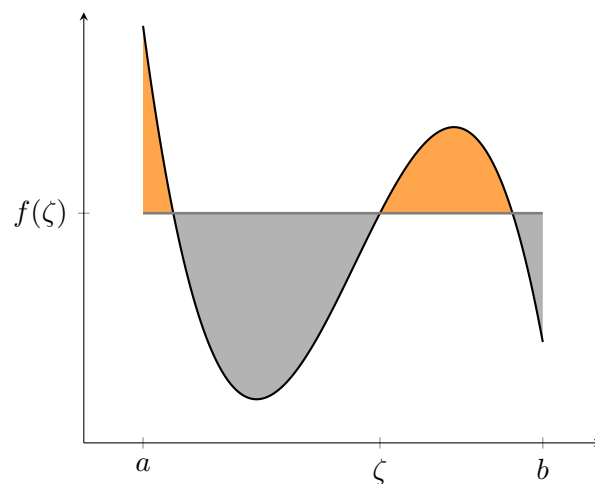
1.3. `stmplotsstyles`

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  %   - 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
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{stmplots}[2019/10/27 STMs custom LaTeX plot
       definitions]
34
35  % ---------------------------
36  % Options
```

```latex
37  % --------------------------
38
39  % 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
105           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 this file. LaTeX will ignore anything after
        this line.
114 \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  %   - 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
       Adaptive 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{stmplots}[2019/10/27 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  %  - Premble:
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
       Adaptive 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{stmplotslibraries}[2019/10/27 STMs custom
       LaTeX pgfplots library definitions]
34
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  %  - Premble:
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
          Adaptive 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}[2019/10/27 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
```

11

```
              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
```

12

```
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
```