hsrstud — HSR-Stud Style and Macros*

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1 Package Options

arrowvec Tells the package to use a vector notation with a small arrow over the variables, as it were handwritten.

textvecdiff Disables the "Nabla" or "Del" notation for vector derivatives. Instead the symbols $\nabla, \nabla \cdot, \nabla \times, \nabla^2$ are be replaced with grad, div, curl and div grad.

- 1 \newif\if@arrowvec\@arrowvecfalse
- 2 \DeclareOption{arrowvec}{\@arrowvectrue}

3

- 4 \newif\if@textvecdiff\@textvecdifffalse
- 5 \DeclareOption{textvecdiff}{\@textvecdifftrue}

6

 $7 \ProcessOptions\relax$

2 Mathematics

2.1 Formatting

\vec Vectors notation. If the option arrowvec described in §1 is enabled, the notation with a small arrow over the varible will be used, else the vector is bold. Takes one option $\{\langle letter \rangle\}$.

^{*}This file describes version v0.1, last revised 2020/04/16.

$$\mathbf{F} = m\mathbf{a}$$
 \vec{F} = m\vec{a}

- 8 \if@arrowvec
- 9 \else
- 10 \renewcommand{\vec}[1]{\mathbf{\boldsymbol#1}}
- 11 \fi

\uvec Unit vector notation. Takes $\{\langle letter \rangle\}$.

$$\hat{\mathbf{x}} = \mathbf{x}/x$$
 \uvec{x} = \vec{x}/x

12 \newcommand{\uvec}[1]{\mathrm{\vec{\hat{#1}}}}

\mtx Matrix notation. Takes $\{\langle letter \rangle\}$.

$$J = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \qquad \begin{array}{c} \operatorname{\mathtt{Mtx}\{J\}} &= \operatorname{\mathtt{Negin}\{pmarix\}} \\ & 0 & \& 1 & \backslash \\ & 1 & \& 0 \\ & & \operatorname{\mathtt{Nend}\{pmatrix\}} \end{array}$$

13 $\mbox{newcommand{\mtx}[1]{\mathrm{#1}}}$

\ten Tensor notation. Takes $\{\langle letter \rangle\}$.

 $14 \end{ ten} [1] {\end{ ten} f{\boldsymbol{#1}}} \\$

2.2 Equalities

\heq L'Hôpital limit equality symbol.

$$\lim_{x\to\infty}\frac{x}{x^2-1}\stackrel{\hat{\mathrm{H}}}{=}\lim_{x\to\infty}\frac{1}{2x}=0 \quad \begin{array}{c} \lim_{x\to\infty}\{x\to\infty\} & \frac{1}{2x}=1\}\\ & -\infty\\ & -\infty\end{array}$$

 $15 \end{\frac{\heq}{\left[\hat{H}\right]}} = }$

2.3 Derivatives

\dd The differential element. It needs a $\{\langle var \rangle\}$ and has the optional argument $[\langle exponent \rangle]$.

$$dx d^4x dd{x} dd{x}$$

16 \newcommand{\dd}[2][]{\mathrm{d}^{#1} #2}

\di This is the same as \dd but with a small space in front, it is intended to be used in integrals for a nicer typesetting.

$$I = \int \mathbf{J} \cdot \mathrm{d}\mathbf{s}$$
 % no spacing needed (because of cdot)
$$I = \inf \operatorname{Vec}\{J\} \cdot \operatorname{d}\{\operatorname{vec}\{s\}\}$$
% needs spacing
$$= \iint \mathbf{J} \cdot \hat{\mathbf{n}} \, \mathrm{d}x \, \mathrm{d}y$$

$$= \inf \operatorname{Vec}\{J\} \cdot \operatorname{d}\{x\} \cdot \operatorname{d}\{y\}$$

```
17 \mbox{newcommand} \di}[2][]{\,\dd[#1]{#2}}
```

\deriv The derivative has arguments $\{\langle function \rangle\}$, $\{\langle var \rangle\}$ and the optional argument $[\langle order \rangle]$.

$$\frac{\mathrm{d}y}{\mathrm{d}x} \qquad \frac{\mathrm{d}^3y}{\mathrm{d}x^3} \qquad \text{\deriv}\{y\}\{x\}$$

 $18 \end{\deriv} [3] [] {\frac{\dd[#1]{#2}}{\dd[]{#3^{#1}}}}$

\pderiv The partial derivative has arguments $\{\langle function \rangle\}$, $\{\langle var \rangle\}$ and the optional argument $[\langle order \rangle]$.

$$\frac{\partial y}{\partial x}$$
 $\frac{\partial^2 y}{\partial x^2}$ \deriv{f}{x} \deriv[2]{f}{x}

19 \newcommand{\pderiv}[3][]{\frac{\partial^{#1} #2}{\partial #3^{#1}}}

\grad The gradient operator.

$$abla f$$
 \grad f

 $20 \footnote{otherwise}$

21 \newcommand{\grad}{\text{grad }}

22 \else

23 \newcommand{\grad}{\nabla}%

24 \fi

\div The divergence operator, \div is renamed to \divsymb.

$$abla \cdot f$$
 \div f

 $25 \left| \text{divsymb=} \right|$

26 \if@textvecdiff

27 \renewcommand{\div}{\text{div}}

 $28 \ensuremath{\setminus} \texttt{else}$

29 \renewcommand{\div}{\nabla\cdot}

30 \fi

\curl The curl operator.

$$abla imes f$$
 \curl f

31 \if@textvecdiff

32 \newcommand{\curl}{\text{curl }}

33 \else

35 \fi

\laplace The laplace operator.

$$abla^2 f$$
 \laplace f

36 \if@textvecdiff

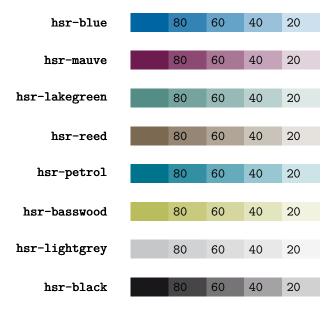
37 \newcommand{\laplace}{\text{div grad}}

 $38 \ensuremath{\setminus} \mathtt{else}$

39 \newcommand{\laplace}{\nabla^2}

40 \fi

3 Colors



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42 \ensuremath{\mbox{definecolor\{hsr-blue80\}\{HTML\}\{3384B5\}}}
43 \end{fine} \label{lem:hsr-blue60} \{\end{HTML} \} \end{fine} \footnote{\end{hsr-blue60}} \end{fine} \footnote{\end{hsr-blue60}} \footnote{\
44 \definecolor{hsr-blue40}{HTML}{99C1DA}
45 \definecolor{hsr-blue20}{HTML}{CCE0ED}
46
47 \definecolor{hsr-mauve}{HTML}{6E1C50}
48 \definecolor{hsr-mauve80}{HTML}{8B4973}
49 \definecolor{hsr-mauve60}{HTML}{A87796}
50 \definecolor{hsr-mauve40}{HTML}{C5A4B9}
51 \definecolor{hsr-mauve20}{HTML}{E2D2DC}
53 \definecolor{hsr-lakegreen}{HTML}{548C86}
54 \ensuremath{\mbox{\mbox{definecolor\{hsr-lakegreen80\}\{HTML\}\{76A39E\}}}
55 \definecolor{hsr-lakegreen60}{HTML}{98BAB6}
56 \definecolor{hsr-lakegreen40}{HTML}{BBD1CF}
57 \definecolor{hsr-lakegreen20}{HTML}{DDE8E7}
59 \definecolor{hsr-reed}{HTML}{7B6951}
60 \definecolor{hsr-reed80}{HTML}{958774}
61 \definecolor{hsr-reed60}{HTML}{BOA597}
62 \definecolor{hsr-reed40}{HTML}{CAC3B9}
63 \definecolor{hsr-reed20}{HTML}{E5E1DC}
65 \definecolor{hsr-petrol}{HTML}{00738D}
66 \definecolor{hsr-petrol80}{HTML}{338FA4}
67 \definecolor{hsr-petrol60}{HTML}{66ABBB}
68 \definecolor{hsr-petrol40}{HTML}{99C7D1}
69 \definecolor{hsr-petrol20}{HTML}{CCE3E8}
71 \definecolor{hsr-basswood}{HTML}{BABD5D}
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72 \definecolor{hsr-basswood80}{HTML}{C8CA7D}

41 \definecolor{hsr-blue}{HTML}{0065A3}

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73 \definecolor{hsr-basswood60}{HTML}{D6D79E}
74 \definecolor{hsr-basswood40}{HTML}{E3E5BE}
75 \definecolor{hsr-basswood20}{HTML}{F1F2DF}
76
77 \definecolor{hsr-lightgrey}{HTML}{C6C7C8}
78 \definecolor{hsr-lightgrey80}{HTML}{D1D2D3}
79 \definecolor{hsr-lightgrey60}{HTML}{DDDDDE}
80 \definecolor{hsr-lightgrey40}{HTML}{E8E8E9}
81 \definecolor{hsr-lightgrey20}{HTML}{F4F4F4}
82
83 \definecolor{hsr-black}{HTML}{1A171B}
84 \definecolor{hsr-black80}{HTML}{484549}
85 \definecolor{hsr-black60}{HTML}{767476}
86 \definecolor{hsr-black40}{HTML}{A4A2A4}
87 \definecolor{hsr-black20}{HTML}{D1D1D1}
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4 Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

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