Preprint-Number

The HEP–PAPER package*
Publications in high energy physics

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Abstract

The hep-paper package aims to provide a single style file containing most configurations and macros necessary to write appealing publications in High Energy Physics. Instead of reinventing the wheel by introducing newly created macros hep-paper preferably loads third party packages as long as they are lightweight enough.

Contents

*This document corresponds to hep-paper v1.6.

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1 Introduction

For usual publications it is enough to load additionally to the `article` class without optional arguments only the HEP-PAPER package [1].

```
\documentclass{article}
\usepackage{hep-paper}
```

The most notable changes after loading the HEP-PAPER package is the change of some LaTeX defaults. The paper and font sizes are set to A4 and 11 pt, respectively. Additionally, the paper geometry is adjusted using the GEOMETRY package [2]. Furthermore, the font is changed to latin modern (LM) using the CFR-LM package [3] with MICROTYPE [4] optimizations. Finally, portable document format (PDF) hyperlinks are implemented with the HYPERREF package [5].

1.1 Options

`paper` The `paper=`⟨*format*⟩ option loads the specified paper format. The possible ⟨*formats*⟩ are: `a0`, `a1`, `a2`, `a3`, `a4`, `a5`, `a6`, `b0`, `b1`, `b2`, `b3`, `b4`, `b5`, `b6`, `c0`, `c1`, `c2`, `c3`, `c4`, `c5`, `c6`, `ansia`, `ansib`, `ansic`, `ansid`, `ansie`, `letter`, `executive`, `legal`. The default is `a4`.

`font` The `font=`⟨*size*⟩ option loads the specified font size. The possible ⟨*sizes*⟩ are: `8pt`, `9pt`, `10pt`, `11pt`, `12pt`, `14pt`, `17pt`, `20pt`. The default is 11 pt.

`lang` The `lang=`⟨*name*⟩ option switches the document language to one of the values values provided by the BABEL package [6]. The default is `british`.

`sansserif` The `sansserif` option switches the document including math to sans serif font shape.

`parskip` The `parskip` option changes how paragraphs are separated from each other using the PARSKIP package [7]. The LaTeX default is separation via indentation the `parskip` option switches to separation via vertical space.[1]

`symbols` The `symbols=`⟨*family*⟩ set the family of the symbol fonts. `symbols=ams` loads the two $\mathcal{AMS}$ fonts [8] and the BM bold fonts. The default `symbols=true` replaces additionally the blackboard font with the DSFONT [9]. `symbols=minion` switches the symbol fonts to the Adobe MinionPro companion font from the MNSYMBOL package [10]. `symbols=false` deactivates loading any additional symbol fonts.

1.1.1 Deactivation

The HEP-PAPER package loads few bigger packages which have a large impact on the document. The deactivation options can prevent such and other adjustments.

`defaults` The `defaults` option prevents the adjustment of the page geometry and the font size set by the document class.

`lining` The `lining` option deactivates the use of text- (123) in favour of lining- (123) figures

[1] Although the `parskip` option is used for this document, it is recommended only for very few document types such as technical manuals or answers to referees.

in text mode.

title The `title=false` option deactivates the title page adjustments.

bibliography The `bibliography=`⟨*key*⟩ option prevents the automatic loading of the BIBLATEX package [11] if ⟨*key*⟩=`false`. Otherwise the ⟨*key*⟩ is passed as `style` string to the BIBLATEX package.

glossaries The `glossaries=false` option deactives acronyms and the use of the GLOSSARIES package [12].

references The `references=false` option prevents the CLEVEREF package [13] from being loaded and deactivates further redefinitions of reference macros.

1.1.2 Compatibility

The compatibility options activate the compatibility mode for certain classes and packages used for publications in high energy physics. They are mostly suitable combinations of options described in the previous section. If HEP-PAPER is able to detect the presence of such a class or package, *i.e.* if it is loaded before the HEP-PAPER package, the compatibility mode is activated automatically.

beamer The `beamer` option activates the BEAMER [14] compatibility mode.

jhep The `jhep` option activates the JHEP [15] compatibility mode.

jcap The `jcap` option activates the JCAP [16] compatibility mode.

revtex The `revtex` option activates the REVTEX [17] compatibility mode.

pos The `pos` option activates the PoS compatibility mode.

springer The `springer` option activates the compatibility mode the `svjour` class [18].

1.1.3 Reactivation

The HEP-PAPER package deactivates unrecommended macros, which can be reactivated manually.

manualplacement The `manualplacement` option reactivates manual float placement.

eqnarray The `eqnarray` option reactivates the depreciated `eqnarray` environment.

2 Macros and environments

twocolumn If the global `twocolumn` option is present the page geometry is changed to cover almost the entire page. Additionally the `abstract*` environment is defined that generates a one column abstract and takes care of placing the title information.
abstract*

2.1 Title page

\title The PDF meta information is set according to the `\title{`⟨*text*⟩`}` and `\author {`⟨*text*⟩`}` information.

\subtitle The `\subtitle{`⟨*subtitle*⟩`}` macro is defined using the TITLING package [19].

\author \affiliation \email In order to facilitate multiple authors with different affiliations the AUTHBLK package [20] is loaded. The following lines add *e.g.* two authors with different affiliations

```
\author[1]{Author one \email{email one}}
\affiliation[1]{Affiliation one}
\author[2]{Author two \email{email two}}
\affiliation[1,2]{Affiliation two}
```

\preprint The `\preprint{`⟨*numer*⟩`}` macro places a pre-print number in the upper right corner of the title page.

abstract The `abstract` environment is adjusted to not start with an indentation.

\titlefont \subtitlefont \authorfont \affiliationfont \preprintfont Various title font macros are defined, allowing to change the appearance of the `\maketitle` output.

2.2 Text

\enquote \MakeOuterQuote Hyphenation is provided by the BABEL package [6] and quotation commands are provided by the CSQUOTES package [21]. The latter package provides the convenient macros `\enquote{`⟨*text*⟩`}` and `\MakeOuterQuote{"}` allowing to leave the choice of quotation marks to LaTeX and use " instead of the pair ‘‘ and ’’, respectively.

\eg \ie \cf \vs The FOREIGN package [22] defines macros such as `\eg`, `\ie`, `\cf`, and `\vs` which are typeset as *e.g.*, *i.e.*, *cf.*, and *vs.*

\no The `\no{`⟨*number*⟩`}` macro is typeset as № 123.

\software The `\software[`⟨*version*⟩`]{`⟨*name*⟩`}` macro is typeset as HEP-PAPER v1.6.

\online The `\online{`⟨*url*⟩`}{`⟨*text*⟩`}` macro combines the features of the `\href{`⟨*url*⟩`}{`⟨*text*⟩`}` [5] and the `\url{`⟨*text*⟩`}` [23] macros, resulting in *e.g.* `ctan.org/pkg/hep-paper`.

inlinelist enumdescript The `inlinelist` and `enumdescript` environments are defined using the ENUMITEM package [24].

```
The three main points are
\begin{inlinelist}
  \item one
  \item two
  \item three
\end{inlinelist}
```

The three main points are i) one, ii) two, and iii) three.

```
\begin{enumdescript}[label=\Roman*)]
  \item{First} one
  \item{Second} two
  \item{Third} three
\end{enumdescript}
```

I) **First** one
II) **Second** two
III) **Third** three

\textsc A bold versions **Small Caps** and a sans serif version of Small Caps based on the computer modern (CM) font [25] is provided, the latter using the sansmath-fonts package [26].

\underline The `\underline` macro is redefined to allow line-breaks using the ulem package [27].

\overline The `\overline` macro is extended to also overline text outside of math environments.

\useparskip If the `parskip` option is activated the `\useparindent` macro switches to the usual parindent mode, while the `\useparskip` macro switches to the parskip mode.

\useparindent

2.2.1 References and footnotes

\cref References are extended with the cleveref package [13], which allows to *e.g.* just type `\cref{`⟨*key*⟩`}` in order to write 'figure 1'. Furthermore, the cleveref package allows to reference multiple objects within one `\cref{`⟨*key1,key2*⟩`}`.

\cite Citations are adjusted to not start on a new line in order to avoid the repeated use of `~\cite{`⟨*key*⟩`}`.

\ref References are also adjusted to not start on a new line.

\eqref Footnotes are adjusted to swallow white space before the footnote mark and at the beginning of the footnote text.

\subref

\footnote

2.2.2 Acronyms

\acronym The `\acronym`⟨*⟩`[`⟨*typeset abbreviation*⟩`]{`⟨*abbreviation*⟩`}`⟨*⟩`{`⟨*definition*⟩`}[`⟨*plural definition*⟩`]` macro generates the singular `\`⟨*abbreviation*⟩ and plural `\`⟨*abbreviation*⟩`s` macros. The first star prevents the addition of an 's' to the abbreviation plural. The second star restores the TeX default of swallowing subsequent white space. The long form is only shown at the first appearance of these macros, later appearances generate the abbreviation with a hyperlink to the long form. The long form is never used in math mode. Capitalization at the beginning of paragraphs and sentences is (mostly) ensured. The `\shortacronym` and `\longacronym` macros are drop-in replacements of the `\acronym` macro showing only the short or long form of their acronym. The first use form of the acronym can be enforced by resetting the acronym counter with `\resetacronym{`⟨*key*⟩`}`. If the acronym counter equals one at the end of the document the short form of the acronym is not introduced. Placing a `\dummyacronym{`⟨*key*⟩`}` at the end of the document ensures that the short form is introduced.

\shortacronym

\longacronym

\resetacronym

\dummyacronym

2.3 Math

The MATHTOOLS [28] and AMSSYMB [8] packages are loaded. They in turn load the $\mathcal{AMS}$-LaTeX AMSMATH [29] and AMSFONTS [8] packages. Bold math, via `\mathbf` is improved by the BM package [30], *i.e.* ($Ab\Gamma\delta\boldsymbol{Ab\Gamma\delta}$). Macros switching to `bfseries` such as `\section{`⟨*text*⟩`}` are ensured to also typeset math in bold. The `\text{`⟨*text*⟩`}` macro makes it possible to write text within math mode, *i.e.* (Ab$\Gamma\delta$**Ab$\Gamma\delta$**). The math sans serif alphabet is redefined to be italic sans serif if the main text is serif and italic serif if the main text is sans serif, *i.e.* ($Ab\Gamma\delta\boldsymbol{Ab\Gamma\delta}$). The `\mathcal` font *i.e.* ($\mathcal{ABCD}$) is accompanied by the `\mathscr` font *i.e.* ($\mathscr{ABCD}$). The `\mathbb` font is improved by the DOUBLESTROKE package [9] and adjusted depending on the `sansserif` option *i.e.* ($\mathbb{Ah1}$). Finally, the `\mathfrak` font is also available *i.e.* ($\mathfrak{Aa}\mathfrak{Bb}12$). Details about the font handling in TeX can be found in reference [31].

`\mathbf` `\text` `\mathsf` `\mathscr` `\mathbb` `\mathfrak`

The `\frac{`⟨*number*⟩`}{`⟨*number*⟩`}` macro is accompanied by `\nicefrac{`⟨*number*⟩`}{`⟨*number*⟩`}`, `\textfrac{`⟨*number*⟩`}{`⟨*number*⟩`}`, and `\flatfrac{`⟨*number*⟩`}{`⟨*number*⟩`}` leading to $\frac{1}{2}$, 1/2, 1/2, and 1/2. Diagonal matrix `\diag` and signum `\sgn` operators are defined.

`\nicefrac` `\flatfrac` `\textfrac`

The `\mathdef{`⟨*name*⟩`}[`⟨*arguments*⟩`]{`⟨*code*⟩`}` macro (re-)defines macros only within math mode without changing the text mode definition.

`\diag` `\sgn`

The imaginary unit i and the differential d are defined using this functionality.

`\mathdef`

For longer paper it can be useful to re-number the equation in accordance with the section numbering `\numberwithin{equation}{section}`. In order to further reduce the size the of equation counter it can be useful to wrap `align` environments with multiple rows in a `subequations` environment. Both macros are provided by the AMSMATH package.

`\i` `\d` `\numberwithin` `subequations`

The depreciated `eqnarray` environment is undefined as long this behaviour is not prevented by the `eqnarray` package option. The `split`, `multline`, `align`, `multlined`, `aligned`, `alignedat`, and `cases` environments of the AMSMATH and MATHTOOLS packages should be used instead.

`eqnarray`

Use the `equation` environment for short equations.

`equation`

```
\begin{equation}
  left = right \ .
\end{equation}
```

$$\boxed{\text{left}} = \boxed{\text{right}}\ . \tag{1}$$

Use the `multline` environment for longer equations.

`multline`

```
\begin{multline}
  left = right 1 \\
  + right 2 \ .
\end{multline}
```

$$\boxed{\text{left}} = \boxed{\text{right 1}}$$
$$\boxed{+\ \text{right 2}}\ . \tag{2}$$

Use the `split` sub environment for equations in which multiple equal signs should be aligned.

`split`

```
\begin{equation} \begin{split}
  left &= right 1 \\
  &= right 2 \ .
\end{split} \end{equation}
```

$$\begin{aligned} \boxed{\text{left}} &= \boxed{\text{right 1}} \\ &= \boxed{\text{right 2}} \ . \end{aligned} \tag{3}$$

align Use the `align` environment for the vertical alignment and horizontal distribution of multiple equations.

```
\begin{subequations} \begin{align}
  left &= right \ , &
  left &= right \ , \\
  left &= right \ , &
  left &= right \ .
\end{align} \end{subequations}
```

$$\boxed{\text{left}} = \boxed{\text{right}} \ , \quad \boxed{\text{left}} = \boxed{\text{right}} \ , \tag{4a}$$

$$\boxed{\text{left}} = \boxed{\text{right}} \ , \quad \boxed{\text{left}} = \boxed{\text{right}} \ . \tag{4b}$$

aligned Use the `aligned` environment within a `equation` environment if the aligned equations should be labeled with a single equation number.

multlined Use the `multlined` environment if either `split` or `align` contain very long lines.

```
\begin{equation} \begin{split}
  left &= right 1 \\ &=
  \begin{multlined}[t]
    right 2 \\ + right 3 \ .
  \end{multlined}
\end{split} \end{equation}
```

$$\begin{aligned} \boxed{\text{left}} &= \boxed{\text{right 1}} \\ &= \boxed{\text{right 2}} \\ &\quad \boxed{+ \text{ right 3}} \ . \end{aligned} \tag{5}$$

alignat Use the `alignat` environment together with the `\mathllap` macro for the alignment of multiple equations with vastly different lengths.

```
\begin{subequations}
\begin{alignat}{2}
  left &= long right &&  \ , \\
  le. 2 &= ri. 2 \ , &
  \mathllap{le. 3 = ri. 3} & \ .
\end{alignat}
\end{subequations}
```

$$\boxed{\text{left}} = \boxed{\text{long right}} \ , \tag{6a}$$

$$\boxed{\text{le. 2}} = \boxed{\text{ri. 2}} \ , \qquad \boxed{\text{le. 3}} = \boxed{\text{ri. 3}} \ . \tag{6b}$$

As a rule of thumb if you have to use `\notag`, `\nonumber`, or perform manual spacing via `\quad` you are probably using the wrong environment.

2.3.1 Physics

\unit \inv The correct spacing for units, *cf.* equation (7), is provided by the macro `\unit[`⟨*value*⟩`]{`⟨*unit*⟩`}` from the UNITS package [32] which can also be used in text mode. The macro `\inv[`⟨*power*⟩`]{`⟨*text*⟩`}` allows to avoid math mode also for inverse units such as $5\,\mathrm{fb}^{-1}$ typeset via `\unit[5]{\inv{fb}}`.

Greek letters are adjusted to always be italic and upright in math and text mode, respectively, using the FIXMATH [33] and ALPHABETA [34] packages. This allows differentiations like

$$\sigma = 5\,\mathrm{fb} \ , \qquad \text{at } 5\,\sigma \text{ C.L.} \ , \qquad \mu = 5\,\mathrm{cm} \ , \qquad l = 5\,\mu\mathrm{m} \ , \tag{7}$$

```
\begin{panels}{.6}
  code
\panel{.4}
  \begin{tabular}...\end{tabular}
\end{panels}
```

(a) Code for this panel environment.

	one		two	
a	b	c	d	
	b	c	d	

(b) The booktabs and multirow features.

Table 1: Example use of the panels environment in Panel (a) and the features from the BOOKTABS and MULTIROW packages in Panel (b).

and *e.g.* to distinguish gauge ν and mass ν eigenstates in models with massive neutrinos. Note that `\mathrm` and therefore `\unit` transform italic greek character to seemingly random upright characters, this can be avoided by using `\unit{\text\mu m}`. Additionally, Greek letters can also be directly typed using Unicode.

`\ev` The PHYSICS package [35] provides additional macros such as

`\pdv` `\comm`

$$\langle\phi\rangle\ , \qquad \frac{\partial^n f}{\partial x^n}\ , \qquad [A,B]\ , \qquad \mathcal{O}\big(x^2\big)\ , \qquad x\Big|_0^\infty\ , \qquad \det(M)\ . \tag{8}$$

`\order` `\cancel` `\slashed`

The `\cancel{`⟨*characters*⟩`}` macro from the CANCEL package [36] and the `\slashed{`⟨*character*⟩`}` macro from the SLASHED package [37] allow to ~~cancel~~ math and use the Dirac slash notation *i.e.* $\not{\partial}$, respectively.

`\overleftright` A better looking over left right arrow is defined *i.e.* $\overleftrightarrow{\partial}$.

2.4 Floats

`figure` `table` Automatic float placement is adjusted to place a single float at the top of pages and to reduce the number of float pages, using the LaTeX macros.

```
\setcounter{bottomnumber}{0}          no floats at the bottom of a page (default 1)
\setcounter{topnumber}{1}             a single float at the top of a page (default 2)
\setcounter{dbltopnumber}{1}          same for full widths floats in two-column mode
\renewcommand{\textfraction}{.1}      large floats are allowed (default 0.2)
\renewcommand{\topfraction}{.9}       (default 0.7)
\renewcommand{\dbltopfraction}{.9}    (default 0.7)
\renewcommand{\floatpagefraction}{.8} float pages must be full (default 0.5)
```

Additionally, manual float placement is deactivated but can be reactivated using the `manualplacement` package option. It is however recommended to archive the desired design by adjusting above macros. The most useful float placement is usually `\raggedright` archived by placing the float *in front* of the paragraph it is referenced in first. The float environments have been adjusted to center their content. The usual behaviour can be reactivated using `\raggedright`.

`panels` The `panels` environment makes use of the SUBCAPTION package [38]. It provides `\panel` sub-floats and takes as mandatory argument either the number of sub-floats (default 2) or the width of the first sub-float as fraction of the `\linewidth`. Within

the \begin{panels}[⟨*vertical alignment*⟩]{⟨*width*⟩} environment the \panel macro initiates a new sub-float. In the case that the width of the first sub-float has been given as an optional argument to the panels environment the \panel{⟨*width*⟩} macro takes the width of the next sub-float as mandatory argument. The example code is presented in table 1a.

tabular The BOOKTABS [39] and MULTIROW [40] packages are loaded enabling publication quality tabulars such as in table 1b.

\graphic
\graphics The GRAPHICX package [41] is loaded and the \graphic[⟨*width*⟩]{⟨*figure*⟩} macro is defined, which is a wrapper for the \includegraphics{⟨*figure*⟩} macro and takes the figure width as fraction of the \linewidth as optional argument (default 1). If the graphics are located in a sub-folder its path can be indicated by \graphics{⟨*subfolder*⟩}.

2.5 Bibliography

\bibliography
\printbibliography The BIBLATEX package [11] is loaded for bibliography management. The user has to add the line \bibliography{⟨*my.bib*⟩} to the preamble of the document and \printbibliography at the end of the document. The bibliography is generated by BIBER [42]. biblatex is extended to be able to cope with the collaboration and reportNumber fields provided by inspirehep.net and a bug in the volume number is fixed. Additionally, the PubMed IDs are recognized and ctan.org, github.com, gitlab.com, bitbucket.org, launchpad.net, sourceforge.net, and hepforge.org are

erratum valid eprinttypes. Errata can be included using the related feature.

```
\article{key1,
   ...,
  relatedtype="erratum",
  related="key2",
}
\article{key2,
   ...,
}
```

3 Conclusion

The HEP-PAPER package provides a matching selection of preloaded packages and additional macros enabling the user to focus on the content instead of the layout by reducing the amount of manual tasks. The majority of the loaded packages are fairly lightweight, the others can be deactivated with package options.

arxiv-collector arxiv.org [43] requires the setup dependent bbl files instead of the original bib files, which causes trouble if the local LaTeX version differs from the one used by arXiv. The ARXIV-COLLECTOR python script [44] alleviates this problem by collecting all files necessary for publication on arXiv (including figures).

A Math alphabet allocation

Of the 16 available math alphabets, TEX loads four by default

0. **OT1** Text (latin, upper case greek, numerals, text symbols)
1. **OML** Math Italic (latin, greek, numerals, text symbols)
2. **OMS** Symbol (\mathcal, operators)
3. **OMX** Math Extension (big operators, delimiters)

The text font 0. of CM is **cmr10** \OT1/cmr/m/n/10, which is replaced by LM to be **rm-lmr10** \OT1/lmr/m/n/10, the sansserif option uses **rm-lmss10** \OT1/lmss/m/n/10. The italic math font 1. of CM is **cmmi10** \OML/cmm/m/it/10, and is replaced by LM to be **lmmi10** \OML/lmm/m/it/10, the sansserif options uses **cmbrmi10** \OML/cmbrm/m/it/10 from the CMBRIGHT package [45]. The symbol font 2. of CM is **cmsy10** \OMS/cmsy/m/n/10, and is replaced by LM to be **lmsy10** \OMS/lmsy/m/n/10, the sansserif options uses **cmsssy10** \OMS/cmsssy/m/n/10 from the SANSMATHFONTS package [26]. The extension font 3. of CM is **cmex10** \OMX/cmex/m/n/5, and is replaced by the EXSCALE package [46] to be **cmex10** \OMX/cmex/m/n/10, the sansserif option loads **cmssex10** \OMX/cmssex/m/n/10. The AMSSYMB (AMSFONTS) packages [47] load two more symbol fonts

4. **msam10** \U/msa/m/n/10 AMS symbol font A (special math operators)
5. **msbm10** \U/msb/m/n/10 AMS symbol font B (\mathbb, negated operators)

The sansserif option replaces them with **ssmsam10** \U/ssmsa/m/n/10 and **ssmsbm10** \U/ssmsb/m/n/10 from the SANSMATHFONTS package [26], respectively. The BM package [30] loads the bold version for the fonts 0. to 2..

Other math alphabets are only loaded on demand, *e.g.* \mathsf uses a sans serif font and \mathbf without the BM package uses a bold font. The \mathscr macro uses the script font from the MATHRSFS package [48]

9. **rsfs10** \U/rsfs/m/n/10 Math script font (capital letters)

The \mathbb macro loads the double stroke font from the DSFONT package [9], this can be prevented with the symbols=ams option.

10. **dsrom10** \U/dsrom/m/n/10 Double stroke font

The \mathfrak macro loads the fractur font from the AMSSYMB package [47]

11. **eufm10** \U/euf/m/n/10 Math fraktur (Basic Latin)

The HEP-PAPER package uses nine of the available 16 math alphabets. This number can be reduced by three using \newcommand{\bmmax}{0} from the BM package [30] and brought down to the default of four with the option symbols=false.

(a) Text

(b) Math

(c) Symbol

(d) AMS a

(e) AMS b

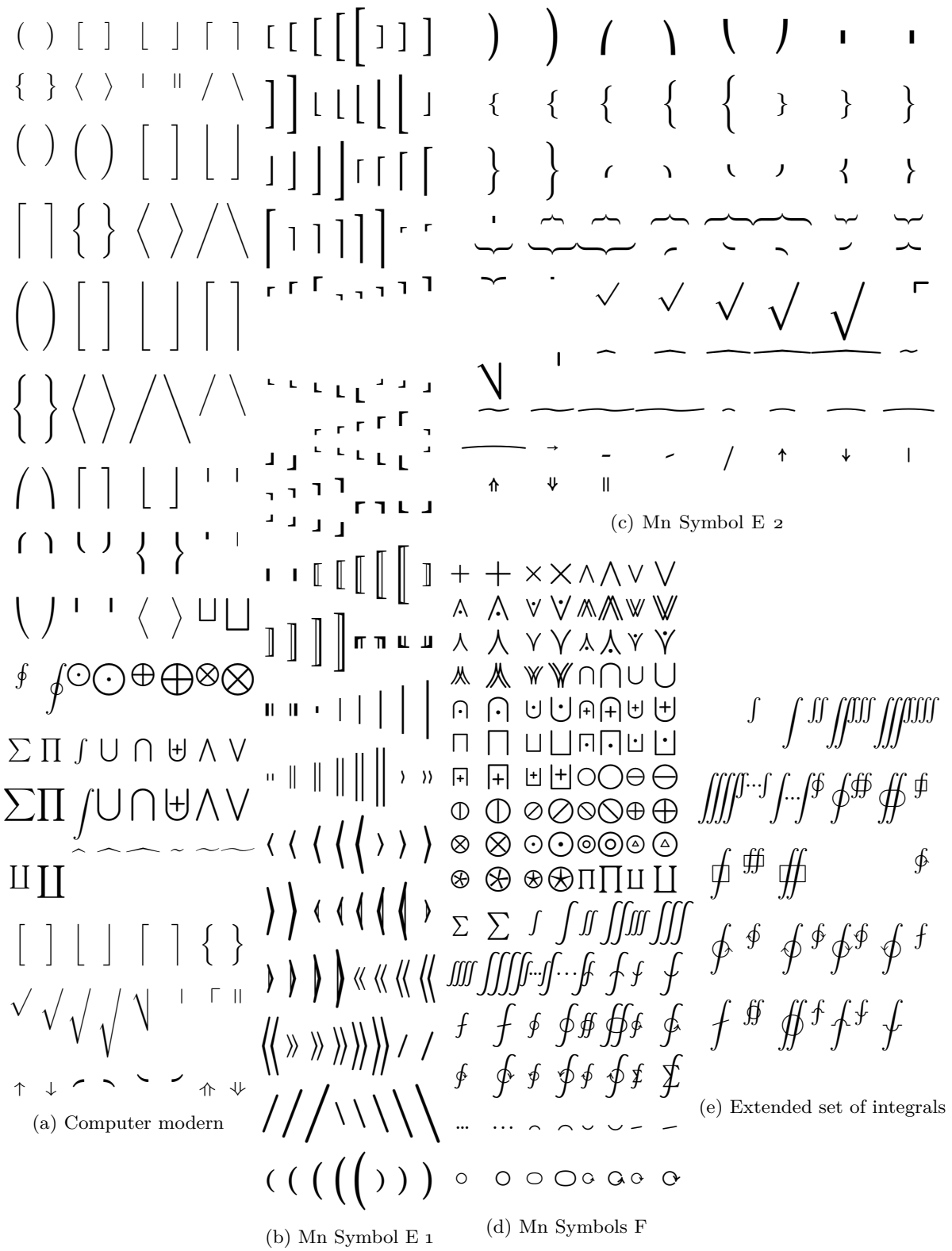
(f) Euler fraktur

(g) Euler calligraphy

(h) Minion calligraphy

(i) Doublestroke

Figure 1: Basic math fonts



(a) Computer modern

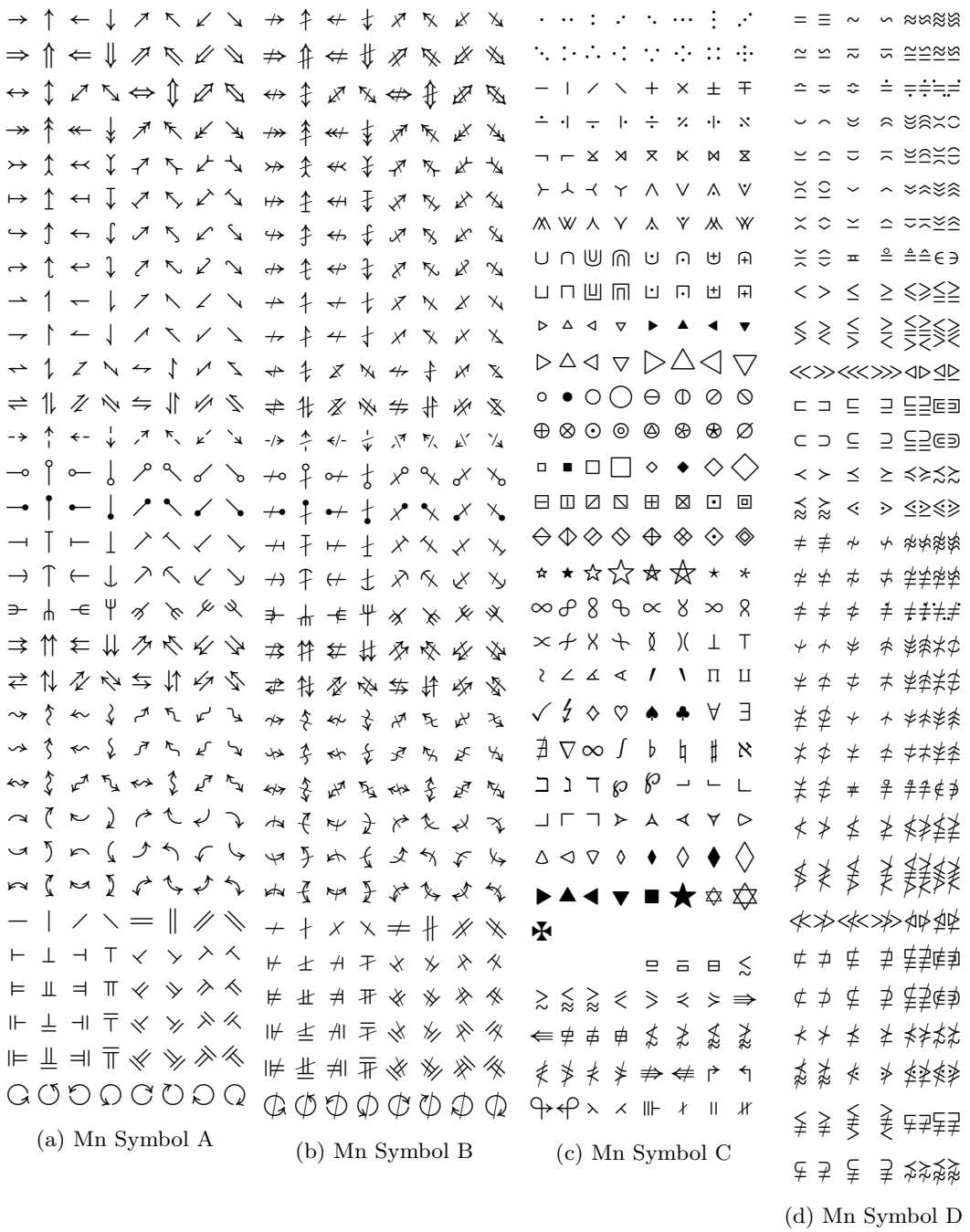
(b) Mn Symbol E 1

(c) Mn Symbol E 2

(d) Mn Symbols F

(e) Extended set of integrals

Figure 2: Math extension fonts



(a) Mn Symbol A

(b) Mn Symbol B

(c) Mn Symbol C

(d) Mn Symbol D

Figure 3: Minion symbol fonts

The symbols=minion options replaces the fonts 2. to 5. with corresponding fonts from the MnSymbol package [10]. Additionally, two more symbol alphabets are allocated, the bm package [30] loads one more font and now \mathcal triggers the use of one additional alphabet. Hence, the minion option uses three to four more math alphabets than a usual setup.

B Options

Load the pdftexcmds [49] and kvoptions [50] packages and define a hep namespace.

```
\RequirePackage{pdftexcmds}
\RequirePackage{kvoptions}
\SetupKeyvalOptions{
  family=hep,
  prefix=hep@
}
```

paper Define a paper=⟨*size*⟩ option. Make A4 paper the default.

```
\DeclareStringOption[a4]{paper}
```

font Define a figures=⟨*size*⟩ option. Make 11 pt the default font size.

```
\DeclareStringOption[11pt]{font}
```

lang Define the lang option, which takes the values provided by the babel package [6]. Make british the default language.

```
\DeclareStringOption[british]{lang}
```

sansserif Define the option pair serif and sansserif controling the font shape of the whole document.

```
\DeclareBoolOption[true]{serif}
\DeclareComplementaryOption{sansserif}{serif}
```

parskip Define the option pair parindent and parskip controlling the separation of paragraphs.

```
\DeclareBoolOption[true]{parindent}
\DeclareComplementaryOption{parskip}{parindent}
```

symbols Provide the symbols option allowing to switch the symbol font.

```
\DeclareStringOption[true]{symbols}
```

B.1 Deactivation

defaults Define the defaults option which deactivates the paper and font options and prevents the change of the class defaults by this package.

```
\DeclareBoolOption[false]{defaults}
```

lining Define the lining option deactivating the use of text figures in text mode.

```
\DeclareBoolOption[false]{lining}
```

title Provide the title option deactivating redefinitions of title macros.

```
\DeclareBoolOption[true]{title}
```

physics Provide the physics option for deactivating redefinition of physics macros.

```
\DeclareBoolOption[true]{physics}
```

bibliography Provide the bibliography option for passing a style string to the BIBLATEX package [11] or disabling the automatic loading of biblatex.

```
\DeclareStringOption[numeric-comp]{bibliography}
```

glossaries Provide the glossaries option able to turn of the use of the GLOSSARIES package [12].

```
\DeclareBoolOption[true]{glossaries}
```

references Provide the references option for preventing the CLEVEREF package from being loaded redefinitions of reference macros.

```
\DeclareBoolOption[true]{references}
```

B.2 Compatibility

beamer Provide the beamer option for BEAMER [14] compatibility mode.

```
\DeclareBoolOption[false]{beamer}
```

revtex Provide the revtex option for REVTEX [17] compatibility mode.

```
\DeclareBoolOption[false]{revtex}
```

jhep Provide the jhep option for JHEP [15] compatibility mode.

```
\DeclareBoolOption[false]{jhep}
```

jcap Provide the jcap option for JCAP [16] compatibility mode.

```
\DeclareBoolOption[false]{jcap}
```

pos Provide the pos option for PoS compatibility mode.

```
\DeclareBoolOption[false]{pos}
```

springer Provide the springer option for Springer compatibility mode.

```
\DeclareBoolOption[false]{springer}
```

B.3 Reactivation

eqnarray Provide the eqnarray option for reactivating the eqnarray environment.

```
\DeclareBoolOption[false]{eqnarray}
```

manualplacement Provide the manualplacement option for reactivating the manual placement of floats.

```
\DeclareBoolOption[false]{manualplacement}
```

B.4 Process options

```
\ProcessKeyvalOptions*
```

Read the class options regarding font and paper size.

```
\def\hep@get@class#1.cls#2\relax{\def\hep@class{#1}}
\def\hep@getclass{\expandafter\hep@get@class\@filelist\relax}
\hep@getclass
\@ifclasswith{\hep@class}{10pt}{\setkeys{hep}{font=10pt}}{}
\@ifclasswith{\hep@class}{12pt}{\setkeys{hep}{font=12pt}}{}
\@ifclasswith{\hep@class}{a5paper}{\setkeys{hep}{paper=a5}}{}
\@ifclasswith{\hep@class}{b5paper}{\setkeys{hep}{paper=b5}}{}
\@ifclasswith{\hep@class}{letterpaper}{\setkeys{hep}{paper=letter}}{}
\@ifclasswith{\hep@class}{legalpaper}{\setkeys{hep}{paper=legal}}{}
\@ifclasswith{\hep@class}{executivepaper}{%
  \setkeys{hep}{paper=executive}%
}{}
```

B.5 Set compatibility

Set the springer compatibility options.

```
\@ifclassloaded{svjour}{\setkeys{hep}{springer}}{}
\@ifclassloaded{svjour2}{\setkeys{hep}{springer}}{}
\@ifclassloaded{svjour3}{\setkeys{hep}{springer}}{}
\ifhep@springer
  \setkeys{hep}{defaults, title=false}
  \let\cl@chapter\undefined
\fi
```

Set the pos compatibility options.

```
\@ifclassloaded{PoS}{\setkeys{hep}{pos}}{}
```

```
\ifhep@pos
  \setkeys{hep}{defaults, title=false}
  \DeclareRobustCommand\boldmath{\@nomath\boldmath\mathversion{bold}}
\fi
```

Set the `beamer` compatibility options.

```
\@ifclassloaded{beamer}{\setkeys{hep}{beamer}}{}
\ifhep@beamer
  \setkeys{hep}{defaults, title=false, references=false, sansserif}
  \@ifpackageloaded{beamerbasefont}{\usefonttheme{professionalfonts}}{}
  \setbeamertemplate{navigation symbols}{}
\fi
```

Set the `revtex` compatibility options.

```
\@ifclassloaded{revtex4}{\setkeys{hep}{revtex}}{}
\@ifclassloaded{revtex4-1}{\setkeys{hep}{revtex}}{}
\@ifclassloaded{revtex4-2}{\setkeys{hep}{revtex}}{}
\ifhep@revtex
  \setkeys{hep}{defaults, title=false, bibliography=false, lang=american}
\fi
```

Define the SISSA conditional.

```
\@ifpackageloaded{jheppub}{\setkeys{hep}{jhep}}{}
\@ifpackageloaded{jcappub}{\setkeys{hep}{jcap}}{}
\newif\ifhep@sissa
\ifhep@jhep\hep@sissatrue
\else
  \ifhep@jcap\hep@sissatrue
  \else\hep@sissafalse
  \fi
\fi
```

Set the SISSA compatibility options.

```
\ifhep@sissa
  \setkeys{hep}{title=false, bibliography=false}
  \PassOptionsToPackage{
    colorlinks=true, linktocpage=true, pdfproducer=medialab, pdfa=true,
    urlcolor=blue, anchorcolor=blue, citecolor=blue, filecolor=blue,
    linkcolor=blue, menucolor=blue, pagecolor=blue
  }{hyperref}
  \PassOptionsToPackage{reset}{geometry}
  \AtBeginDocument{\renewcommand{\foreignabbrfont}{}}
\fi
```

Set the JHEP compatibility options.

```
\ifhep@jhep
  \voffset 0in
```

```
  \hoffset 0in
\fi
```

C Text

Set the whole text to sans serif if requested.

```
\ifhep@serif\else
  \renewcommand{\familydefault}{\sfdefault}
\fi
```

\ifxetexorluatex Load the IFLUATEX [51] and IFXETEX [52] packages. Define the \ifxetexorluatex conditional checking if the package is executed by LuaLaTeX or XeLaTeX.

```
\RequirePackage{ifluatex}
\RequirePackage{ifxetex}
\newif\ifxetexorluatex
\ifxetex\xetexorluatextrue
\else
  \ifluatex\xetexorluatextrue
  \else\xetexorluatexfalse
  \fi
\fi
```

Pick the correct font encoding depending on the engine used and load the FONTENC package [53] with this encoding. For details of the font encoding see [54].

```
\ifxetexorluatex
  \def\hep@encoding{TU}
\else
  \def\hep@encoding{T1}
\fi
\RequirePackage[\hep@encoding]{fontenc}
```

Fix the remaining CM fonts [55], load the LM font via CFR-LM [3] supported also by LMODERN [56], the TEXTCOMP extension [57], and the MICROTYPE font optimization [4]. Adjust the figures according to the lining option and ensure that tables always use lining, using the ETOOLBOX package [58].

```
\RequirePackage{fix-cm}
\RequirePackage{microtype}
\ifhep@lining
  \RequirePackage[rm={lining},sf={lining},tt={lining}]{cfr-lm}
\else
  \RequirePackage{cfr-lm}
\fi
\RequirePackage{etoolbox}
% \AtBeginEnvironment{tabular}{\tlstyle}
\RequirePackage{textcomp}
```

Define bold and sans serif small caps font shapes using the FONTSPEC package [59]. The font abbreviations are

lmr LM regular font
lmss LM sans serif font
cmss CM sans serif font
xcmss Extended CM sans serif font (from the SANSMATHFONTS package [26])
bx Bold extended series
b Bold series
m Medium weight and width series
c Medium weight, condensed width series
sc Caps and small caps font shape

```
\newcommand{\hep@sf@fontshape}[3]{%
  \DeclareFontShape{\hep@encoding}{\sfdefault}{#1}{#2}{#3}{}%
}
\newcommand{\hep@rm@fontshape}[3]{%
  \DeclareFontShape{\hep@encoding}{\rmdefault}{#1}{#2}{#3}{}%
}
\ifxetexorluatex
  \RequirePackage{fontspec}
  \setmainfont{Latin Modern Roman}[
    UprightFeatures={SmallCapsFont={[lmromancaps10-regular.otf]}},
    BoldFeatures={
      SmallCapsFeatures={Letters=SmallCaps},
      SmallCapsFont={[cmunbx.otf]}
    }
  ]
  \hep@sf@fontshape{bx}{sc}{<->cmssbxcsc10}{}
  \hep@sf@fontshape{b}{sc}{<->cmssbxcsc10}{}
  \hep@sf@fontshape{m}{scit}{<->cmsscsci10}{}
  \hep@sf@fontshape{m}{sc}{%
    <-9>cmsscsc8<9-10>cmsscsc9<10->cmsscsc10%
  }{}
\else
  \rmfamily
  \hep@rm@fontshape{b}{sc}{<->ssub*cmr/bx/sc}{}
  \hep@rm@fontshape{bx}{sc}{<->ssub*cmr/bx/sc}{}
  \sffamily
  \hep@sf@fontshape{m}{sc}{<->ssub*xcmss/m/sc}{}
  \hep@sf@fontshape{b}{sc}{<->ssub*xcmss/bx/sc}{}
  \hep@sf@fontshape{bx}{sc}{<->ssub*xcmss/bx/sc}{}
  \hep@sf@fontshape{m}{scit}{<->ssub*xcmss/m/scit}{}
  \hep@sf@fontshape{b}{scit}{<->ssub*xcmss/bx/scit}{}
  \hep@sf@fontshape{bx}{scit}{<->ssub*xcmss/bx/scit}{}
\fi
```

Load the INPUTENC package [60].

```
\ifxetexorluatex\else
```

```
  \RequirePackage[utf8]{inputenc}
\fi
```

Load the BABEL package [6] for hyphenation and the recommended CSQUOTES package [21].

```
\RequirePackage[\hep@lang]{babel}
\RequirePackage[autostyle]{csquotes}
```

\underline Load the ULEM package [27] for hyphenable underlined text.

```
\RequirePackage[normalem]{ulem}
\let\underline\uline
```

C.1 Font size

Undefine previously defined font sizes and load the LaTeX font size file corresponding to the font size option.

```
\ifhep@defaults\else
  \def\hep@remove@pt#1pt{#1}
  \edef\hep@pt@size{\expandafter\hep@remove@pt\hep@font}
  \let\small\relax
  \let\footnotesize\relax
  \let\scriptsize\relax
  \let\tiny\relax
  \let\large\relax
  \let\Large\relax
  \let\LARGE\relax
  \let\huge\relax
  \let\Huge\relax
  \input{size\hep@pt@size.clo}
\fi
```

C.2 Text macros

\vs Load the FOREIGN package [22] in order to highlight abbreviations and vocabularies from foreign languages. Add the missing `\vs` command.

```
\ifnum\pdf@strcmp{\hep@lang}{american}=0
  \newcommand{\hep@lang@foreign}{USenglish}
\else
  \ifnum\pdf@strcmp{\hep@lang}{USenglish}=0
    \newcommand{\hep@lang@foreign}{USenglish}
  \else
    \newcommand{\hep@lang@foreign}{british}
  \fi
\fi
\RequirePackage[all, \hep@lang@foreign]{foreign}
\DeclareRobustCommand\vs{\xperiodafter{{\foreignabbrfont{vs}}}}
```

The FOREIGN package relies on the XSPACE package [61]. Ensure that `\xspace` is compatible with the `\enquote` macro from the CSQUOTE package.

```
\xspaceaddexceptions{\csq@qclose@i}
```

`\no` Define the macro `\no{`⟨*number*⟩`}` for the use of № with appropriate spacing.

```
\newcommand{\no}[1]{\textnumero~#1}
```

`\software` Define a macro for software with optional version information `\software[`⟨*version*⟩`]{`⟨*name*⟩`}`, using the RELSIZE package [62].

```
\RequirePackage{relsize}
\newcommand{\software}[2][\hspace{-\fontdimen2\font}]{%
  {\smaller[.5]\textsc{#2}~#1}%
}
```

`\online` `\email` Define the `\online{`⟨*text*⟩`}{`⟨*url*⟩`}` macro combining the features of the `\href` and the `\url` macros. Define a macro for typesetting emails.

```
\newcommand{\online}[2]{\href{#1}{\nolinkurl{#2}}}
\providecommand{\email}[1]{\online{mailto:#1}{#1}}
```

`\prefix` Define the `\prefix{`⟨*prefix*⟩`}{`⟨*word*⟩`}` macro ensuring the correct linebreak in (prefix-) word.

```
\newcommand{\prefix}[2]{(#1\mbox{-})\allowbreak #2}
```

C.3 Lists

Load the ENUMITEM package [24].

```
\RequirePackage[inline]{enumitem}
```

`inlinelist` Define an inline list environment.

```
\newlist{inlinelist}{enumerate*}{1}
\setlist*[inlinelist,1]{%
  label=\roman*), itemjoin={,\ }, itemjoin*={, and\ }, after=.%
}
```

`enumdescript` Define an enumdescript list environment.

```
\newlist{enum@descript}{enumerate}{2}
\setlist[enum@descript]{label=\arabic*.}
\newenvironment{enumdescript}[1][]{
\begin{enum@descript}[#1]
  \let\hep@item\item
  \renewcommand{\item}[2][]{
    \ifx&##1&\hep@item\else\hep@item[##1]\fi
```

```
    \textbf{##2}\ifx##2\empty\else~\fi\@ifnextchar\par\@gobble\relax
  }
}{\end{enum@descript}}
```

D Geometry

Load the GEOMETRY package [2] and adjust the text width and height. This step must happen after readjusting the font size in appendix C.1.

```
\ifhep@defaults\else
  \RequirePackage{geometry}
  \geometry{\hep@paper paper, includeheadfoot}
  \if@twocolumn
    \geometry{hscale=.85, vscale=.925, vmarginratio=1:1}
    \geometry{headsep=2ex, footskip=6ex}
    \setlength{\columnsep}{1.1em}
  \else
    \geometry{hscale=.75, vscale=.8, vmarginratio=3:4}
  \fi
\fi
```

\useparskip
\useparindent

Load the PARSKIP package [7] if requested and provide two commands switching between the two paragraph modes.

```
\ifhep@parindent\else
\RequirePackage{parskip}
\newcommand{\useparskip}{%
  \setlength{\parskip}{.5\baselineskip plus 2pt}%
  \setlength{\parindent}{0pt}%
}
\newcommand{\useparindent}{%
  \setlength{\parskip}{0pt}%
  \setlength{\parindent}{15pt}%
  \if@twocolumn\setlength\parindent{1em}
  \else\setlength\parindent{1.5em}
  \fi
}
\fi
```

E Math

Load the MATHTOOLS package [28] which loads the AMSMATH package [29]. Allow page breaks within equations if necessary.

```
\RequirePackage{mathtools}
\allowdisplaybreaks[1]
```

\diag
\sgn

Provide the \diag and \sgn operators

```
\DeclareMathOperator{\diag}{diag}
\DeclareMathOperator{\sgn}{sgn}
```

\mathdef Define the \mathdef{⟨*name*⟩}[⟨*arguments*⟩]{⟨*macro*⟩} macro which (re-)defines macros in math mode only. This macro is implemented using the xparse package [63].

```
\RequirePackage{xparse}
\DeclareDocumentCommand{\mathdef}{mO{0}m}{%
  \expandafter\let\csname text\string#1\endcsname=#1
  \expandafter\newcommand\csname math\string#1\endcsname[#2]{#3}
  \DeclareRobustCommand#1{%
    \ifmmode
      \expandafter\let\expandafter\next\csname math\string#1\endcsname
    \else
      \expandafter\let\expandafter\next\csname text\string#1\endcsname
    \fi
    \next
  }%
}
```

\i Provide an upright imaginary unit in math mode.

```
\AtBeginDocument{\mathdef{\i}{\operatorname{i}}}
```

\overline Redefine \overline to be a text macro using the ulem package [27]. Extend it as a math macro with the original definition from the amsmath package [29].

```
\def\overline#1{{\renewcommand{\ULdepth}{-1.9ex}{}\uline{#1}}}
\DeclareRobustCommand{\over@line}[1]{\@@overline{#1}}
\mathdef{\overline}{\over@line}
```

\left \right Load the mleftright package [64] and adjust the spacing around \left and \right.

```
\RequirePackage{mleftright}
\mleftright
```

eqnarray Undefine the eqnarray environment if not prevented by package option.

```
\ifhep@eqnarray\else
  \let\eqnarray\@undefined
  \let\endeqnarray\@undefined
\fi
```

E.1 Math fonts

Define conditionals based on the symbols package option.

```
\newif\ifhep@symbols
\ifnum\pdf@strcmp{\hep@symbols}{false}=0\else\hep@symbolstrue\fi
\newif\ifhep@ams
```

```
\ifnum\pdf@strcmp{\hep@symbols}{ams}=0 \hep@amstrue\fi
\newif\ifhep@minion
\ifnum\pdf@strcmp{\hep@symbols}{minion}=0 \hep@miniontrue\fi
```

Load the FIXMATH [33] and ALPHABETA [34] packages ensuring that upper Greek letters in math mode are italic and providing upright Greek letters in text mode, respectively. Ensure that this works also after loading other fonts packages such as CFR-LM using SUBSTITUTEFONT [65].

```
\ifhep@symbols
  \RequirePackage{fixmath}
  \RequirePackage{alphabeta}
  \RequirePackage{substitutefont}
  \substitutefont{LGR}{\rmdefault}{lmr}
  \DeclareFontFamily{LGR}{\rmdefault}{}
  \DeclareFontShape{LGR}{\rmdefault}{b}{n}{<->ssub*lmr/bx/n}{}
  \DeclareFontShape{LGR}{\rmdefault}{b}{sc}{<->ssub*lmr/bx/sc}{}
  \substitutefont{LGR}{\ttdefault}{lmtt}
  \DeclareFontFamily{LGR}{\ttdefault}{}
  \DeclareFontShape{LGR}{\ttdefault}{b}{n}{<->ssub*cmtt/bx/n}{}
  \substitutefont{LGR}{\sfdefault}{lmss}
  \DeclareFontFamily{LGR}{\sfdefault}{}
  \DeclareFontShape{LGR}{\sfdefault}{b}{n}{<->ssub*lmss/bx/n}{}
  \DeclareFontShape{LGR}{\sfdefault}{b}{sc}{<->ssub*lmss/bx/sc}{}
```

Either load the MNSYMBOL package [10] or the the EXSCALE package in order to fix Latin Modern lmex fonts. Additionally, load the AMSSYMB package [8] which provides further math symbols and also loads the AMSFONTS package [8].

```
  \ifhep@minion
    \RequirePackage{MnSymbol}
  \else
    \RequirePackage{exscale}
    \RequirePackage{amssymb}
  \fi
\fi
```

\mathsf If the sansserif package option is active use the CMBRIGHT font [45] and code adjusted from the SANSMATHFONTS package [26]. Ensure that \mathsf is italic as well as sans serif and sans for sans and sans serif documents, respectively.

```
\ifhep@serif
  \newcommand\hep@font@sf{cmbrm}
  \DeclareMathAlphabet{\mathsf}{OML}{\hep@font@sf}{m}{it}
  \SetMathAlphabet{\mathsf}{bold}{OML}{\hep@font@sf}{b}{it}
\else
  \newcommand\hep@font@sf{lmr}
  \newcommand\hep@font@text{lmss}
  \newcommand\hep@font@math{cmbrm}
  \newcommand\hep@font@symbol{cmsssy}
```

```
\newcommand\hep@font@extra{cmssex}
\newcommand\hep@font@amsa{ssmsa}
\newcommand\hep@font@amsb{ssmsb}
```

Declare font substitutions.

```
\DeclareFontSubstitution{OML}{\hep@font@math}{m}{it}
\ifhep@symbols\ifhep@minion\else
  \DeclareFontSubstitution{OMS}{\hep@font@symbol}{m}{n}
  \DeclareFontSubstitution{OMX}{\hep@font@extra}{m}{n}
\fi\fi
```

Declare the symbol fonts.

```
\DeclareSymbolFont{operators}{OT1}{\hep@font@text}{m}{n}
\DeclareSymbolFont{letters}{OML}{\hep@font@math}{m}{it}
\ifhep@symbols\ifhep@minion\else
  \DeclareSymbolFont{symbols}{OMS}{\hep@font@symbol}{m}{n}
  \DeclareSymbolFont{largesymbols}{OMX}{\hep@font@extra}{m}{n}
\fi\fi
```

Set bold symbol fonts.

```
\SetSymbolFont{operators}{bold}{OT1}{\hep@font@text}{b}{n}
\SetSymbolFont{letters}{bold}{OML}{\hep@font@math}{b}{it}
\ifhep@symbols\ifhep@minion\else
  \SetSymbolFont{symbols}{bold}{OMS}{\hep@font@symbol}{b}{n}
\fi\fi
```

Adjust the fonts loaded by the AMSFONTS [8] and ESINT [66] packages.

```
\ifhep@symbols\ifhep@minion\else
  \DeclareSymbolFont{AMSa}{U}{\hep@font@amsa}{m}{n}
  \DeclareSymbolFont{AMSb}{U}{\hep@font@amsb}{m}{n}
\fi\fi
\AtBeginDocument{%
  \@ifpackageloaded{esint}{%
    \DeclareSymbolFont{largesymbolsA}{U}{ssesint}{m}{n}
  }{}
}
```

Declare the symbol font alphabets.

```
\DeclareSymbolFontAlphabet{\mathrm}{operators}
\DeclareSymbolFontAlphabet{\mathnormal}{letters}
\ifhep@minion\else
  \DeclareSymbolFontAlphabet{\mathcal}{symbols}
\fi
```

Declare `\mathit`.

```
\DeclareMathAlphabet{\mathit}{OML}{\hep@font@text}{m}{it}
\SetMathAlphabet\mathit{bold}{OML}{\hep@font@text}{bx}{it}
```

Declare \mathtt.

```
\DeclareMathAlphabet{\mathtt}{OT1}{cmtl}{m}{n}
```

Declare \mathsf.

```
\DeclareMathAlphabet{\mathsf}{OML}{\hep@font@sf}{m}{it}
\SetMathAlphabet{\mathsf}{bold}{OML}{\hep@font@sf}{bx}{it}
```

End of sansserif.

```
\fi
```

\mathbf Load the BM package [30] for superior boldmath. Make math symbols bold whenever they appear in bold macros such as \section{⟨*text*⟩}.

```
\ifhep@symbols
  \RequirePackage{bm}
  \AtBeginDocument{\let\mathbf\bm}
  \g@addto@macro\bfseries{\boldmath}
```

\mathscr Provid the \mathscr math script font from the MATHRSFS package [48].

```
  \DeclareMathAlphabet{\mathscr}{U}{rsfs}{m}{n}
```

\mathbb Redefine the the \mathbb math blackboard style font according to the (sans-)serif option with the font from the DSFONT package [9].

```
  \ifhep@minion
    \DeclareMathAlphabet{\mathbb}{U}{%
      \ifhep@serif dsrom\else dsss\fi%
    }{m}{n}
  \else
    \ifhep@ams\else
      \SetMathAlphabet{\mathbb}{normal}{U}{%
        \ifhep@serif dsrom\else dsss\fi%
      }{m}{n}
    \fi
  \fi
\fi
```

E.2 Physics notation

\cancel \slashed \unit Load the PHYSICS package [35] which provides macros useful for publications in physics. Additionally, load the CANCEL [36] and SLASHED [37] packages which provide the \cancel and \slashed macros. Finally, load the UNITS package [32] which provides the \units and \nicefrac macros.

```
\ifhep@physics
```

```
\RequirePackage{physics}
\RequirePackage{cancel}
\RequirePackage{slashed}
\RequirePackage{units}
\newcommand{\textfrac}[2]{\ensuremath{\nicefrac{\text{#1}}{\text{#2}}}}
```

\inv Provide a macro for the inverse, useful in combination with the unit macro in text mode.

```
\newcommand{\inv}[2][1]{#2\ensuremath{^{-#1}}}
```

\d Provide a differential \d.

```
\AtBeginDocument{\mathdef{\d}{\dd}}
```

\oset Define a new overset macro \oset[⟨*offset*⟩]{⟨*over*⟩}{⟨*base*⟩}

```
\newcommand{\oset}[3][-1pt]{%
  \text{\raisebox{.2ex}{$\mathop{#3}\limits^{%
    \vbox to#1{\kern-2\ex@\hbox{$\scriptscriptstyle#2$}\vss}%
  }$}}%
}
```

\overleftright Define a over left right arrow \overleftright{⟨*base*⟩}.

```
\newcommand{\overleftright}[1]{\oset{\leftrightarrow}{#1}}
```

End of physics conditional.

```
\fi
```

F Floats

Adjust the LaTeX float placement defaults

```
\setcounter{bottomnumber}{0} % 1
\setcounter{topnumber}{1} % 2
\setcounter{dbltopnumber}{1} % 2
\renewcommand{\topfraction}{.9} % .7
\renewcommand{\dbltopfraction}{.9} % .7
\renewcommand{\textfraction}{.1} % .2
\renewcommand{\floatpagefraction}{.8} % .5
```

figure table Center the content of figure and table environments. Ignore the manual placement if the manualplacement option is set to false.

```
\let\@figure@\figure%
\let\@end@figure@\endfigure%
\let\@table@\table%
```

```
\let\@end@table@\endtable%
\ifhep@manualplacement%
  \renewenvironment{figure}[1][tbp]{%
    \@figure@[#1]\centering%
    }{\@end@figure@}%
  \renewenvironment{table}[1][tbp]{%
    \@table@[#1]\centering%
  }{\@end@table@}%
\else%
  \renewenvironment{figure}[1][]{%
    \@figure@\centering%
  }{\@end@figure@}%
  \renewenvironment{table}[1][]{%
    \@table@\centering%
  }{\@end@table@}
\fi%
```

F.1 Sub-floats

\ifhep@journal Define a new journal conditional.

```
\newif\ifhep@journal
\ifhep@sissa\hep@journaltrue
\else
  \ifhep@revtex\hep@journaltrue
  \else
    \ifhep@pos\hep@journaltrue
    \else
      \ifhep@springer\hep@journaltrue
      \else\hep@journalfalse
      \fi
    \fi
  \fi
\fi
```

Prevent the CAPTION package [67] from complaining about the journal classes and packages.

```
\ifhep@journal
  \setlength\abovecaptionskip{\f@size\p@}
  \setlength\belowcaptionskip{0\p@}
  \long\def\@makecaption#1#2{%
    \vskip\abovecaptionskip
    \sbox\@tempboxa{#1: #2}%
    \ifdim \wd\@tempboxa >\hsize
      #1: #2\par
    \else
      \global \@minipagefalse
      \hb@xt@\hsize{\hfil\box\@tempboxa\hfil}%
    \fi
```

```
    \vskip\belowcaptionskip%
  }
\fi
```

Load the SUBCAPTION package [38]. Provide the old `\subcaption@minipage` macro.

```
\RequirePackage[subrefformat=parens]{subcaption}
\captionsetup{font=small}
\captionsetup[sub]{font=small}
\providecommand*\subcaption@minipage[2]{%
  \minipage#1{#2}\setcaptionsubtype\relax%
}
```

panels
\panel

Define the `panels` environment and the `\panel` macro.

```
\newenvironment{panels}[2][b]{%
```

Define an internal macro for global behaviour.

```
  \newcommand{\begin@subcaption@minipage}[2][b]{%
    \caption@withoptargs\subcaption@minipage[##1]{##2}%
    \centering\vskip 0pt%
  }
```

Define the `\panel` macro for the case that the number of panels is given.

```
  \ifdim#2pt>1pt%
    \newcommand{\panel}[1][b]{%
      \endminipage\hfill\begin@subcaption@minipage[#1]{\linewidth/#2}%
    }%
    \begin@subcaption@minipage[#1]{\linewidth/#2}%
```

Define the `\panel` macro for the case that the width of the panel is given.

```
  \else%
    \newcommand{\panel}[2][b]{%
      \endminipage\hfill\begin@subcaption@minipage[#1]{##2\linewidth}%
    }%
    \begin@subcaption@minipage[#1]{#2\linewidth}%
  \fi%
}{\endminipage}
```

Reajust the captions to the revtex class using the RAGGED2E package [68].

```
\ifhep@revtex
  \RequirePackage{ragged2e}
  \DeclareCaptionFormat{revtex}{#1#2\justifying{#3}}
  \captionsetup{font=small, format=revtex}
  \captionsetup[sub]{font=footnotesize, format=plain}
  \renewcommand{\figurename}{Figure}
  \renewcommand{\tablename}{Table}
\fi
```

F.2 Tables

tabular Enhance tabulars with the BOOKTABS and MULTIROW packages [39, 40].

```
\RequirePackage{booktabs}
\RequirePackage{multirow}
```

F.3 Figures

\graphic Provide the \graphic macro for the inclusion of figures using the GRAPHICX package [41].

```
\RequirePackage{graphicx}
\providecommand{\tikzsetnextfilename}[1]{}
\newcommand{\graphic}[2][1]{\tikzsetnextfilename{#2}{%
  \centering\includegraphics[width=#1\linewidth]{#2}\par%
}}
```

\graphics Provide the \graphics macro for the inclusion of figures located in a subfolder.

```
\newcommand{\graphics}[1]{\graphicspath{{./#1/}}}
```

G Title page

Begin of title conditional.

```
\ifhep@title
```

\date Allow absent date field.

```
\date{}
```

G.1 Titles

Extend the title using the TITLING package [19].

```
\RequirePackage{titling}
```

\preprintfont
\titlefont
\subtitlefont
\authorfont
\affiliationfont
\datefont
Allow to change the fontface of the individual parts of the title.

```
\let\hep@preprint@font\relax
\newcommand{\preprintfont}[1]{\def\hep@preprint@font{#1}}
\let\hep@title@font\relax
\newcommand{\titlefont}[1]{\def\hep@title@font{#1}}
\let\hep@subtitle@font\relax
\newcommand{\subtitlefont}[1]{\def\hep@subtitle@font{#1}}
\let\hep@author@font\relax
\newcommand{\authorfont}[1]{\def\hep@author@font{#1}}
\let\hep@affiliation@font\relax
\newcommand{\affiliationfont}[1]{\def\hep@affiliation@font{#1}}
```

```
\let\hep@date@font\relax
\newcommand{\datefont}[1]{\def\hep@date@font{#1}}
```

\subtitle Define a subtitle.

```
\newcommand{\presubtitle}[1]{\def\hep@pre@sub@title{#1}}
\newcommand{\subtitle}[1]{\def\sub@title{#1}}
\newcommand{\postsubtitle}[1]{\def\hep@post@sub@title{#1}}
\renewcommand{\maketitlehookb}{%
  \@ifundefined{sub@title}{}{%
    \hep@pre@sub@title\sub@title\hep@post@sub@title%
  }%
}
```

Set standard values mostly taken from the TITLING package, add the font hook, and reduce the `date` font size.

```
\titlefont{\ifhep@serif\tistyle\else\qtstyle\fi}
\pretitle{\begin{center}\LARGE\hep@title@font}
\posttitle{\par\end{center}}
\subtitlefont{\ifhep@serif\tistyle\else\qtstyle\fi}
\presubtitle{\begin{center}\Large\hep@subtitle@font}
\postsubtitle{\par\end{center}}
\preauthor{%
  \begin{center}\large\hep@author@font\lineskip.5em\begin{tabular}[t]{c}%
}
\postauthor{\end{tabular}\par\end{center}}
\predate{\begin{center}\hep@date@font}
\postdate{\par\end{center}}
```

G.2 Authors

\author Allow absent author field. Enable the handling of multiple authors with different affiliations using the AUTHBLK package [20].

```
\author{}
\RequirePackage{authblk}
\renewcommand{\Affilfont}{\small\hep@affiliation@font}
\renewcommand\Authfont{\hep@author@font}
```

\email Redefine the email macro to place the email address in a footnote if called from within the `\author` macro `\author{`⟨*name*⟩ `\email{`⟨*email*⟩`}}`.

```
\let\hep@author\author
\def\author{%
  \renewcommand{\email}[1]{\unskip\thanks{\online{mailto:##1}{##1}}}%
  \hep@author
}
```

\affiliation Define the \affiliation macro, ensure that linebreaks happen after a comma.

```
\newcommand\hep@penalty{\if@twocolumn85\else50\fi}
\newcommand\hep@active@comma{,\penalty-\hep@penalty\relax}
\newcommand\hep@cat@comma@active{\catcode`\,\active}
{\hep@cat@comma@active\gdef,{\hep@active@comma}}
\newcommand\hep@affil[1]{%
  \endgroup\@flushglue=0pt plus .5\linewidth\affil{#1}%
}
\def\hep@affil@opt[#1]#2{%
  \endgroup\@flushglue=0pt plus .5\linewidth\affil[#1]{#2}%
}
\DeclareRobustCommand\hep@affiliation{%
  \@ifnextchar[{\hep@affil@opt}{\hep@affil}%
}
\newcommand{\affiliation}{%
  \begingroup\hep@cat@comma@active\hep@affiliation%
}
```

G.3 Preprint

\preprint Define the \preprint macro using the VARWIDTH package [69].

```
\let\hep@preprint\relax
\newcommand\preprint[1]{\def\hep@preprint{#1}}
\RequirePackage{varwidth}
\newcommand{\hep@preprint@box}{%
  \begin{varwidth}{\textwidth}%
    \smaller[.5]\hep@preprint@font\hep@preprint%
  \end{varwidth}%
}
\preprintfont{\scshape}
```

\placepreprint Places a preprint number in the top right corner of the title page using the ATBEGSHI [70] and PICTURE [71] packages.

```
\RequirePackage{atbegshi}
\RequirePackage{picture}
\newcommand{\placepreprint}{%
  \AtBeginShipoutFirst{%
    \put(
      \textwidth+\oddsidemargin-\widthof{\hep@preprint@box},
      -2pt-\topmargin-\heightof{\hep@preprint@box}
    ){\normalfont\hep@preprint@box}
  }
}
\renewcommand{\maketitlehooka}{\placepreprint\vspace{-\bigskipamount}}
```

G.4 Abstract

abstract Adjust the abstract environment to not start with indentation.

```
\@ifundefined{abstract}{}{%
  \let\hep@abstract\abstract%
  \renewcommand\abstract{\hep@abstract\noindent\ignorespaces}%
}
```

abstract* Add a abstract* environment for two column mode taking also care of placing the title using the ENVIRON [72] and ABSTRACT [73] packages.

```
\if@twocolumn
  \RequirePackage{environ}
  \RequirePackage{abstract}
  \renewcommand{\abstitleskip}{-3ex}
  \NewEnviron{abstract*}{%
    \twocolumn[\maketitle\vspace{-1.5cm}%
    \begin{onecolabstract}\noindent\BODY\end{onecolabstract}%
    \vspace{.5cm}]\saythanks%
  }
\else
  \newenvironment{abstract*}{\maketitle\begin{abstract}}{\end{abstract}}
\fi
```

End of title conditional.

```
\fi
```

H Bibliography

Check if bibliography management is requested.

```
\ifnum\pdf@strcmp{\hep@bibliography}{false}=0\else
```

\bibliography Load the BIBLATEX package [11] with the datamodel defined in appendix K.

```
\RequirePackage[style=\hep@bibliography, datamodel=hep-paper]{biblatex}
```

hep-paper Provide the \DeclareSortingTemplate macro for older biblatex installations. Define a new sorting template that sorts only multi key \cite entries according to their date and leaves the rest of the bibliography entries in the order they appear in the text.

```
\providecommand{\DeclareSortingTemplate}{\DeclareSortingScheme}
\DeclareSortingTemplate{hep-paper}{
  \sort{\citeorder}
  \sort[final]{\field{sortkey}}
  \sort{\field{sortyear} \field{year} \literal{9999}}
  \sort{\field{month}}
  \sort{\field{eprint} \field{doi}}
```

```
  \sort{\field{sorttitle} \field{title}}
  \sort{\field{subtitle} \field{volume}}
}
```

Use the new sorting scheme and abbreviat all first names.

```
\ExecuteBibliographyOptions{
  sorting=hep-paper,
  safeinputenc,
  giveninits=true
}
```

Shrink the biblography in two column mode.

```
\ifhep@journal\else
  \if@twocolumn
    \AtBeginBibliography{\small}
    \setlength\biblabelsep{\labelsep}
  \fi
\fi
```

erratum Add new bibliography string 'Erratum' for the use in the `relatedtype` field.

```
\NewBibliographyString{erratum,erratums}
\DefineBibliographyStrings{english}{erratum={Erratum},erratums={Errata}}
\providecommand{\relateddelimerratum}{\addsemicolon\space}
```

\printbibliography Allow the bibliography to be printed sloppy

```
\let\hep@printbibliography\printbibliography
\renewcommand{\printbibliography}{\sloppy\hep@printbibliography}
```

H.1 Sourcemap

\reg@exp@one
\reg@exp@two
\reg@exp@url
\reg@exp@pmc
Define regular expressions in order to deal with inconsistent journal title and volume naming as well as uniform resource locator (URL) protocols and the PMCID.

```
\newcommand{\reg@exp@one}{\regexp{\A(\p{L}+)?\d+(\p{L}+)?\Z}}
\newcommand{\reg@exp@two}{\regexp{\A(\p{L}+)?(\d+)(\p{L}+)?\Z}}
\newcommand{\reg@exp@url}{\regexp{\A(ht|f)tp(s)?:\/\/}}
\newcommand{\reg@exp@pmc}{\regexp{\A(PMC)?}}
```

\DeclareSourcemap Use the `\DeclareSourcemap` feature.

```
\DeclareSourcemap{%
  \maps[datatype=bibtex, overwrite=true]{%
```

collaboration Read the collaboration information if present.

```
    \map{%
```

```
      \step[fieldsource=Collaboration, final=true]%
      \step[fieldset=collaboration, origfieldval, final=true]
    }%
```

reportnumber Read the pre-print information if present.

```
    \map{%
      \step[fieldsource=reportNumber, final=true]%
      \step[fieldset=reportnumber, origfieldval, final=true]
    }%
```

journal Move letters from the volume field to the journal field.

```
    \map[overwrite]{
      \step[fieldsource=volume, match=\reg@exp@one, final]
      \step[fieldsource=volume, match=\reg@exp@two, replace={$2}]
      \step[fieldsource=journal, fieldtarget=journaltitle]
      \step[fieldset=journaltitle, fieldvalue={\space$1$2}, append=true]
    }
```

url Remove the protocol from URL.

```
    \map{
      \step[fieldsource=url, final=true]
      \step[fieldset=protocollessurl, origfieldval, final=true]
      \step[fieldsource=protocollessurl, match=\reg@exp@url, replace={}]
    }
```

pmc Remove the PMC from the PMCID.

```
    \map{
      \step[fieldsource=pmcid, final=true]
      \step[fieldset=pmc, origfieldval, final=true]
      \step[fieldsource=pmc, match=\reg@exp@pmc, replace={}]
    }
  }%
}
```

\letbibmacro Provide the \letbibmacro macro for old biblatex installations.

```
\providecommand{\letbibmacro}[2]{\csletcs{abx@macro@#1}{abx@macro@#2}}
```

collaboration Execute the author macro even if only the collaboration information if present and override the author information with collaboration information if present.

```
\renewbibmacro*{author/translator+others}{%
  \ifboolexpr{
    test \ifuseauthor and (
      not test {\ifnameundef{author}} or
      not test {\iffieldundef{collaboration}}
```

```
    )
  }
  {\usebibmacro{author}}
  {\usebibmacro{translator+others}}
}
\letbibmacro{hep@bib@author}{author}
\renewbibmacro*{author}{%
  \iffieldundef{collaboration}{%
    \usebibmacro{hep@bib@author}}{\textit{\printfield{collaboration}}%
  }%
}
```

`In:` Remove spurious 'In:' if no journal is present.

```
\renewbibmacro*{in:}{%
  \iffieldundef{journaltitle}{}{\printtext{\bibstring{in}\intitlepunct}}%
}
```

`url` Show URLs without the protocol.

```
\DeclareFieldFormat{url}{%
  \mkbibacro{URL}\addcolon\space\online{#1}{\thefield{protocollessurl}}%
}
```

`\bib@online` Private `\bib@online` macro

```
\newcommand{\bib@online}[2]{%
  \ifhyperref{\online{#1}{#2}}{\nolinkurl{#2}}%
}
```

`pmid` `pmcid` Present PubMed IDs.

```
\DeclareFieldFormat{pmid}{%
  \mkbibacro{PM}\addcolon\space%
  \bib@online{https://www.ncbi.nlm.nih.gov/pubmed/#1}{#1}%
}
\DeclareFieldFormat{pmc}{%
  \mkbibacro{PMC}\addcolon\space%
  \bib@online{https://www.ncbi.nlm.nih.gov/pmc/articles/PMC#1}{#1}%
}
```

`pmcid` `pmid` `reportnumber` Add the pre-print and PubMed information if present.

```
\letbibmacro{hep-doi+eprint+url}{doi+eprint+url}
\renewbibmacro*{doi+eprint+url}{%
  \usebibmacro{hep-doi+eprint+url}
  \iffieldundef{pmc}{%
    \iffieldundef{pmid}{}{\printfield{pmid}\newunit}%
  }{\printfield{pmc}\newunit}
  \iffieldundef{reportnumber}{}{%
```

```
    \newunitpunct\textnumero\intitlepunct%
    \textsc{\smaller[.5]\printfield{reportnumber}}%
    \newunit%
  }%
}
```

H.2 Eprints

\new@eprint Private \new@eprint macro

```
\NewDocumentCommand{\new@eprint}{smm}{
  \DeclareFieldFormat{eprint:#2}{%
    \newcommand{\@path}{\IfBooleanT{#1}{\thefield{eprintclass}/}##1}%
    #2\addcolon\space\bib@online{#3/\@path}{\@path}%
  }%
}
```

CTAN Add CTAN as a eprint option

```
\new@eprint{CTAN}{https://ctan.org/pkg}
\DeclareFieldAlias{eprint:ctan}{eprint:CTAN}
```

GitHub Add GitHub as a eprint option

```
\new@eprint*{GitHub}{https://github.com}
\DeclareFieldAlias{eprint:github}{eprint:GitHub}
```

GitLab Add GitLab as a eprint option

```
\new@eprint*{GitLab}{https://gitlab.com}
\DeclareFieldAlias{eprint:gitlab}{eprint:GitLab}
```

Bitbucket Add Bitbucket as a eprint option

```
\new@eprint*{Bitbucket}{https://bitbucket.org}
\DeclareFieldAlias{eprint:bitbucket}{eprint:Bitbucket}
```

Launchpad Add Launchpad as a eprint option

```
\new@eprint{Launchpad}{https://launchpad.net}
\DeclareFieldAlias{eprint:launchpad}{eprint:Launchpad}
```

SourceForge Add SourceForge as a eprint option

```
\new@eprint{SourceForge}{https://sourceforge.net/projects}
\DeclareFieldAlias{eprint:launchpad}{eprint:SourceForge}
```

HEPForge Add HEPForge as a eprint option

```
\DeclareFieldFormat{eprint:hepforge}{%
```

```
  HEPForge\addcolon\space\bib@online{https://#1/hepforge.org}{#1}%
}
\DeclareFieldAlias{eprint:HEPForge}{eprint:hepforge}
```

End check for bibliography option.

```
\fi
```

I Hyperlinks, Footnotes and References

Load the HYPERREF package [5] enable Unicode encoding and hide links.

```
\RequirePackage{hyperref}
\hypersetup{
  pdfencoding=auto, psdextra,
  hidelinks, linktoc=all, breaklinks=true,
  pdfcreator={}, pdfproducer={}
}
```

Set the PDF meta data according to the paper information and ensure that unnecessary information is suppressed.

```
\pdfstringdefDisableCommands{\def\varepsilon{\textepsilon}}
\AtBeginDocument{
  \pdfstringdefDisableCommands{\let\ensuremath\@gobble}
  \pdfstringdefDisableCommands{\let\mathsurround\@gobble}
  \pdfstringdefDisableCommands{\let\unskip\@gobble}
  \pdfstringdefDisableCommands{\let\thanks\@gobble}
  \pdfstringdefDisableCommands{\let\footnote\@gobble}
  \pdfstringdefDisableCommands{\let\\\@gobble}
}
\ifhep@revtex
  \AtBeginShipout{\hypersetup{pdftitle={\@title}}}
\else
  \ifhep@beamer\else
    \AtBeginDocument{\hypersetup{pdftitle={\@title}}}
  \fi
\fi
\ifhep@title
  \AtBeginDocument{\hypersetup{pdfauthor=\AB@authlist}}
\else
  \ifhep@beamer\else
    \AtBeginDocument{\hypersetup{pdfauthor={\@author}}}
  \fi
\fi
```

I.1 Footnotes

Place a hyperlink from the footnote back to its referencing label using the FOOTNOTEBACKREF package [74].

```
\def\BackrefFootnoteTag{}
\RequirePackage{footnotebackref}
```

\footnote Ensure that no spaces appear before the footmark or at the beginning of the footnote.

```
\let\@foot@note\footnote
\renewcommand{\footnote}[1]{\unskip\@foot@note{\ignorespaces#1}}
```

I.2 References

Begin of `references` conditional

```
\ifhep@references
```

\cref Improve reference using the CLEVEREF package [13].

```
\RequirePackage[noabbrev, nameinlink]{cleveref}
\newcommand{\creflastconjunction}{, and\nobreakspace}
\crefname{enumi}{point}{points}
\crefname{inlinelisti}{point}{points}
```

\no@break@before Define a macro able to prevent line breaks.

```
\newcommand\no@break@before{%
  \relax\ifvmode\else%
    \ifhmode%
      \ifdim\lastskip > 0pt%
        \relax\unskip\nobreakspace%
      \fi%
    \fi%
  \fi%
}
```

\ref Adjust `\ref{`⟨*key*⟩`}` in order to prevent preceding line breaks.

```
\let\hep@ref\ref
\AtBeginDocument{\renewcommand\ref{\no@break@before\hep@ref}}
```

\eqref Adjust `\eqref{`⟨*key*⟩`}` in order to prevent preceding line breaks.

```
\renewcommand\eqref{\no@break@before\labelcref}
```

\subref Adjust `\subref{`⟨*key*⟩`}` in order to prevent preceding line breaks.

```
\let\hep@subref\subref
```

```
\renewcommand\subref{\no@break@before\hep@subref}
\renewcommand*\subcaption@ref[2]{\begingroup%
  \caption@setoptions{sub}%
  \subcaption@reffmt\p@subref{\hep@ref#1{sub@#2}}%
\endgroup}
```

\subcref Provide the \subcref macro.

```
\newcommand{\subcref}[1]{\cref{sub@#1}}
```

\eqcrefname Define the \eqcrefname macro for named equation types.

```
\NewDocumentCommand{\eqcrefname}{mmo}{
  \crefname{#1}{#2}{\IfValueTF{#3}{#3}{#2s}}
  \creflabelformat{#1}{(##2##1##3)}
}
```

\labelcrefrange Define the missing \labelcrefrange{⟨*key1*⟩}{⟨*key2*⟩} macro.

```
\DeclareRobustCommand{\labelcrefrange}[2]{%
  \@crefrangenostar{labelcref}{#1}{#2}%
}
```

End of references conditional

```
\fi
```

I.3 Citations

\cite Adjust \cite{⟨*key*⟩} in order to prevent preceding line breaks.

```
\let\hep@cite\cite
\renewcommand\cite{\no@break@before\hep@cite}
```

Begin of bibliography if.

```
\ifnum\pdf@strcmp{\hep@bibliography}{false}=0\else
```

Define bibstrings for reference names.

```
\NewBibliographyString{refname}
\NewBibliographyString{refsname}
\DefineBibliographyStrings{english}{%
  refname = {reference},
  refsname = {references}
}
```

\ccite Define *clever* citation macros.

\Ccite

```
\DeclareCiteCommand{\ccite}{%
```

```
  \ifnum\thecitetotal=1
    \bibstring{refname}%
  \else%
    \bibstring{refsname}%
  \fi%
  \addnbspace\bibopenbracket%
  \usebibmacro{cite:init}\usebibmacro{prenote}%
}{\usebibmacro{citeindex}\usebibmacro{cite:comp}}{}{%
  \usebibmacro{cite:dump}\usebibmacro{postnote}%
  \bibclosebracket%
}

\newrobustcmd*{\Ccite}{\bibsentence\ccite}
```

End of biblatex if.

```
\fi
```

J Acronyms

Acronyms are implemented with the GLOSSARIES-EXTRA package [75] which is an extension of the GLOSSARIES package [12] and must be loaded after the HYPERREF pacakge in appendix I.

```
\ifhep@glossaries
\RequirePackage[nostyles]{glossaries-extra}
```

The entry count feature is used.

```
\glsenableentrycount
\glssetcategoryattribute{abbreviation}{entrycount}{1}
```

Provide macros for older glossaries-extra installations.

```
\providecommand{\glsxtrusefield}[2]{\@gls@entry@field{#1}{#2}}
\providecommand{\glsxtrsetfieldifexists}[3]{\glsdoifexists{#1}{#3}}
\providecommand{\gGlsXtrSetField}[3]{%
  \glsxtrsetfieldifexists{#1}{#2}{%
    \csgdef{glo@\glsdetoklabel{#1}@#2}{#3}%
  }%
}
```

Hyperlinks from the abbreviation to their definition in the text are set.

```
\glssetcategoryattribute{abbreviation}{nohyperfirst}{true}
\renewcommand*{\glsdonohyperlink}[2]{{%
  \glsxtrprotectlinks\edef\fieldvalue{%
    \glsxtrusefield{\glslabel}{hastarget}%
  }%
  \ifdefstring\fieldvalue{true}{#2}{%
```

```
    \gGlsXtrSetField{\glslabel}{hastarget}{true}%
    \glsdohypertarget{#1}{#2}%
  }%
}}
```

\begin@sentence Mark the beginning of a paragraph as if it would follow a full stop using the EVERYHOOK package [76].

```
\RequirePackage[excludeor]{everyhook}
\newcommand{\begin@sentence}{1001}
\PushPostHook{par}{{\spacefactor=\begin@sentence}}
```

\frenchspacing Adjust the \frenchspacing macro to be compatibel with this idea.

```
\def\frenchspacing{%
  \sfcode`\.\begin@sentence \sfcode`\?\begin@sentence
  \sfcode`\!\begin@sentence \sfcode`\:\begin@sentence
  \sfcode`\;\@m \sfcode`\,\@m
}
```

\if@begin@of@sentence Provide a macro checking for the beginning of a sentence by examining the length of the preceeding space.

```
\newcommand{\if@begin@of@sentence}[2]{\leavevmode\protecting{%
  \ifboolexpr{ test {\ifnumcomp{\spacefactor}{=}{3000}} or%
               test {\ifnumcomp{\spacefactor}{=}{2000}} or%
               test {\ifnumcomp{\spacefactor}{=}{\begin@sentence}}%
  }{#1}{#2}%
}}
```

\acronym The \acronym⟨*⟩[⟨*typeset abbreviation*⟩]{⟨*abbreviation*⟩}⟨*⟩{⟨*definition*⟩}[⟨*plural definition*⟩] macro is defined.

- #1 star for omitting the 's' in the short plural
- #2 optional typeset abbreviation
- #3 mandatory abbreviation
- #4 star for restoring the TEX default for space after text macros
- #5 mandatory long form
- #6 optional plural long form

```
\NewDocumentCommand{\acronym}{somsmo}{
  \newabbreviation[
    type=\acronymtype,
    sort=#3,
    \glsshortpluralkey=\IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}},
    longplural=\IfNoValueTF{#6}{#5s}{#6}
  ]{#3}{\IfNoValueTF{#2}{#3}{#2}}{#5}
```

Provide the singular acronym macro.

```
  \expandafter\newcommand\csname#3\endcsname{%
    \if@begin@of@sentence{%
      \ifglsused{#3}{\cgls{#3}}{\cGls{#3}}%
    }{\cgls{#3}}%
    \ifnum\glsentrycurrcount{#3}>1\relax
      \IfBooleanTF{#4}{}{\@\xspace}%
    \else\@\xspace\fi
  }
```

Expand the singular acronym macro in PDF labels.

```
  \pdfstringdefDisableCommands{\expandafter\def\csname#3\endcsname{%
    \IfNoValueTF{#2}{#3}{#2} }%
  }
```

Provide the singular acronym macro in math mode.

```
  \expandafter\mathdef\csname#3\endcsname{%
    \text{\glsxtrshort{#3}}\@gls@increment@currcount{#3}%
  }
```

Provide the plural acronym macro.

```
  \expandafter\newcommand\csname#3s\endcsname{%
    \if@begin@of@sentence{\cGlspl{#3}}{\cglspl{#3}}%
    \IfBooleanTF{#4}{}{\@\xspace}%
  }
```

Expand the plural acronym macro in PDF labels.

```
  \pdfstringdefDisableCommands{\expandafter\def\csname#3s\endcsname{%
    \IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}} }%
  }
```

Provide the plural acronym macro in math mode.

```
  \expandafter\mathdef\csname#3s\endcsname{%
    \text{\glsxtrshortpl{#3}}\@gls@increment@currcount{#3}%
  }
}
```

\shortacronym The \shortacronym never expands into the long form.

```
\NewDocumentCommand{\shortacronym}{somsmo}{
```

Provide the singular acronym macro.

```
  \expandafter\newcommand\csname#3\endcsname{%
    \IfNoValueTF{#2}{#3}{#2}\IfBooleanTF{#4}{}{\@\xspace}%
  }
```

Expand the singular acronym macro in PDF labels.

```
  \pdfstringdefDisableCommands{\expandafter\def\csname#3\endcsname{%
    \IfNoValueTF{#2}{#3}{#2} }%
  }
```

Provide the singular acronym macro in math mode.

```
  \expandafter\mathdef\csname#3\endcsname{%
    \text{\IfNoValueTF{#2}{#3}{#2}}%
  }
```

Provide the plural acronym macro.

```
  \expandafter\newcommand\csname#3s\endcsname{%
    \IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}}%
    \IfBooleanTF{#4}{}{\@\xspace}%
  }
```

Expand the plural acronym macro in PDF labels.

```
  \pdfstringdefDisableCommands{\expandafter\def\csname#3s\endcsname{%
    \IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}} }%
  }
```

Provide the plural acronym macro in math mode.

```
  \expandafter\mathdef\csname#3s\endcsname{%
    \text{\IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}}}%
  }%
}
```

\longacronym The \longacronym never shows the abbreviated form.

```
\NewDocumentCommand{\longacronym}{somsmo}{
```

Provide the singular acronym macro.

```
  \expandafter\newcommand\csname#3\endcsname{%
    \if@begin@of@sentence{\MakeUppercase#5}{#5}%
    \IfBooleanTF{#4}{}{\@\xspace}%
  }
```

Expand the singular acronym macro in PDF labels.

```
  \pdfstringdefDisableCommands{\expandafter\def\csname#3\endcsname{#5 }}
```

Provide the plural acronym macro.

```
  \expandafter\newcommand\csname#3s\endcsname{%
    \if@begin@of@sentence{%
      \IfNoValueTF{#6}{\MakeUppercase#5s}{\MakeUppercase#6}%
```

```
    }{%
      \IfNoValueTF{#6}{#5s}{#6}}\IfBooleanTF{#4}{}{\@\xspace}%
  }
```

Expand the plural acronym macro in PDF labels.

```
  \pdfstringdefDisableCommands{\expandafter\def\csname#3s\endcsname{%
    \IfNoValueTF{#6}{#5s}{#6} }%
  }
}
```

Silence warning if no acronyms are defined.

```
\renewcommand*{\@gls@write@entrycounts}{%
  \immediate\write\@auxout{%
    \string\providecommand*{\string\@gls@entry@count}[2]{}
  }%
  \count@=0\relax
  \forallglsentries{\@glsentry}{%
    \glshasattribute{\@glsentry}{entrycount}{%
      \ifglsused{\@glsentry}{%
        \immediate\write\@auxout{%
          \string\@gls@entry@count{\@glsentry}{%
            \glsentrycurrcount{\@glsentry}%
          }
        }%
      }{}\advance\count@ by \@ne
    }{}%
  }%
}
```

\resetacronym
\dummyacronym

Add two macros for acronym management.

```
\newcommand{\resetacronym}[1]{\protect\glsreset{#1}}
\newcommand{\dummyacronym}[1]{\protect\glsunset{#1}}
```

abstract

Adjust the abstract environment to reset all acronym counters.

```
\@ifundefined{endabstract}{}{%
  \let\end@hep@abstract\endabstract%
  \renewcommand\endabstract{\glsresetall\end@hep@abstract}%
}
```

\tableofcontents
\listoffigures
\listoftables

Adjust the \tableofcontents macro to never show the long form of acronyms.

```
\let\hep@table@of@contents\tableofcontents
\renewcommand\tableofcontents{%
  \glsunsetall\hep@table@of@contents\glsresetall%
}
\let\hep@list@of@figures\listoffigures
```

```
\renewcommand\listoffigures{%
  \glsunsetall\hep@list@of@figures\glsresetall%
}
\let\hep@list@of@tables\listoftables
\renewcommand\listoftables{%
  \glsunsetall\hep@list@of@tables\glsresetall%
}
```

\acronyms Add a possibility to have different groups of acronyms.

```
\NewDocumentCommand{\acronyms}{om}{%
  \IfNoValueTF{#1}{
    \newglossary{#2}{#2.in}{#2.out}{#2}%
    \renewcommand{\acronymtype}{#2}%
  }{
    \newglossary{#1}{#1.in}{#1.out}{#2}%
    \renewcommand{\acronymtype}{#1}%
  }
}
```

End of glossaries if.

```
\fi
```

K Biblatex datamodel file

collaboration
reportnumber
pmid
pmcid
pmc
protocollessurl

Define the `dbx` file containing the `hep-paper` datamodel.

```
\DeclareDatamodelFields[type=field, datatype=literal]{
  collaboration, reportnumber, pmid, pmcid, pmc,
}
\DeclareDatamodelFields[type=field, datatype=uri]{protocollessurl}
\DeclareDatamodelEntryfields{
  collaboration, reportnumber, pmid, pmcid, pmc, protocollessurl,
}
```

References

[1] J. Hajer. 'The hep-paper package. Publications in high energy physics' (2019). CTAN: hep-paper. DOI: 10.5281/zenodo.3606436. GitHub: janhajer/hep-paper.

[2] D. Carlisle and H. Umeki. 'The geometry package. Flexible and complete interface to document dimensions' (1996). CTAN: geometry. GitHub: davidcarlisle / geometry.

[3] C. F. Rees. 'The cfr-lm package. Enhanced support for the Latin Modern fonts' (2008). CTAN: cfr - lm.

[4] R. Schlicht. 'The microtype package. Subliminal refinements towards typographical perfection' (2004). CTAN: microtype.

[5] *LaTeX3 Project*. 'Hypertext marks in LaTeX: a manual for hyperref. Extensive support for hypertext in LaTeX' (1995). CTAN: hyperref. GitHub: latex3 / hyperref.
[6] J. Braams, J. Bezos and at al. 'Babel Localization and internationalization. Multilingual support for Plain TeX or LaTeX' (1989). CTAN: babel. GitHub: latex3 / babel.
[7] R. Fairbairns, F. Mittelbach and H. Partl. 'The parskip package. Layout with zero \parindent, non-zero \parskip' (1989). CTAN: parskip. GitHub: FrankMittelbach / fmitex.
[8] *American Mathematical Society*. 'The amsfonts package. TeX fonts from the American Mathematical Society' (1995). CTAN: amsfonts. URL: ams.org / tex / amsfonts.
[9] O. Kummer. 'The doublestroke font. Typeset mathematical double stroke symbols' (1995). CTAN: doublestroke.
[10] A. Blumensath. 'The MnSymbol package. Mathematical symbol font for Adobe MinionPro' (2005). CTAN: MnSymbol.
[11] P. Lehman et al. 'The biblatex Package. Sophisticated Bibliographies in LaTeX' (2006). CTAN: biblatex. GitHub: plk / biblatex.
[12] N. Talbot. 'The glossaries package. Create glossaries and lists of acronyms' (2007). CTAN: glossaries.
[13] T. Cubitt. 'The cleveref package. Intelligent cross-referencing' (2006). CTAN: cleveref. URL: dr-qubit.org / cleveref.
[14] T. Tantau, J. Wright and V. Miletić. 'The beamer class. A LaTeX class for producing presentations and slides' (2003). CTAN: beamer. GitHub: josephwright / beamer.
[15] *SISSA Medialab*. 'The JHEP package' (1997). URL: jhep.sissa.it/jhep/help/JHEP_TeXclass.jsp.
[16] *SISSA Medialab*. 'The JCAP package' (2002). URL: jcap.sissa.it/jcap/help/JCAP_TeXclass.jsp.
[17] *American Physical Society*. 'The REVTeX class. Styles for various Physics Journals' (1999). CTAN: revtex. URL: journals.aps.org/revtex.
[18] *Springer Verlag*. 'The svjour package. Macros for Springer journals' (1997). CTAN: springer.
[19] P. R. Wilson. 'The titling package. Control over the typesetting of the \maketitle command' (2000). CTAN: titling.
[20] P. W. Daly. 'A LaTeX Package to Prepare Author and Affiliation Blocks. Support for footnote style author/affiliation' (2001). CTAN: authblk.
[21] P. Lehman and J. Wright. 'The csquotes Package. Context sensitive quotation facilities' (2003). CTAN: csquotes.
[22] P. G. Ratcliffe. 'The foreign package for LaTeX 2_ε. Systematic treatment of "foreign" words in documents' (2012). CTAN: foreign.
[23] D. Arseneau. 'The url package. Verbatim with URL-sensitive line breaks' (1996). CTAN: url.

[24] J. Bezos. 'Customizing lists with the enumitem package. Control layout of itemize, enumerate, description' (2003). CTAN: enumitem. URL: texnia.com/enumitem.html. GitHub: jbezos/enumitem.
[25] *Donald E. Knuth.* 'Computer Modern fonts' (1986). CTAN: cm.
[26] A. Barton. 'The sansmathfonts package. Correct placement of accents in sans-serif maths' (2013). CTAN: sansmathfonts.
[27] D. Arseneau. 'The ulem package. Package for underlining' (1989). CTAN: ulem.
[28] L. Madsen et al. 'The mathtools package. Mathematical tools to use with amsmath' (2004). CTAN: mathtools.
[29] *LaTeX Team.* 'The amsmath package. AMS mathematical facilities for LaTeX' (1994). CTAN: amsmath. URL: ams.org/tex/amslatex.
[30] *LaTeX Team.* 'The bm package. Access bold symbols in maths mode' (1993). CTAN: bm.
[31] *LaTeX Team.* 'LaTeX 2_ε font selection. Docmentation of LaTeX font commands' (1995). CTAN: fntguide.
[32] A. Reichert. 'The units and nicefrac packages. Typeset units' (1998). CTAN: units.
[33] W. Schmidt. 'The fixmath package for LaTeX 2_ε. Make maths comply with ISO 31-0:1992 to ISO 31-13:1992' (2000). CTAN: fixmath.
[34] G. Milde. 'The alphabeta package. LICR macros and encoding definition files for Greek' (2013). CTAN: greek-fontenc.
[35] S. C. de la Barrera. 'The physics package. Macros supporting the Mathematics of Physics' (2012). CTAN: physics.
[36] D. Arseneau. 'The cancel package. Place lines through maths formulae' (2013). CTAN: cancel.
[37] D. Carlisle. 'The slashed package. Put a slash through characters' (1987). CTAN: slashed.
[38] A. Sommerfeldt. 'The subcaption package. Support for sub-captions' (2007). CTAN: subcaption. GitLab: axelsommerfeldt/caption.
[39] D. Els and S. Fear. 'The booktabs package. Publication quality tables in LaTeX' (1995). CTAN: booktabs.
[40] P. van Oostrum and J. Leichter. 'The multirow, bigstrut and bigdelim packages. Create tabular cells spanning multiple rows' (1994). CTAN: multirow.
[41] D. Carlisle and S. Rahtz. 'Packages in the "graphics" bundle. Enhanced support for graphics' (1994). CTAN: graphicx.
[42] F. Charette and P. Kime. 'biber. Backend processor for BibLaTeX' (2009). GitHub: plk/biber. sourceforge: biblatex-biber.
[43] *arXiv Team.* 'arXiv. free distribution service and an open archive for scholarly articles' (1991). URL: arxiv.org.
[44] D. Sutherland. 'arxiv-collector. A little Python script to collect LaTeX sources for upload to the arXiv' (2018). GitHub: dougalsutherland/arxiv-collector.
[45] W. A. Schmidt. 'The cmbright package. Using the CM Bright typeface with LaTeX' (1996). CTAN: cmbright.

[46] F. Mittelbach and R. Schöpf. 'The exscale package. Implements scaling of the "cmex" fonts' (1993). CTAN: exscale.
[47] *American Mathematical Society.* 'The amssymb package' (1995). CTAN: amsfonts.
[48] J. Knappen. 'The mathrsfs package. Support for using RSFS fonts in maths' (1995). CTAN: mathrsfs.
[49] H. Oberdiek. 'The pdftexcmds package. LuaTeX support for pdfTeX utility functions' (2007). CTAN: pdftexcmds.
[50] H. Oberdiek. 'The kvoptions package. Key value format for package options' (2004). CTAN: kvoptions. GitHub: ho-tex/kvoptions.
[51] *LaTeX Team.* 'The ifluatex package. Provides the \ifluatex switch' (2007). CTAN: ifluatex.
[52] *LaTeX Team.* 'The iftex package. Am I running under XeTeX?' (2006). CTAN: ifxetex. GitHub: latex3/iftex.
[53] *LaTeX Team.* 'The fontenc package. Standard package for selecting font encodings' (1995). CTAN: fontenc.
[54] *LaTeX3 Project Team.* 'LaTeX font encodings. Documentation of LaTeX font encodings' (1995). CTAN: encguide.
[55] F. Mittelbach et al. 'The fix-cm package. Permit Computer Modern fonts at arbitrary sizes' (1993). CTAN: fix-cm.
[56] B. Jackowski and J. Nowacki. 'Latin Modern Family of Fonts. Latin modern fonts in outline formats' (2003). CTAN: lm. URL: gust.org.pl/projects/e-foundry/latin-modern.
[57] *LaTeX Team.* 'The textcomp package. LaTeX support for the Text Companion fonts' (1995). CTAN: textcomp.
[58] P. Lehman and J. Wright. 'The etoolbox package. e-TeX tools for LaTeX' (2007). CTAN: etoolbox.
[59] W. Robertson and K. Hosny. 'The fontspec package. Advanced font selection in XeLaTeX and LuaLaTeX' (2004). CTAN: fontspec.
[60] *LaTeX Team.* 'The inputenc package. Accept different input encodings' (1989). CTAN: inputenc.
[61] *LaTeX Team.* 'The xspace package. Define commands that appear not to eat spaces' (1993). CTAN: xspace.
[62] D. Arseneau and M. Swift. 'The relsize package. Set the font size relative to the current font size' (2011). CTAN: relsize.
[63] *LaTeX3 Project.* 'The xparse package. A generic document command parser' (1999). CTAN: xparse.
[64] H. Oberdiek. 'The mleftright package. Variants of delimiters that act as maths open/close' (2010). CTAN: mleftright.
[65] G. Milde. 'The substitutefont package. Easy font substitution' (2010). CTAN: substitutefont.
[66] E. Saudrais. 'The esint package. Extended set of integrals for Computer Modern' (2005). CTAN: esint.

[67] A. Sommerfeldt. 'The caption package. Customising captions in floating environments' (1994). CTAN: caption. GitLab: axelsommerfeldt/caption.
[68] M. Schröder. 'The ragged2e-package. Alternative versions of "ragged"-type commands' (1996). CTAN: ragged2e. GitLab: hagenbuch/ragged2e.
[69] D. Arseneau. 'The varwidth package. A variable-width minipage' (2003). CTAN: varwidth.
[70] H. Oberdiek. 'The atbegshi package. Execute stuff at shipout time' (2007). CTAN: atbegshi. GitHub: ho-tex/atbegshi.
[71] H. Oberdiek. 'The picture package. Dimens for picture macros' (2006). CTAN: picture. GitHub: ho-tex/picture.
[72] W. Robertson. 'The environ package. A new interface for environments in LaTeX' (2007). CTAN: environ.
[73] P. R. Wilson. 'The abstract package. Control the typesetting of the abstract environment' (2000). CTAN: abstract.
[74] H. Lange. 'The footnotebackref package. Back-references from footnotes' (2012). CTAN: footnotebackref.
[75] N. T. Dickimaw Books. 'The glossaries-extra package. An extension to the glossaries package' (2015). CTAN: glossaries-extra.
[76] S. Checkoway. 'The everyhook package. Hooks for standard TeX token lists' (2010). CTAN: everyhook.

Change History