

The HEP-PAPER package^{*}

Publications in high energy physics

Jan Hajer[†]

Department of Physics, University of Basel,
Klingelbergstraße 82, 4056 Basel, Switzerland

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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.

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^{*}This document corresponds to HEP-PAPER v1.8.

[†]jan.hajer@unibas.ch

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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 L^AT_EX 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]. If only subset of the functionality is needed one of the smaller style files HEP-TITLE, HEP-ACRONYMS, and HEP-BIBLIOGRAPHY containing only the macros relevant to sections 2.1, 2.2.2, and 2.5, respectively.

hep-title

hep-bibliography

hep-acronyms

1.1 Options

- paper** The `paper=<format>` option loads the specified paper format. The possible *<formats>* are: `ao`, `a1`, `a2`, `a3`, `a4`, `a5`, `a6`, `bo`, `b1`, `b2`, `b3`, `b4`, `b5`, `b6`, `co`, `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 `11pt`.
- lang** The `lang=<name>` option switches the document language to one of the 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.
- oldstyle** The `oldstyle` option activates the use of oldstyle text- (123) in favour of lining- (123) figures in text mode.
- parskip** The `parskip` option changes how paragraphs are separated from each other using the PARSKIP package [7]. The L^AT_EX 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 $\mathcal{A}\mathcal{M}\mathcal{S}$ fonts [8] and the BM bold fonts. The default `symbols=true` replaces additionally the blackboard font with the D_SFONT [9]. `symbols=minion` switches the symbol fonts to the Adobe MinionPro companion font from the M_NSYMBOL package [10]. `symbols=false` deactivates loading any additional symbol fonts.

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.

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.
- `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 deactivates 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 deprecated `eqnarray` environment.

2 Macros and environments

- `twocolumn` If the global `twocolumn` option is present the page geometry is changed to cover
- `abstract*`

almost the entire page. Additionally the `abstract*` environment is defined that generates a one column abstract and takes care of placing the title information.

2.1 Title page

`\series` The `\series{<series>}` macro is defined using the TITLING package [19].

`\title` The PDF meta information is set according to the `\title{<text>}` and `\author{<text>}` information.

`\subtitle` The `\subtitle{<subtitle>}` macro is defined.

`\editor` 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`

`\affiliation` `\author[1]{Author one \email{email one}}`

`\affiliation[1]{Affiliation one}`

`\email` `\author[2]{Author two \email{email two}}`

`\affiliation[1,2]{Affiliation two}`

`\preprint` The `\preprint{<number>}` 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` Various title font macros are defined, allowing to change the appearance of the `\maketitle` output.

`\subtitlefont`

`\authorfont`

2.2 Text

`\affiliationfont`

`\preprintfont` 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 L^AT_EX and use ... instead of the pair ... and ..., respectively.

`\enquote`

`\MakeOuterQuote`

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

`\vs`

`\no` The `\no{<number>}` macro is typeset as \mathbb{N}^{123} .

`\software` The `\software{<version>}{<name>}` macro is typeset as HEP-PAPER v1.8.

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

`enumdescript`

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

`\shortacronym`

`\longacronym`

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`

`\dummyacronym`

`\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.

2.3 Math

The `MATHTOOLS` [28] and `AMSSYMB` [8] packages are loaded. They in turn load the `\mathbf` $\mathcal{AMS-L}^{\text{ATEX}}$ `AMSMATH` [29] and `AMSFONTS` [8] packages. Bold math, via `\mathbf` is improved by the `BM` package [30], *i.e.* ($Ab\Gamma\delta\mathbf{Ab}\Gamma\delta$). 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.* ($Ab\Gamma\delta\mathbf{Ab}\Gamma\delta$). 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.* ($Ab\Gamma\delta\mathbf{Ab}\Gamma\delta$). The `\mathcal` font *i.e.* ($ABCD$) is accompanied by the `\mathscr` font *i.e.* ($\mathcal{A}\mathcal{B}\mathcal{C}\mathcal{D}$). The `\mathbb` font is improved by the `DOUBLESTROKE` package [9] and adjusted depending on the `sansserif` option *i.e.* ($\mathbb{A}\mathbb{h}\mathbb{1}$). Finally, the `\mathfrak` font is also available *i.e.* ($\mathfrak{A}\mathfrak{a}\mathfrak{B}\mathfrak{b}\mathfrak{1}\mathfrak{2}$). Details about the font handling in `TeX` can be found in reference [31].

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

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

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

`\i` 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

`\numberwithin` 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.

`eqnarray` The deprecated `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.

`equation` Use the `equation` environment for short equations.

`\begin{equation}`

$$\boxed{\text{left}} = \boxed{\text{right}} . \quad (1)$$

`\end{equation}`

`multline` Use the `multline` environment for longer equations.

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

$$\boxed{\text{left}} = \boxed{\text{right 1}} + \boxed{\text{right 2}} . \quad (2)$$

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

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

$$\boxed{\text{left}} = \boxed{\text{right 1}} = \boxed{\text{right 2}} . \quad (3)$$

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}`

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

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

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}`

$$\boxed{\text{left}} = \boxed{\text{right 1}} = \boxed{\text{right 2}} + \boxed{\text{right 3}} . \quad (5)$$

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}`

$$\boxed{\text{left}} = \boxed{\text{long right}} , \quad (6a)$$

$$\boxed{\text{le. 2}} = \boxed{\text{ri. 2}} , \quad \boxed{\text{le. 3}} = \boxed{\text{ri. 3}} . \quad (6b)$$

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 The correct spacing for units, *cf.* equation (7), is provided by the macro `\unit[⟨value⟩]`
\inv `{⟨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 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

$$\sigma = 5\text{ fb} , \quad \text{at } 5\sigma \text{ C.L.} , \quad \mu = 5\text{ cm} , \quad l = 5\mu\text{m} . \quad (7)$$

Additionally, Greek letters can also be directly typed using Unicode.

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

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

`\comm`

`\order` 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

`\cancel` Dirac slash notation *i.e.* $\cancel{\phi}$, respectively.

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

`\overleftright`

2.4 Floats

`figure` Automatic float placement is adjusted to place a single float at the top of pages and
`table` 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 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`.

`\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

```

\begin{panels}{2}
  code
\panel
  \begin{tabular}{...}\end{tabular}
\end{panels}

```

(a) Code for this panel environment.

		one		two	
		b		c	
a		b		c	
		b		c	

(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).

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` 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` 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]. `bibtex` 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 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 ($\backslash\text{mathcal}$, operators)
- 3) **OMX** Math Extension (big operators, delimiters)

The text font 0) of CM is **cmr10** $\backslash\text{OT1}/\text{cmr}/\text{m}/\text{n}/10$, which is replaced by LM to be **rm-lmr10** $\backslash\text{OT1}/\text{lmr}/\text{m}/\text{n}/10$, the **sansserif** option uses **rm-lmss10** $\backslash\text{OT1}/\text{lmss}/\text{m}/\text{n}/10$. The italic math font 1) of CM is **cmi10** $\backslash\text{OML}/\text{cmi}/\text{m}/\text{it}/10$, and is replaced by LM to be **lmmi10** $\backslash\text{OML}/\text{lmm}/\text{m}/\text{it}/10$, the **sansserif** options uses **cmbrmi10** $\backslash\text{OML}/\text{cmbrm}/\text{m}/\text{it}/10$ from the CMBRIGHT package [45]. The symbol font 2) of CM is **cmsy10** $\backslash\text{OMS}/\text{cmsy}/\text{m}/\text{n}/10$, and is replaced by LM to be **lmsy10** $\backslash\text{OMS}/\text{lmsy}/\text{m}/\text{n}/10$, the **sansserif** options uses **cmsssy10** $\backslash\text{OMS}/\text{cmsssy}/\text{m}/\text{n}/10$ from the SANSMATHFONTS package [26]. The extension font 3) of CM is **cmex10** $\backslash\text{OMX}/\text{cmex}/\text{m}/\text{n}/5$, and is replaced by the EXSCALE package [46] to be **cmex10** $\backslash\text{OMX}/\text{cmex}/\text{m}/\text{n}/10$, the **sansserif** option loads **cmssex10** $\backslash\text{OMX}/\text{cmssex}/\text{m}/\text{n}/10$. The AMSSYMB (AMSFONTS) packages [47] load two more symbol fonts

- 4) **msam10** $\backslash\text{U}/\text{msa}/\text{m}/\text{n}/10$ AMS symbol font A (special math operators)
- 5) **msbm10** $\backslash\text{U}/\text{msb}/\text{m}/\text{n}/10$ AMS symbol font B ($\backslash\text{mathbb}$, negated operators)

The **sansserif** option replaces them with **ssmsam10** $\backslash\text{U}/\text{ssmsa}/\text{m}/\text{n}/10$ and **ssmsbm10** $\backslash\text{U}/\text{ssmsb}/\text{m}/\text{n}/10$ 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.* $\backslash\text{mathsf}$ uses a sans serif font and $\backslash\text{mathbf}$ without the BM package uses a bold font. The $\backslash\text{mathscr}$ macro uses the script font from the MATHRSFS package [48]

- 9) **rsfs10** $\backslash\text{U}/\text{rsfs}/\text{m}/\text{n}/10$ Math script font (capital letters)

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

- 10) **dsrom10** $\backslash\text{U}/\text{dsrom}/\text{m}/\text{n}/10$ Double stroke font

The $\backslash\text{mathfrak}$ macro loads the fractur font from the AMSSYMB package [47]

- 11) **eufm10** $\backslash\text{U}/\text{euf}/\text{m}/\text{n}/10$ Math fraktur (Basic Latin)

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

Figure 1: Basic math fonts

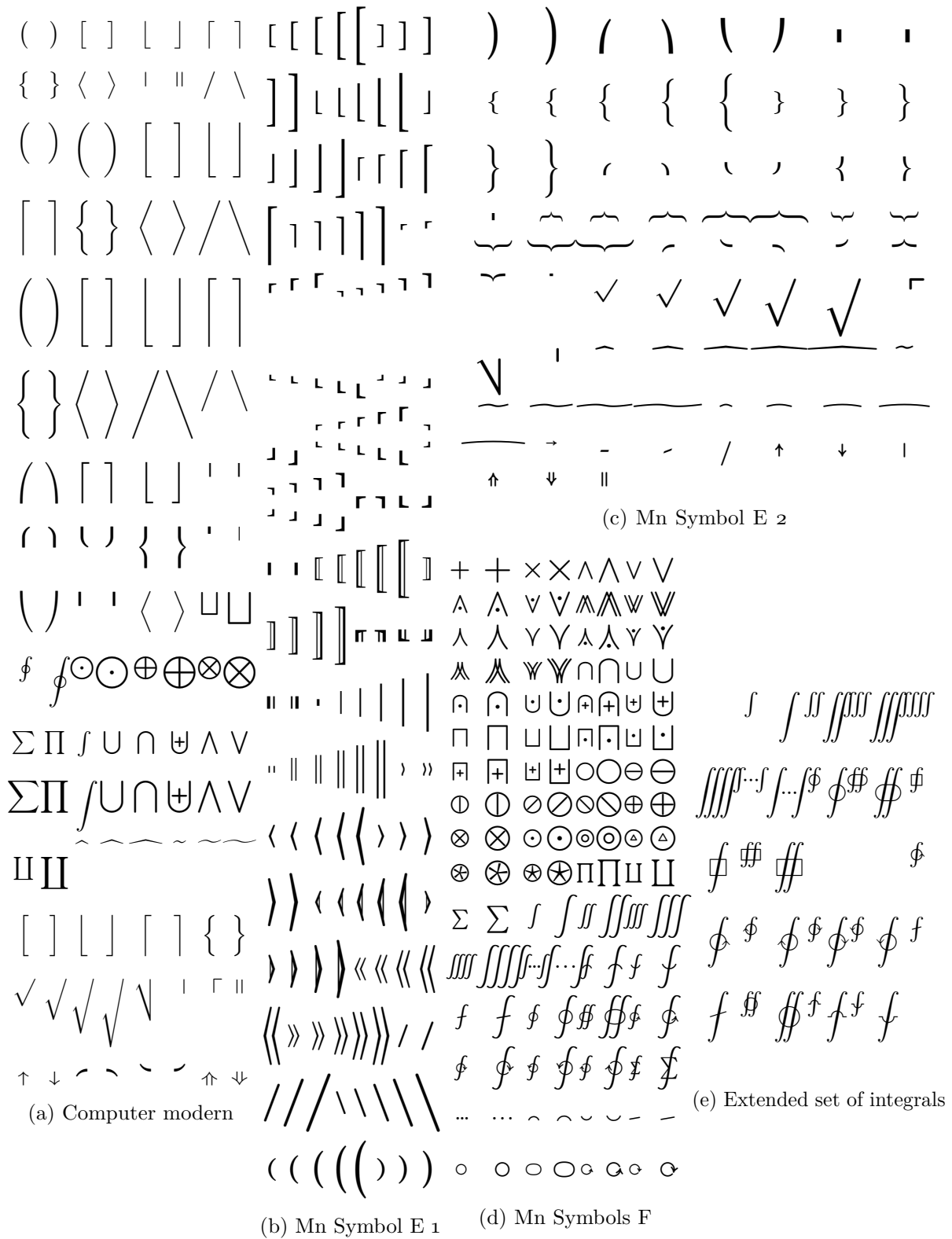


Figure 2: Math extension fonts

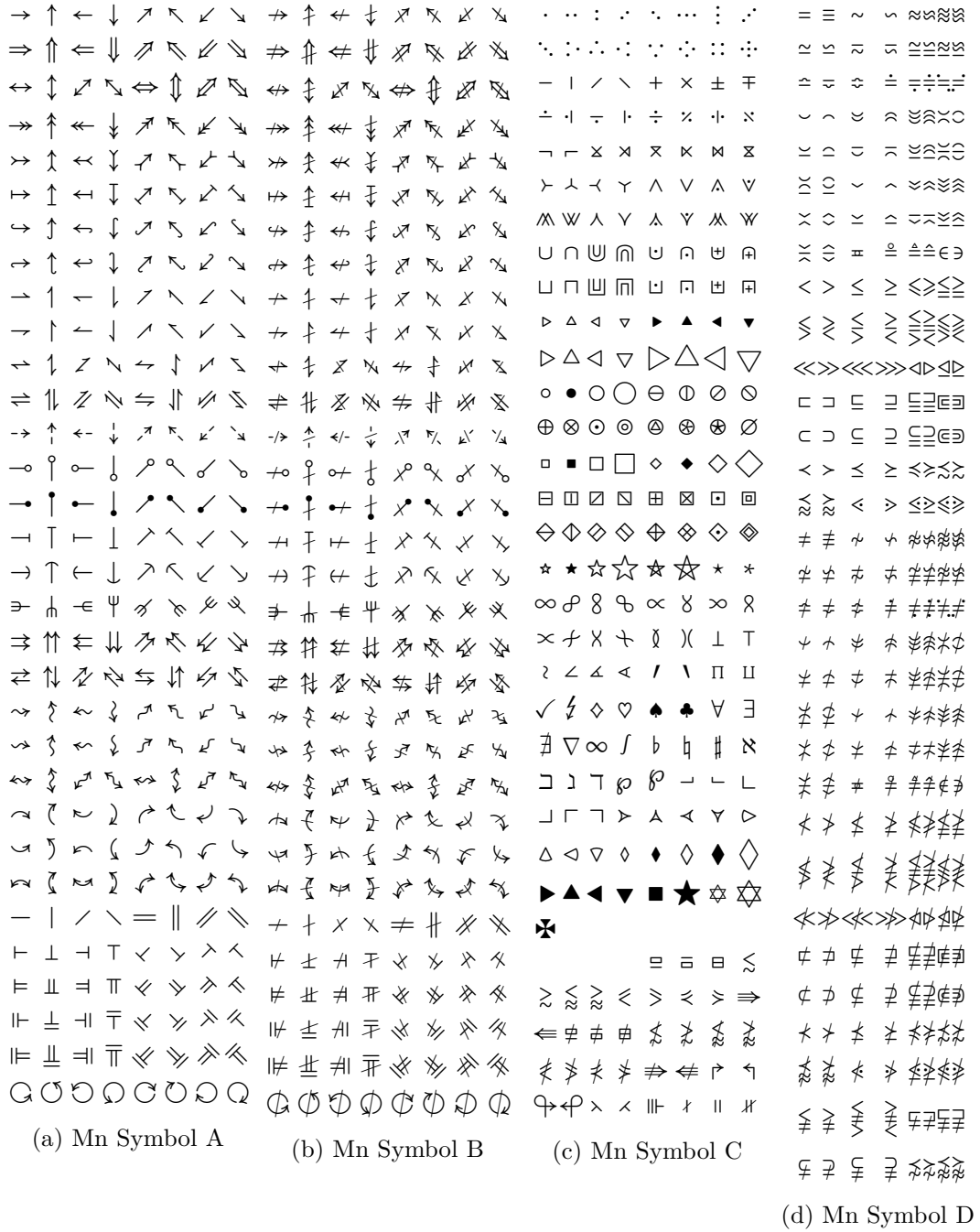


Figure 3: Minion symbol fonts

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

`<*package|title|font|math|floats|acronyms|bibliography> <*package>`

Load the `PDFTEXCMDs` [49] and `KVOPTIONS` [50] packages and define a `hep` namespace.

```
1 \RequirePackage{pdftexcmds}
2 \RequirePackage{kvoptions}
3 \SetupKeyvalOptions{
4   family=hep,
5   prefix=hep@
6 }
```

paper Define a `paper=size` option. Make `A4` paper the default.

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

font Define a `figures=size` option. Make `11pt` the default font size.

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

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

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

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

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

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

```
12 \DeclareBoolOption[true]{lining}
13 \DeclareComplementaryOption{oldstyle}{lining}
```

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

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


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

```
16 \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.

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

title Provide the **title** option deactivating redefinitions of title macros.

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

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

```
19 \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**.

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

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

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

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

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

B.2 Compatibility

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

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

revtex Provide the **revtex** option for REVTeX [17] compatibility mode.

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

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

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

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

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

`pos` Provide the `pos` option for PoS compatibility mode.

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

`springer` Provide the `springer` option for Springer compatibility mode.

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

`amsart` Provide the `amsart` option for AMS article compatibility mode.

```
29 \DeclareBoolOption[false]{amsart}
```

B.3 Reactivation

`eqnarray` Provide the `eqnarray` option for reactivating the `eqnarray` environment.

```
30 \DeclareBoolOption[true]{eqnarray}
```

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

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

B.4 Process options

```
32 \ProcessKeyvalOptions*
```

Read the class options regarding font and paper size.

```
33 \def\hep@get@class#1.cls#2\relax{\def\hep@class{#1}}
34 \def\hep@get@class{\expandafter\hep@get@class\@filelist\relax}
35 \hep@get@class
36 \@ifclasswith{\hep@class}{10pt}{\setkeys{hep}{font=10pt}}{}
37 \@ifclasswith{\hep@class}{12pt}{\setkeys{hep}{font=12pt}}{}
38 \@ifclasswith{\hep@class}{a5paper}{\setkeys{hep}{paper=a5}}{}
39 \@ifclasswith{\hep@class}{b5paper}{\setkeys{hep}{paper=b5}}{}
40 \@ifclasswith{\hep@class}{letterpaper}{\setkeys{hep}{paper=letter}}{}
41 \@ifclasswith{\hep@class}{legalpaper}{\setkeys{hep}{paper=legal}}{}
42 \@ifclasswith{\hep@class}{executivepaper}{%
43   \setkeys{hep}{paper=executive}%
44 }{}}
```

B.5 Set compatibility

Set the `amsart` compatibility options.

```
45 \@ifclassloaded{amsart}{\setkeys{hep}{amsart}}{}
46 \ifhep@amsart
47   \setkeys{hep}{defaults, title=false}
48   \RequirePackage{xpatch}
49   \xpretocmd{\@adminfootnotes}{\let\@makefntext\BHFN@OldMakefntext}{}{}
50 \fi
```

Set the `springer` compatibility options.

```
51 \@ifclassloaded{svjour}{\setkeys{hep}{springer}}{}
52 \@ifclassloaded{svjour2}{\setkeys{hep}{springer}}{}
53 \@ifclassloaded{svjour3}{\setkeys{hep}{springer}}{}
54 \ifhep@springer
55   \setkeys{hep}{defaults, title=false}
56   \let\cl@chapter\undefined
57 \fi
```

Set the `pos` compatibility options.

```
58 \@ifclassloaded{PoS}{\setkeys{hep}{pos}}{}
59 \ifhep@pos
60   \setkeys{hep}{defaults, title=false}
61   \DeclareRobustCommand\boldmath{\@nomath\boldmath\mathversion{bold}}
62 \fi
```

Set the `beamer` compatibility options.

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

Set the `revtex` compatibility options.

```
69 \@ifclassloaded{revtex4}{\setkeys{hep}{revtex}}{}
70 \@ifclassloaded{revtex4-1}{\setkeys{hep}{revtex}}{}
71 \@ifclassloaded{revtex4-2}{\setkeys{hep}{revtex}}{}
72 \ifhep@revtex
73   \setkeys{hep}{defaults, title=false, bibliography=false, lang=american}
74 \fi
```

Define the `SISSA` conditional.

```
75 \@ifpackageloaded{jheppub}{\setkeys{hep}{jhep}}{}
76 \@ifpackageloaded{jcappub}{\setkeys{hep}{jcap}}{}
77 \newif\ifhep@sisssa
78 \ifhep@jhep\hep@sisssatrue
79 \else
80   \ifhep@jcap\hep@sisssatrue
81   \else\hep@sissafalse
82   \fi
83 \fi
```

Set the `SISSA` compatibility options.

```
84 \ifhep@sisssa
85   \setkeys{hep}{title=false, bibliography=false}
```

```

86 \PassOptionsToPackage{
87   colorlinks=true, linktocpage=true, pdfproducer=medialab, pdfa=true,
88   urlcolor=blue, anchorcolor=blue, citecolor=blue, filecolor=blue,
89   linkcolor=blue, menucolor=blue, pagecolor=blue
90 }{hyperref}
91 \PassOptionsToPackage{reset}{geometry}
92 \AtBeginDocument{\renewcommand{\foreignabbrfont}{}}
93 \fi

```

Set the JHEP compatibility options.

```

94 \ifhep@jhep
95   \voffset 0in
96   \hoffset 0in
97 \fi

```

</package>

C Font

<*package|font>

Set the whole text to sans serif if requested.

```

98 %<font>\newif\ifhep@serif\hep@seriftrue
99 \ifhep@serif\else
100   \renewcommand{\familydefault}{\sfdefault}
101 \fi

```

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

```

102 \RequirePackage{ifluatex}
103 \RequirePackage{ifxetex}
104 \newif\ifxetexorluatex
105 \ifxetex\etexorluatextrue
106 \else
107   \ifluatex\etexorluatextrue
108   \else\etexorluatexfalse
109   \fi
110 \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].

```

111 \ifxetexorluatex
112   \def\hep@encoding{TU}
113 \else
114   \def\hep@encoding{T1}
115 \fi

```

```
116 \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].

```
117 \RequirePackage{fix-cm}
118 \RequirePackage{microtype}
119 %<font>\newif\ifhep@lining
120 \ifxetexorluatex
121   \RequirePackage{nfssexp-cfr}
122   \RequirePackage{lmodern}
123 \else
124   \ifhep@lining
125     \RequirePackage[rm={lining},sf={lining},tt={lining}]{cfr-lm}
126   \else
127     \RequirePackage{cfr-lm}
128   \fi
129 \fi
130 \RequirePackage{etoolbox}
131 % \AtBeginEnvironment{tabular}{\tlstyle}
132 \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

```
133 \newcommand{\hep@sf@fontshape}[3]{%
134   \DeclareFontShape{\hep@encoding}{\sfdefault}{#1}{#2}{#3}{}%
135 }
136 \newcommand{\hep@rm@fontshape}[3]{%
137   \DeclareFontShape{\hep@encoding}{\rmdefault}{#1}{#2}{#3}{}%
138 }
139 \ifxetexorluatex
140   \RequirePackage{fontspec}
141   \setmainfont{Latin Modern Roman}[
142     UprightFeatures={SmallCapsFont={\lmromancaps10-regular.otf}}},
143   BoldFeatures={
144     SmallCapsFeatures={Letters=SmallCaps},
145     SmallCapsFont={\cmunbx.otf}]
```

```

146     }
147 ]
148 \hep@sf@fontshape{bx}{sc}{<->cmssbxcsc10}{}
149 \hep@sf@fontshape{b}{sc}{<->cmssbxcsc10}{}
150 \hep@sf@fontshape{m}{scit}{<->cmsscsci10}{}
151 \hep@sf@fontshape{m}{sc}{%
152     <-9>cmsscsc8<9-10>cmsscsc9<10->cmsscsc10%
153 }{}
154 \else
155 \rmfamily
156 \ifhep@lining
157 \RequirePackage{slantsc}
158 \hep@rm@fontshape{b}{sc}{<->ssub*cmr/bx/sc}{}
159 \hep@rm@fontshape{bx}{sc}{<->ssub*cmr/bx/sc}{}
160 \hep@rm@fontshape{b}{scsl}{<->ssub*cmr/bx/scsl}{}
161 \hep@rm@fontshape{bx}{scsl}{<->ssub*cmr/bx/scit}{}
162 \hep@rm@fontshape{b}{scit}{<->ssub*cmr/bx/scsl}{}
163 \hep@rm@fontshape{bx}{scit}{<->ssub*cmr/bx/scit}{}
164 \else
165 \DeclareFontFamily{\hep@encoding}{hfor}{}
166 \DeclareFontShape{\hep@encoding}{hfor}{bx}{sc}{
167     <-6>hfoxc0500<6-7>hfoxc0600<7-8>hfoxc0700<8-9>hfoxc0800
168     <9-10>hfoxc0900<10-12>hfoxc1000<12-17>hfoxc1200<17->hfoxc1728
169 }{}
170 \DeclareFontShape{\hep@encoding}{hfor}{bx}{scsl}{
171     <-6>hfooc0500<6-7>hfooc0600<7-8>hfooc0700<8-9>hfooc0800
172     <9-10>hfooc0900<10-12>hfooc1000<12-17>hfooc1200<17->hfooc1728
173 }{}
174 \hep@rm@fontshape{b}{sc}{<->ssub*hfor/bx/sc}{}
175 \hep@rm@fontshape{bx}{sc}{<->ssub*hfor/bx/sc}{}
176 \hep@rm@fontshape{bx}{scsl}{<->ssub*hfor/bx/scsl}{}
177 \hep@rm@fontshape{b}{scit}{<->ssub*hfor/bx/scsl}{}
178 \hep@rm@fontshape{bx}{scit}{<->ssub*hfor/bx/scsl}{}
179 \hep@rm@fontshape{b}{scsl}{<->ssub*hfor/bx/scsl}{}
180 \fi
181 \sffamily
182 \hep@sf@fontshape{m}{sc}{<->ssub*xcms/m/sc}{}
183 \hep@sf@fontshape{b}{sc}{<->ssub*xcms/bx/sc}{}
184 \hep@sf@fontshape{bx}{sc}{<->ssub*xcms/bx/sc}{}
185 \hep@sf@fontshape{m}{scit}{<->ssub*xcms/m/scit}{}
186 \hep@sf@fontshape{b}{scit}{<->ssub*xcms/bx/scit}{}
187 \hep@sf@fontshape{bx}{scit}{<->ssub*xcms/bx/scit}{}
188 \hep@sf@fontshape{m}{scsl}{<->ssub*xcms/m/scit}{}
189 \hep@sf@fontshape{b}{scsl}{<->ssub*xcms/bx/scit}{}
190 \hep@sf@fontshape{bx}{scsl}{<->ssub*xcms/bx/scit}{}
191 \hep@sf@fontshape{m}{ui}{<->cmssu10}{}
192 \fi

```

Load the INPUTENC package [60].

```

193 \ifxetexorluatex\else

```

```

194 \RequirePackage[utf8]{inputenc}
195 \fi

```

</package|font>

C.1 Math fonts

<*package|font>

```

196 %<font>\RequirePackage{pdftexcmds}
197 %<font>\def\hep@symbols{true}
198 %<font>\RequirePackage{amstext}

```

Define conditionals based on the symbols package option.

```

199 \newif\ifhep@symbols
200 \ifnum\pdf@strcmp{\hep@symbols}{false}=0\else\hep@symbolstrue\fi
201 \newif\ifhep@ams
202 \ifnum\pdf@strcmp{\hep@symbols}{ams}=0 \hep@amstrue\fi
203 \newif\ifhep@minion
204 \ifnum\pdf@strcmp{\hep@symbols}{minion}=0 \hep@miniontrue\fi

```

Load the `FIXMATH` [33] and `TEXTALPHA` [61] packages ensuring that upper Greek letters in math mode are italic and providing upright Greek letters in text mode, respectively. Ensure that both `\text` and `\mathrm` produce upright Greek letters.

```

205 \ifhep@symbols
206   \RequirePackage{fixmath}
207   \RequirePackage{textalpha}
208   \def\hep@greek#1{%
209     \expandafter\let\csname math%
210     \expandafter\@gobble\string#1\endcsname=#1%
211     \edef#1{%
212       \noexpand\TextOrMath{%
213         \expandafter\noexpand\csname text%
214         \expandafter\@gobble\string#1\endcsname%
215       }{%
216         \noexpand\ifnum\noexpand\fam=0
217         \noexpand\text{%
218           \expandafter\noexpand\csname text%
219           \expandafter\@gobble\string#1\endcsname%
220         }%
221         \noexpand\else
222         \expandafter\noexpand\csname math%
223         \expandafter\@gobble\string#1\endcsname%
224         \noexpand\fi
225       }%
226     }%
227   }
228   \hep@greek\alpha \hep@greek\beta \hep@greek\gamma
229   \hep@greek\delta \hep@greek\epsilon \hep@greek\zeta

```

```

230 \hepgreek\eta      \hepgreek\theta  \hepgreek\iota
231 \hepgreek\kappa    \hepgreek\lambda  \hepgreek\mu
232 \hepgreek\nu      \hepgreek\xi     \hepgreek\pi
233 \hepgreek\rho      \hepgreek\sigma  \hepgreek\tau
234 \hepgreek\upsilon   \hepgreek\phi     \hepgreek\chi
235 \hepgreek\psi      \hepgreek\omega
236 \hepgreek\Gamma    \hepgreek\Delta  \hepgreek\Theta
237 \hepgreek\Lambda   \hepgreek\Xi     \hepgreek\Pi
238 \hepgreek\Sigma    \hepgreek\Upsilon \hepgreek\Phi
239 \hepgreek\Psi      \hepgreek\Omega

```

Ensure that this works also after loading other fonts packages such as CFR-LM using SUBSTITUTEFONT [62].

```

240 \ifxetexorluatex
241   % missing code
242 \else
243   \RequirePackage{substitutefont}
244   \substitutefont{LGR}{\rmdefault}{lmr}
245   \DeclareFontFamily{LGR}{\rmdefault}{}
246   \DeclareFontShape{LGR}{\rmdefault}{b}{n}{<->ssub*lmr/bx/n}{}
247   \DeclareFontShape{LGR}{\rmdefault}{b}{sc}{<->ssub*lmr/bx/sc}{}
248   \substitutefont{LGR}{\ttdefault}{lmtt}
249   \DeclareFontFamily{LGR}{\ttdefault}{}
250   \DeclareFontShape{LGR}{\ttdefault}{b}{n}{<->ssub*lmtt/bx/n}{}
251   \substitutefont{LGR}{\sfdefault}{lmss}
252   \DeclareFontFamily{LGR}{\sfdefault}{}
253   \DeclareFontShape{LGR}{\sfdefault}{b}{n}{<->ssub*lmss/bx/n}{}
254   \DeclareFontShape{LGR}{\sfdefault}{b}{sc}{<->ssub*lmss/bx/sc}{}
255 \fi

```

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].

```

256 \ifhep@minion
257   \RequirePackage{MnSymbol}
258 \else
259   \RequirePackage{exscale}
260   \RequirePackage{amssymb}
261 \fi
262 \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.

```

263 \ifhep@serif
264   \newcommand\hep@font@sf{cmbm}
265   \DeclareMathAlphabet{\mathsf}{OML}{\hep@font@sf}{m}{it}

```



```

266 \SetMathAlphabet{\mathsf}{bold}{OML}{\hep@font@sf}{b}{it}
267 \else
268 \newcommand\hep@font@sf{lmr}
269 \newcommand\hep@font@text{lmss}
270 \newcommand\hep@font@math{cmbrm}
271 \newcommand\hep@font@symbol{cmsssy}
272 \newcommand\hep@font@extra{cmssex}
273 \newcommand\hep@font@amsa{ssmsa}
274 \newcommand\hep@font@amsb{ssmsb}

```

Declare font substitutions.

```

275 \DeclareFontSubstitution{OML}{\hep@font@math}{m}{it}
276 \ifhep@symbols\ifhep@minion\else
277 \DeclareFontSubstitution{OMS}{\hep@font@symbol}{m}{n}
278 \DeclareFontSubstitution{OMX}{\hep@font@extra}{m}{n}
279 \fi\fi

```

Declare the symbol fonts.

```

280 \DeclareSymbolFont{operators}{OT1}{\hep@font@text}{m}{n}
281 \DeclareSymbolFont{letters}{OML}{\hep@font@math}{m}{it}
282 \ifhep@symbols\ifhep@minion\else
283 \DeclareSymbolFont{symbols}{OMS}{\hep@font@symbol}{m}{n}
284 \DeclareSymbolFont{largesymbols}{OMX}{\hep@font@extra}{m}{n}
285 \fi\fi

```

Set bold symbol fonts.

```

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

```

Adjust the fonts loaded by the AMSFONTS [8] and ESINT [63] packages.

```

291 \ifhep@symbols\ifhep@minion\else
292 \DeclareSymbolFont{AMSA}{U}{\hep@font@amsa}{m}{n}
293 \DeclareSymbolFont{AMSB}{U}{\hep@font@amsb}{m}{n}
294 \fi\fi
295 \AtBeginDocument{%
296 \ifpackageloaded{esint}{%
297 \DeclareSymbolFont{largesymbolsA}{U}{ssesint}{m}{n}
298 }{}
299 }

```

Declare the symbol font alphabets.

```

300 \DeclareSymbolFontAlphabet{\mathrm}{operators}
301 \DeclareSymbolFontAlphabet{\mathnormal}{letters}
302 \ifhep@minion\else

```

```

303   \DeclareSymbolFontAlphabet{\mathcal}{symbols}
304   \fi

Declare \mathit.

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

Declare \mathhtt.

307 %   \DeclareMathAlphabet{\mathhtt}{OT1}{cmtl}{m}{n}

Declare \mathsf.

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

End of sansserif.

310 \fi

```

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

```

311 \ifhep@symbols
312   \RequirePackage{bm}
313   \AtBeginDocument{\let\mathbf\bm}
314   \g@addto@macro\bfseries{\boldmath}

```

\mathhtt

```

315   \DeclareMathAlphabet{\mathhtt}{OT1}{lmtt}{m}{n}
316   \SetMathAlphabet\mathhtt{bold}{OT1}{lmtt}{bx}{n}

```

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

```

317   \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].

```

318   \ifhep@minion
319     \DeclareMathAlphabet{\mathbb}{U}{%
320       \ifhep@serif dsrom\else dsss\fi%
321     }{m}{n}
322   \else
323     \ifhep@ams\else
324       \SetMathAlphabet{\mathbb}{normal}{U}{%
325         \ifhep@serif dsrom\else dsss\fi%
326       }{m}{n}

```

```

327 \fi
328 \fi
329 \fi

</package|font>

```

C.2 Font size

```
<*package>
```

Undefine previously defined font sizes and load the L^AT_EX font size file corresponding to the font size option.

```

330 \ifhep@defaults\else
331 \def\hep@remove@pt#1pt{#1}
332 \edef\hep@pt@size{\expandafter\hep@remove@pt\hep@font}
333 \let\small\relax
334 \let\footnotesize\relax
335 \let\scriptsize\relax
336 \let\tiny\relax
337 \let\large\relax
338 \let\Large\relax
339 \let\LARGE\relax
340 \let\huge\relax
341 \let\Huge\relax
342 \input{size\hep@pt@size.clo}
343 \fi

```

D Text

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

```

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

```

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

```

346 \RequirePackage[normalem]{ulem}
347 \let\underline\uuline

```

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

```

348 \ifnum\pdf@strcmp{\hep@lang}{american}=0
349 \newcommand{\hep@lang@foreign}{USenglish}
350 \else
351 \ifnum\pdf@strcmp{\hep@lang}{USenglish}=0
352 \newcommand{\hep@lang@foreign}{USenglish}

```

```

353 \else
354   \newcommand{\hep@lang@foreign}{british}
355 \fi
356 \fi
357 \RequirePackage[all, \hep@lang@foreign]{foreign}
358 \DeclareRobustCommand\vs{\xperiodafter{\foreignabbrfont{vs}}}{%

```

The FOREIGN package relies on the XSPACE package [64]. Ensure that `\xspace` is compatible with the `\enquote` macro from the CSQUOTE package.

```

359 \xspaceaddexceptions{\csq@qclose@i}

```

`\no` Define the macro `\no{<number>}` for the use of \mathbb{N} with appropriate spacing.

```

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

```

`\software` Define a macro for software with optional version information `\software[<version>]{<name>}`, using the RELSIZE package [65].

```

361 \RequirePackage{relsize}
362 \newcommand{\software}[2][\hspace{-\fontdimen2\font}]{%
363   {\smaller[.5]\textsc{#2}~#1}%
364 }

```

</package> <*package|title|bibliography>

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

```

365 \providecommand{\online}[2]{\ttfamily{#2}}%
366 \newcommand{\hep@email}[1]{\online{mailto:#1}{#1}}
367 \providecommand\email{\hep@email}
368 \AtEndOfPackage{\ifpackageloaded{hyperref}{%
369   \renewcommand{\online}[2]{\href{#1}{\nolinkurl{#2}}}%
370 }{}
371 }

```

</package|title|bibliography> <*package>

`\prefix` Define the `\prefix{<prefix>}{<word>}` macro ensuring the correct linebreak in (prefix-) word.

```

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

```

D.1 Lists

Load the ENUMITEM package [24].

```

373 \RequirePackage[inline]{enumitem}

```

`inlinelist` Define an inline list environment.

```

374 \newlist{inlinelist}{enumerate*}{1}
375 \setlist*{inlinelist,1}{%
376   label=\roman*), itemjoin={,\ }, itemjoin*={, and\ }, after=.%
377 }
```

`enumdescript` Define an enumdescript list environment.

```

378 \newlist{enum@descript}{enumerate}{2}
379 \setlist[enum@descript]{label=\arabic*}
380 \newenvironment{enumdescript}[1][]{
381   \begin{enum@descript}[#1]
382     \let\hep@item\item
383     \renewcommand{\item}[2][]{
384       \ifx&##1&\hep@item\else\hep@item[##1]\fi
385       \textbf{##2}\ifx##2\empty\else~\fi\@ifnextchar\par\@gobble\relax
386     }
387   }\end{enum@descript}}
```

`</package>` `<*package|bibliography>`

`commalist` Define a commalist environment.

```

388 \RequirePackage{xparse}
389 \ExplSyntaxOn
390 \NewDocumentEnvironment{commalist}{0{\space}+b}{
391   \hep@comma@list:n{#2}
392 }{#1}
393 \seq_new:N \hep@items@sequence
394 \cs_new_protected:Npn \hep@comma@list:n #1{
395   \seq_set_split:Nnn \hep@items@sequence{\item}{#1}
396   \seq_pop_left:NN \hep@items@sequence \l_tmpa_tl
397   \seq_use:Nnnn \hep@items@sequence{~and~}{,~}{,~and~}
398 }
399 \ExplSyntaxOff
```

`</package|bibliography>`

E Geometry

`<*package>`

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

```

400 \ifhep@defaults\else
401   \RequirePackage{geometry}
402   \geometry{\hep@paper paper, includeheadfoot}
```

```

403 \if@twocolumn
404   \geometry{hscale=.85, vscale=.925, vmarginratio=1:1}
405   \geometry{headsep=2ex, footskip=6ex}
406   \setlength{\columnsep}{1.1em}
407 \else
408   \geometry{hscale=.75, vscale=.8, vmarginratio=3:4}
409 \fi
410 \fi

```

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

```

411 \ifhep@parindent\else
412 \RequirePackage{parskip}
413 \newcommand{\useparskip}{\%
414   \setlength{\parskip}{.5\baselineskip plus 2pt}\%
415   \setlength{\parindent}{0pt}\%
416 }
417 \newcommand{\useparindent}{\%
418   \setlength{\parskip}{0pt}\%
419   \setlength{\parindent}{15pt}\%
420   \if@twocolumn\setlength{\parindent}{1em}
421   \else\setlength{\parindent}{1.5em}
422   \fi
423 }
424 \fi

```

</package>

F Math

<*package|math>

Load the MATHTOOLS package [28] which loads the AMSMATH package [29]. Allow page breaks within equations if necessary. Adjust the thick and med mu skips slightly.

```

425 %<package>\ifhep@physics
426 %<math>\newif\ifhep@lining\hep@liningtrue
427 %<math>\newif\ifhep@eqnarray\hep@eqnarraytrue
428 \RequirePackage{mathtools}
429 \allowdisplaybreaks[1]
430 \thickmuskip=5mu plus 3mu minus 1mu
431 \medmuskip=4mu plus 2mu minus 3mu

```

</package|math> <*package|math|acronyms>

`\mathdef` Define the `\mathdef{<name>}{<arguments>}{<macro>}` macro which (re-)defines macros in math mode only. This macro is implemented using the XPARSE package [66].

```

432 \RequirePackage{xparse}
433 \DeclareDocumentCommand{\mathdef}{m0{0}m}{%
434   \expandafter\let\csname hep@text\string#1\endcsname=#1
435   \expandafter\newcommand\csname hep@math\string#1\endcsname[#2]{#3}
436   \DeclareRobustCommand#1{%
437     \ifmmode
438       \expandafter\let\expandafter\next\csname%
439         hep@math\string#1\endcsname%
440     \else
441       \expandafter\let\expandafter\next\csname%
442         hep@text\string#1\endcsname%
443     \fi
444     \next
445   }%
446 }

```

</package|math|acronyms> <*package|math>

\i Provide an upright imaginary unit in math mode.

```

447 \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].

```

448 \RequirePackage{ulem}
449 \def\overline#1{\renewcommand{\ULdepth}{-1.9ex}}\uline{#1}}
450 \DeclareRobustCommand{\over@line}[1]{\@@overline{#1}}
451 \mathdef{\overline}{\over@line}

```

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

```

452 \newcommand{\oset}[3][-1pt]{%
453   \text{\raisebox{.2ex}{\mathop{#3}\limits^{%
454     \vbox to#1{\kern-2\ex@\hbox{\scriptscriptstyle#2}\vss}%
455   }}}}%
456 }

```

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

```

457 \newcommand{\overleftarrow}[1]{\oset{\leftarrow}{#1}}

```

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

```

458 \ifhepeqnarray\else
459   \let\eqnarray\@undefined
460   \let\endeqnarray\@undefined
461 \fi

```

F.1 Operators

`\tr` Provide the `\diag`, `\sgn`, and other operators.

`\Tr`

```
462 \DeclareMathOperator{\tr}{tr}
463 \DeclareMathOperator{\Tr}{Tr}
464 \DeclareMathOperator{\rank}{rank}
465 \DeclareMathOperator{\erf}{erf}
466 \DeclareMathOperator{\Res}{Res}
467 \DeclareMathOperator{\sgn}{sgn}
468 \DeclareMathOperator{\diag}{diag}
```

`\Re` Redefine the real and imaginary projectors.

`\Im`

```
469 \let\Re\relax\DeclareMathOperator{\Re}{Re}
470 \let\Im\relax\DeclareMathOperator{\Im}{Im}
```

F.1.1 Trigonometric functions

```
471 \let\cos\undefined\DeclareMathOperator{\cos}{cos\phantom{i}}
472 \let\tan\undefined\DeclareMathOperator{\tan}{tan\phantom{i}}

473 \DeclareMathOperator{\arccsc}{arccsc}
474 \DeclareMathOperator{\arcsec}{arcsec}
475 \DeclareMathOperator{\arccot}{arccot}

476 \DeclareMathOperator{\asin}{asin}
477 \DeclareMathOperator{\acos}{acos}
478 \DeclareMathOperator{\atan}{atan}
479 \DeclareMathOperator{\acsc}{acsc}
480 \DeclareMathOperator{\asec}{asec}
481 \DeclareMathOperator{\acot}{acot}

482 \DeclareMathOperator{\csch}{csch}
483 \DeclareMathOperator{\sech}{sech}
```

F.2 Units and fractions

`\unit` Load the `UNITS` package [32] which provides the `\units` and `\nicefrac` macros. Patch the `\unit` and `\unitfrac` macros to work with lining numerals using the `XPATCH` package [67].

```
484 \RequirePackage{units}
485 \RequirePackage{xpatch}
486 \ifhep@lining\else
487   \xpatchcmd{\unit}{\else#1}{%
488     \else\ifthenelse{\boolean{mmode}}{#1}{\textl{#1}}}%
489   }{}{}
490   \xpatchcmd{\unitfrac}{\else#1}{%
491     \else\ifthenelse{\boolean{mmode}}{#1}{\textl{#1}}}%
492   }{}{}
493 \fi
```


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

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

`\flatfrac` Flat fraction.

```
495 \DeclarePairedDelimiterX{\hep@flatfrac}[2]{.}{.}{%
496   #1\delimsize/\makelefttdelim#2%
497 }
498 \NewDocumentCommand{\flatfrac}{somm}{%
499   \IfBooleanTF{#1}{%
500     \hep@flatfrac*{#3}{#4}%
501   }{%
502     \IfNoValueTF{#2}{\,\makelefttdelim#3\makelefttdelim#4\,%
503   }{%
504     \hep@flatfrac[#2]{#3}{#4}%
505   }%
506 }%
507 }
```

`\textfrac` Provide the `\textfrac` macro.

```
508 \newcommand{\textfrac}[2]{\ensuremath{\textstyle\nicefrac{\text{#1}}{\text{#2}}}}
```

F.2.1 Differentials and derivatives

`\differential` Provide a differential `\d`.

```
\d
509 \newcommand{\makedifferential}[1]{\mathop{\d}!#1}
510 \providecommand{\differentialsymbol}{\d}
511 \newcommand{\differential}{\makedifferential\differentialsymbol}
512 \AtBeginDocument{\mathdef{\d}{\differential}}
```

`\makederivative`

```
513 \newcommand\makederivative[2]{
514   \NewDocumentCommand{#1}{somso}{%
515     \IfBooleanTF{##4}{%
516       \IfBooleanTF{##1}{\nicefrac}{\frac}%
517     }{%
518       \IfBooleanTF{##1}{\flatfrac}{\dfrac}%
519     }{%
520       \makedifferential#2\IfValueT{##2}{\sim{##2}}\IfValueT{##5}{##5}%
521     }{%
522       \makedifferential#2{##3}\IfValueT{##2}{\sim{##2}}%
523     }%
524   }
525 }
```

\derivative

```
526 \makederivative{\derivative}{d}
527 \newcommand\dv{\derivative}
```

\variation

```
528 \newcommand\variation{\makedifferential\delta}
529 \newcommand\var{\variation}
```

\functionalderivative

```
530 \makederivative{\functionalderivative}{\delta}
531 \newcommand\fdv{\functionalderivative}
```

\makepartialderivative

```
532 \RequirePackage{etoolbox}
533 \newcommand\makepartialderivative[2]{
534   \NewDocumentCommand{#1}{s0{}0{}msoo}{%
535     \IfBooleanTF{##5}{%
536       \IfBooleanTF{##1}{\nicefrac}{\frac}%
537     }{%
538       \IfBooleanTF{##1}{\flatfrac}{\dfrac}%
539     }{%
540       \makedifferential#2\IfValueTF{##7}{%
541         \ifblank{##2}{
542           \ifblank{##3}{~2}{~{\the\numexpr##3+1\relax}}%
543         }{%
544           \ifblank{##3}{%
545             ~{\the\numexpr##2+1\relax}}{~{\the\numexpr##2+##3\relax}}%
546           }%
547         }%
548       }{\IfValueT{##2}{~{##2}}}\IfValueT{##6}{##6}%
549     }{%
550       \makedifferential#2{##4}\IfValueT{##2}{~{##2}}%
551       \IfValueT{##7}{#2##7\IfValueT{##3}{~{##3}}}%
552     }%
553   }
554 }
```

\partialderivative

```
555 \makepartialderivative{\partialderivative}{\partial}
556 \newcommand\pdv{\partialderivative}
```

\cancel Additionally, load the CANCEL [36] and SLASHED [37] packages which provide the
\slashed \cancel and \slashed macros.

```
557 \RequirePackage{cancel}
558 \RequirePackage{slashed}
```

F.3 Paired delimiters

`\left` Load the MLEFTRIGHT package [68] and adjust the spacing around `\left` and `\right`.
`\right`

```
559 \RequirePackage{mleftright}
560 \mleftright
```

`\abs` Absolute value and norm.

```
\norm
\pnorm 561 \newcommand{\noargumentsymbol}{\:\cdot\:}
562 \newcommand{\optionalargument}[1]{\ifblank{#1}{\noargumentsymbol}{#1}}
563 \DeclarePairedDelimiterX\abs[1]{\lvert\lvert}{\rvert\lvert}{\optionalargument{#1}}
564 \DeclarePairedDelimiterX\norm[1]{\lVert\lVert}{\rVert\lVert}{\optionalargument{#1}}
565 \DeclarePairedDelimiterXPP\hep@pnorm[2]{}{\lVert\lVert}_{#1}{#2}
566 \NewDocumentCommand{\pnorm}{som}{%
567   \IfValueTF{#2}{%
568     \IfBooleanTF{#1}{\hep@pnorm*}{\hep@pnorm}{#2}%
569   }{%
570     \IfBooleanTF{#1}{\norm*}{\norm}%
571   }{\optionalargument{#3}}%
572 }
```

`\order` Order symbol and macro.

```
573 \providecommand{\ordersymbol}{\mathcal{O}}
574 \DeclarePairedDelimiterXPP\order[1]{\ordersymbol}{}{#1}
```

`\evaluated` Vertical evaluation bar

```
\eval
575 \DeclarePairedDelimiter{\hep@evaluated}{.}{\rvert}
576 \NewDocumentCommand{\evaluated}{som}{%
577   \IfBooleanTF{#1}{%
578     \hep@evaluated*{#3}%
579   }{%
580     \IfNoValueTF{#2}{#3\rvert}{\hep@evaluated[#2]{#3}}%
581   }%
582 }
583 \newcommand\eval{\evaluated}
```

F.3.1 Set and Probability

`\midbar`

```
584 \newcommand\makeleftdelim{\mathopen{}}
585 \providecommand{\midbar}[1]{}{%
586   \nonscript\:#1\vert\allowbreak\nonscript\:\makeleftdelim%
587 }
```

`\suchthat`

```
\set
588 \providecommand\suchthat{\midbar}
```

```

589 \DeclarePairedDelimiterX\set[1]{\}{\}{\}%
590 \renewcommand\suchthat{\midbar[\delimsize]}#1%
591 }

```

\probabilitysymbol

\given

\Pr

```

592 \providecommand{\probabilitysymbol}{\operatorname{Pr}}
593 \providecommand\given{\midbar}
594 \DeclarePairedDelimiterXPP\hep@Pr[1]{%
595   \probabilitysymbol}{\}{\}%
596   \renewcommand\given{\midbar[\delimsize]}#1%
597 }
598 \let\Pr\relax
599 \NewDocumentCommand{\Pr}{so}{%
600   \IfValueTF{#2}{%
601     \IfBooleanTF{#1}{\hep@Pr*}{\hep@Pr}{#2}%
602   }{%
603     \probabilitysymbol%
604   }%
605 }

```

F.3.2 Commutators

\innerproduct Poissonbracket, commutator and anti-commutator.

\poissonbracket

\commutator

\anticommutator

```

606 \DeclarePairedDelimiterX\innerproduct[2]{%
607   \langle\rangle{\optionalargument{#1},\optionalargument{#2}}%
608 }
609 \DeclarePairedDelimiterX\poissonbracket[2]{%
610   \lbrace\rbrace{\optionalargument{#1},\optionalargument{#2}}%
611 }
612 \newcommand\pb{\poissonbracket}
613 \DeclarePairedDelimiterX\commutator[2]{%
614   \lbrack\rbrack{\optionalargument{#1},\optionalargument{#2}}%
615 }
616 \newcommand\comm{\commutator}
617 \DeclarePairedDelimiterX\anticommutator[2]{%
618   \lbrace\rbrace{\optionalargument{#1},\optionalargument{#2}}%
619 }
620 \newcommand\acomm{\anticommutator}

```

F.3.3 Bra-ket notation

```

621 \providecommand\bracketspace{\mskip1mu}
622 \newcommand\hep@midvert{%
623   \bracketspace\delimsize\vert\bracketspace\makeleftdelim%
624 }

```

\braket

```

625 \DeclarePairedDelimiterX\braket[2]{\langle\rangle}{\bracketspace#1\hep@midvert#2\braket

```

\bra

```

626 \DeclarePairedDelimiterXPP\hep@bra[1]{%
627   }\langle\lvert\braket\braket#1\braket\braket%
628 }
629 \NewDocumentCommand{\bra}{smt\ket sgt\ketbra sgg}{%
630   \IfBooleanTF{#6}{%
631     \IfBooleanTF{#1}{\braket*{#2}{#8}}{\braket{#2}{#8}}%
632     \IfBooleanTF{#7}{\bra*{#9}}{\bra{#9}}%
633   }{
634     \IfBooleanTF{#3}{%
635       \IfBooleanTF{#1}{\braket*}{%
636         \IfBooleanTF{#4}{\braket*}{\braket}}{#2}{#5%
637       }%
638     }{
639       \IfBooleanTF{#1}{\hep@bra*}{\hep@bra}{#2}%
640     }%
641   }%
642 }

```

\ket

```

643 \DeclarePairedDelimiterXPP\ket[1]{%
644   \braket\lvert\langle\lvert\braket\makeleftdelim#1\braket\braket%
645 }

```

\ketbra

```

646 \NewDocumentCommand{\ketbra}{smt}{%
647   \IfBooleanTF{#1}{%
648     \ket*{#2}\bra*{#3}%
649   }{
650     \ket{#2}\bra{#3}%
651   }%
652 }

```

\matricelement

```

653 \DeclarePairedDelimiterX\matricelement[3]{%
654   \langle\langle\braket\hep@midvert#2\hep@midvert#3\braket\braket%
655 }
656 \newcommand\matrixel{\matricelement}
657 \newcommand\mel{\matricelement}

```

\expectationvalue

```

658 \DeclarePairedDelimiterX\hep@expvalue[1]{\langle\langle\braket\braket%
659 \NewDocumentCommand{\expectationvalue}{som}{%
660   \IfNoValueTF{#2}{%
661     \IfBooleanTF{#1}{\hep@expvalue*}{\hep@expvalue}{#3}%

```

```

662 }{%
663   \IfBooleanTF{#1}{\matricelement*}{\matricelement}{#2}{#3}{#2}%
664 }%
665 }
666 \newcommand\ev{\expectationvalue}
667 \newcommand\vev[1]{\expectationvalue[0]{#1}}

```

End of physics conditional.

```

668 %<package>\fi

</package|math>

```

G Floats

```

<*package|floats>

669 %<floats>\newif\ifhep@manualplacement\hep@manualplacementfalse

Adjust the LATEX float placement defaults

670 \setcounter{bottomnumber}{0} % 1
671 \setcounter{topnumber}{1} % 2
672 \setcounter{dbltopnumber}{1} % 2
673 \renewcommand{\topfraction}{.9} % .7
674 \renewcommand{\dbltopfraction}{.9} % .7
675 \renewcommand{\textfraction}{.1} % .2
676 \renewcommand{\floatpagefraction}{.8} % .5

```

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

```

677 \let\hep@figure\figure%
678 \let\end@hep@figure\endfigure%
679 \let\hep@table\table%
680 \let\end@hep@table\endtable%
681 \ifhep@manualplacement%
682   \renewenvironment{figure}[1][tbp]{%
683     \hep@figure[#1]\centering%
684   }\end@hep@figure}%
685   \renewenvironment{table}[1][tbp]{%
686     \hep@table[#1]\centering%
687   }\end@hep@table}%
688 \else%
689   \renewenvironment{figure}[1][]{%
690     \hep@figure\centering%
691   }\end@hep@figure}%
692   \renewenvironment{table}[1][]{%
693     \hep@table\centering%
694   }\end@hep@table}

```

```
695 \fi%
```

```
</package|floats>
```

G.1 Sub-floats

```
<*package>
```

`\ifhep@journal` Define a new journal conditional.

```
696 \newif\ifhep@journal
697 \ifhep@sissa\hep@journaltrue
698 \else
699   \ifhep@revtex\hep@journaltrue
700   \else
701     \ifhep@pos\hep@journaltrue
702     \else
703       \ifhep@springer\hep@journaltrue
704       \else\hep@journalfalse
705     \fi
706   \fi
707 \fi
708 \fi
```

Prevent the CAPTION package [69] from complaining about the journal classes and packages.

```
709 \ifhep@journal
710   \setlength\abovecaptionskip{\f@size\p@}
711   \setlength\belowcaptionskip{0\p@}
712   \long\def\@makecaption#1#2{%
713     \vskip\abovecaptionskip
714     \sbox\@tempboxa{#1: #2}%
715     \ifdim \wd\@tempboxa >\hsize
716       #1: #2\par
717     \else
718       \global \@minipagefalse
719       \hb@xt@\hsize{\hfil\box\@tempboxa\hfil}%
720     \fi
721     \vskip\belowcaptionskip%
722   }
723 \fi
```

```
</package> <*package|floats>
```

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

```
724 \RequirePackage[subrefformat=parens]{subcaption}
725 \captionsetup{font=small}
726 \captionsetup[sub]{font=small}
```

```

727 \providecommand*\subcaption@minipage[2]{%
728   \minipage#1{#2}\setcaptionsubtype\relax%
729 }

```

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

```

\panel
730 \newcommand{\hep@panels@space}{20}
731 \newenvironment{panels}[2][b]{%

```

Define an internal macro for global behaviour.

```

732   \newcommand{\begin@subcaption@minipage}[2][b]{%
733     \caption@withoptargs\subcaption@minipage[##1]{##2}%
734     \centering\vskip 0pt%
735   }

```

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

```

736   \ifdim#2pt>1pt%
737     \newcommand{\hep@panel@space}{%
738       (1-#2+\hep@panels@space)/\hep@panels@space%
739     }%
740     \newcommand{\panel}[1][b]{%
741       \endminipage\hfill\begin@subcaption@minipage[#1]{%
742         \linewidth/#2*\hep@panel@space%
743       }%
744     }%
745     \begin@subcaption@minipage[#1]{\linewidth/#2*\hep@panel@space}%

```

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

```

746   \else%
747     \newcommand{\panel}[2][b]{%
748       \endminipage\hfill\begin@subcaption@minipage[#1]{##2\linewidth}%
749     }%
750     \begin@subcaption@minipage[#1]{#2\linewidth}%
751     \fi%
752 }{\endminipage}

```

</package|floats> <*package>

Reajust the captions to the revtex class using the RAGGED2E package [70].

```

753 \ifhep@revtex
754   \RequirePackage{ragged2e}
755   \DeclareCaptionFormat{revtex}{#1#2\justifying{#3}}
756   \captionsetup{font=small, format=revtex}
757   \captionsetup[sub]{font=footnotesize, format=plain}
758   \renewcommand{\figurename}{Figure}
759   \renewcommand{\tablename}{Table}
760 \fi

```


</package>

G.2 Tables

<*package|floats>

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

```
761 \RequirePackage{booktabs}
762 \RequirePackage{multirow}
```

G.3 Figures

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

```
763 \RequirePackage{graphicx}
764 \providecommand{\tikzsetnextfilename}[1]{}
765 \newcommand{\graphic}[2][1]{\tikzsetnextfilename{#2}{%
766   \centering\includegraphics[width=#1\linewidth]{#2}\par%
767 }}
```

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

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

</package|floats>

H Title page

<*package|title>

Redefine previous macros just for the title package.

```
769 \newif\ifhep@first%
```

</package|title> <*package>

Define title internal conditionals outside of main conditional. TODO: replace this hack Begin of title conditional.

```
770 \newif\ifnewaffil%
771 \ifhep@title
```

</package> <*package|title>

\hep@multi@ref Transform reference list to list of references.

```
772 \newcommand{\hep@multi@ref}[1]{%
773   \hep@firsttrue%
774   \forcsvlist{%
```

```

775     \ifhep@first\hep@firstfalse\else\textsuperscript,\fi\ref%
776   }{\#1}%
777 }

```

Redefine the email macro for the title page.

```

778 \renewcommand{\email}[2] [] {\unskip\thanks[#1]{\hep@email{#2}}}%
779 \AtBeginDocument{
780   \let\hep@maketitle\maketitle
781   \renewcommand\maketitle{\hep@maketitle\let\email\hep@email}
782 }

```

H.1 Preprint and title

H.1.1 Preprint

`\preprintfont` Define the `\preprintfont` macro.

```

783 \let\hep@preprint@font\relax
784 \newcommand{\preprintfont}[1] {\def\hep@preprint@font{#1}}
785 \preprintfont{\scshape\small}

```

`\preprint` Define the `\preprint` macro using the `VARWIDTH` package [71].

```

786 \let\hep@preprint\relax
787 \newcommand\preprint[1] {\def\hep@preprint{#1}}
788 \RequirePackage{varwidth}
789 \newcommand{\hep@preprint@box}{%
790   \begin{varwidth}{\textwidth}%
791     \hep@preprint@font\hep@preprint%
792   \end{varwidth}%
793 }

```

`\placepreprint` Places a preprint number in the top right corner of the title page using the `AT-BEGSHI` [72] and `PICTURE` [73] packages.

```

794 %<title>\RequirePackage{calc}
795 \RequirePackage{atbegshi}
796 \RequirePackage{picture}
797 \newcommand{\placepreprint}{%
798   \AtBeginShipoutFirst{%
799     \put(
800       \textwidth+\oddsidemargin-\widthof{\hep@preprint@box},
801       -2pt-\topmargin-\heightof{\hep@preprint@box}
802     ){\normalfont\hep@preprint@box}
803   }
804 }

```

H.1.2 Series

`\series` Define a series title.

```
805 \newcommand{\preseries}[1]{\def\hep@pre@series{#1}}
806 \newcommand{\series}[1]{\def\hep@series{#1}}
807 \newcommand{\postseries}[1]{\def\hep@post@series{#1}}
```

`\seriesfont` Allow to change the fontface of the series title.

```
808 \let\hep@series@font\relax
809 \newcommand{\seriesfont}[1]{\def\hep@series@font{#1}}
```

Set the default series title layout.

```
810 \preseries{\begin{center}\Large\hep@series@font}
811 \postseries{\par\end{center}}
```

H.1.3 Title

Extend the title using the TITLING package [19]. Fix the footnote indent.

```
812 \RequirePackage{titling}
813 \setlength{\thanksmarkwidth}{1.5em}
```

`\maketitlehooka` Place the preprint and the series title using `\maketitlehooka`.

```
814 \renewcommand{\maketitlehooka}{%
815   \placepreprint\vspace{-\bigskipamount}%
816   \@ifundefined{hep@series}{}{%
817     \hep@pre@series\hep@series\hep@post@series%
818   }%
819   \vspace{-\bigskipamount}%
820 }
```

`\titlefont` Allow to change the fontface of the the title.

```
821 \let\hep@title@font\relax
822 \newcommand{\titlefont}[1]{\def\hep@title@font{#1}}
```

Set default title layout.

```
823 \prettitle{\begin{center}\LARGE\hep@title@font}
824 \postttitle{\par\end{center}}
```

H.1.4 Subtitle

`\subtitle` Define a subtitle.

```
825 \newcommand{\presubtitle}[1]{\def\hep@pre@sub@title{#1}}
826 \newcommand{\subtitle}[1]{\def\hep@sub@title{#1}}
827 \newcommand{\postsubtitle}[1]{\def\hep@post@sub@title{#1}}
```

`\subtitlefont` Allow to change the fontface of the subtitle.

```
828 \let\hep@subtitle@font\relax
829 \newcommand{\subtitlefont}[1]{\def\hep@subtitle@font{#1}}
```

Set default subtitle layout.

```
830 \presubtitle{\begin{center}\Large\hep@subtitle@font}
831 \postsubtitle{\par\end{center}}
```

H.2 Authors and Editors

H.2.1 Editors

Define editors, similar to authors using the AUTHBLK package. Enable the handling of multiple authors with different affiliations using the AUTHBLK package [20].

```
832 \RequirePackage{authblk}
833 \newcounter{editors}
834 \newcommand\hep@editorlist{}
835 \newcommand\hep@editors{}
```

`\editor` Copy of the authblk author code adjusted for editors.

```
836 \newcommand\editor[2][]{%
837   \ifnewaffil%
838     \addtocounter{affil}{1}%
839     \edef\AB@thenote{\arabic{affil}}%
840   \fi%
841   \if\relax#1\relax%
842     \def\AB@note{\AB@thenote}%
843   \else%
844     \def\AB@note{#1}\setcounter{Maxaffil}{0}%
845   \fi%
846   \ifnum\value{editors}>1\relax%
847     \@namedef{@sep\number\c@editors}{\Authsep}%
848   \fi%
849   \addtocounter{editors}{1}%
850   \begingroup%
851     \let\protect\unexpandable@protect \let\and\AB@pand%
852     \def\thanks{\protect\thanks}\def\footnote{\protect\footnote}%
853     \@temptokena=\expandafter{\hep@editors}{%
854       \def\{%
855         \protect\[\@affilsep]\protect\Affilfont\protect\AB@resetsep%
856       }%
857       \xdef\hep@editor{\AB@blk@and#2}%
858     \ifnewaffil%
859       \gdef\AB@las{}\gdef\AB@lasx{\protect\Authand}\gdef\AB@as{}%
860       \xdef\hep@editors{\the\@temptokena\AB@blk@and}%
861     \else%
862       \xdef\hep@editors{\the\@temptokena\AB@as\AB@au@str}%

```

```

863      \global\let\AB@las\AB@lasx\gdef\AB@lasx{\protect\Authands}%
864      \gdef\AB@as{\Authsep}%
865      \fi%
866      \gdef\AB@au@str{#2}%
867  }%
868  \@temptokena=\expandafter{\hep@editorlist}%
869  \let\=\editorcr%
870  \xdef\hep@editorlist{%
871    \the\@temptokena%
872    \protect\@nameuse{@sep\number\c@editors}%
873    \protect\Authfont#2%
874    \if\relax#1\relax\else%
875      \protect\hep@multi@ref{\AB@note}%
876    \fi%
877  }%
878  \endgroup%
879  \ifnum\value{editors}>2\relax%
880    \@namedef{@sep\number\c@editors}{\Authands}%
881  \fi%
882  \newaffilfalse%
883 }

```

`\editorfont` Allow to change the fontface of the editors.

```

884 \let\hep@editor@font\relax
885 \newcommand{\editorfont}[1]{\def\hep@editor@font{#1}}

```

`\preditor` Set editor style.

`\postditor`

```

886 \newcommand{\preeditor}[1]{\def\hep@pre@editor{#1}}
887 \newcommand{\posteditor}[1]{\def\hep@post@editor{#1}}
888 \newcommand{\editortitle}[2]{
889   \def\hep@editor@title{#1}
890   \def\hep@editor@title@pl{#2}
891 }
892 \newcommand{\editortitlefont}[1]{\def\hep@editor@title@font{#1}}
893 \newcommand{\preeditortitle}[1]{\def\hep@pre@editor@title{#1}}
894 \newcommand{\posteditortitle}[1]{\def\hep@post@editor@title{#1}}
895 \editortitle{Editor}{Editors}
896 \editortitlefont{\itshape}
897 \preeditortitle{\hep@editor@title@font}
898 \posteditortitle{: }
899 \preeditor{%
900   \begin{center}%
901     \large\hep@editor@font\lineskip.5em%
902     \begin{tabular}[t]{c}{%
903       \hep@pre@editor@title%
904       \ifnum\value{editors}>1\relax%
905         \hep@editor@title@pl%
906       \else%

```

```

907      \hep@editor@title%
908      \fi%
909      \hep@post@editor@title%
910    }%
911  }
912 \posteditor{\end{tabular}\par\end{center}}

```

`\maketitlehookb` Show subtitle and editor.

```

913 \renewcommand{\maketitlehookb}{%
914   \ifundefined{hep@sub@title}{\fi}%
915   \hep@pre@sub@title\hep@sub@title\hep@post@sub@title%
916 }%
917 \smallskip%
918 \ifx\hep@editorlist\AB@empty\else%
919   \hep@pre@editor\hep@editorlist\hep@post@editor%
920 \fi
921 }

```

H.2.2 Authors

`\author` Allow absent author field.

```

922 % \author{}

```

Switch authblk to a label ref system for affiliations.

```

923 %<title>\RequirePackage{xpatch}
924 \xpatchcmd{\author}{%
925   \protect\AUTHfont#2\AB@authnote{\AB@note}%
926 }{%
927   \protect\AUTHfont#2%
928   \if\relax#1\relax\else\unskip\protect\hep@multi@ref{\AB@note}\fi%
929 }{}{}

```

`\authorfont` Allow to change the fontface of the individual parts of the title.

```

930 \let\hep@author@font\relax
931 \newcommand{\authorfont}[1]{\def\hep@author@font{#1}}
932 \renewcommand\AUTHfont{\hep@author@font}

```

Set default author fontface.

```

933 \newcommand{\authortitle}[2]{
934   \def\hep@author@title{#1}
935   \def\hep@author@title@pl{#2}
936 }
937 \newcommand{\authortitlefont}[1]{\def\hep@author@title@font{#1}}
938 \newcommand{\preauthortitle}[1]{\def\hep@pre@author@title{#1}}
939 \newcommand{\postauthortitle}[1]{\def\hep@post@author@title{#1}}

```

```

940 \author{Author}{Authors}
941 \authorfont{\itshape}
942 \preauthor{\hep@author@font}
943 \postauthor{: }
944 \preauthor{%
945   \begin{center}%
946     \large\hep@author@font\lineskip.5em%
947     \begin{tabular}[t]{c}{%
948       \ifnum\value{editors}>0\relax%
949         \hep@pre@author@title%
950       \ifnum\value{authors}>1\relax%
951         \hep@author@title\pl\else\hep@author@title%
952       \fi\hep@post@author@title%
953     }%
954   }%
955 }
956 \postauthor{\end{tabular}\par\end{center}}

```

H.2.3 Affiliation

Patch the `\affiliation` macro to comply with the label ref system.

```

957 \newcounter{affiliation}
958 \renewcommand{\theaffiliation}{%
959   \textsuperscript{\normalfont\alph{affiliation}}%
960 }
961 \xpatchcmd{\affil}{%
962   \AB@affilnote{\AB@note}%
963 }{%
964   \protect\refstepcounter{affiliation}\protect\label{\AB@note}%
965   \if\relax#1\relax\else\protect\ref{\AB@note}\fi%
966 }{}{}

```

`\affiliationfont` Allow to change the fontface of affiliation.

```

967 \let\hep@affiliation@font\relax
968 \newcommand{\affiliationfont}[1]{\def\hep@affiliation@font{#1}}
969 %<title>\newif\ifhep@lining\hep@liningtrue
970 \ifhep@lining
971   \renewcommand{\Affilfont}{\small\hep@affiliation@font}
972 \else
973   \renewcommand{\Affilfont}{\small\ostyle\hep@affiliation@font}
974 \fi

```

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

```

975 \newcommand\hep@penalty{\if@twocolumn85\else50\fi}
976 \newcommand\hep@active@comma{,\penalty-\hep@penalty\relax}
977 \newcommand\hep@cat@comma@active{\catcode'\,\active}
978 {\hep@cat@comma@active\gdef,{\hep@active@comma}}

```

```

979 \newcommand\hep@affil[1]{%
980   \endgroup\@flushglue=0pt plus .5\linewidth\affil{#1}%
981 }
982 \def\hep@affil@opt[#1]#2{%
983   \endgroup\@flushglue=0pt plus .5\linewidth\affil[#1]{#2}%
984 }
985 \DeclareRobustCommand\hep@affiliation{%
986   \@ifnextchar[{\hep@affil@opt}{\hep@affil}%
987 }
988 \newcommand{\affiliation}{%
989   \begingroup\hep@cat@comma@active\hep@affiliation%
990 }

```

H.3 Date and Abstract

H.3.1 Date

`\date` Allow absent date field.

```

991 \date{\vspace{-4ex}}

```

`\datefont` Allow to change the fontface of the individual parts of the title.

```

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

```

Set the default date fontface.

```

994 \predate{\begin{center}\hep@date@font}
995 \postdate{\par\end{center}}

```

H.3.2 Abstract

`abstract` Adjust the abstract environment to not start with indentation.

```

996 \@ifundefined{abstract}{}{%
997   \let\hep@abstract\abstract%
998   \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` [74] and `ABSTRACT` [75] packages.

```

999   \if@twocolumn
1000     \RequirePackage{environ}
1001     \RequirePackage{abstract}
1002     \renewcommand{\abstitle skip}{-3ex}
1003     \NewEnviron{abstract*}{%
1004       \twocolumn[\maketitle\vspace{-5ex}]%
1005       \begin{onecolabstract}\noindent\BODY\end{onecolabstract}%
1006       \vspace{.5cm}}\saythanks%
1007     }%

```



```

1008 \else
1009 \newenvironment{abstract*}{%
1010 \maketitle\begin{abstract}%
1011 }{%
1012 \end{abstract}%
1013 }
1014 \fi
1015 }

```

H.4 Thanks

`\thanks` Redefine thank to have a optional argument for a reference label.

```

1016 \let\hep@thanks\thanks
1017 \AtEndDocument{\let\thanks\hep@thanks}
1018 % \AddToHook{begindocument/begin}{\let\thanks\hep@thanks}
1019 \DeclareRobustCommand\thanks[2][{}]{%
1020 \AfterEndPreamble{%
1021 % \AddToHook{begindocument/end}{%
1022 \if\relax#1\relax%
1023 \footnotemark%
1024 \else%
1025 \renewcommand\thefootnote{\textsuperscript{\@fnsymbol\c@footnote}}%
1026 \protect\refstepcounter{footnote}\protect\label{#1}%
1027 \renewcommand\thefootnote{\@arabic\c@footnote}%
1028 \fi%
1029 \protected@xdef\@thanks{%
1030 \@thanks\protect\footnotetext[\the\c@footnote]{#2}%
1031 }
1032 \if@twocolumn
1033 \protected@xdef\@bs@thanks{%
1034 \@bs@thanks\protect\footnotetext[\the\c@footnote]{#2}%
1035 }%
1036 \fi%
1037 }%
1038 }

```

`</package|title> <*package>`

End of title conditional.

```

1039 \fi

```

I Bibliography

Check if bibliography management is requested.

```

1040 \ifnum\pdf@strcmp{\hep@bibliography}{false}=0\else

```

```
</package> <*package|bibliography>
```

```
1041 %<bibliography>\def\hep@bibliography{numeric-comp}
1042 %<bibliography>\newif\ifhep@journal\hep@journalfalse
```

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

```
1043 \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.

```
1044 \providecommand{\DeclareSortingTemplate}{\DeclareSortingScheme}
1045 \DeclareSortingTemplate{hep-paper}{
1046   \sort{\citeorder}
1047   \sort[final]{\field{sortkey}}
1048   \sort{\field{sortyear} \field{year} \literal{9999}}
1049   \sort{\field{month}}
1050   \sort{\field{eprint} \field{doi}}
1051   \sort{\field{sorttitle} \field{title}}
1052   \sort{\field{subtitle} \field{volume}}
1053 }
```

Use the new sorting scheme and abbreviat all first names.

```
1054 \ExecuteBibliographyOptions{
1055   sorting=hep-paper,
1056   safeinputenc,
1057   giveninits=true,
1058   maxbibnames=7
1059 }
```

Shrink the bibliography in two column mode.

```
1060 \ifhep@journal\else
1061   \if@twocolumn
1062     \AtBeginBibliography{\small}
1063     \setlength\biblabeledsep{\labelsep}
1064   \fi
1065 \fi
```

translationof Redefine the `translationof` string to fit better to documents without a original title.

```
1066 \DefineBibliographyStrings{english}{translationof={Original}}
```

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

```
1067 \NewBibliographyString{erratum,erratums}
1068 \DefineBibliographyStrings{english}{erratum={Erratum},erratums={Errata}}
1069 \providecommand{\relateddelimerratum}{\addsemicolon\space}
```

Activate the Oxford comma when using `british` and separate title and subtitle with a colon.

```
1070 \DefineBibliographyExtras{british}{\def\finalandcomma{\addcomma}}
1071 \renewcommand{\subtitlepunct}{\addcolon\addspace}
```

`\printbibliography` Allow the bibliography to be printed sloppy

```
1072 \let\hep@printbibliography\printbibliography
1073 \renewcommand{\printbibliography}{\sloppy\hep@printbibliography}
```

I.1 Sourcemap

`\reg@exp@one` 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.

```
\reg@exp@url
\reg@exp@pmc
1074 \newcommand{\reg@exp@one}{\regexp{\A(\p{L}+)?\d+(\p{L}+)?\Z}}
1075 \newcommand{\reg@exp@two}{\regexp{\A(\p{L}+)?(\d+)(\p{L}+)?\Z}}
1076 \newcommand{\reg@exp@url}{\regexp{\A(ht|f)tp(s)?://\Z}}
1077 \newcommand{\reg@exp@pmc}{\regexp{\A(PMC)?\Z}}
```

`\DeclareSourcemap` Use the `\DeclareSourcemap` feature.

```
1078 \DeclareSourcemap{%
1079   \maps[datatype=bibtex, overwrite=true]{%
```

`collaboration` Read the collaboration information if present.

```
1080   \map{%
1081     \step[fieldsource=Collaboration, final=true]%
1082     \step[fieldset=collaboration, origfieldval, final=true]
1083   }%
```

`reportnumber` Read the pre-print information if present.

```
1084   \map{%
1085     \step[fieldsource=reportNumber, final=true]%
1086     \step[fieldset=reportnumber, origfieldval, final=true]
1087   }%
```

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

```
1088   \map[overwrite]{
1089     \pertype{article}
1090     \step[fieldsource=volume, match=\reg@exp@one, final]
1091     \step[fieldsource=volume, match=\reg@exp@two, replace={$2}]
1092     \step[fieldsource=journal, fieldtarget=journaltitle]
1093     \step[fieldset=journaltitle, fieldvalue={\space$1$2}, append=true]
1094   }
```

url Remove the protocol from URL.

```
1095     \map{
1096         \step[fieldsource=url, final=true]
1097         \step[fieldset=protocollessurl, origfieldval, final=true]
1098         \step[fieldsource=protocollessurl, match=\reg@exp@url, replace={}]
1099     }
```

pmc Remove the PMC from the PMCID.

```
1100     \map{
1101         \step[fieldsource=pmcid, final=true]
1102         \step[fieldset=pmc, origfieldval, final=true]
1103         \step[fieldsource=pmc, match=\reg@exp@pmc, replace={}]
1104     }
1105 }%
1106 }
```

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

```
1107 \providecommand{\letbibmacro}[2]{\csletcs{abx@macro@#1}{abx@macro@#2}}
```

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

```
1108 \renewbibmacro*{author/translator+others}{%
1109     \ifboolexpr{
1110         test \ifuseauthor and (
1111             not test {\ifnameundef{author}} or
1112             not test {\iffieldundef{collaboration}}
1113         )
1114     }
1115     {\usebibmacro{author}}
1116     {\usebibmacro{translator+others}}
1117 }
1118 \letbibmacro{hep@bib@author}{author}
1119 \renewbibmacro*{author}{%
1120     \iffieldundef{collaboration}{%
1121         \usebibmacro{hep@bib@author}}{\textit{\printfield{collaboration}}}%
1122     }%
1123 }
```

In: Remove spurious ‘In:’ if no journal is present.

```
1124 \renewbibmacro*{in:}{%
1125     \iffieldundef{journalttitle}{\printtext{\bibstring{in}\intitlepunct}}%
1126 }
```

reportnumber Print the reportnumber as commalist

```

1127 %<bibliography>\RequirePackage{relsize}
1128 \DeclareFieldFormat{reportnumber}{%
1129   \edef\commalistbody{\forcsvfield{%
1130     \egroup\noexpand\item\unexpanded{\bgroup\smaller[.5]\textsc}
1131   }\reportnumber}}%
1132   \expandafter\commalist\commalistbody\egroup\endcommalist%
1133 }

```

url Show URLs without the protocol.

```

1134 \DeclareFieldFormat{url}{%
1135   \mkbibacro{URL}\addcolon\space\online{#1}{\thefield{protocollessurl}}%
1136 }

```

\bib@online Private \bib@online macro

```

1137 \newcommand{\bib@online}[2]{%
1138   \ifhyperref{\online{#1}{#2}}{\nolinkurl{#2}}%
1139 }

```

pmid Present PubMed IDs.

```

pmcid
1140 \DeclareFieldFormat{pmid}{%
1141   \mkbibacro{PM}\addcolon\space%
1142   \bib@online{https://www.ncbi.nlm.nih.gov/pubmed/#1}{#1}%
1143 }
1144 \DeclareFieldFormat{pmc}{%
1145   \mkbibacro{PMC}\addcolon\space%
1146   \bib@online{https://www.ncbi.nlm.nih.gov/pmc/articles/PMC#1}{#1}%
1147 }

```

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

```

pmid
reportnumber
1148 \letbibmacro{hep-doi+eprint+url}{doi+eprint+url}
1149 \renewbibmacro*{doi+eprint+url}{%
1150   \usebibmacro{hep-doi+eprint+url}
1151   \iffieldundef{pmc}{%
1152     \iffieldundef{pmid}{}{\printfield{pmid}\newunit}%
1153   }\printfield{pmc}\newunit}
1154   \iffieldundef{reportnumber}{}{%
1155     \newunitpunct\textnumero\intitlepunct%
1156     \printfield{reportnumber}\newunit%
1157   }%
1158 }

```

I.2 Eprints

\new@eprint Private \new@eprint macro

```

1159 \NewDocumentCommand{\new@eprint}{smm}{

```

```

1160 \DeclareFieldFormat{eprint:#2}{%
1161   \newcommand{\@path}{\IfBooleanT{#1}{\thefield{eprintclass}}{##1}}%
1162   #2\addcolon\space\bib@online{#3/\@path}{\@path}%
1163 }%
1164 }

```

CTAN Add CTAN as a eprint option

```

1165 \new@eprint{CTAN}{https://ctan.org/pkg}
1166 \DeclareFieldAlias{eprint:ctan}{eprint:CTAN}

```

GitHub Add GitHub as a eprint option

```

1167 \new@eprint*{GitHub}{https://github.com}
1168 \DeclareFieldAlias{eprint:github}{eprint:GitHub}

```

GitLab Add GitLab as a eprint option

```

1169 \new@eprint*{GitLab}{https://gitlab.com}
1170 \DeclareFieldAlias{eprint:gitlab}{eprint:GitLab}

```

Bitbucket Add Bitbucket as a eprint option

```

1171 \new@eprint*{Bitbucket}{https://bitbucket.org}
1172 \DeclareFieldAlias{eprint:bitbucket}{eprint:Bitbucket}

```

Launchpad Add Launchpad as a eprint option

```

1173 \new@eprint{Launchpad}{https://launchpad.net}
1174 \DeclareFieldAlias{eprint:launchpad}{eprint:Launchpad}

```

SourceForge Add SourceForge as a eprint option

```

1175 \new@eprint{SourceForge}{https://sourceforge.net/projects}
1176 \DeclareFieldAlias{eprint:launchpad}{eprint:SourceForge}

```

HEPForge Add HEPForge as a eprint option

```

1177 \DeclareFieldFormat{eprint:hepforge}{%
1178   HEPForge\addcolon\space\bib@online{https://#1/hepforge.org}{#1}}%
1179 }
1180 \DeclareFieldAlias{eprint:HEPForge}{eprint:hepforge}

```

</package|bibliography> <*package>

End check for bibliography option.

```

1181 \fi

```

J Hyperlinks, Footnotes and References

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

```
1182 \RequirePackage{hyperref}
1183 \hypersetup{
1184   pdfencoding=auto, psdextra,
1185   hidelinks, linktoc=all, breaklinks=true,
1186   pdfcreator={}, pdfproducer={}
1187 }
```

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

```
1188 \pdfstringdefDisableCommands{\def\varepsilon{\textepsilon}}
1189 \pdfstringdefDisableCommands{\def\to{\textrightarrow}}
1190 \AtBeginDocument{
1191   \pdfstringdefDisableCommands{\let\ensuremath@gobble}
1192   \pdfstringdefDisableCommands{\let\mathsurround@gobble}
1193   \pdfstringdefDisableCommands{\let\unskip@gobble}
1194   \pdfstringdefDisableCommands{\let\thanks@gobble}
1195   \pdfstringdefDisableCommands{\let\footnote@gobble}
1196   \pdfstringdefDisableCommands{\let\\\@gobble}
1197 }
1198 \ifhep@revtex
1199   \AtBeginShipout{\hypersetup{pdftitle={\@title}}}}
1200 \else
1201   \ifhep@beamer\else
1202     \AtBeginDocument{\hypersetup{pdftitle={\@title}}}}
1203   \fi
1204 \fi
1205 \ifhep@title
1206   \AtBeginDocument{\hypersetup{pdfauthor=\AB@authlist}}
1207 \else
1208   \ifhep@beamer\else
1209     \ifhep@pos\else\AtBeginDocument{\hypersetup{pdfauthor={\@author}}}\fi
1210   \fi
1211 \fi
```

J.1 Footnotes

Place a hyperlink from the footnote back to its referencing label using the FOOTNOTE-BACKREF package [76].

```
1212 \def\BackrefFootnoteTag{}
1213 \RequirePackage{footnotebackref}
```

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

```
1214 \let\@foot@note\footnote
1215 \renewcommand{\footnote}[1]{\unskip\@foot@note{\ignorespaces#1}}
```

J.2 References

Begin of references conditional

```
1216 \ifhep@references
```

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

```
1217 \RequirePackage[noabbrev, nameinlink]{cleveref}
1218 \newcommand{\creflastconjunction}{, and\nobreakspace}
1219 \crefname{enumi}{point}{points}
1220 \crefname{inlinelisti}{point}{points}
```

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

```
1221 \newcommand\no@break@before{%
1222   \relax\ifvmode\else%
1223     \ifhmode%
1224       \ifdim\lastskip > 0pt%
1225         \relax\unskip\nobreakspace%
1226       \fi%
1227     \fi%
1228   \fi%
1229 }
```

`\ref` Adjust `\ref{<key>}` in order to prevent preceding line breaks.

```
1230 \let\hep@ref\ref
1231 \AtBeginDocument{\renewcommand\ref{\no@break@before\hep@ref}}
```

`\eqref` Adjust `\eqref{<key>}` in order to prevent preceding line breaks.

```
1232 \renewcommand\eqref{\no@break@before\labelcref}
```

`\subref` Adjust `\subref{<key>}` in order to prevent preceding line breaks.

```
1233 \let\hep@subref\subref
1234 \renewcommand\subref{\no@break@before\hep@subref}
1235 \renewcommand*\subcaption@ref[2]{\begingroup%
1236   \caption@setoptions{sub}%
1237   \subcaption@reffmt\p@subref{\hep@ref#1{sub@#2}}}%
1238 \endgroup}
```

`\subcref` Provide the `\subcref` macro.

```
1239 \newcommand{\subcref}[1]{\cref{sub@#1}}
```

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

```
1240 \NewDocumentCommand{\eqcrefname}{mmo}{
```



```

1241 \crefname{#1}{#2}{\IfValueTF{#3}{#3}{#2s}}
1242 \creflabelformat{#1}{(##2##1##3)}
1243 }

```

`\labelcrefrange` Define the missing `\labelcrefrange{<key1>}{<key2>}` macro.

```

1244 \DeclareRobustCommand{\labelcrefrange}[2]{%
1245   \@crefrangenostar{labelcref}{#1}{#2}%
1246 }

```

Adjust the title page

```

1247 \ifhep@title
1248   \labelcrefmultiformat{affiliation}{#2#1#3}{%
1249     \textsuperscript,#2#1#3}{\textsuperscript,#2#1#3%
1250   }{%
1251     \textsuperscript,#2#1#3%
1252   }
1253   \labelcrefrangeformat{affiliation}{#3#1#4\textsuperscript{--}#5#2#6}
1254 %   \thanksmarkseries{alph}
1255 \fi

```

End of references conditional

```

1256 \fi

```

J.3 Citations

`\cite` Adjust `\cite{<key>}` in order to prevent preceding line breaks.

```

1257 \let\hep@cite\cite
1258 \renewcommand\cite{\no@break@before\hep@cite}

```

Begin of bibliography if.

```

1259 \ifnum\pdf@strcmp{\hep@bibliography}{false}=0\else

```

Define bibstrings for reference names.

```

1260 \NewBibliographyString{refname}
1261 \NewBibliographyString{refsname}
1262 \DefineBibliographyStrings{english}{%
1263   refname = {reference},
1264   refsname = {references}
1265 }

```

`\ccite` Define *clever* citation macros.

```

\Ccite
1266 \DeclareCiteCommand{\ccite}{%
1267   \ifnum\thecitetotal=1
1268     \bibstring{refname}%

```

```

1269 \else%
1270 \bibstring{refsnam}%
1271 \fi%
1272 \addnbspace\bibopenbracket%
1273 \usebibmacro{cite:init}\usebibmacro{prenote}%
1274 }\usebibmacro{cite:index}\usebibmacro{cite:comp}}\}{%
1275 \usebibmacro{cite:dump}\usebibmacro{postnote}%
1276 \bibclosebracket%
1277 }
1278
1279 \newrobustcmd*{\Ccite}{\bibsentence\ccite}

```

End of biblatex if.

```
1280 \fi
```

K Acronyms

Define acronyms if not deactivated.

```
1281 \ifhepglossaries
```

```
</package> <*package|acronyms>
```

Acronyms are implemented with the GLOSSARIES-EXTRA package [77] which is an extension of the GLOSSARIES package [12] and must be loaded after the HYPERREF package in appendix J. Set the abbreviation style.

```

1282 \RequirePackage[nostyles]{glossaries-extra}
1283 \setabbreviationstyle{long-hyphen-short-hyphen}

```

The entry count feature is used.

```

1284 \glsenableentrycount
1285 \glsssetcategoryattribute{abbreviation}{entrycount}{1}

```

Provide macros for older glossaries-extra installations.

```

1286 \AtEndOfPackage{
1287 \ifpackageloaded{hyperref}{
1288 \providecommand{\glxtrusefield}[2]{\@gls@entry@field{#1}{#2}}
1289 \providecommand{\glxtrsetfieldifexists}[3]{\glsdoifexists{#1}{#3}}
1290 \providecommand{\gGlsXtrSetField}[3]{%
1291 \glxtrsetfieldifexists{#1}{#2}{%
1292 \csgdef{glo@glstdetoklabel{#1}@#2}{#3}%
1293 }%
1294 }

```

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

```
1295 \glsssetcategoryattribute{abbreviation}{nohyperfirst}{true}
```

```

1296 \renewcommand*{\glsdonohyperlink}[2]{%
1297 \glsxtrprotectlinks\edef\fieldvalue{%
1298 \glsxtrusefield{\glslabel}{hastarget}%
1299 }%
1300 \ifdefstring\fieldvalue{true}{#2}{%
1301 \glsXtrSetField{\glslabel}{hastarget}{true}%
1302 \glsdohypertarget{#1}{#2}%
1303 }%
1304 }}
1305 }\providecommand{\pdfstringdefDisableCommands}[1]{}
1306 }

```

`\begin@sentence` Mark the beginning of a paragraph as if it would follow a full stop using the `EVERYHOOK` package [78].

```

1307 \RequirePackage[excludeor]{everyhook}
1308 \newcommand{\begin@sentence}{1001}
1309 \PushPostHook{par}{\spacefactor=\begin@sentence}

```

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

```

1310 \def\frenchspacing{%
1311 \sfcode'\.\begin@sentence \sfcode'?\begin@sentence
1312 \sfcode'\!\begin@sentence \sfcode'\:\begin@sentence
1313 \sfcode'\;\@m \sfcode'\,\@m
1314 }

```

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

```

1315 \newcommand{\if@begin@of@sentence}[2]{\leavevmode\protecting{%
1316 \ifboolexpr{ test {\ifnumcomp{\spacefactor}{=}{3000}} or%
1317 test {\ifnumcomp{\spacefactor}{=}{2000}} or%
1318 test {\ifnumcomp{\spacefactor}{=}{\begin@sentence}}}%
1319 }{#1}{#2}%
1320 }}

```

`\acronym` The `\acronym*[\typeset abbreviation]{\langle abbreviation \rangle*{\langle definition \rangle}[\langle plural definition \rangle]}` 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

```

1321 %<acronyms>\RequirePackage{xspace}
1322 \NewDocumentCommand{\acronym}{\somsmo}{

```

```

1323 \newabbreviation[
1324     type=\acronymtype,
1325     sort=#3,
1326     \glsshortpluralkey=\IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}},
1327     longplural=\IfNoValueTF{#6}{#5s}{#6}
1328 ]{#3}{\IfNoValueTF{#2}{#3}{#2}}{#5}

```

Provide the singular acronym macro.

```

1329 \expandafter\newcommand\csname#3\endcsname[1][\{%
1330     \if@begin@of@sentence{%
1331         \ifglused{#3}{\cgl{s}{#3}[##1]}\{\cgl{s}{#3}[##1]}\%
1332     }\{\cgl{s}{#3}[##1]}\%
1333     \ifnum\glentrycurrcount{#3}>1\relax
1334         \IfBooleanTF{#4}{\@{\xspace}}%
1335     \else\@{\xspace}\fi
1336 }

```

Expand the singular acronym macro in PDF labels.

```

1337 \pdfstringdefDisableCommands{\expandafter\def\csname#3\endcsname{%
1338     \IfNoValueTF{#2}{#3}{#2} }%
1339 }

```

Provide the singular acronym macro in math mode.

```

1340 \expandafter\mathdef\csname#3\endcsname{%
1341     \text{\glxtrshort{#3}}\@gls@increment@currcount{#3}%
1342 }

```

Provide the plural acronym macro.

```

1343 \expandafter\newcommand\csname#3s\endcsname[1][\{%
1344     \if@begin@of@sentence{\cgl{spl}{#3}[##1]}\{\cgl{spl}{#3}[##1]}\%
1345     \IfBooleanTF{#4}{\@{\xspace}}%
1346 }

```

Expand the plural acronym macro in PDF labels.

```

1347 \pdfstringdefDisableCommands{\expandafter\def\csname#3s\endcsname{%
1348     \IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s} }%
1349 }

```

Provide the plural acronym macro in math mode.

```

1350 \expandafter\mathdef\csname#3s\endcsname{%
1351     \text{\glxtrshortpl{#3}}\@gls@increment@currcount{#3}%
1352 }
1353 }

```

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

```

1354 \NewDocumentCommand{\shortacronym}{somsmo}{

```

Provide the singular acronym macro.

```

1355 \expandafter\newcommand\csname#3\endcsname[1][1]{%
1356   \IfNoValueTF{#2}{#3}{#2}\IfBooleanTF{#4}{1}{\@xspace}##1%
1357 }

```

Expand the singular acronym macro in PDF labels.

```

1358 \pdfstringdefDisableCommands{\expandafter\def\csname#3\endcsname{%
1359   \IfNoValueTF{#2}{#3}{#2} }%
1360 }

```

Provide the singular acronym macro in math mode.

```

1361 \expandafter\mathdef\csname#3\endcsname{%
1362   \text{\IfNoValueTF{#2}{#3}{#2}}%
1363 }

```

Provide the plural acronym macro.

```

1364 \expandafter\newcommand\csname#3s\endcsname[1][1]{%
1365   \IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}}%
1366   \IfBooleanTF{#4}{1}{\@xspace}##1%
1367 }

```

Expand the plural acronym macro in PDF labels.

```

1368 \pdfstringdefDisableCommands{\expandafter\def\csname#3s\endcsname{%
1369   \IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}} }%
1370 }

```

Provide the plural acronym macro in math mode.

```

1371 \expandafter\mathdef\csname#3s\endcsname{%
1372   \text{\IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}}}%
1373 }%
1374 }

```

`\longacronym` The `\longacronym` never shows the abbreviated form.

```

1375 \NewDocumentCommand{\longacronym}{somsmo}{

```

Provide the singular acronym macro.

```

1376 acronyms
1377 \expandafter\newcommand\csname#3\endcsname[1][1]{%
1378   \if@begin@of@sentence{\MakeUppercase#5}{#5}%
1379   \IfBooleanTF{#4}{1}{\@xspace}##1%
1380 }

```

Expand the singular acronym macro in PDF labels.

```

1381 \pdfstringdefDisableCommands{\expandafter\def\csname#3\endcsname{#5 }}

```

Provide the plural acronym macro.

```

1382 \expandafter\newcommand\csname#3s\endcsname[1][\{
1383 \if@begin@of@sentence{
1384 \IfNoValueTF{#6}{\MakeUppercase#5s}{\MakeUppercase#6}%
1385 }{
1386 \IfNoValueTF{#6}{#5s}{#6}}\IfBooleanTF{#4}{\@xspace}##1%
1387 }

```

Expand the plural acronym macro in PDF labels.

```

1388 \pdfstringdefDisableCommands{\expandafter\def\csname#3s\endcsname{
1389 \IfNoValueTF{#6}{#5s}{#6} }%
1390 }
1391 }

```

Silence warning if no acronyms are defined.

```

1392 \renewcommand*{\@gls@write@entrycounts}{
1393 \immediate\write\@auxout{
1394 \string\providecommand*\string\@gls@entry@count}[2]{
1395 }%
1396 \count@=0\relax
1397 \forallglsentries{\@glsentry}{
1398 \glshasattribute{\@glsentry}{entrycount}{
1399 \ifglused{\@glsentry}{
1400 \immediate\write\@auxout{
1401 \string\@gls@entry@count{\@glsentry}{
1402 \glsentrycurrcount{\@glsentry}%
1403 }
1404 }%
1405 }{ }\advance\count@ by \@ne
1406 }{ }%
1407 }%
1408 }

```

`\resetacronym` Add two macros for acronym management.

```

\dummyacronym
1409 \newcommand{\resetacronym}[1]{\protect\glsreset{#1}}
1410 \newcommand{\dummyacronym}[1]{\protect\glsunset{#1}}

```

`abstract` Adjust the `abstract` environment to reset all acronym counters.

```

1411 \@ifundefined{endabstract}{\}{
1412 \let\end@hep@abstract\endabstract%
1413 \renewcommand\endabstract{\glsresetall\end@hep@abstract}%
1414 }

```

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

```

\listoffigures
\listoftables
1415 \let\hep@table@of@contents\tableofcontents

```

```

1416 \renewcommand\tableofcontents{%
1417   \glsunsetall\hep@table@of@contents\glsresetall%
1418 }
1419 \let\hep@list@of@figures\listoffigures
1420 \renewcommand\listoffigures{%
1421   \glsunsetall\hep@list@of@figures\glsresetall%
1422 }
1423 \let\hep@list@of@tables\listoftables
1424 \renewcommand\listoftables{%
1425   \glsunsetall\hep@list@of@tables\glsresetall%
1426 }

```

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

```

1427 \NewDocumentCommand{\acronyms}{\om}{\%
1428   \IfNoValueTF{#1}{
1429     \newglossary{#2}{#2.in}{#2.out}{#2}%
1430     \renewcommand{\acronymtype}{#2}%
1431   }{
1432     \newglossary{#1}{#1.in}{#1.out}{#2}%
1433     \renewcommand{\acronymtype}{#1}%
1434   }
1435 }

```

`</package|acronyms>` `<*package>`

End of glossaries if.

```
1436 \fi
```

`</package>` `</package|title|font|math|floats|acronyms|bibliography>`

L Biblatex datamodel file

`<*datamodel>`

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

```

      pmid
      pmcid 1437 \DeclareDatamodelFields[type=field, datatype=literal]{
      pmc    1438   collaboration, pmid, pmcid, pmc,
1439 }
reportnumber 1440 \DeclareDatamodelFields[type=field, format=xsv, datatype=literal]{
protocollessurl 1441   reportnumber,
1442 }
1443 \DeclareDatamodelFields[type=field, datatype=uri]{protocollessurl}
1444 \DeclareDatamodelEntryfields{
1445   collaboration, pmid, pmcid, pmc, reportnumber, protocollessurl,
1446 }

```

`</datamodel>`

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Change History

v1.0		v1.2	
General: Initial version of the style file.	1	General: Introduction of package options.	1
v1.1			
General: Transition to documented L ^A T _E X source file.	1	v1.3	
		General: Inclusion of JHEP and	

	JCAP package options. Fix of incompatibility with recent subcaption package version. Move of biblatex datamodel into its own file	1		
v1.4	General: If possible the compatibility options are selected automatically. Inclusion of PubMed IDs in bibliography.	1	v1.6	General: Implementation of the twocolumn mode.
				1
			v1.7	General: Introduction of dedicated style file for the title, acronyms and bibliography macros. Extension of the title macros. . . .
				1
v1.5	General: Reduce the number of math alphabets used in sans serif mode. Add more title options such as a subtitle. Use standard class options.	1	v1.8	General: Expand thanks to allow for reference label and fine tune the title page. Reimplement the must relevant macros from the physics package. Make mathrm produce upright Greek.
				1