stmmath package description

v20191210

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These are the math definitions for `stmlatex`. It is build upon the amsmath package.

Contents

1. Commands

1.1. Operators

`\dev`	Deviatoric	dev
`\dif`	Infinitesimal differential	d
`\divergenceoperator`	Quantity of a vector field	div
`\erf`	Error function	erf
`\sign`	Signum function	sign
`\sph`	Spherical	sph
`\spur`	Trace	Tr
`\Grad`	Gradient w.r.t. material coordinates	Grad
`\grad`	Gradient w.r.t. spatial coordinates	grad

1.2. Symbols

`\minus`	$-$
`\curveplus`	$\curvearrowright +$
`\rightplus`	$\overset{+}{\rightarrow}$
`\upplus`	$+\uparrow$

2. Commands

There are additional commands available which require parameters. They are defined dependent of the symbols used in `stmglossaries`.

3. Environments

A. The code

A.1. stmmath.sty

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Header                              %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%
% This is a interface to all stm tikz definitions
% Based upon the amsmath package:
%   https://ctan.org/pkg/amsmath
%
% Usage
%  - Premble:
%    - \usepackage{stmmath}
%
% 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{stmmath}[2019/10/27 STMs custom LaTeX math
   definitions]

% ----------------------------
% Options
```

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

% For options
\@ifpackageloaded{kvoptions}{}{\RequirePackage{kvoptions}}%

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

% Items
\DeclareBoolOption[true]{items}

% Process options
\ProcessKeyvalOptions{stmmath}

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

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

% Load the items
\ifstmmath@items
  \@ifpackageloaded{stmmathitems}{}{%
    \RequirePackage{stmmathitems}%
  }%
\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. stmmathbase.sty

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Header                                      %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%
% This is a interface to all stm tikz definitions
% Based upon the amsmath package:
%   https://ctan.org/pkg/amsmath
%
% Usage
%  - Premble:
%    - \usepackage{stmmathbase}
%
% 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{stmmathbase}[2019/10/27 STMs custom LaTeX
   math definitions]

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

```

```
% Load amsmath to defined math operators
\@ifpackageloaded{amsmath}{}{\RequirePackage{amsmath}}%
\@ifpackageloaded{amssymb}{}{\RequirePackage{amssymb}}%

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% 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. stmmathitems.sty

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% Header                             %
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%
% This is a interface to all stm tikz definitions
% Based upon the amsmath package:
%   https://ctan.org/pkg/amsmath
%
% Usage
%  - Premble:
%    - \usepackage{stmmathitems}
%
% 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{stmmathitems}[2019/10/27 STMs custom LaTeX math definitions]

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

% Load base package
\@ifpackageloaded{stmmathbase}{}{\RequirePackage{stmmathbase}}%

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

% Oeprators
\@ifundefined{dev}{\DeclareMathOperator{\dev}{dev}}{}
\@ifundefined{divergenceoperator}{\DeclareMathOperator{\divergenceoperator}{div}}{}
\@ifundefined{erf}{\DeclareMathOperator{\erf}{erf}}{}
\@ifundefined{sign}{\DeclareMathOperator{\sign}{sign}}{}
\@ifundefined{sph}{\DeclareMathOperator{\sph}{sph}}{}
\@ifundefined{spur}{\DeclareMathOperator{\spur}{Tr}}{}
\@ifundefined{Grad}{\DeclareMathOperator{\Grad}{Grad}}{}% englisch gradient w.r.t material coordinates
\@ifundefined{grad}{\DeclareMathOperator{\grad}{grad}}{}% englisch gradient w.r.t spatial coordinates

% ----------------------------
% Symbols
% ----------------------------

% Upright dif-symbol
\@ifundefined{dif}{\newcommand*\dif{\mathop{}\!\mathrm{d}}}{}

% shorter minus sign
\@ifpackageloaded{graphicx}{}{\RequirePackage{graphicx}}%
\@ifundefined{minus}{\newcommand{\minus}{\scalebox
```

```
   {0.75}[1.0]{$-$}}}{}

% Symbols for static equilibrium conditions:
\newcommand*\curveplus{%
  \mathbin{\rotatebox[origin=c]{90}{$\m@th\curvearrowleft$}+}
     %
}

\newcommand*\rightplus{%
  \mathpalette\@rightplus\relax%
}

\newcommand*\@rightplus[1]{%
  \mathbin{\vcenter{\hbox{$\m@th\overset{#1+}{\to}$}}}%
}

\newcommand*\upplus{%
  \mathbin{+\mathord\uparrow}%
}

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