stmplots package description

v20191205

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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

- `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`

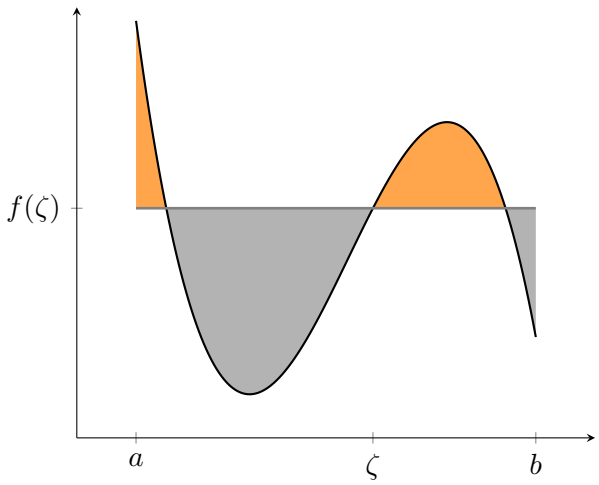
This package contains standard libraries commonly required in the creation of plots.

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]

% ---------------------------
% Package
```

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

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

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

\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}

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

\pgfplotsset{compat=\stmplots@compat}

```

```
% ----------------------------
% Modules
% ----------------------------

% Libraries
\ifstmplots@libraries
  \RequirePackage{stmplotslibraries}
\fi

% Styles
\ifstmplots@styles
  \RequirePackage{stmplotsstyles}
\fi

% Externalization
\ifstmplots@externalization
  \@ifpackageloaded{stmtikzexternalization}{}{
    \RequirePackage[%
      outputfolder=\stmplots@externalizationoutputfolder,%
      global={\ifstmplots@globalexternalization true\else
         false\fi}%
    ]{stmtikzexternalization}
  }
\fi

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% 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.2. 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
%
%                                  __/|__
%                                 /_/_/_/
%            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.3. 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
%
%                                    __/|__
%                                   /_/_/_/
%            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 ~~~~~~~~~~~~~

\pgfplotsset{
  abaqusdiscrete12colorbar style/.style={
    separate axis lines,
    samples=13,                                % Number of
       steps+1
  }
```

```
}

\pgfplotsset{
  abaqusdiscrete256colorbar style/.style={
    separate axis lines,
    samples=256,                                % Number of
       steps+1
  }
}

\pgfplotsset{
  ansysdiscrete9colorbar style/.style={
    separate axis lines,
    samples=10,                                 % Number of
       steps+1
  }
}

\pgfplotsset{
  paraviewdiscrete256colorbar style/.style={
    separate axis lines,
    samples=256,                                % Number of
       steps+1
  }
}

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% 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
```