The HEP-FLOAT package*

Convenience package for float placement

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2023/07/01

Abstract

The HEP-FLOAT package redefines some LaTeX float placement defaults and defines convenience wrappers for floats.

The HEP-FLOAT package can be loaded with `\usepackage{hep-float}`.

`figure` (*env.*)
`table` (*env.*)

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

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

`manualplacement`

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 can be deactivated using the `manualplacement` package option.

`\raggedright`

The float environments have been adjusted to center their content. The usual behaviour can be reactivated using `\raggedright`.

`panels` (*env.*)
`\panel`

The `panels` environment makes use of the SUBCAPTION package [1]. 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. The spacing between the panels can be adjusted by adjusting the `\panelvspace` in terms of a `\linewidth` fraction `\renewcommand{\panelhspace}`fraction and the `\panelvspace` in terms of a length `\renewcommand{\panelvspace}{`⟨*length*⟩`}`.

`\panelhspace`
`\panelvspace`

`tabular` (*env.*)

The BOOKTABS [2] and MULTIROW [3] packages are loaded enabling publication quality tabulars such as in table 1b.

`\graphic`
`\graphics`

The GRAPHICX package [4] 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*⟩`}`.

*This document corresponds to HEP-FLOAT v1.2.

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```
\begin{panels}{2}
  code
\panel
  \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).

A Implementation

<*package>

Load the KVOPTIONS package [5] and define a hepfloat namespace.

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

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

```
\DeclareBoolOption[true]{manualplacement}
\ProcessKeyvalOptions*
```

Adjust the LaTeX float placement defaults

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

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

```
\let\hep@figure\figure%
\let\end@hep@figure\endfigure%
\let\hep@table\table%
\let\end@hep@table\endtable%
\ifhepfloat@manualplacement%
  \renewenvironment{figure}[1][tbp]{%
    \hep@figure[#1]\centering\small%
    }{\end@hep@figure}%
  \renewenvironment{table}[1][tbp]{%
    \hep@table[#1]\centering\small%
  }{\end@hep@table}%
\else%
```

```
  \renewenvironment{figure}[1][]{%
    \hep@figure\centering\small%
  }{\end@hep@figure}%
  \renewenvironment{table}[1][]{%
    \hep@table\centering\small%
  }{\end@hep@table}
\fi%
```

A.1 floats

`figures` (*env.*) Define the figures environment that places figures next to each other.

`\figure`

```
\newcommand{\figurehspace}{0.0333}
\newcommand{\figurevspace}{.5\baselineskip}
\newenvironment{figures}[2][b]{%
  \begin{figure}
  \let\oldcaption\caption
  \renewcommand{\caption}[1]{%
    \renewcommand{\caption}{\oldcaption}%
    \captionof{figure}{##1}\vspace{\figurevspace}%
  }
  \ifdim#2pt>1pt%
    \newcommand{\hep@figure@space}{\figurehspace\linewidth/#2}%
    \renewcommand{\figure}[1][b]{%
      \end{minipage}\hfill%
      \begin{minipage}[##1]{\linewidth/#2-\hep@figure@space}%
    }
    \begin{minipage}[#1]{\linewidth/#2-\hep@figure@space}
  \else%
    \newcommand{\hep@figure@space}[1]{##1\linewidth*\real{\figurehspace}}
    \renewcommand{\figure}[2][b]{%
      \end{minipage}\hfill%
      \begin{minipage}[##1]{##2\linewidth-\hep@figure@space{##2}}%
    }
    \begin{minipage}[#1]{#2\linewidth-\hep@figure@space{#2}}
  \fi%
}{%
\end{minipage}\end{figure}%
}
```

`tables` (*env.*) Define the tables environment that places tables next to each other.

`\table`

```
\newcommand{\tablehspace}{0.0333}
\newcommand{\tablevspace}{.5\baselineskip}
\newenvironment{tables}[2][b]{%
  \begin{table}
  \let\oldcaption\caption
  \renewcommand{\caption}[1]{%
    \renewcommand{\caption}{\oldcaption}%
    \captionof{table}{##1}\vspace{\tablevspace}%
  }
```

```
  \ifdim#2pt>1pt%
    \newcommand{\hep@table@space}{\tablehspace\linewidth/#2}%
    \renewcommand{\table}[1][b]{%
      \end{minipage}\hfill%
      \begin{minipage}[##1]{\linewidth/#2-\hep@table@space}\centering%
    }
    \begin{minipage}[#1]{\linewidth/#2-\hep@table@space}\centering
  \else%
    \newcommand{\hep@table@space}[1]{##1\linewidth*\real{\tablehspace}}
    \renewcommand{\table}[2][b]{%
      \end{minipage}\hfill%
      \begin{minipage}[##1]{##2\linewidth-\hep@table@space{##2}}%
      \centering%
    }
    \begin{minipage}[#1]{#2\linewidth-\hep@table@space{#2}}%
    \centering
  \fi%
}{%
\end{minipage}\end{table}%
}
```

A.2 Sub-floats

Load the SUBCAPTION package [1].

```
\PassOptionsToPackage{subrefformat=parens}{subcaption}
\RequirePackage{subcaption}
\captionsetup{font=small}
\captionsetup[sub]{font=small}
```

Provide the macros for older versions of the SUBCAPTION package using the XPARSE [6] package.

```
\RequirePackage{xparse}
\providecommand*\subcaption@minipage[2]{%
  \minipage#1{#2}\setcaptionsubtype\relax%
}
\ProvideDocumentEnvironment{subcaptionblock}{O{b}m}{%
  \caption@withoptargs\subcaption@minipage[#1]{#2}%
}{\endminipage}
```

`panels` (*env.*)
`\panel`
`\panelhspace`
`\panelvspace`

Define the `panels` environment and the `\panel` macro using the CALC [7] and ETOOLBOX [8] packages.

```
\RequirePackage{calc}
\RequirePackage{etoolbox}
\newcommand{\panelhspace}{0.0333}
\newcommand{\panelvspace}{.5\baselineskip}
\newenvironment{panels}[2][b]{%
  \addtolength{\belowcaptionskip}{\panelvspace}%
```

Define an internal macro for global behaviour.

```
\newcommand{\begin@subcaption@minipage}[2][b]{%
% \caption@withoptargs\subcaption@minipage[##1]{##2}%
  \subcaptionblock[##1]{##2}%
  \centering\vskip 0pt%
% \renewcommand{\hep@panel@vspace}{\panelvspace}%
}%
```

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

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

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

```
\else%
  \newcommand{\hep@panel@space}[1]{##1\linewidth*\real{\panelhspace}}%
  \newcommand{\panel}[2][b]{%
    \endminipage\hfill\begin@subcaption@minipage[#1]{%
      ##2\linewidth-\hep@panel@space{##2}%
    }%
  }%
  \begin@subcaption@minipage[#1]{%
    #2\linewidth-\hep@panel@space{#2}%
  }%
\fi%
}{%
\endsubcaptionblock%
\vspace{-\panelvspace}%
}
```

A.3 Tables

`tabular` (*env.*) Enhance tabulars with the BOOKTABS and MULTIROW packages [2, 3].

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

A.4 Figures

`\graphic` Provide the \graphic macro for the inclusion of figures using the GRAPHICX package [4].

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

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

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

</package>

B Test

<*test>

```
\documentclass{article}

\usepackage[showframe]{geometry}
\usepackage{hep-float}

\begin{document}

\begin{figure}
\graphic[.5]{example-image-4x3}
\caption{test}
\end{figure}

\begin{figures}{.3}
\graphic{example-image-4x3}
\caption{one}
\figure{.4}
\graphic{example-image-16x9}
\caption{two}
\figure{.3}
\graphic{example-image-4x3}
\caption{three}
\figure{.3}
\graphic{example-image-4x3}
\caption{one}
\figure{.4}
\graphic{example-image-16x9}
\caption{two}
\figure{.3}
\graphic{example-image-4x3}
\caption{three}
\end{figures}

\begin{figures}{3}
\graphic{example-image-1x1}
\caption{one}
\figure
\graphic{example-image-1x1}
\caption{two}
\figure
\graphic{example-image-1x1}
```

```
\caption{three}
\figure
\graphic{example-image-1x1}
\caption{one}
\figure
\graphic{example-image-1x1}
\caption{two}
\figure
\graphic{example-image-1x1}
\caption{three}
\end{figures}


\begin{figure}
\begin{panels}{3}
\graphic{example-image-1x1}
\caption{a}
\panel
\graphic{example-image-1x1}
\caption{b}
\panel
\graphic{example-image-1x1}
\caption{c}
\panel
\graphic{example-image-1x1}
\caption{d}
\panel
\graphic{example-image-1x1}
\caption{e}
\panel
\graphic{example-image-1x1}
\caption{f}
\end{panels}
\caption{Panels}
\end{figure}

\begin{figure}
\begin{panels}{.3}
\graphic{example-image-4x3}
\caption{a}
\panel{.4}
\graphic{example-image-16x9}
\caption{b}
\panel{.3}
\graphic{example-image-4x3}
\caption{c}
\panel{.225}
\graphic{example-image-1x1}
\caption{d}
\panel{.4}
```

```
\graphic{example-image-16x9}
\caption{e}
\panel{.225}
\graphic[.8]{example-image-1x1}
\caption{f}
\end{panels}
\caption{Panels 2}
\end{figure}

\begin{tables}{2}
\begin{tabular}{cc}\toprule
a & b \\
\bottomrule\end{tabular}
\caption{a}
\table
\begin{tabular}{cc}\toprule
a & b \\
\bottomrule\end{tabular}
\caption{b}
\end{tables}

\end{document}
```

</test>

C Readme

<*readme>

```
# The ‘hep-float‘ package

Convenience package for float placement

## Introduction

The ‘hep-float‘ package redefines some ‘LaTeX‘ float placement defaults
and defines convenience wrappers for floats. The ‘hep-float‘ package can
be loaded with ‘\usepackage{hep-float}‘.

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part of all distributions of LaTeX version 2005/12/01 or later.
```

</readme>

References

[1] A. Sommerfeldt. 'The subcaption package: Support for sub-captions' (2007). CTAN: subcaption. GitLab: axelsommerfeldt/caption.

[2] D. Els and S. Fear. 'The booktabs package: Publication quality tables in LaTeX' (1995). CTAN: booktabs.

[3] P. van Oostrum and J. Leichter. 'The multirow, bigstrut and bigdelim packages: Create tabular cells spanning multiple rows' (1994). CTAN: multirow.

[4] D. Carlisle and S. Rahtz. 'Packages in the "graphics" bundle: Enhanced support for graphics' (1994). CTAN: graphicx.

[5] H. Oberdiek. 'The kvoptions package: Key value format for package options' (2004). CTAN: kvoptions. GitHub: ho-tex/kvoptions.

[6] *LaTeX3 Project*. 'The xparse package: A generic document command parser' (1999). CTAN: xparse.

[7] *LaTeX3 Project*. 'The calc package: Simple arithmetic in LaTeX commands' (1992). CTAN: calc.

[8] P. Lehman and J. Wright. 'The etoolbox package: e-TeX tools for LaTeX' (2007). CTAN: etoolbox.