

The HEP-FLOAT package*

Convenience package for float placement

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Abstract

The HEP-FLOAT package configures float placement for publication-style documents and adds convenience wrappers for figures, tables, sub-floats, and graphics. It centres float contents by default, provides side-by-side figure and table environments, loads BOOKTABS, MULTIROW, and SUBCAPTION, and defines compact graphics helpers.

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

figure (*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 L^AT_EX macros.

table (*env.*)

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

local The most useful float placement is usually achieved 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**.

figures (*env.*) The **figures** environment places several figure panels next to each other inside one **figure** float. It takes an optional vertical alignment and a mandatory argument that is either the number of equal-width figures or the width of the first figure as a fraction of `\linewidth`. Inside the environment the **\figure** macro starts the next figure panel. The horizontal and vertical spacing are controlled by **\figurehspace** and **\figurevspace**.

tables (*env.*) The **tables** environment is the analogous wrapper for several tables inside one **table** float. Inside the environment **\table** starts the next table panel, and **\tablehspace** and **\tablevspace** control the spacing.

\tablehspace 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}[\langle vertical alignment \rangle]{\langle width \rangle}** 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{\langle width \rangle}**

*This document corresponds to HEP-FLOAT v1.5.

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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
a	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).

<code>\panelhspace</code>	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 <code>\panelvspace</code> in terms of a <code>\linewidth</code> fraction <code>\renewcommand*{\panelhspace}{fraction}</code> and the <code>\panelvspace</code> in terms of a length <code>\renewcommand*{\panelvspace}{\langle length \rangle}</code> .
<code>\panelvspace</code>	
<code>tabular (env.)</code>	The <code>BOOKTABS</code> [2] and <code>MULTIROW</code> [3] packages are loaded enabling publication quality tabulars such as in table 1b.
<code>\graphic</code>	The <code>GRAPHICX</code> package [4] is loaded and the <code>\graphic[\langle width \rangle]{\langle figure \rangle}</code> macro is defined, which is a wrapper for the <code>\includegraphics{\langle figure \rangle}</code> macro and takes the figure width as fraction of the <code>\linewidth</code> as optional argument (default 1). If the graphics are located in a sub-folder its path can be indicated by <code>\graphics{\langle subfolder \rangle}</code> .
<code>\graphics</code>	

A Implementation

<*package>

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

```

1 \RequirePackage{kvoptions}
2 \SetupKeyvalOptions{
3   family=hepfloat,
4   prefix=hepfloat@
5 }

```

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

```

6 \DeclareBoolOption[true]{local}
7 \DeclareComplementaryOption[global]{local}

8 \ProcessKeyvalOptions*

```

Adjust the `LATEX` float placement defaults

```

9 \setcounter{bottomnumber}{0} % 1
10 \setcounter{topnumber}{1} % 2
11 \setcounter{dbltopnumber}{1} % 2
12 \renewcommand*{\topfraction}{.9} % .7
13 \renewcommand*{\dbltopfraction}{.9} % .7
14 \renewcommand*{\textfraction}{.1} % .2
15 \renewcommand*{\floatpagefraction}{.8} % .5

```

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

```

16 \ifhepfloat@local%
17 \renewenvironment{figure}[1][tbp]{%
18   \@float{figure}[#1]\centering\small%
19 }{\end@float}
20 \renewenvironment{figure*}[1][tbp]{%
21   \@dblfloat{figure}[#1]\centering\small%
22 }{\end@dblfloat}
23 \renewenvironment{table}[1][tbp]{%
24   \@float{table}[#1]\centering\small%
25 }{\end@float}
26 \renewenvironment{table*}[1][tbp]{%
27   \@dblfloat{table}[#1]\centering\small%
28 }{\end@dblfloat}
29 \else%
30 \renewenvironment{figure}[1][]{%
31   \@float{figure}\centering\small%
32 }{\end@float}
33 \renewenvironment{figure*}[1][]{%
34   \@dblfloat{figure}\centering\small%
35 }{\end@dblfloat}
36 \renewenvironment{table}[1][]{%
37   \@float{table}\centering\small%
38 }{\end@float}
39 \renewenvironment{table*}[1][]{%
40   \@dblfloat{table}\centering\small%
41 }{\end@dblfloat}
42 \fi%
```

A.1 floats

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

```

\figure
43 \newcommand*{\figurehspace}{0.0333}
44 \newcommand*{\figurevspace}{.5\baselineskip}
45 \newenvironment{figures}[2][b]{%
46   \begin{figure}
47   \let\oldcaption\caption
48   \renewcommand*{\caption}[1]{%
49     \renewcommand*{\caption}{\oldcaption}%
50     \captionof{figure}{##1}\vspace{\figurevspace}%
51   }
52   \ifdim#2pt>1pt%
53     \newcommand*{\hep@figure@space}{\figurehspace\linewidth/#2}%
54     \renewcommand*{\figure}[1][b]{%
55       \end{minipage}\hfill%
56       \begin{minipage}[##1]{\linewidth/#2-\hep@figure@space}%
57     }
58     \begin{minipage}[#1]{\linewidth/#2-\hep@figure@space}
```

```

59 \else%
60 \newcommand*{\hep@figure@space}[1]{##1\linewidth*\real{\figurehspace}}
61 \renewcommand*{\figure}[2][b]{%
62 \end{minipage}\hfill%
63 \begin{minipage}[##1]{##2\linewidth-\hep@figure@space{##2}}%
64 }
65 \begin{minipage}[#1]{#2\linewidth-\hep@figure@space{#2}}
66 \fi%
67 }{%
68 \end{minipage}\end{figure}%
69 }

```

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

```

\table
70 \newcommand*{\tablehspace}{0.0333}
71 \newcommand*{\tablevspace}{.5\baselineskip}
72 \newenvironment{tables}[2][b]{%
73 \begin{table}
74 \let\oldcaption\caption
75 \renewcommand*{\caption}[1]{%
76 \renewcommand*{\caption}{\oldcaption}%
77 \captionof{table}[##1]\vspace{\tablevspace}%
78 }
79 \ifdim#2pt>1pt%
80 \newcommand*{\hep@table@space}{\tablehspace\linewidth/#2}%
81 \renewcommand*{\table}[1][b]{%
82 \end{minipage}\hfill%
83 \begin{minipage}[##1]{\linewidth/#2-\hep@table@space}\centering%
84 }
85 \begin{minipage}[#1]{\linewidth/#2-\hep@table@space}\centering
86 \else%
87 \newcommand*{\hep@table@space}[1]{##1\linewidth*\real{\tablehspace}}
88 \renewcommand*{\table}[2][b]{%
89 \end{minipage}\hfill%
90 \begin{minipage}[##1]{##2\linewidth-\hep@table@space{##2}}%
91 \centering%
92 }
93 \begin{minipage}[#1]{#2\linewidth-\hep@table@space{#2}}%
94 \centering
95 \fi%
96 }{%
97 \end{minipage}\end{table}%
98 }

```

A.2 Sub-floats

Load the SUBCAPTION package [1].

```

99 \PassOptionsToPackage{subrefformat=pars}{subcaption}
100 \RequirePackage{subcaption}
101 \captionsetup{font=small}

```

```
102 \captionsetup[sub]{font=small}
```

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

```
103 \RequirePackage{xparse}
104 \providecommand*\subcaption@minipage[2]{%
105   \minipage#1{#2}\setcaptionsubtype\relax%
106 }
107 \ProvideDocumentEnvironment{subcaptionblock}{0{b}m}{%
108   \caption@withoptargs\subcaption@minipage[#1]{#2}%
109 }\endminipage}
```

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

```
\panelhspace
\panelvspace
110 \RequirePackage{calc}
111 \RequirePackage{etoolbox}
112 \newcommand*\panelhspace{0.0333}
113 \newcommand*\panelvspace{.5\baselineskip}
114 \newenvironment{panels}[2][b]{%
115   \addtolength{\belowcaptionskip}{\panelvspace}%
116 }
```

Define an internal macro for global behaviour.

```
116 \newcommand*\begin@subcaption@minipage[2][b]{%
117 %   \caption@withoptargs\subcaption@minipage[##1]{##2}%
118   \subcaptionblock[##1]{##2}%
119   \centering\vskip 0pt%
120 %   \renewcommand*\hep@panel@vspace{\panelvspace}%
121 }%
```

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

```
122 \ifdim#2pt>1pt%
123   \newcommand*\hep@panel@space{\panelhspace\linewidth/#2}%
124   \newcommand*\panel[1][b]{%
125     \endminipage\hfill\begin@subcaption@minipage[#1]{%
126       \linewidth/#2-\hep@panel@space%
127     }%
128   }%
129   \begin@subcaption@minipage[#1]{\linewidth/#2-\hep@panel@space}%
130 }
```

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

```
130 \else%
131   \newcommand*\hep@panel@space[1]{##1\linewidth*\real{\panelhspace}}%
132   \newcommand*\panel[2][b]{%
133     \endminipage\hfill\begin@subcaption@minipage[#1]{%
134       ##2\linewidth-\hep@panel@space{##2}%
135     }%
136   }%
137   \begin@subcaption@minipage[#1]{%
138     #2\linewidth-\hep@panel@space{#2}%
139   }%
140 }
```

```

139     }%
140     \fi%
141   }{%
142 \endsubcaptionblock%
143 \vspace{-\panelvspace}%
144 }

```

A.3 Tables

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

```

145 \RequirePackage{booktabs}
146 \RequirePackage{multirow}
147 \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].

```

148 \RequirePackage{graphicx}
149 \providecommand*\tikzsetnextfilename[1]{}
150 \newcommand*\graphic[2][1]{\tikzsetnextfilename{#2}{%
151   \centering\includegraphics[width=#1\linewidth]{#2}\par%
152 }}

```

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

```

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

```

</package>

B Test

<*test>

```

154 \documentclass{article}
155
156 \usepackage[showframe]{geometry}
157 \usepackage{hep-float}
158
159 \begin{document}
160
161 \begin{figure}
162 \graphic[.5]{example-image-4x3}
163 \caption{test}
164 \end{figure}
165
166 \begin{figures}{.3}
167 \graphic{example-image-4x3}
168 \caption{one}
169 \figure{.4}

```

```

170 \graphic{example-image-16x9}
171 \caption{two}
172 \figure{.3}
173 \graphic{example-image-4x3}
174 \caption{three}
175 \figure{.3}
176 \graphic{example-image-4x3}
177 \caption{one}
178 \figure{.4}
179 \graphic{example-image-16x9}
180 \caption{two}
181 \figure{.3}
182 \graphic{example-image-4x3}
183 \caption{three}
184 \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}
235 \graphic{example-image-16x9}
236 \caption{b}
237 \panel{.3}
238 \graphic{example-image-4x3}
239 \caption{c}
240 \panel{.225}
241 \graphic{example-image-1x1}
242 \caption{d}
243 \panel{.4}
244 \graphic{example-image-16x9}
245 \caption{e}
246 \panel{.225}
247 \graphic{.8}{example-image-1x1}
248 \caption{f}
249 \end{panels}
250 \caption{Panels 2}
251 \end{figure}
252
253 \begin{tables}{2}
254 \begin{tabular}{cc}\toprule
255 a & b \\
256 \bottomrule\end{tabular}
257 \caption{a}
258 \table
259 \begin{tabular}{cc}\toprule
260 a & b \\
261 \bottomrule\end{tabular}
262 \caption{b}
263 \end{tables}
264
265 \end{document}

```

</test>

C Readme

<*readme>

```
266 # The 'hep-float' package
267
268 Convenience package for float placement
269
270 ## Introduction
271
272 The 'hep-float' package configures float placement for publication-style
273 documents and adds convenience wrappers for figures, tables, sub-floats,
274 and graphics. It centres float contents by default, provides side-by-side
275 'figures', 'tables', and 'panels' environments, loads 'booktabs',
276 'multirow', and 'subcaption', and defines compact graphics helpers.
277
278 It can be loaded with '\usepackage{hep-float}'.
279
280 ## Author
281
282 Jan Hajer
283
284 ## License
285
286 This file may be distributed and/or modified under the conditions of the
287 'LaTeX' Project Public License, either version 1.3c of this license or
288 (at your option) any later version. The latest version of this license is
289 in 'http://www.latex-project.org/lppl.txt' and version 1.3c or later is
290 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 L^AT_EX' (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] L^AT_EX₃ Project. 'The xparse package: A generic document command parser' (1999). CTAN: xparse.
- [7] L^AT_EX₃ Project. 'The calc package: Simple arithmetic in L^AT_EX commands' (1992). CTAN: calc.
- [8] P. Lehman and J. Wright. 'The etoolbox package: e-T_EX tools for L^AT_EX' (2007). CTAN: etoolbox.

Change History

v1.0	General: Created the dedicated float package with panel, subfloat, caption, placement, and float-styling helpers. . . .	1	formatting.	1
v1.1	General: Added manual float placement, panel spacing commands, subcaption-block compatibility, and reworked panel spacing with xparse, calc, and etoolbox.	1	v1.3	General: Added the <code>\header</code> helper.
v1.2	General: Added side-by-side figure and table environments with horizontal and vertical spacing controls, small centred float contents, and refreshed documentation and README		v1.4	General: Renamed manual placement to local and global placement modes, reimplemented figure and table wrappers through the standard float internals, and applied starred command definitions.
			v1.5	General: Raised the LaTeX format requirement, bumped release metadata, and expanded the abstract, user documentation, README, and examples.
				1