stmplots package description

v20230211

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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`

- `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 explicitely 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`

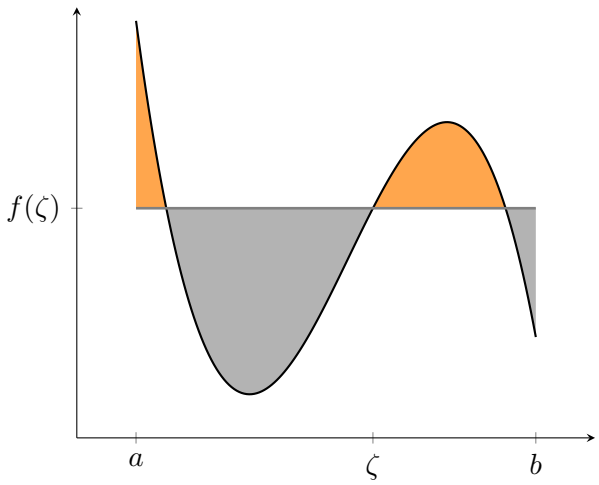
This package contains standard libraries commonly required in the creation of plots.

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

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Header                             %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%
% This is a interface to all stm pgfplots definitions
% Based upon the pgfplots package:
%   https://ctan.org/pkg/pgfplots
%
% Usage
%  - Premble:
%    - \usepackage{stmplots}
%
% Revisions: 2019-10-27 Martin Raedel <martin.raedel@dlr.de>
%                       Initial draft
%
% Contact:   Martin Raedel,  martin.raedel@dlr.de
%            DLR Composite Structures and Adaptive Systems
%
%                                 __/|__
%                                /_/_/_/
%            www.dlr.de/fa/en      |/ DLR
%
% Copyright (C) 2019-... DLR Composite Structures and Adaptive Systems
%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Content                            %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Declare that this style file requires at least LaTeX version 2e.
\NeedsTeXFormat{LaTeX2e}

% Provide the name of your page, the date it was last updated, and a
    comment about what it's used for
\ProvidesPackage{stmplots}[2019/10/27 STMs custom LaTeX plot definitions]

% ---------------------------
% Options
% ---------------------------

% For options
```

```
\@ifpackageloaded{kvoptions}{}{\RequirePackage{kvoptions}}%

% Option group
\SetupKeyvalOptions{%
  family=stmplots,%
  prefix=stmplots@,%
  setkeys=\kvsetkeys,%
}

% Output folder
\DeclareStringOption[newest]{compat}

% Libraries
\DeclareBoolOption[true]{libraries}

% Styles
\DeclareBoolOption[true]{styles}

% Externalization
\DeclareBoolOption[true]{externalization}

% Global externalization
\DeclareBoolOption[false]{globalexternalization}

% Output folder
\DeclareStringOption[ZZZ_TikZ]{externalizationoutputfolder}

% Process options
\ProcessKeyvalOptions{stmplots}

% ----------------------------
% Modules
% ----------------------------

% Load the base package
\@ifpackageloaded{stmplotsbase}{}{%
  \RequirePackage{stmplotsbase}%
}%

% ----------------------------
% Pgf version
% ----------------------------

\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
      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
```

```
%  - Premble:
%    - \usepackage{stmplots}
%
% Revisions: 2019-10-27 Martin Raedel <martin.raedel@dlr.de>
%                       Initial draft
%
% Contact:   Martin Raedel,  martin.raedel@dlr.de
%            DLR Composite Structures and Adaptive Systems
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%            www.dlr.de/fa/en      |/ DLR
%
% Copyright (C) 2019-... DLR Composite Structures and Adaptive Systems
%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Content                            %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Declare that this style file requires at least LaTeX version 2e.
\NeedsTeXFormat{LaTeX2e}

% Provide the name of your page, the date it was last updated, and a
    comment about what it's used for
\ProvidesPackage{stmplotsbase}[2019/10/27 STMs custom LaTeX plot
    definitions]

% ---------------------------
% Package
% ---------------------------

\@ifpackageloaded{pgfplots}{}{\RequirePackage{pgfplots}}%
\@ifpackageloaded{pgfplotstable}{}{\RequirePackage{pgfplotstable}}%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% That's it                          %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Finally, we'll use \endinput to indicate that LaTeX can stop reading
    this file. LaTeX will ignore anything after this line.
\endinput
```

A.3. stmplotslibraries.sty

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Header                              %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%
% This file includes unit definitions.
% Based upon the pgfplots package:
%   https://ctan.org/pkg/pgfplots
%
% Usage
%  - Premble:
%    - \usepackage{stmplotslibraries}
%
% Revisions: 2019-10-27 Martin Raedel <martin.raedel@dlr.de>
%                       Initial draft
%
% Contact:   Martin Raedel,  martin.raedel@dlr.de
%            DLR Composite Structures and Adaptive Systems
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%                                /_/_/_/
%            www.dlr.de/fa/en      |/ DLR
%
% Copyright (C) 2019-... DLR Composite Structures and Adaptive Systems
%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Content                             %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Declare that this style file requires at least LaTeX version 2e.
\NeedsTeXFormat{LaTeX2e}

% Provide the name of your page, the date it was last updated, and a
    comment about what it's used for
\ProvidesPackage{stmplotslibraries}[2019/10/27 STMs custom LaTeX pgfplots
     library definitions]

% ---------------------------
% Package
% ---------------------------

\@ifpackageloaded{pgfplots}{}{\RequirePackage{pgfplots}}%

% ---------------------------
% Libraries
```

```
% ---------------------------

\usepgfplotslibrary{fillbetween}%
\usepgfplotslibrary{groupplots}%
\usepgfplotslibrary{patchplots}%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% That's it                        %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

% Finally, we'll use \endinput to indicate that LaTeX can stop reading
    this file. LaTeX will ignore anything after this line.
\endinput
```

A.4. stmplotsstyles.sty

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Header                           %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%
% This is a interface to all stm pgfplots definitions
% Based upon the pgfplots package:
%   https://ctan.org/pkg/pgfplots
%
% Usage
%  - Premble:
%    - \usepackage{stmtikz}
%
% Revisions: 2019-10-27 Martin Raedel <martin.raedel@dlr.de>
%                       Initial draft
%
% Contact:   Martin Raedel,  martin.raedel@dlr.de
%            DLR Composite Structures and Adaptive Systems
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%                                 __/|__
%                                /_/_/_/
%            www.dlr.de/fa/en      |/ DLR
%
% Copyright (C) 2019-... DLR Composite Structures and Adaptive Systems
%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Content                          %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

```

```
% Declare that this style file requires at least LaTeX version 2e.
\NeedsTeXFormat{LaTeX2e}

% Provide the name of your page, the date it was last updated, and a
    comment about what it's used for
\ProvidesPackage{stmplotsstyles}[2019/10/27 STMs custom LaTeX plot styles
     definitions]

% ---------------------------
% Package
% ---------------------------

\@ifpackageloaded{pgfplots}{}{%
  \usepackage{pgfplots}%
}

% ---------------------------
% colormaps
% ---------------------------

\pgfplotsset{
  colormap={abaqusblueredcolormap}{
    rgb255( 0cm)=(  0,  0,255);
    rgb255( 1cm)=(  0, 93,255);
    rgb255( 2cm)=(  0,185,255);
    rgb255( 3cm)=(  0,255,232);
    rgb255( 4cm)=(  0,255,139);
    rgb255( 5cm)=(  0,255,139);
    rgb255( 6cm)=(  0,255, 46);
    rgb255( 7cm)=( 46,255,  0);
    rgb255( 8cm)=(139,255,  0);
    rgb255( 9cm)=(232,255,  0);
    rgb255(10cm)=(255,185,  0);
    rgb255(11cm)=(255, 93,  0);
    rgb255(12cm)=(255,  0,  0);
  }
}

\pgfplotsset{
  colormap={paraviewblueredcolormap}{
    rgb255( 0cm)=(  0,  0,255);
    rgb255( 1cm)=(  0, 93,255);
    rgb255( 2cm)=(  0,185,255);
    rgb255( 3cm)=(  0,255,232);
```

```
    rgb255( 4cm)=(  0,255,139);
    rgb255( 5cm)=(  0,255,139);
    rgb255( 6cm)=(  0,255, 46);
    rgb255( 7cm)=( 46,255,  0);
    rgb255( 8cm)=(139,255,  0);
    rgb255( 9cm)=(232,255,  0);
    rgb255(10cm)=(255,185,  0);
    rgb255(11cm)=(255, 93,  0);
    rgb255(12cm)=(255,  0,  0);
  }
}

\pgfplotsset{
  colormap={whiteblack}{color(0cm)=(white);color(1cm)=(black)}
}

% ---------------------------
% pgfplotsset
% ---------------------------

%~~~~~ Number format ~~~~~~~~

% call with e.g.: y tick label style={numberformatfixed={3}}
\pgfplotsset{
    numberformatfixed/.style 2 args={
      /pgf/number format/fixed,
      /pgf/number format/fixed zerofill,% Allow trailing zeros
      /pgf/number format/precision=#1,   % Nr of decimal digits
    },
    numberformatfixed/.default={2}
}

%~~~~~ Colorbar axis ~~~~~~~~

\pgfplotsset{
  basecolorbaraxis style/.style={
    hide axis,
    scale only axis,
    colormap/bluered,                          % Colormap preset
    colorbar sampled,                          % Steps in colorbar
  }
}

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