The HEP-REFERENCE package*

Hyperref and cleveref setup with unbreakable references, footnote back-links and PDF metadata

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Abstract

The HEP-REFERENCE package collects small reference-related adjustments for high-energy physics documents. It loads and configures HYPERREF, CLEVEREF, and FOOTNOTEBACKREF, suppresses unwanted line breaks before references and citations, adds backlinking footnotes, sets useful PDF metadata from the document title data, and provides helper macros for text labels, subobject references, and named equation-like references.

1 Introduction

Load the package with `\usepackage{hep-reference}`.

The HYPERREF package [1] is loaded with hidden, breakable links and Unicode-aware PDF strings. The package also clears the PDF creator and producer fields and disables fragile formatting commands in bookmarks. In PDF strings such as bookmarks and the PDF title, line breaks `\\` become spaces, footnotes, thanks, and citations are dropped, and `\eqref{`⟨*key*⟩`}` gives the equation number in parentheses. Before `\maketitle` is executed, the PDF title is filled from `\title` and, if present, the subtitle defined by HEP-TITLE; keywords from HEP-TITLE are passed to the PDF metadata as well. If HEP-TITLE is loaded, label-only references to affiliations are formatted as superscript lists and ranges on the title page.

`\subject` The `\subject{`⟨*subject*⟩`}` macro sets the subject of the PDF, which is also passed to the PDF metadata before `\maketitle` is executed. Classes that define their own `\subject`, such as the KOMA-Script classes, keep their definition, and the subject given with it becomes the PDF subject.

`\cref` `\labelcrefrange` References are extended with the CLEVEREF package [2], loaded with the `noabbrev` and `nameinlink` options. This allows `\cref{`⟨*key*⟩`}` to write context-sensitive references such as 'figure 1', and `\cref{`⟨*key1,key2*⟩`}` to combine multiple references. The final conjunction is set to a comma followed by a non-breaking 'and', enumerated items from `enumerate` and `inlinelist` are named 'point' and 'points', and `\labelcrefrange{`⟨*key1*⟩`}{`⟨*key2*⟩`}` provides the corresponding range command for label-only references.

`\eqcrefname` The `\eqcrefname{`⟨*counter*⟩`}{`⟨*singular*⟩`}[`⟨*plural*⟩`]` macro declares a CLEVEREF name for an equation-like counter and formats label-only references to that counter in parentheses. If the optional plural is omitted, the plural form is built by appending 's' to the singular name.

`\ref` `\eqref` `\subref` `\cite` The `\ref`, `\eqref`, `\subref`, and `\cite` commands are adjusted so that a preceding inter-word space is converted to a non-breaking space. Wider spaces, such as `\quad`, are kept. This avoids line

*This document corresponds to HEP-REFERENCE v1.6.

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starts such as '[1]' or '(2)' without requiring repeated manual uses of `~\cite{⟨key⟩}`. The adjusted commands are robust, so they can be used in section titles and captions. When AMSMATH is loaded, `\eqref` is routed through `\labelcref`. When SUBCAPTION is loaded, `\subref` keeps the same no-break behaviour.

`\subcref` If SUBCAPTION is loaded, the package additionally defines `\subcref{⟨key⟩}`, which applies `\cref` to the underlying subobject label.

`\footnote` Footnotes are adjusted to swallow white space before the footnote mark and at the beginning of the footnote text; the optional footnote number of `\footnote[⟨number⟩]{⟨text⟩}` is kept, and the text may contain several paragraphs. They also receive backlinks to the text location from which they were called.

`\textlabel` The `\textlabel[⟨reference format⟩]{⟨key⟩}[⟨text format⟩]{⟨text⟩}` macro creates a hyperlink target and a label for a piece of text while also printing the text. The first optional argument formats the text stored in the label and the second optional argument formats the printed text. The text is the reference of both `\ref` and `\cref`.

`\usecommand` The `\usecommand[⟨number of arguments⟩]{⟨definition⟩}` helper defines a temporary command with the requested number of arguments and immediately applies it to the following arguments.

<*package>

A Implementation

Load the HYPERREF package [1] enable Unicode encoding and hide links.

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

`\hep@gobble@opt@mand` `\hep@gobble@cite` `\hep@pdf@newline` `\hep@pdf@eqref` Ensure that unnecessary information is suppressed in PDF strings. Footnotes, thanks, and citations are dropped, together with an optional argument and, for citations, the following spaces. Line breaks become spaces, `\unskip` and `\m@th` are ignored, and the content of `\ensuremath` is kept. Equation references become the parenthesised reference number.

```
\RequirePackage{xparse}
\NewExpandableDocumentCommand\hep@gobble@opt@mand{o+m}{}
\NewExpandableDocumentCommand\hep@gobble@cite{oom}{\ignorespaces}
\newcommand*\hep@pdf@newline{\space\ignorespaces}
\newcommand*\hep@pdf@eqref[1]{(\ref*{#1})}
\pdfstringdefDisableCommands{\def\varepsilon{\textepsilon}}
\pdfstringdefDisableCommands{\def\to{\textrightarrow}}
\AtBeginDocument{%
  \pdfstringdefDisableCommands{%
    \let\ensuremath\@firstofone
    \let\m@th\@empty
    \let\mathsurround\@gobble
    \let\unskip\@empty
```

```
    \let\thanks\@gobble
    \let\footnote\hep@gobble@opt@mand
    \let\\\hep@pdf@newline
    \let\cite\hep@gobble@cite
    \let\eqref\hep@pdf@eqref
    \let\@latex@warning@no@line\@gobble
    \let\class@warn\@gobble
  }%
}
```

`\subject` Set the PDF meta data according to the paper information. The title and keywords are left to HEP-TITLE or HEP-JOURNAL if one of them is loaded, and a title or keywords set by the user with `\hypersetup` are kept. A missing title is skipped, since its default is a warning, which loops in a PDF string if the SILENCE package is loaded. For the same reason the warnings of the missing title in LaTeX (`\@latex@warning@no@line`) and REVTeX (`\class@warn`) are dropped in PDF strings. Define `\subject{`⟨*subject*⟩`}` for the PDF subject, unless the class already defines it. The KOMA-Script classes define `\subject` and store its argument in `\@subject`, which then becomes the PDF subject.

```
\@ifundefined{subject}{%
  \NewDocumentCommand{\subject}{m}{\def\hep@subject{#1}}%
}{}
\newcommand*{\hep@if@title@package}{%
  \@ifpackageloaded{hep-title}{\@firstoftwo}{%
    \@ifpackageloaded{hep-journal}{\@firstoftwo}{\@secondoftwo}%
  }%
}
\AddToHook{cmd/maketitle/before}[hep-reference/pdfinfo]{%
  \hep@if@title@package{}{%
    \ifx\@pdftitle\@empty
      \expandafter\in@\expandafter\@latex@warning@no@line
        \expandafter{\@title}%
      \ifin@\else
        \@ifundefined{hep@sub@title}{%
          \hypersetup{pdftitle={\@title}}%
        }{%
          \hypersetup{pdftitle={\@title: \hep@sub@title}}%
        }%
      \fi
    \fi
    \ifx\@pdfkeywords\@empty
      \@ifundefined{hep@key@words}{}{%
        \hypersetup{pdfkeywords={\hep@key@words}}%
      }%
    \fi
  }%
  \@ifundefined{hep@subject}{%
    \@ifundefined{@subject}{}{%
      \ifx\@subject\@empty\else\hypersetup{pdfsubject=\@subject}\fi
    }%
  }{%
```

```
    \hypersetup{pdfsubject=\hep@subject}%
  }%
}
```

A.1 Footnotes

Place a hyperlink from the footnote back to its referencing label using the FOOTNOTEBACKREF package [3].

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

`\footnote` Ensure that no spaces appear before the footmark or at the beginning of the footnote. The footnote text may contain paragraphs.

```
\NewCommandCopy\@foot@note\footnote
\RenewDocumentCommand{\footnote}{o+m}{%
  \unskip%
  \IfValueTF{#1}{\@foot@note[#1]}{\@foot@note}{\ignorespaces#2}%
}
```

A.2 References

`\ref` Adjust `\ref{`⟨*key*⟩`}` in order to prevent preceding line breaks. Keep it robust, so that it is written unexpanded to auxiliary files.

```
\AtBeginDocument{%
  \NewCommandCopy\hep@ref\ref
  \DeclareRobustCommand*\ref{\no@break@before\hep@ref}%
}
```

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

```
\AtBeginDocument{\@ifpackageloaded{amsmath}{%
  \DeclareRobustCommand*\eqref{\no@break@before\labelcref}%
}{}}
```

`\usecommand` Define the `\usecommand` macro providing an anonymous function.

```
\providecommand*\hep@use@command{}
\newcommand*\usecommand[2][1]{%
  \renewcommand*\hep@use@command[#1]{#2}\hep@use@command%
}
```

`\textlabel` Define the `\textlabel` macro allowing to link to a piece of text using the ETOOLBOX pcakage [4]. The label is also written in the form of CLEVEREF, with the type `textlabel` and a value that grows by two with every text label, so that `\cref` lists several text labels in the order of the document without combining them into ranges.

```
\RequirePackage{etoolbox}
\newcount\hep@textlabel
\NewDocumentCommand\textlabel{O{}mO{}m}{%
```

```
  \global\advance\hep@textlabel\tw@
  \protected@write\@auxout{}{%
    \string\newlabel{#2}{%
      {\protecting{#1{#4}}}{\thepage}{#4}{#2}{}%
    }%
    \string\newlabel{#2@cref}{%
      {[textlabel][\the\hep@textlabel][]\protecting{#1{#4}}}%
      {[1][\arabic{page}][]\thepage}{}{}{}%
    }%
  }%
  \hypertarget{#2}{}%
  {#3{#4}}%
}
```

`\cref` Improve reference using the CLEVEREF package [2]. It must be loaded after AMSMATH [5], so load that first.

```
\RequirePackage{amsmath}
\PassOptionsToPackage{noabbrev, nameinlink}{cleveref}
\RequirePackage{cleveref}
\newcommand*{\creflastconjunction}{, and\nobreakspace}
\crefname{enumi}{point}{points}
\crefname{inlinelisti}{point}{points}
```

References to text labels consist of the text alone.

```
\crefformat{textlabel}{#2#1#3}
\Crefformat{textlabel}{#2#1#3}
\crefmultiformat{textlabel}{#2#1#3}{\crefpairconjunction#2#1#3}%
  {\crefmiddleconjunction#2#1#3}{\creflastconjunction#2#1#3}
\Crefmultiformat{textlabel}{#2#1#3}{\crefpairconjunction#2#1#3}%
  {\crefmiddleconjunction#2#1#3}{\creflastconjunction#2#1#3}
```

`\no@break@before` `\hep@space@width` Define a macro able to prevent line breaks. A preceding inter-word space becomes a non-breaking space. Wider skips, such as `\quad`, are kept, so only a skip that is not wider than the widest inter-word space of the current font is replaced. That is its width after a sentence, or the `\spaceskip` or `\xspaceskip` if they are set and wider.

```
\newdimen\hep@space@width
\newcommand*\no@break@before{%
  \relax\ifvmode\else%
    \ifhmode%
      \ifdim\lastskip > 0pt%
        \hep@space@width\dimexpr\fontdimen2\font+\fontdimen7\font\relax%
        \ifdim\spaceskip>\hep@space@width\hep@space@width\spaceskip\fi%
        \ifdim\xspaceskip>\hep@space@width\hep@space@width\xspaceskip\fi%
        \ifdim\lastskip>\hep@space@width\else%
          \unskip\nobreakspace%
        \fi%
      \fi%
    \fi%
```

```
  \fi%
}
```

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

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

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

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

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

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

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

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

Adjust the title page

```
\AtBeginDocument{\@ifpackageloaded{hep-title}{%
  \labelcrefmultiformat{affiliation}{#2#1#3}{%
    \textsuperscript,#2#1#3}{\textsuperscript,#2#1#3%
  }{%
    \textsuperscript,#2#1#3%
  }
  \labelcrefrangeformat{affiliation}{#3#1#4\textsuperscript{--}#5#2#6}
}{}}
```

A.3 Citations

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

```
\NewCommandCopy\hep@cite\cite
\DeclareRobustCommand*\cite{\no@break@before\hep@cite}
```

</package>

B Tests

<*test>

```
\documentclass{article}

\usepackage{amsmath}
\usepackage{hep-reference}
\usepackage{parskip}
\providecommand*{\cref}{section \ref}

\begin{document}

\section{Section} \label{sec:Section}

Lorem ipsum dolor sit amet, consectetuer adipiscing elit.
Etiam lobortis section \ref{sec:Section}

Lorem ipsum dolor sit amet, consectetuer adipiscing elit.
Etiam lobortis \cref{sec:Section}

Lorem ipsum dolor sit amet, consectetuer adipiscing elit.
Etiam loborti equation \eqref{eq:Equation}

Lorem ipsum dolor sit amet, consectetuer adipiscing elit.
Etiam loborti reference \cite{cite}

Lorem ipsum dolor sit amet, consectetuer adipiscing elit.
\footnote{
 Lorem ipsum dolor sit amet, consectetuer adipiscing elit.
}

\begin{equation} \label{eq:Equation}
E=mc^2
\end{equation}


\begin{thebibliography}{1}
\bibitem{cite} reference
\end{thebibliography}

\end{document}
```

</test>

C Readme

<*readme>

```
# The ‘hep-reference‘ package

```

```
Hyperref and cleveref setup with unbreakable references, footnote
back-links and PDF metadata

## Introduction

The ‘hep-reference‘ package loads and configures ‘hyperref‘,
‘cleveref‘, and ‘footnotebackref‘ for high-energy physics documents.
It hides and breaks links, fills PDF title and keyword metadata from the
document title data, prevents unwanted line breaks before references and
citations, adds footnote backlinks, and provides helper macros for text
labels, subobject references, and named equation-like references.

Load the package with ‘\usepackage{hep-reference}‘.

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‘LaTeX‘ Project Public License, either version 1.3c of this license or
(at your option) any later version. The latest version of this license is
in ‘http://www.latex-project.org/lppl.txt‘ and version 1.3c or later is
part of all distributions of LaTeX version 2005/12/01 or later.
```

</readme>

References

[1] *LaTeX3 Project*. ‘Hypertext marks in LaTeX: a manual for `hyperref`: Extensive support for hypertext in LaTeX’ (1995). CTAN: `hyperref`. GitHub: `latex3/hyperref`.

[2] T. Cubitt. ‘The `cleveref` package: Intelligent cross-referencing’ (2006). CTAN: `cleveref`. URL: `dr-qubit.org/cleveref`.

[3] H. Lange. ‘The `footnotebackref` package: Back-references from footnotes’ (2012). CTAN: `footnotebackref`.

[4] P. Lehman and J. Wright. ‘The `etoolbox` package: e-TeX tools for LaTeX’ (2007). CTAN: `etoolbox`.

[5] *LaTeX Team*. ‘The `amsmath` package: AMS mathematical facilities for LaTeX’ (1994). CTAN: `amsmath`. URL: `ams.org/tex/amslatex`.

Change History

v1.1

General: First release on CTAN: hidden hyperref links, PDF metadata including keywords, footnote back-links, non-breaking references and citations, cleveref integration, subreferences, `\usecommand`, `\textlabel`, and affiliation reference formats. 1

v1.2

General: Included the subtitle in the PDF title. 1

v1.3

General: Released without changes. 1

v1.4

General: Applied starred command definitions consistently, handled missing titles in the PDF metadata, and stopped setting the PDF author from the raw author macro. 1

v1.5

General: Raised the LaTeX format requirement, set the PDF metadata at `\maketitle`, and expanded the documentation and README. 1

v1.6

General: Kept the optional footnote argument, made ref, eqref, subref, and cite robust, fixed line breaks, equation references, citations, and math in PDF strings, removed the negative space from textlabel references, and removed spurious spaces and split links from eqcrefname, left the PDF title and keywords to hep-title and to the user, and loaded amsmath before cleveref, so that the package can be loaded first. Left the PDF title and keywords also to hep-journal and dropped a missing title, which looped in the PDF string. Made `\cref` work with `\textlabel`, and kept skips wider than an inter-word space before references and citations. . 1