The HEP-FLOAT package*

Convenience package for float placement

Jan Hajer†

2025/09/01

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)

`local`

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 `local` package option.

`\raggedright`

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

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

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*⟩`}`.

`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 v1.4.

†jan.hajer@tecnico.ulisboa.pt

```
\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@
}
```

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

```
\DeclareBoolOption[true]{local}
\DeclareComplementaryOption{global}{local}

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

```
\ifhepfloat@local%
  \renewenvironment{figure}[1][tbp]{%
    \@float{figure}[#1]\centering\small%
  }{\end@float}
  \renewenvironment{figure*}[1][tbp]{%
    \@dblfloat{figure}[#1]\centering\small%
  }{\end@dblfloat}
  \renewenvironment{table}[1][tbp]{%
    \@float{table}[#1]\centering\small%
  }{\end@float}
  \renewenvironment{table*}[1][tbp]{%
```

```
    \@dblfloat{table}[#1]\centering\small%
  }{\end@dblfloat}
\else%
  \renewenvironment{figure}[1][]{%
    \@float{figure}\centering\small%
  }{\end@float}
  \renewenvironment{figure*}[1][]{%
    \@dblfloat{figure}\centering\small%
  }{\end@dblfloat}
  \renewenvironment{table}[1][]{%
    \@float{table}\centering\small%
  }{\end@float}
  \renewenvironment{table*}[1][]{%
    \@dblfloat{table}\centering\small%
  }{\end@dblfloat}
\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}
\newcommand*\header[1]{\multicolumn{1}{c}{#1}}
```

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}
```

```
185
186 \begin{figures}{3}
187 \graphic{example-image-1x1}
188 \caption{one}
189 \figure
190 \graphic{example-image-1x1}
191 \caption{two}
192 \figure
193 \graphic{example-image-1x1}
194 \caption{three}
195 \figure
196 \graphic{example-image-1x1}
197 \caption{one}
198 \figure
199 \graphic{example-image-1x1}
200 \caption{two}
201 \figure
202 \graphic{example-image-1x1}
203 \caption{three}
204 \end{figures}
205
206
207 \begin{figure}
208 \begin{panels}{3}
209 \graphic{example-image-1x1}
210 \caption{a}
211 \panel
212 \graphic{example-image-1x1}
213 \caption{b}
214 \panel
215 \graphic{example-image-1x1}
216 \caption{c}
217 \panel
218 \graphic{example-image-1x1}
219 \caption{d}
220 \panel
221 \graphic{example-image-1x1}
222 \caption{e}
223 \panel
224 \graphic{example-image-1x1}
225 \caption{f}
226 \end{panels}
227 \caption{Panels}
228 \end{figure}
229
230 \begin{figure}
231 \begin{panels}{.3}
232 \graphic{example-image-4x3}
233 \caption{a}
234 \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}‘.

## Author

Jan Hajer
```

```
## License

This file may be distributed and/or modified under the conditions of the
‘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] 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`.