

# The `hep-paper` package\*

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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` v1.3.

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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<sup>A</sup>T<sub>E</sub>X defaults. The paper and font sizes are set to A4 and 11 pt, respectively. Additionally, the paper geometry is set to the values known from the (deprecated) `a4wide` package [2] using the `geometry` package [3]. Furthermore, the font is changed to `lmodern` [4] with `microtype` [5] optimizations. Finally, portable document format (PDF) hyperlinks are implemented with the `hyperref` package [6].

## 1.1 Options

- |                 |   |
|-----------------|---|
| paper           | The <code>paper=<i>&lt;format&gt;</i></code> option loads the specified paper format. The possible <i>&lt;formats&gt;</i> are: <code>a0</code> , <code>a1</code> , <code>a2</code> , <code>a3</code> , <code>a4</code> , <code>a5</code> , <code>a6</code> , <code>b0</code> , <code>b1</code> , <code>b2</code> , <code>b3</code> , <code>b4</code> , <code>b5</code> , <code>b6</code> , <code>c0</code> , <code>c1</code> , <code>c2</code> , <code>c3</code> , <code>c4</code> , <code>c5</code> , <code>c6</code> , <code>ansia</code> , <code>ansib</code> , <code>ansic</code> , <code>ansid</code> , <code>ansie</code> , <code>letter</code> , <code>executive</code> , <code>legal</code> . |
| font            | The <code>font=<i>&lt;size&gt;</i></code> option loads the specified font size. The possible <i>&lt;sizes&gt;</i> are: <code>8pt</code> , <code>9pt</code> , <code>10pt</code> , <code>11pt</code> , <code>12pt</code> , <code>14pt</code> , <code>17pt</code> , <code>20pt</code> .  |
| defaults        | The <code>defaults</code> option prevents the adjustment of the page geometry and the font size set by the document class.  |
| lang            | The <code>lang=<i>&lt;name&gt;</i></code> option switches the document language to the chosen value. The possible values are given by the <code>babel</code> package [7]. The default is <code>british</code> .   |
| parskip         | The <code>parskip</code> option makes use of the <code>parskip</code> package [8] and changes how two paragraphs are separated from each other. The L <sup>A</sup> T <sub>E</sub> X default is separation via indentation the <code>parskip</code> option switches to separation via vertical space. <sup>1</sup>   |
| sansserif       | The <code>sansserif</code> option switches the document including math to sans serif font shape.  |
| title           | The <code>title=false</code> option deactivates the title page adjustments.   |
| manualplacement | The <code>manualplacement</code> option reactivates manual float placement.   |
| bibliography    | The <code>bibliography=<i>&lt;key&gt;</i></code> option prevents the automatic loading of the <code>biblatex</code> package [9] if <i>&lt;key&gt;</i> = <code>false</code> . Otherwise the <i>&lt;key&gt;</i> is passed as <code>style</code> string to the <code>biblatex</code> package.  |
| glossaries      | The <code>glossaries=false</code> option deactivates the use of the <code>glossaries</code> package [10].   |
| jhpeg           | The <code>jhpeg</code> option activates the JHEP [11] compatibility mode.   |
| jcap            | The <code>jcap</code> option activates the JCAP [12] compatibility mode.  |
| revtex          | The <code>revtex</code> option activates the REVTeX [13] compatibility mode.  |

---

<sup>1</sup>The `parskip` option is used for this document.

- `pos` The `pos` option activates the PoS compatibility mode.
- `eqnarray` The `eqnarray` option reactivates the deprecated `eqnarray` environment.

## 2 Macros and environments

### 2.1 Title page

- `\author` In order to facilitate multiple authors with different affiliations the `authblk` package [14] is loaded. The following lines add *e.g.* two authors with different affiliations
- `\affiliation`
- `\email` `\author[1]{Author one \email{Email one}}`  
`\affiliation[1]{Affiliation one}`  
`\author[2]{Author two \email{Email two}}`  
`\affiliation[1,2]{Affiliation two}`
- `\title` The PDF meta information is set according to the `\title{<text>}` and `\author{<text>}` information.
- `\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.

### 2.2 Text

- Hyphenation is provided by the `babel` package [7] and quotation commands are provided by the `csquotes` package [15] recommended by the `babel` package. The latter package provides the convenient macros `\enquote{<text>}` and `\MakeOuterQuote{<text>}` allowing to leave the choice of quotation marks to L<sup>A</sup>T<sub>E</sub>X and use " instead of the pair ‘ ‘ and ’ ’, respectively.
- `\enquote`
- `\MakeOuterQuote`
- `\eg` The `foreign` package [16] 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 № 123.
- `\software` The `\software[<version>]{<name>}` macro is typeset as HEP-PAPER v1.3.
- `\online` The `\online{<url>}{<text>}` macro combines the features of the `\href{<url>}{<text>}` [6] and the `\url{<text>}` [17] macros, resulting in *e.g.* `ctan.org/pkg/hep-paper`.
- The `inlinelist` and `enumdescript` environments are defined using the `enumitem` package [18].

<code>inlinelist</code>	<p>The three main points are</p> <pre> \begin{inlinelist}   \item one   \item two   \item three \end{inlinelist} </pre>	<p>The three main points are i) one, ii) two, and iii) three.</p>
<code>enumdescript</code>	<pre> \begin{enumdescript}[label=\Roman*])   \item{First} one   \item{Second} two   \item{Third} three \end{enumdescript} </pre>	<p>I) <b>First</b> one  II) <b>Second</b> two  III) <b>Third</b> three</p>
<code>\textsc</code>	<p>A sans serif version of SMALL CAPS is provided, using the <code>sansmathfonts</code> package [19].</p>	
<code>\underline</code> <code>\overline</code>	<p>The <code>\underline</code> macro is redefined to allow linebreaks using the <code>soul</code> package [20].  The <code>\overline</code> macro is extended to also <u>overline</u> text outside of math environments.</p>	
<code>\useparskip</code> <code>\useparindent</code>	<p>If the <code>\parskip</code> option is activated the <code>\useparindent</code> macro switches back the usual parindent mode, while the <code>\useparskip</code> macro switches to the <code>\parskip</code> mode.</p>	

### 2.2.1 References and footnotes

<code>\cref</code>	<p>References are extended with the <code>cleveref</code> package [21], which allows to <i>e.g.</i> just type <code>\cref{&lt;key&gt;}</code> in order to write ‘Figure 1’. Furthermore, the <code>cleveref</code> package allows to reference multiple objects within one <code>\cref{&lt;key1,key2&gt;}</code>.</p>
<code>\cite</code>	<p>Citations are adjusted to not start on a new line in order to avoid the repeated use of <code>\cite{&lt;key&gt;}</code>.</p>
<code>\ref</code> <code>\eqref</code>	<p>References are also adjusted to not start on a new line and are redefined in order to handle multiple references at once.</p>
<code>\subref</code> <code>\footnote</code>	<p>Footnotes are adjusted to swallow white space before the footnote mark and at the beginning of the footnote text.</p>

### 2.2.2 Acronyms

<code>\acronym</code> <code>\shortacronym</code> <code>\longacronym</code>	<p>The <code>\acronym{&lt;*&gt;[&lt;typeset abbreviation&gt;]{&lt;abbreviation&gt;}{&lt;*&gt;}{&lt;definition&gt;}[&lt;plural definition&gt;]}</code> macro generates the singular <code>\&lt;abbreviation&gt;</code> and plural <code>\&lt;abbreviation&gt;s</code> macros. The first star prevents the addition of an ‘s’ to the abbreviation plural. The second star restores the T<sub>E</sub>X 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. Capitalization at the beginning of paragraphs and sentences is ensured. The <code>\shortacronym</code> and <code>\longacronym</code> macros only show the short or long form of their acronym. The first use form of the acronym can be enforced by resetting the acronym counter. If the acronym counter</p>
<code>\resetacronym</code> <code>\dummyacronym</code>	

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` [22] and `amssymb` [23] packages are loaded. They in turn load the  $\mathcal{A}\mathcal{M}\mathcal{S}$ - $\text{\LaTeX}$  `amsmath` [24] and `amsfonts` [23] packages. Details about the font handling in  $\text{\LaTeX}$  can be found in [25]. Bold math, including `\mathbf` is provided by the `bm` package [26], *i.e.* ( $Ab\Gamma\delta\mathbf{A}\mathbf{b}\mathbf{\Gamma}\mathbf{\delta}$ ). Macros switching to `bfseries` such as `\section{<text>}` are ensured to also typeset math in bold. This may cause trouble if bold symbols carry an additional non-implicit meaning. The `\text{<text>}` macro makes it possible to write text within math mode, *i.e.* ( $Ab\Gamma\delta\mathbf{A}\mathbf{b}\mathbf{\Gamma}\mathbf{\delta}$ ). The often used `\mathrm{<text>}` and `\rm{<text>}` macros are *not* the correct tool for this purpose, as they switch to roman font shape. This behaviour conflicts *e.g.* with the `sansserif` package option. 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.* ( $Ab\Gamma\delta\mathbf{A}\mathbf{b}\mathbf{\Gamma}\mathbf{\delta}$ ). The `\mathcal` font *i.e.* ( $\mathcal{A}\mathcal{B}\mathcal{C}\mathcal{D}$ ) is accompanied by the `\mathscr` font *i.e.* ( $\mathscr{A}\mathscr{B}\mathscr{C}\mathscr{D}$ ). The `\mathbb` font is changed by the `bbm` [27] package and adjusted depending on the `sansserif` option *i.e.* ( $\mathbb{A}\mathbb{1}\mathbf{A}\mathbf{b}\mathbb{1}$ ).

The `\frac{<number>}{<number>}` macro is accompanied by `\nicefrac{<number>}{<number>}` and `\flatfrac{<number>}{<number>}` leading to  $\frac{1}{2}$ ,  $\frac{1}{2}$ , and  $\frac{1}{2}$ .

A diagonal matrix operator is defined `\diag`.

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

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

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

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 should be used instead.

### 2.3.1 Physics

Greek letters are adjusted to always be italic and upright in math and text mode, respectively, using the `fixmath` [28] and `alphabetalpha` [29] packages. This allows differentiations like

$$\sigma = 5 \text{ fb} , \quad \text{at } 5 \sigma \text{ C.L.} , \quad \mu = 5 \text{ cm} , \quad l = 5 \mu\text{m} , \quad (1)$$

```

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

```

(a) Code for this panel environment.

one		two	
a	b	c	d
	b	c	d

(b) The `booktabs` and `multirow` features.

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

and *e.g.* to distinguish gauge  $\nu$  and mass  $\nu$  eigenstates in models with massive neutrinos. Additionally, Greek letters can also be directly typed using Unicode.

`\ev` The `physics` package [30] provides additional macros such as

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

`\comm`

`\order` The `\slashed{<character>}` macro from the `slashed` [31] package allows to use the Dirac slash notation.

`\slashed`

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

`\unit` The correct spacing for units, *cf.* equation (1), 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  $5\text{ fb}^{-1}$  typeset via `\unit[5]{\inv{fb}}`.

## 2.4 Floats

`figure` Automatic float placement is adjusted to place a single float at the top of pages and to reduce the number of float pages. The most useful float placement is usually archived by placing the float *in front* of the paragraph it is referenced in first. Additionally, manual float placement is deactivated but can be reactivated using the `manualplacement` package option. The float environments have been adjusted to center their content. The usual behaviour can be reactivated using `\raggedright`.

`table`

`\raggedright`

`panels` The `panels` environment makes use of the `subcaption` package [33]. It provides sub-floats and takes as mandatory argument either the number of sub-floats (default 2) or the width of the first sub-float as fraction of the `\linewidth`. Within the `\begin{panels}[<vertical alignment>]{<width>}` environment the `\panel` macro initiates a new sub-float. In the case that the width of the first sub-float has been given as an optional argument to the `panels` environment the `\panel{<width>}` macro takes the width of the next sub-float as mandatory argument. The example code is presented in table 1a.

`\panel`

`tabular` The `booktabs` [34] and `multirow` [35] packages are loaded enabling publication quality tabulars such as in table 1b.

`\graphic` The `graphicx` package [36] is loaded and the `\graphic[ $\langle width \rangle$ ]{ $\langle figure \rangle$ }` macro is defined, which is a wrapper for the `\includegraphics{ $\langle figure \rangle$ }` 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{ $\langle subfolder \rangle$ }`.

## 2.5 Bibliography

`\bibliography` The `biblatex` package [9] is loaded for bibliography management. The user has to add the line `\bibliography{ $\langle my.bib \rangle$ }` to the preamble of the document and `\printbibliography` at the end of the document. The bibliography is generated by BIBER [37]. `biblatex` is extended to be able to cope with the `collaboration` and `reportNumber` fields provided by `inspirehep.net` and a bug in the volume number is fixed. Additionally, `ctan.org`, `github.com`, `gitlab.com`, `bitbucket.org`, `launchpad.net`, `sourceforge.net`, and `hepforge.org` are recognized as `eprinttypes`. Errata can be included using the `related` feature.

```
\article{ $\langle key1 \rangle$ ,
  ...,
  relatedtype="erratum",
  related="<math>\langle key2 \rangle</math>",
}
\article{ $\langle key2 \rangle$ ,
  ...,
}
```

## 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 [38] requires the setup dependent `bb1` files instead of the original `bib` files, which causes trouble if the local  $\text{\LaTeX}$  version differs from the one used by arXiv. The `arxiv-collector` python script [39] alleviates this problem by collecting all files necessary for publication on arXiv (including figures).

## A Options

`<*package>`

Load the `pdftexcmds` [40] and `kvoptions` [41] 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 `font=size` option. Make 11 pt the default font size.

```

8 \DeclareStringOption[11pt]{font}

```

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

```

9 \DeclareBoolOption[false]{defaults}

```

**lang** Define the `lang` option, which takes the values provided by the `babel` package [7]. Make `british` the default language.

```

10 \DeclareStringOption[british]{lang}

```

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

```

11 \DeclareBoolOption[true]{parindent}
12 \DeclareComplementaryOption{parskip}{parindent}

```

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

```

13 \DeclareBoolOption[true]{serif}
14 \DeclareComplementaryOption{sansserif}{serif}

```

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

```

15 \DeclareBoolOption[false]{eqnarray}

```

**bibliography** Provide the option `bibliography` for passing a `style` string to the `biblatex` package [9] or disabling the automatic loading of `biblatex`.

```

16 \DeclareStringOption[numeric-comp]{bibliography}

```

**glossaries** Provide the option `glossaries` able to turn of the use of the `glossaries` package [10].

```

17 \DeclareBoolOption[true]{glossaries}

```

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

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

`title` Provide the option `title` for deactivating redefinition of title macros.

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

`revtex` Provide the option `revtex` for REVTeX [13] compatibility mode.

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

`jhep` Provide the option `jhep` for JHEP [11] compatibility mode.

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

`jcap` Provide the option `jcap` for JCAP [12] compatibility mode.

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

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

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

## A.1 Process options

```
24 \ProcessKeyvalOptions*
```

Set the `pos` compatibility options.

```
25 \ifhep@pos
26   \setkeys{hep}{title=false, defaults}
27 \fi
```

Set the `revtex` compatibility options.

```
28 \ifhep@revtex
29   \setkeys{hep}{defaults, title=false, lang=american, bibliography=false}
30 \fi
```

Define the SISSA conditional.

```
31 \newif\ifhep@sisssa
32 \ifhep@jhep\hep@sisssatrue
33 \else
34   \ifhep@jcap\hep@sisssatrue
35   \else\hep@sissafalse
36   \fi
37 \fi
```

Set the SISSA compatibility options.

```

38 \ifhep@sisssa
39   \setkeys{hep}{title=false, bibliography=false}
40   \PassOptionsToPackage{
41     colorlinks=true, linktocpage=true, pdfproducer=medialab, pdfa=true,
42     urlcolor=blue, anchorcolor=blue, citecolor=blue, filecolor=blue,
43     linkcolor=blue, menucolor=blue, pagecolor=blue
44   }{hyperref}
45   \hoffset 0pt
46   \voffset 0pt
47 \fi

```

## B Engine

`\ifxetexorluatex` Load the `ifluatex` [42] and `ifxetex` [43] packages. Define the `\ifxetexorluatex` conditional checking if the package is executed by Lua<sup>A</sup>T<sub>E</sub>X or X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

```

48 \RequirePackage{ifluatex}
49 \RequirePackage{ifxetex}
50 \newif\ifxetexorluatex
51 \ifxetex\etexorluatextrue
52 \else
53   \ifluatex\etexorluatextrue
54   \else\etexorluatexfalse
55   \fi
56 \fi

```

## C Text

Load the `alphabeta` package [29] first in order to archive the correct behaviour. The `alphabeta` package provides upright Greek letters in text mode.

```

57 \RequirePackage{alphabeta}

```

Set the whole text to sans serif if requested. Load the `sansmathfonts` package [19] first. Although, most fonts will later be overwritten by the `lmodern` package [4] some mathematical objects are ensured to be in sans serif.

```

58 \ifhep@serif\else
59   \RequirePackage{sansmathfonts}
60   \renewcommand\familydefault{\sfdefault}
61 \fi

```

Pick the correct font encoding depending on the engine used and load the `fontenc` package [44] with this encoding. For details of the font encoding see [45].

```

62 \ifxetexorluatex
63   \def\@encoding{TU}
64 \else
65   \def\@encoding{T1}

```

```
66 \fi
67 \RequirePackage[\@encoding]{fontenc}
```

Load the `lmodern` font [4], the `textcomp` extension [46], and the `microtype` font optimization [5].

```
68 \RequirePackage{lmodern}
69 \RequirePackage{textcomp}
70 \RequirePackage{microtype}
```

Define sans serif small caps font shapes. The font abbreviations are

**lmss** Latin modern sans serif font  
**cmss** Computer modern sans serif font  
**xcms** Extended computer modern sans serif font (from the `sansmathfonts` package [19])  
**bx** Bold extended series  
**m** Medium weight and width series  
**c** Medium weight, condensed width series  
**sc** Caps and small caps font shape

```
71 \ifxetexorluatex
72   \DeclareFontShape{\@encoding}{lmss}{bx}{sc}{<->cmssbxsc10}{%
73     \DeclareFontShape{\@encoding}{lmss}{m}{sc}{%
74       <-9>cmsscsc8<9-10>cmsscsc9<10->cmsscsc10%
75     }{}
76 \else
77   \sffamily
78   \DeclareFontShape{\@encoding}{lmss}{bx}{sc}{<->ssub*xcms/bx/sc}{%
79     \DeclareFontShape{\@encoding}{lmss}{m}{sc}{<->ssub*xcms/m/sc}{%
80 \fi
```

Load the `inputenc` [47] package.

```
81 \ifxetexorluatex\else
82   \RequirePackage[utf8]{inputenc}
83 \fi
```

Load the `babel` [7] package for hyphenation and the recommended `csquotes` package [15].

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

`\underline` Load the `soul` package [20] for hyphenable underlined text.

```
86 \RequirePackage{soul}
87 \let\underline\u
```

## C.1 Font size

Undefine previously defined font sizes and load the L<sup>A</sup>T<sub>E</sub>X font size file corresponding to the font size option.

```
88 \ifhep@defaults\else
89   \def\remove@pt#1pt{#1}
90   \edef\@ptsize{\expandafter\remove@pt\hep@font}
91   \let\small\relax
92   \let\footnotesize\relax
93   \let\scriptsize\relax
94   \let\tiny\relax
95   \let\large\relax
96   \let\Large\relax
97   \let\LARGE\relax
98   \let\huge\relax
99   \let\Huge\relax
100  \input{size\@ptsize.clo}
101 \fi
```

## C.2 Text macros

**\vs** Load the `foreign` package [16] in order to highlight abbreviations and vocabularies from foreign languages. Add the missing `\vs` command.

```
102 \ifnum\pdf@strcmp{\hep@lang}{american}=0
103   \newcommand{\hep@lang@foreign}{USenglish}
104 \else
105   \ifnum\pdf@strcmp{\hep@lang}{USenglish}=0
106     \newcommand{\hep@lang@foreign}{USenglish}
107   \else
108     \newcommand{\hep@lang@foreign}{british}
109   \fi
110 \fi
111 \RequirePackage{all, \hep@lang@foreign}{foreign}
112 \DeclareRobustCommand\vs{\xperiodafter{\foreignabbrfont{vs}}}
```

The `foreign` package relies on the `xspace` package [48]. Ensure that `\xspace` is compatible with the `\enquote` macro from the `csquote` package.

```
113 \xspaceaddeceptions{\csq@qclose@i}
```

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

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

**\software** Define a macro for software with optional version information `\software[⟨version⟩]{⟨name⟩}`, using the `relsize` package [49].

```
115 \RequirePackage{relsize}
```

```

116 \newcommand{\software}[2][\hspace{-\fontdimen2\font}]{%
117   {\smaller\textsc{#2}~#1}%
118 }

```

`\online` The `\online{<text>}{<url>}` macro combines the features of the `\href` and the `\url` macros.

```

119 \newcommand{\online}[2]{\href{#1}{\nolinkurl{#2}}}

```

### C.3 Lists

Load the `enumitem` package [18].

```

120 \RequirePackage[inline]{enumitem}

```

`inlinelist` Define an inline list environment.

```

121 \newlist{inlinelist}{enumerate*}{1}
122 \setlist*[inlinelist,1]{%
123   label=\roman*), itemjoin={,\ }, itemjoin*={, and\ }, after=.%
124 }

```

`enumdescript` Define an `enumdescript` list environment.

```

125 \newlist{enum@descript}{enumerate}{2}
126 \setlist[enum@descript]{label=\arabic*.}
127 \newenvironment{enumdescript}[1][ ]{
128   \begin{enum@descript}[#1]
129   \let\old@item\item
130   \renewcommand{\item}[2][ ]{
131     \ifx&##1&\old@item\else\old@item[##1]\fi
132     \textbf{##2}\ifx##2\empty\else~\fi\@ifnextchar\par\@gobble\relax
133   }
134 }{\end{enum@descript}}

```

### C.4 Footnotes

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

```

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

```

## D Geometry

Load the `geometry` package [3] and adjust the text width and height to the values of the `a4wide` package [2]. This step must happen after readjusting the font size in appendix C.1.

```

137 \ifhep@defaults\else

```

```

138 \RequirePackage[\hep@paper paper]{geometry}
139 \geometry{hscale=.75, vscale=.8, vmarginratio=3:4, includeheadfoot}
140 \fi

```

`\useparskip` Load the `parskip` package [8] if requested and provide two commands switching  
`\useparindent` between the two paragraph modes.

```

141 \ifhep@parindent\else
142 \RequirePackage{parskip}
143 \newcommand{\useparskip}{%
144   \setlength{\parskip}{.5\baselineskip plus 2pt}%
145   \setlength{\parindent}{0pt}%
146 }
147 \newcommand{\useparindent}{%
148   \setlength{\parskip}{0pt}%
149   \setlength{\parindent}{15pt}%
150   \if@twocolumn\setlength\parindent{1em}
151   \else\setlength\parindent{1.5em}
152   \fi
153 }
154 \fi

```

## E Math

Load the `mathtools` package [22] which loads the `amsmath` package [24]. Additionally, load the `amssymb` package [23] which provides further math symbols and also loads the `amsfont` package [23]. Allow page breaks within equations if necessary.

```

155 \RequirePackage{mathtools}
156 \RequirePackage{amssymb}
157 \allowdisplaybreaks[1]

```

`\diag` Provide a `diag` operator

```

158 \DeclareMathOperator{\diag}{diag}

```

`\mathdef` Define the `\mathdef{<name>}[<arguments>]{<macro>}` macro which (re-)defines macros in math mode only. This macro is implemented using the `xparse` package [50].

```

159 \RequirePackage{xparse}
160 \DeclareDocumentCommand{\mathdef}{m0{0}m}{%
161   \expandafter\let\csname text\string#1\endcsname=#1
162   \expandafter\newcommand\csname math\string#1\endcsname[#2]{#3}
163   \DeclareRobustCommand#1{%
164     \ifmmode
165       \expandafter\let\expandafter\next\csname math\string#1\endcsname
166     \else
167       \expandafter\let\expandafter\next\csname text\string#1\endcsname

```

```

168     \fi
169     \next
170 }%
171 }

```

`\i` Provide an upright imaginary unit in math mode.

```

172 \AtBeginDocument{\mathdef{\i}{\operatorname{i}}}

```

`\overline` Redefine `\overline` to be a text macro using the `soul` package [20]. Extend it as a math macro with the original definition from `amsmath` [24].

```

173 \def\overline#1{\setul{-2ex}{}\ul{#1}}
174 \DeclareRobustCommand{\over@line}[1]{\@@overline{#1}}
175 \mathdef{\overline}{\over@line}

```

`eqnarray` Undefine the `eqnarray` environment.

```

176 \ifhep@eqnarray\else
177   \let\eqnarray\@undefined
178   \let\endeqnarray\@undefined
179 \fi

```

## E.1 Math fonts

`\mathbf` Load the `bm` package [26] for superior boldmath after limiting the number of allocated math alphabets. Make math symbols bold whenever they appear in bold macros such as `\section{<text>}`.

```

180 \newcommand{\bmmax}{2}
181 \RequirePackage{bm}
182 \let\mathbf\bm
183 \g@addto@macro\bfseries{\boldmath}

```

`\mathsf` Load the `fixmath` package [28] which ensures that upper Greek letters in math mode are italic. Ensure that also math mode is sans serif using the `sfmath` package [51] if the option `sans serif` is passed to the package. Ensure that `\mathsf` is italic as well as sans serif and sans for sans and sans serif documents, respectively. The font abbreviations are

**OML** T<sub>E</sub>X math italic font encoding  
**cmm** Computer modern math italic font  
**cmbr** Computer modern bright font  
**bx** Bold extended series  
**m** Medium weight and width series  
**it** Italic font shape

```

184 \ifhep@serif
185   \RequirePackage{fixmath}

```



```

186 \DeclareMathAlphabet{\mathsf}{OML}{cmbr}{m}{it}
187 \SetMathAlphabet{\mathsf}{bold}{OML}{cmbr}{bx}{it}
188 \else
189 \RequirePackage[slantedGreek]{sfmath}
190 \RequirePackage{sansmathfonts}
191 \DeclareMathAlphabet{\mathsf}{OML}{cmm}{m}{it}
192 \SetMathAlphabet{\mathsf}{bold}{OML}{cmm}{bx}{it}
193 \fi

```

`\mathscr` Load the `mathrsfs` package for the `\mathscr` math script font.

```

194 \RequirePackage{mathrsfs}

```

`\mathbb` Load the `bbm` package [27] for the `\mathbb` math blackboard style font in (sans-) serif.

```

195 \RequirePackage{bbm}
196 \ifhep@serif
197 \let\mathbb\mathbbbm
198 \else
199 \let\mathbb\mathbbbmss
200 \fi

```

## E.2 Physics notation

`\slashed` Load the `physics` package [30] which provides macros useful for publications in physics. Additionally, load the `slashed` package [31] which provides the `slashed` macro for Dirac notation. Finally, load the `units` package [32] which provides the `\units` and `\nicefrac` macros.

```

201 \RequirePackage{physics}
202 \RequirePackage{slashed}
203 \RequirePackage{units}

```

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

```

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

```

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

```

205 \AtBeginDocument{\mathdef{\d}{\dd}}

```

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

```

206 \newcommand{\oset}[3][-1pt]{%
207 \raisebox{1pt}{\ensuremath{\mathop{#3}\limits^{#1}}}
208 \vbox to#1{\kern-2\ex@{\hbox{$\scriptscriptstyle#2$}\vss}}%
209 }}%
210 }

```

`\overleftrighth` Define a over left right arrow `\overleftrighth{<base>}`.

```
211 \newcommand{\overleftrighth}[1]{\oset{\leftrightharrow}{#1}}
```

## F Floats

Adjust the L<sup>A</sup>T<sub>E</sub>X float placement defaults

```
212 \renewcommand{\textfraction}{0.01}
213 \setcounter{topnumber}{1}
214 \renewcommand{\topfraction}{.9}
215 \setcounter{bottomnumber}{0}
216 \renewcommand{\floatpagefraction}{.8}
```

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

```
217 \let\@figure@\figure%
218 \let\@end@figure@\endfigure%
219 \let\@table@\table%
220 \let\@end@table@\endtable%
221 \ifhep@manualplacement%
222   \renewenvironment{figure}[1][tbp]{%
223     \@figure@[#1]\centering%
224   }\@end@figure@}%
225   \renewenvironment{table}[1][tbp]{%
226     \@table@[#1]\centering%
227   }\@end@table@}%
228 \else%
229   \renewenvironment{figure}[1][]{%
230     \@figure@\centering%
231   }\@end@figure@}%
232   \renewenvironment{table}[1][]{%
233     \@table@\centering%
234   }\@end@table@}%
235 \fi%
```

### F.1 Sub-floats

Prevent the `caption` package [52] from complaining about the `revtex` class.

```
236 \ifhep@revtex
237   \setlength\abovecaptionskip{\f@size\p@}
238   \setlength\belowcaptionskip{0\p@}
239   \long\def\@makecaption#1#2{%
240     \vskip\abovecaptionskip
241     \sbox\@tempboxa{#1: #2}%
242     \ifdim \wd\@tempboxa >\hsize
243       #1: #2\par
244     \else
```

```

245     \global \@minipagefalse
246     \hb@xt@\hsize{\hfil\box\@tempboxa\hfil}%
247     \fi
248     \vskip\belowcaptionskip%
249   }
250 \fi

```

Load the subcaption package [33]. Provide old `\subcaption@minipage` macro.

```

251 \RequirePackage[subrefformat=parens]{subcaption}
252 \captionsetup{font=small}
253 \captionsetup[sub]{font=small}
254 \providecommand*\subcaption@minipage[2]{%
255   \minipage#1{#2}\setcaptionsubtype\relax%
256 }

```

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

```

\panel
257 \newenvironment{panels}[2][b]{%

```

Define an internal macro for global behaviour.

```

258   \newcommand{\begin@subcaption@minipage}[2][b]{%
259     \caption@withoptargs\subcaption@minipage[##1]{##2}%
260     \centering\vskip 0pt%
261   }

```

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

```

262   \ifdim#2pt>1pt%
263     \newcommand{\panel}[1][b]{%
264       \endminipage\hfill\begin@subcaption@minipage[#1]{\linewidth/#2}%
265     }%
266     \begin@subcaption@minipage[#1]{\linewidth/#2}%

```

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

```

267   \else%
268     \newcommand{\panel}[2][b]{%
269       \endminipage\hfill\begin@subcaption@minipage[#1]{##2\linewidth}%
270     }%
271     \begin@subcaption@minipage[#1]{#2\linewidth}%
272   \fi%
273 }\endminipage}

```

Reajust the captions to the `revtex` class using the `ragged2e` package [53].

```

274 \ifhep@revtex
275   \RequirePackage{ragged2e}
276   \DeclareCaptionFormat{revtex}{#1#2\justifying{#3}}
277   \captionsetup{font=small, format=revtex}

```

```

278 \captionsetup[sub]{font=footnotesize, format=plain}
279 \renewcommand{\figurename}{Figure}
280 \renewcommand{\tablename}{Table}
281 \fi

```

## F.2 Tables

`tabular` Enhance tabulars with the `booktabs` and `multirow` packages [34, 35].

```

282 \RequirePackage{booktabs}
283 \RequirePackage{multirow}

```

## F.3 Figures

`\graphic` Provide the `\graphic` macro for the inclusion of figures using the `graphicx` package [36].

```

284 \RequirePackage{graphicx}
285 \providecommand{\tikzsetnextfilename}[1]{}
286 \newcommand{\graphic}[2][1]{\tikzsetnextfilename{#2}{%
287   \centering\includegraphics[width=#1\linewidth]{#2}\par%
288 }}

```

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

```

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

```

## G Title page

`\date` Allow empty date field.

```

290 \ifhep@title
291 \date{}

```

### G.1 Authors

`\author` Allow empty author field.

```

292 \author{}

```

`\email` Define a macro for the email of authors used as `\author{<name> \email{<email>}}`.

```

293 \AtEndOfClass{\newcommand{\email}[1]{%
294   \unskip\thanks{\online{mailto:#1}{#1}}
295 }}

```

Enable the handling of multiple authors with different affiliations using the `authblk` package [14].

```

296 \RequirePackage{authblk}
297 \renewcommand\Affilfont{\footnotesize}

```

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

```

298 \newcommand\active@comma{\penalty-5\relax}
299 \newcommand\cat@comma@active{\catcode'\,\active}
300 {\cat@comma@active\gdef,{\active@comma}}
301 \newcommand\@affil[1]{%
302   \endgroup\@flushglue=0pt plus .5\linewidth\affil{#1}%
303 }
304 \def\@affil@opt[#1]#2{%
305   \endgroup\@flushglue=0pt plus .5\linewidth\affil[#1]{#2}%
306 }
307 \DeclareRobustCommand\@affiliation{\@ifnextchar[{\@affil@opt}{\@affil}}
308 \newcommand{\affiliation}{\begingroup\cat@comma@active\@affiliation}

```

## G.2 Preprint

**\preprint** Define the `\preprint` macro using the `varwidth` package [54].

```

309 \let\@preprint\relax
310 \newcommand\preprint[1]{\long\gdef\@preprint{#1}}
311 \RequirePackage{varwidth}
312 \newcommand{\@preprint@box}{%
313   \begin{varwidth}{\textwidth}%
314     \textsc{\small\@preprint}%
315   \end{varwidth}%
316 }

```

**\maketitle** Places a preprint number in the top right corner of the title page using the `atbegshi` [55] and `picture` [56] packages.

```

317 \RequirePackage{atbegshi}
318 \RequirePackage{picture}
319 \let\old@maketitle\maketitle
320 \renewcommand{\maketitle}{%
321   \old@maketitle%
322   \AtBeginShipoutFirst{%
323     \put(
324       \textwidth+\oddsidemargin-\widthof{\@preprint@box},
325       -2pt-\topmargin-\heightof{\@preprint@box}
326     ){\normalfont\@preprint@box}
327   }
328 }

```

## G.3 Abstract

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

```

329 \@ifundefined{abstract}{}{%
330   \let\old@abstract\abstract%
331   \renewcommand\abstract{\old@abstract\noindent\ignorespaces}%
332 }

```

End of check for title option.

```

333 \fi

```

## H Bibliography

Check if bibliography management is requested.

```

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

```

`\bibliography` Load the biblatex package [9] with the datamodel defined in appendix K.

```

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

```

`hep-paper` 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. Provide the `\DeclareSortingTemplate` macro for older biblatex installations.

```

336 \providecommand{\DeclareSortingTemplate}{\DeclareSortingScheme}
337 \DeclareSortingTemplate{hep-paper}{
338   \sort{\citeorder}
339   \sort[final]{
340     \field{sortkey}
341   }
342   \sort{
343     \field{sortyear}
344     \field{year}
345     \literal{9999}
346   }
347   \sort{
348     \field{month}
349   }
350   \sort{
351     \field{eprint}
352     \field{doi}
353   }
354   \sort{
355     \field{sorttitle}
356     \field{title}
357   }
358   \sort{
359     \field{subtitle}
360     \field{volume}

```

```

361   }
362 }

```

Use the new sorting scheme and abbreviat all first names.

```

363 \ExecuteBibliographyOptions{
364   sorting=hep-paper,
365   giveninits=true
366 }

```

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

```

367 \NewBibliographyString{erratum}
368 \DefineBibliographyStrings{english}{erratum={Erratum}}

```

**\printbibliography** Allow the bibliography to be printed sloppy

```

369 \let\old@printbibliography\printbibliography
370 \renewcommand{\printbibliography}{\sloppy\old@printbibliography}

```

## H.1 Sourcemap

**\reg@exp@one** Define regular expressions in order to deal with inconsistent journal title and volume naming as well as URL protocols.

```

\reg@exp@two
\reg@exp@url
371 \newcommand{\reg@exp@one}{\regex{\A(\p{L}+)?\d+(\p{L}+)?\Z}}
372 \newcommand{\reg@exp@two}{\regex{\A(\p{L}+)?(\d+)(\p{L}+)?\Z}}
373 \newcommand{\reg@exp@url}{\regex{\A(ht|f)tp(s)?:\//}}

```

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

```

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

```

**collaboration** Read the collaboration information if present.

```

376     \map{%
377       \step[fieldsource=Collaboration, final=true]%
378       \step[fieldset=collaboration, origfieldval, final=true]
379     }%

```

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

```

380     \map{%
381       \step[fieldsource=reportNumber, final=true]%
382       \step[fieldset=reportnumber, origfieldval, final=true]
383     }%

```

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

```
384 \map[overwrite]{
385   \step[fieldsource=volume, match=\reg@exp@one, final]
386   \step[fieldsource=volume, match=\reg@exp@two, replace={$2}]
387   \step[fieldsource=journal, fieldtarget=journaltitle]
388   \step[fieldset=journaltitle, fieldvalue={\space$1$2}, append=true]
389 }
```

**url** Remove the protocol from URL.

```
390 \map{
391   \step[fieldsource=url, final=true]
392   \step[fieldset=protocollessurl, origfieldval, final=true]
393   \step[fieldsource=protocollessurl, match=\reg@exp@url, replace={}]
394 }
395 }%
396 }
```

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

```
397 \renewbibmacro*{in:}{%
398   \iffieldundef{journaltitle}{}{\printtext{\bibstring{in}\intitlepunct}}%
399 }
```

**url** Show URLs without the protocol.

```
400 \DeclareFieldFormat{url}{%
401   \mkbibacro{URL}\addcolon\space\online{#1}{\thefield{protocollessurl}}%
402 }
```

**collaboration** Override the author information with collaboration information if present.

```
403 \renewbibmacro*{author}{%
404   \iffieldundef{collaboration}{%
405     \printnames{author}}{\textbf{\printfield{collaboration}}}%
406   }%
407 }
```

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

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

**reportnumber** Add the pre-print information if present.

```
409 \letbibmacro{doi+eprint+url-old}{doi+eprint+url}
410 \renewbibmacro*{doi+eprint+url}{%
411   \usebibmacro{doi+eprint+url-old}
412   \iffieldundef{reportnumber}{}{\textls[0]{%
413     \newunitpunct\textnumero\intitlepunct%
```



```

414 \textsc{\small\printfield{reportnumber}}}%
415 }}%
416 }

```

## H.2 Eprints

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

```

417 \newcommand{\bib@online}[2]{%
418 \ifhyperref{\online{#1}{#2}}{\nolinkurl{#2}}}%
419 }

```

`\new@eprint` Private `\new@eprint` macro

```

420 \NewDocumentCommand{\new@eprint}{smm}{
421 \DeclareFieldFormat{eprint:#2}{%
422 \newcommand{\@path}{\IfBooleanT{#1}{\thefield{eprintclass}/}##1}%
423 #2\addcolon\space\bib@online{#3/\@path}{\@path}%
424 }%
425 }

```

CTAN Add CTAN as a eprint option

```

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

```

GitHub Add GitHub as a eprint option

```

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

```

GitLab Add GitLab as a eprint option

```

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

```

Bitbucket Add Bitbucket as a eprint option

```

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

```

Launchpad Add Launchpad as a eprint option

```

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

```

SourceForge Add SourceForge as a eprint option

```

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

```

HEPForge Add HEPForge as a eprint option

```
438 \DeclareFieldFormat{eprint:hepforge}{%
439   HEPForge\addcolon\space\bib@online{https://#1/hepforge.org}{#1}%
440 }
441 \DeclareFieldAlias{eprint:HEPForge}{eprint:hepforge}
```

End check for bibliography option.

```
442 \fi
```

## I Hyperlinks and References

Load the `hyperref` package [6] enable Unicode encoding and hide links.

```
443 \RequirePackage{hyperref}
444 \hypersetup{
445   pdfencoding=auto,
446   psdextra,
447   hidelinks,
448   linktoc=all,
449   breaklinks=true,
450   pdfcreator={},
451   pdfproducer={}
452 }
```

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

```
453 \pdfstringdefDisableCommands{\def\varepsilon{\textepsilon}}
454 \AtBeginDocument{
455   \pdfstringdefDisableCommands{\let\ensuremath@gobble}
456   \pdfstringdefDisableCommands{\let\mathsurround@gobble}
457   \pdfstringdefDisableCommands{\let\unskip@gobble}
458   \pdfstringdefDisableCommands{\let\thanks@gobble}
459   \pdfstringdefDisableCommands{\let\footnote@gobble}
460   \pdfstringdefDisableCommands{\let\\\@gobble}
461 }
462 \ifhep@revtex
463   \AtBeginShipout{\hypersetup{pdftitle={\@title}}}}
464 \else
465   \AtBeginDocument{\hypersetup{pdftitle={\@title}}}}
466 \fi
467 \ifhep@title
468   \AtBeginDocument{\hypersetup{pdfauthor=AB@authlist}}
469 \else
470   \AtBeginDocument{\hypersetup{pdfauthor={\@author}}}}
471 \fi
```

`\cref` Improve reference using the `cleveref` package [21].

```
472 \RequirePackage[noabbrev, nameinlink]{cleveref}
473 \newcommand{\creflastconjunction}{, and\nobreakspace}
474 \crefname{enumi}{point}{points}
475 \Crefname{enumi}{Point}{Points}
```

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

```
476 \newcommand\no@break@before{%
477   \relax\ifvmode\else%
478     \ifhmode%
479       \ifdim\lastskip > 0pt%
480         \relax\unskip\nobreakspace%
481       \fi%
482     \fi%
483   \fi%
484 }
```

`\ref` Adjust `\ref{<key>}` in order to prevent preceding line breaks and to enable the possibility to reference multiple references at once.

```
485 \let\old@ref\ref
486 \AtBeginDocument{\renewcommand\ref{\no@break@before\labelcref}}
```

! Bug ! in equations the additional brackets from the `cleveref` macro conflict with the traditional (`\ref{<key>}`) approach

`\eqref` Adjust `\eqref{<key>}` in order to prevent preceding line breaks and to enable the possibility to reference multiple equations at once.

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

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

```
488 \let\old@subref\subref
489 \renewcommand\subref{\no@break@before\old@subref}
490 \renewcommand*\subcaption@ref[2]{\begingroup%
491   \caption@setoptions{sub}%
492   \subcaption@reffmt\p@subref{\old@ref#1{sub@#2}}}%
493 \endgroup}
```

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

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

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

```
495 \NewDocumentCommand{\eqcrefname}{mmo}{
496   \crefname{#1}{#2}{\IfValueTF{#3}{#3}{#2s}}
```

```

497 \creflabelformat{#1}{(##2##1##3)}
498 }

```

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

```

499 \DeclareRobustCommand{\labelcrefrange}[2]{%
500   \@crefrangenostar{labelcref}{#1}{#2}%
501 }

```

## I.1 Citations

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

```

502 \let\old@cite\cite
503 \renewcommand\cite{\no@break@before\old@cite}

```

Begin of bibliography if.

```

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

```

Define bibstrings for reference names.

```

505 \NewBibliographyString{refname}
506 \NewBibliographyString{refsname}
507 \DefineBibliographyStrings{english}{%
508   refname = {reference},
509   refsname = {references}
510 }

```

`\ccite` Define *clever* citation macros.

`\Ccite`

```

511 \DeclareCiteCommand{\ccite}{%
512   \ifnum\thecitetotal=1
513     \bibstring{refname}%
514   \else%
515     \bibstring{refsname}%
516   \fi%
517   \addnbspace\bibopenbracket%
518   \usebibmacro{cite:init}\usebibmacro{prenote}%
519 }{\usebibmacro{cite:index}\usebibmacro{cite:comp}}{}{%
520   \usebibmacro{cite:dump}\usebibmacro{postnote}%
521   \bibclosebracket%
522 }
523
524 \newrobustcmd*{\Ccite}{\bibsentence\ccite}

```

End of biblatex if.

```

525 \fi

```

## J Acronyms

Acronyms are implemented with the `glossaries-extra` package [57] which is an extension of the `glossaries` package [10].

```
526 \ifhepglossaries
527 \RequirePackage[nostyles]{glossaries-extra}
```

The entry count feature is used.

```
528 \glsenableentrycount
529 \glsssetcategoryattribute{abbreviation}{entrycount}{1}
```

Provide macros for older `glossaries-extra` installations.

```
530 \providecommand{\glstrusefield}[2]{\@gls@entry@field{#1}{#2}}
531 \providecommand{\glstrsetfieldifexists}[3]{\glsoifexists{#1}{#3}}
532 \providecommand{\glsXtrSetField}[3]{%
533   \glstrsetfieldifexists{#1}{#2}{%
534     \csgdef{glo@glsetoklabel{#1}@#2}{#3}%
535   }%
536 }
```

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

```
537 \glsssetcategoryattribute{abbreviation}{nohyperfirst}{true}
538 \renewcommand*{\glsdonohyperlink}[2]{{%
539   \glstrprotectlinks\edef\fieldvalue{%
540     \glstrusefield{\glslabel}{hastarget}%
541   }%
542   \ifdefstring\fieldvalue{true}{#2}{%
543     \glsXtrSetField{\glslabel}{hastarget}{true}%
544     \glsohypertarget{#1}{#2}%
545   }%
546 }}
```

`\begin@sentence` Mark the beginning of a paragraph as if it would follow a full stop using the `everyhook` package [58].

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

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

```
550 \def\frenchspacing{%
551   \sfcode'\.\begin@sentence \sfcode'?\begin@sentence
552   \sfcode'\!\begin@sentence \sfcode'\:\begin@sentence
553   \sfcode'\;\@m \sfcode'\,\@m
554 }
```

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

```

555 \newcommand{\if@begin@of@sentence}[2]{\leavevmode\protecting{%
556   \ifboolexpr{ test {\ifnumcomp{\spacefactor}{=}{3000}} or%
557               test {\ifnumcomp{\spacefactor}{=}{2000}} or%
558               test {\ifnumcomp{\spacefactor}{=}{\begin@sentence}}}%
559   }{#1}{#2}%
560 }}

```

`\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 T<sub>E</sub>X default for space after text macros  
 #5 mandatory long form  
 #6 optional plural long form

```

561 \NewDocumentCommand{\acronym}{somsmo}{
562   \newabbreviation[
563     longplural=\IfNoValueTF{#6}{#5s}{#6},
564     \glsshortpluralkey=\IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}}
565   ]{#3}{\IfNoValueTF{#2}{#3}{#2}}{#5}

```

Provide the singular acronym macro.

```

566 \expandafter\newcommand\csname#3\endcsname{%
567   \if@begin@of@sentence{\cGls{#3}}{\cgl{s}{#3}}%
568   \IfBooleanTF{#4}{\@xspace}%
569 }

```

Expand the singular acronym macro in PDF labels.

```

570 \pdfstringdefDisableCommands{\expandafter\def\csname#3\endcsname{%
571   \IfNoValueTF{#2}{#3}{#2} }%
572 }

```

Provide the singular acronym macro in math mode.

```

573 \expandafter\mathdef\csname#3\endcsname{%
574   \text{\glstrshort{#3}}\@gls@increment@currcount{#3}%
575 }

```

Provide the plural acronym macro.

```

576 \expandafter\newcommand\csname#3s\endcsname{%
577   \if@begin@of@sentence{\cGlspl{#3}}{\cgl{spl}{#3}}%
578   \IfBooleanTF{#4}{\@xspace}%
579 }

```

Expand the plural acronym macro in PDF labels.

```
580 \pdfstringdefDisableCommands{\expandafter\def\csname#3s\endcsname{%
581   \IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}} }%
582 }
```

Provide the plural acronym macro in math mode.

```
583 \expandafter\mathdef\csname#3s\endcsname{%
584   \text{\glxstrshortpl{#3}}\@glx@increment@currcount{#3}%
585 }
586 }
```

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

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

Provide the singular acronym macro.

```
588 \expandafter\newcommand\csname#3\endcsname{%
589   \IfNoValueTF{#2}{#3}{#2}\IfBooleanTF{#4}{}{\@xspace}%
590 }
```

Expand the singular acronym macro in PDF labels.

```
591 \pdfstringdefDisableCommands{\expandafter\def\csname#3\endcsname{%
592   \IfNoValueTF{#2}{#3}{#2}}}%
593 }
```

Provide the singular acronym macro in math mode.

```
594 \expandafter\mathdef\csname#3\endcsname{%
595   \text{\IfNoValueTF{#2}{#3}{#2}}}%
596 }
```

Provide the plural acronym macro.

```
597 \expandafter\newcommand\csname#3s\endcsname{%
598   \IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}}}%
599   \IfBooleanTF{#4}{}{\@xspace}%
600 }
```

Expand the plural acronym macro in PDF labels.

```
601 \pdfstringdefDisableCommands{\expandafter\def\csname#3s\endcsname{%
602   \IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}} }%
603 }
```

Provide the plural acronym macro in math mode.

```
604 \expandafter\mathdef\csname#3s\endcsname{%
605   \text{\IfBooleanTF{#1}{#3}{\IfNoValueTF{#2}{#3s}{#2s}}}%
606 }
```

```

606 }%
607 }

```

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

```

608 \NewDocumentCommand{\longacronym}{\somsmo}{

```

Provide the singular acronym macro.

```

609 \expandafter\newcommand\csname#3\endcsname{%
610   \if@begin@of@sentence{\MakeUppercase#5}{#5}%
611   \IfBooleanTF{#4}{\@xspace}%
612 }

```

Expand the singular acronym macro in PDF labels.

```

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

```

Provide the plural acronym macro.

```

614 \expandafter\newcommand\csname#3s\endcsname{%
615   \if@begin@of@sentence{%
616     \IfNoValueTF{#6}{\MakeUppercase#5s}{\MakeUppercase#6}%
617   }{%
618     \IfNoValueTF{#6}{#5s}{#6}}\IfBooleanTF{#4}{\@xspace}%
619 }

```

Expand the plural acronym macro in PDF labels.

```

620 \pdfstringdefDisableCommands{\expandafter\def\csname#3s\endcsname{%
621   \IfNoValueTF{#6}{#5s}{#6} }}
622 }
623 }

```

Silence warning if no acronyms are defined.

```

624 \renewcommand*{\@gls@write@entrycounts}{%
625   \immediate\write\@auxout{%
626     \string\providecommand*\@string\@gls@entry@count}[2]{%
627   }%
628   \count@=0\relax
629   \forallglsentries{\@glsentry}{%
630     \glsattribute{\@glsentry}{entrycount}{%
631       \ifglsused{\@glsentry}{%
632         \immediate\write\@auxout{%
633           \string\@gls@entry@count{\@glsentry}{%
634             \glsentrycurrcount{\@glsentry}%
635         }
636       }%
637     }}\advance\count@ by \@ne
638   }}%

```



```

639  }%
640 }

\resetacronym  Add two macros for acronym management.
\dummyacronym
641 \newcommand{\resetacronym}[1]{\protect\glsreset{#1}}
642 \newcommand{\dummyacronym}[1]{\protect\glsunset{#1}}

abstract  Adjust the abstract environment to reset all acronym counters.

643 \@ifundefined{abstract}{}{%
644   \let\end@old@abstract\endabstract%
645   \renewcommand\endabstract{\glsresetall\end@old@abstract}%
646 }

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

647 \let\old@table@of@contents\tableofcontents
648 \renewcommand\tableofcontents{%
649   \glsunsetall\old@table@of@contents\glsresetall%
650 }

End of glossaries if.

651 \fi

</package>

```

## K Biblatex datamodel file

<\*datamodel>

```

reportnumber  Define the dbx file containing the hep-paper datamodel.
collaboration
protocollessurl
652 \DeclareDatamodelFields[type=field, datatype=literal]{
653   reportnumber,
654   collaboration,
655 }
656 \DeclareDatamodelFields[type=field, datatype=uri]{protocollessurl}
657 \DeclareDatamodelEntryfields{
658   reportnumber,
659   collaboration,
660   protocollessurl,
661 }

</datamodel>

```

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## Change History

v1.0	options . . . . .	1
General: Initial version of the style file	v1.3	
v1.1	General: Inclusion of JHEP and	
General: Transition to documented	JCAP package options, fix	
LaTeX source file . . . . .	incompatibility with recent	
v1.2	subcaption package version, move	
General: Introduction of package	biblatex datamodel into its own file	1