Controlling captions, fullpage and doublepage floats: hvfloat

Herbert Voß

Abstract The package hvfloat defines macros which place objects and captions of floats in different positions with different rotating angles for the object and caption. The object can fill a full column, a full page or full doublepage, with or without taking margins into account.

Sommario Il pacchetto hvfloat definisce macro che posizionano oggetti e didascalie di float in posizioni diverse con angoli di rotazione diversi per l’oggetto e la didascalia. L’oggetto può riempire un’intera colonna, una pagina intera o un’intera pagina doppia, con o senza considerare i margini.

1. Introduction

The well-known floating environments like figure and table are easy to handle if there is only one object and one caption which fits into the current page text layout. If you want a caption rotated and beside the object (an image, tabular, …) then you need some \LaTeX{} knowledge or a package which does the rotation and the checking of the current page number if you want to place the rotated caption for a twocolumn document into the outer margin.

All this can be simplified by using the package hvfloat which has a variety of possible options for the floating object and caption. The package is loaded in the usual way:

\usepackage[options]{hvfloat}

The package has options hyperref, nostfloats, and fbox. The latter is only used for locating spacing problems in the document: objects and captions are framed, so unwanted whitespace can easily be seen. With nostfloats one can prevent the loading of the package stfloats, which allows bottom floats in a twocolumn document. This option is needed only in rare cases where a package conflict between stfloats and another package exists. With hyperref the package of that name is loaded.

If you would like to reset the default for the float position parameters to htp (here, top and page) (the default is tbp, top, bottom, and page), then you can load the helper package hvfloat-fps. It knows the optional arguments table, figure, and all. If you have a document with a large number of floats and relatively short text you can load the package with

\usepackage[all=!htb]{hvfloat-fps}

The exclamation allows \LaTeX{} to ignore the internal parameter settings for the floats, e.g. the number of floats on one page Mittelbach et al. 2004.

Usually several \LaTeX{} runs will be needed until hvfloat knows whether figures are on even or odd page and to get all the references correct. The usual warning ‘Label(s) may have changed’ will be shown if another compilation is needed.
2. Dependencies

The following packages are loaded by default: afterpage, caption, expl3, graphicx, ifoddpage, multido, picture, stfloats, subcaption, trimclip, xkeyval.

3. The macros and optional arguments

The three main macros are \hvFloat, \hvFloatSet, and \hvFloatSetDefaults. The syntax for calling them is somewhat complex. Optional arguments are gray shaded:

\begin{verbatim}
\hvFloat \[options\] \[float type\]{floating object}
  \[short caption\] \{long caption\}{label}
\hvFloatSet\{key=value list\}
\hvFloatSetDefaults
\end{verbatim}

The star version of \hvFloat is explained in section 4 on page 30 and the optional + is explained in section 7.2 on page 41.

The \hvFloatSet macro allows the global setting of parameters via the given keyword=value list, while \hvFloatSetDefaults sets all parameters to their default values, as shown in Table 2 on page 28.

If \hvFloat is given an empty second argument for float type, it switches by default to a nonfloat object and activates the option onlyText (see Table 2). The short caption is a second optional argument; if given, it specifies, as usual, the caption entry for the \listof . . . . All other arguments are mandatory but may be empty.

Some other macros are defined, mostly for use in the hvfloat implementation, but they can also be used for a user’s own purposes. Only \tabcaption should be placed at the top of an object.

\begin{verbatim}
\figcaption \{short caption\} \{long text\}
\tabcaption \{short caption\} \{long text\}
\tabcaptionbelow \{short caption\} \{long text\}
\end{verbatim}

They are used for the nonfloat keyword, where these macros write captions in the same way but outside of any float environment. The default caption cannot be used here. It is no problem to use the \tabcaption command to place a caption anywhere, for instance here in an inline mode:

**Table 1.** A caption with neither sense nor object.

In this case a label should be put inside of the argument and not after the command \tabcaption, so that a reference to the nonexistent object Table 1 will still work. Source for this:

ArsTEXnica
It is no problem to use the \verb|\tabcaption| command ... here in an inline mode:
\tabcaption{The caption without sense ...}(A caption with neither sense nor
object.\label{dummy})

In this case a label should be put inside the argument ... so that a reference to
the nonexistent Table\ref{dummy} will still work.

With the macro \verb|\hvDefFloatStyle| one can define a style to be used instead of the individual setting. Internally the style is saved in a macro named \verb|\@name|.

\begin{tabularx}{\textwidth}{@{} l>{\small	tfamily}cX @{}}
\toprule
\textbf{Keyword} & \textbf{Default} ...
\midrule
[\ldots]
\end{tabularx}

Then, to typeset the table, we use the keyword \verb|rotAngle|, which rotates object and caption together:
\begin{verbatim}
\hvFloat*[floatPos=p,rotAngle=90,capPos=top,capWidth=w,useOBox=true]{table}{}
{The optional keywords for the \texttt{\textbackslash hvFloat} macro.}
{tab:options}
\end{verbatim}

3.1. Caption positioning

By default the caption is set below the object and the macro \verb|\hvFloat| behaves like the usual \verb|figure| or \verb|table| environment. With the keyword \verb|capPos| and the value \texttt{before}, the caption can be placed beside the object. For small objects (smaller than a column/page), \texttt{before} is equivalent to \texttt{left}. Thus, here is the code for our first example:

\begin{verbatim}
\hvFloat[capPos=left]{figure}{\includegraphics{frose}}{A short caption beside a
figure \ldots\ without a label.}{}
\end{verbatim}

If the caption is shorter than the possible width it is horizontally centered. The vertical position is by default also centered. This can be changed by the optional argument \verb|capVPos|. The formatting can be modified by the optional arguments of the (already-loaded) package \verb|caption|. They can be specified to \verb|\hvFloat| via the optional argument \verb|capFormat| (see Figure 2 on page 29). The caption is also rotated by setting \verb|capAngle|=90, which is a counter-clockwise rotation:

\begin{verbatim}
\hvFloat[capPos=right, capAngle=90,capWidth=h, capFormat={font=sf}]{figure}
{\includegraphics{frose}}{A caption in sans \ldots, to the right \ldots, as
wide as \ldots, and rotated by 90\textdegree\ldots}{fig:1}
\end{verbatim}
Table 2. The optional keywords for the \hvFloat macro.

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>floatPos</td>
<td>tbp</td>
<td>This is the same default placement setting as in standard \LaTeX; maybe not always the best setting.</td>
</tr>
<tr>
<td>rotAngle</td>
<td>0</td>
<td>The value for the angle if both the object and the caption should be rotated together.</td>
</tr>
<tr>
<td>capWidth</td>
<td>n</td>
<td>The width of the caption. Can be \textit{n} for a natural width given by the current linewidth, \textit{w} for the width of the object, \textit{h} for the height of the object, or a scale factor for \textit{\columnwidth}.</td>
</tr>
<tr>
<td>capAngle</td>
<td>0</td>
<td>The integer value for the angle if the caption should be rotated. Positive is counter-clockwise.</td>
</tr>
<tr>
<td>capPos</td>
<td>bottom</td>
<td>The position of the caption relative to the object. Possible values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\textit{before}: always before (left) from the object.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\textit{left}: always before (left) from the object, but on the same page in twocolumn mode.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\textit{bottom}: always on the bottom of the object.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\textit{inner}: in twoside mode always typeset at the inner margin.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\textit{outer}: in twoside mode with fullpage objects always on an odd page.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\textit{evenPage}: in twoside mode with fullpage objects always on an even page.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>\textit{oddPage}: in twoside mode with fullpage objects always on an odd page.</td>
</tr>
<tr>
<td>capVPos</td>
<td>center</td>
<td>Only used when capPos=left</td>
</tr>
<tr>
<td>objectPos</td>
<td>center</td>
<td>Horizontal placement of the object relative to the document. Possible values are (left</td>
</tr>
<tr>
<td>objectAngle</td>
<td>0</td>
<td>Integer value for the angle if the object should be rotated. Positive is counter-clockwise.</td>
</tr>
<tr>
<td>floatCapSep</td>
<td>5pt</td>
<td>Additional space between the object and a left- or right-placed caption.</td>
</tr>
<tr>
<td>useOBox</td>
<td>false</td>
<td>Instead of passing the object to \hvFloat, with useOBox=true the contents of the predefined box \hvOBox is used.</td>
</tr>
<tr>
<td>onlyText</td>
<td>false</td>
<td>The caption is printed as normal text with no entry in any list of...</td>
</tr>
<tr>
<td>nonFloat</td>
<td>false</td>
<td>The object isn’t put in a floating environment, but printed as standard text with an additional caption. The float counter is increased as usual and can be referenced.</td>
</tr>
<tr>
<td>wide</td>
<td>false</td>
<td>The float can use \textwidth + \marginparwidth as horizontal width.</td>
</tr>
<tr>
<td>objectFrame</td>
<td>false</td>
<td>Put a frame with no separation around the float object.</td>
</tr>
<tr>
<td>style</td>
<td>none</td>
<td>Use a defined style.</td>
</tr>
<tr>
<td>capFormat</td>
<td>none</td>
<td>Define formatting options for \caption; see documentation of package \caption.</td>
</tr>
<tr>
<td>subcapFormat</td>
<td>none</td>
<td>Define formatting options for \subcaption.</td>
</tr>
<tr>
<td>fullpage</td>
<td>false</td>
<td>Use a complete column in twocolumn mode.</td>
</tr>
<tr>
<td>FullPage</td>
<td>false</td>
<td>Use the full text area for the object.</td>
</tr>
<tr>
<td>FULLPAGE</td>
<td>false</td>
<td>Use the full paper width/height for the object.</td>
</tr>
<tr>
<td>doublePage</td>
<td>false</td>
<td>Use the text area on a doublepage with additional text.</td>
</tr>
<tr>
<td>doublePAGE</td>
<td>false</td>
<td>Use the text area on a doublepage without additional text.</td>
</tr>
<tr>
<td>doubleFULLPAGE</td>
<td>false</td>
<td>Use the paperwidth on a doublepage without additional text.</td>
</tr>
<tr>
<td>vfill</td>
<td>false</td>
<td>Put a \vfill between every two objects in a multi- or subfloat.</td>
</tr>
<tr>
<td>sameHeight</td>
<td>false</td>
<td>Use the same text height on both pages for a doublePage object.</td>
</tr>
</tbody>
</table>
Figure 1. A short caption beside a figure object (capPos=left) without a label.

Figure 2. A caption in sans serif (capFormat={font=sf}), to the right of the object (capPos=right), as wide as the object (capWidth=h), and rotated by 90° (capAngle=90).

The caption's vertical position is controlled by the keyword capVPos which accepts the values top, center, and bottom. The capPos=inner setting is explained later (§5.2, p. 33). Typographically, a side caption for images should usually be at the bottom and for a table at the top of the object (Figure 3).

\hvFloat[capPos=inner,capVPos=bottom,objectAngle=180]{figure}{includegraphics{frose}}{This caption is at the inner margin [...], and vertically at the bottom [...], and the object is rotated [...]}(fig:11)

Figure 3. This caption is at the inner margin (capPos=inner, see p. 33), vertically at the bottom of the object (capVPos=bottom), and the object is rotated 180° (objectAngle=180).
3.2. The caption width

For a caption beside the object the horizontal justification is by default centered if the total width of object and caption are less than the current column/line width. The caption width itself can be controlled by the keyword `capWidth`, which can be set to \( n \) (natural width), \( w \) (width of the object), \( h \) (height of the object), or a value by which to scale \( \text{columnwidth} \). Figure 2 on the previous page shows the use of `capWidth=h`, which is used for rotated captions beside the object and Figure 4 shows a caption above the object with the same width.

\[
\texttt{hvFloat}[\text{capWidth=w, capPos=top, capAngle=180, objectAngle=90}](\text{figure})
\]
\[
\{\text{includegraphics(frose)}\}\{A 180^\circ-rotated caption above [...] with the same width.\}(\text{fig:1a})
\]

4. The star version \texttt{hvFloat*}

In two-column mode the floating environment can occupy both columns using the star version \texttt{hvFloat*}. This is analogous to the environments \texttt{figure*} and \texttt{table*}.

\[
\text{Figure 5. A longer caption to the right of the object (capPos=right), and vertically at the bottom of the object (capVPos=bottom). It spans both columns (\texttt{hvFloat*}) and may be at the top or bottom of the page.}
\]
If possible, the floating environment will be placed at the top of the following page or at the bottom of the current page. The latter needs the package `{stfloats}` which is loaded by `{hvfloat}` by default. ( `{stfloats}` cannot place a float at the bottom of the first page of an article or chapter when using the core `{tikz}` document classes; these classes also include code that prevents placement of a float at the top of the first page.) Placing the float across both columns within the text area is not possible. Here is the code for the following example (Figure 5 on the preceding page):

\texttt{hvFloat*[capVPos=bottom,capPos=right]{figure}}
\texttt{(\includegraphics{frose} \includegraphics[angle=180,origin=c]{frose})}
\texttt{(A caption to the right [...], It spans both columns [...])}
\texttt{fig:2}

The same can be seen in Table 3, which also spans two columns (we’ll discuss the content of that table later). Internally the number of possible floating objects on top of the page is controlled by the parameters \texttt{\topnumber} (onecolumn mode) and \texttt{\dbltopnumber} (twocolumn mode). They are preset for this documentclass (`{Arstexnica}`) to 2 and 2 and differ for other document classes. For doublepage objects the values will temporarily be changed to 1.

### 5. Full column or fullpage objects

As mentioned in Table 2 there are three keywords for fullpage objects:

- \texttt{fullpage} for a complete column or page in a onecolumn mode,
- \texttt{FullPage} for a complete text area of a page or both columns in a twocolumn mode, and
- \texttt{FULLPAGE} for the complete paper area without leaving any margin.

This refers to the reserved space which \texttt{hvfloat} will use when typesetting the object and caption. The object itself can be smaller than a full column or page. Package `{hvfloat}` defines five additional optional arguments for the package `{graphicx}` which can be used together with `{includegraphics}` to make the code a bit shorter. They are listed in Table 3. The so-called bind correction is additional free space at the inner margins of a twoside document.

In general, the interface is the same whether using the complete text area or the complete paper area for the floating object; the only difference is \texttt{fullpage} vs. \texttt{FULLPAGE}. By default, such a page will have no page number, no header, and no footer, and the pagestyle is empty.
5 Lists

5.2 Example for list (enumerate)

– First itemtext
  • Second itemtext

5.2 Example for list (enumerate)

1. First itemtext
2. Second itemtext
3. Last itemtext
4. First itemtext
5. Second itemtext

5.2.1 Example for list (4*enumerate)

1. First itemtext
   a) First itemtext
      i. First itemtext
         A. First itemtext
         B. Second itemtext
      ii. Last itemtext
   b) First itemtext
2. Second itemtext

5.3 Example for list (description)
First itemtext
Second itemtext
Last itemtext
First itemtext
Second itemtext

Figure 1: A caption of a fullpage object with capPos=oddPage on an odd-numbered page. And some more text which has no meaning because it merely fills the space for a long caption.

Figure 6. Twoside documents, onecolumn mode.
Top: a fullpage float and capPos=oddPage (example document odd2s1c.tex, pp. 6–7);
bottom: capPos=evenPage and a FULLPAGE float (example document paper-even2s1c.tex, pp. 8–9).
The following pages are printed in the \twocolumn mode to show that all full column, page, and double page examples also work in this mode.

Setting the keyword keepaspectratio to false only makes sense for images which have nearly the same ratio as the current column or page height/width. Using a full column or page for an object implies to put the caption on the preceding or following column/page. For a twocolumn document this should always be the opposite column on the same page and for twoside documents the opposite page. Only for doublepage objects (left–right pages) the caption must be on the preceding or following column/page, by default at the bottom of that page or column.

A label, which is defined by \hvFloat always points to the image, not to the caption. This makes no difference for the default floats, where the image and caption are on the same page. For fullpage or doublepage objects, however, the macro internally defines additional labels; one pointing to the caption (defined by label \langle label⟩-cap) and, if it is a doublepage object, another pointing to the second (right) part of the object (defined by label \langle label⟩-2).

All labels, the given one \langle label⟩ and the internal ones \langle label⟩-cap and \langle label⟩-2, will point to the same object counter, but possibly to different page numbers. An example is shown in section 6, where Figure 13, defined with label fig:dP, has its caption on page 39 and its image on pages 38 and 39. The following table shows the behavior:

<table>
<thead>
<tr>
<th>fig:dP</th>
<th>fig:dP-cap</th>
<th>fig:dP-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>\ref{..}</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>\pageref{..}</td>
<td>38</td>
<td>39</td>
</tr>
</tbody>
</table>

5.1. Twoside and onecolumn mode

In a twoside document with onecolumn mode, a fullpage object and the corresponding caption should be on facing pages (left–right). This can be specified with the keyword capPos and the values evenPage or oddPage. To save space we show only the output of two example documents (Figure 6 on the facing page). The upper pair of pages uses the following settings:

\begin{verbatim}
\hvFloat[fullpage,capPos=evenPage]
\begin{figure}
\includegraphics[fullpage]{frose}
\caption[... for a long caption.]{A caption of a \texttt{fullpage} object with \texttt{capPos=oddPage}}
\end{figure}
\end{verbatim}

The lower two pages in Figure 6 are similar, except capPos=evenPage and the object is set as FULLPAGE instead of fullpage.

The captions here (and throughout) are typeset in red to make them more visible in the examples, which are often reduced in size. The complete code for all examples is on CTAN (mirror.ctan.org/macros/latex/contrib/hvfloat/doc/examples).

5.2. Twoside and twocolumn mode

In contrast, in a twoside document in twocolumn mode, by default a caption appears before the fullpage or fullcolumn object, independent of an even or odd column or page. Figure 8 on page 35 shows the output of this example code:

\begin{verbatim}
\hvFloat[fullpage,capPos=inner]
\begin{figure}
\includegraphics[fullpage]{frose}
\caption[...]{A caption on the inner side of a twoside and twocolumn document (\texttt{capPos=inner}). This can be an even or odd page. And ... long caption.}
\end{figure}
\end{verbatim}

The caption is in the inner column, which is the second one for an even (left) page and the first for an odd (right) page. For a twoside document it also makes sense to have the caption on the even (left) page in the second
be left of the object and on the same page! Figure 7 shows this behavior.

6. Doublepage objects

A doublepage object makes sense only for twoside documents. Then the doublepage object can be placed on facing left–right pages and the caption perhaps on the right page or, in a case where the complete paper width is used, below the right part of the image, or, if need be, on the bottom of the preceding or following page. For example: suppose a doublepage object uses the complete paper area \(2\times\text{paperwidth} \times \text{paperheight}\) on the (left–right) pages 80–81; then the caption can be printed at the bottom of page 79 or page 82 (see Figure 11 on page 37). It is also possible to print the caption over the right part of the object (image) on the bottom or rotated at the right (see Figure 12 on page 37).

With using the keyword doublePage, additional document text may appear below the doublepage object, that is, the object does not occupy the entire textheight. The other two possibilities doublePage (using the doublepage text area) and doubleFULLPAGE (use the doublepage paperwidth) have no additional document text on the two pages, but are still floating environments. We’ll now describe all these in detail.

6.1. Keyword doublePage

This is the same as putting two different floats, one each at the top of the left and right pages. The package hvfloat clips an image which would be wider than the paperwidth. Otherwise it makes no sense to use a doublepage float.

For doublePage the object starts at the left top of the text area and ends on the right page, depending on its width. The inner margins of the two-sided document are ignored, but a binding correction (bindCorr) can be set and...
will be taken into account. The caption will always be on the right page either beside, rotated or not, or below the object. For example, in Figure 13 on page 38 the caption is on the right (capPos=right) and rotated by 90° (capAngle=90). The left part of the image is on page 38, the right part on page 39 and the caption is on page 39. Incidentally, the internally-created labels described earlier were used to print this information. The label for the figure is fig:dP, and so the source for the previous sentence is:

The left part of the image is on page\pageref{fig:dP}, the right part on page\pageref{fig:dP-2} and the caption is on page\pageref{fig:dP-cap}.

A doublePage object allows for document text in addition to the two parts of the object. As for the caption, with capWidth=n and capPos=right the caption will be set to the right of the object with a natural width (from object to margin). This makes sense if the object is narrower than \paperwidth+\textwidth. Figure 13 on page 38 shows this, as well as (at a greatly reduced size) Figure 9 on the next page. The source for Figure 13 is as follows.

\hfloat[doublePage,capWidth=n, capPos=right,capVPos=bottom] {figure}
\{includegraphics[width=2\textwidth] {images/seiser} \}
{A short caption for the LoF}
{A caption for a \texttt{doublePage} object, which will be placed on the right side of the right-hand part of the image. The image begins on the left edge of the

\begin{figure}[h]
\centering
\includegraphics[width=1\textwidth]{images/seiser}
\caption{A caption on the inner side of a two-side and two-column document (capPos=inner). This can be an even or odd page. And some more text with no real meaning because it merely fills the space for a long caption.}
\end{figure}

\hfloat[doublePage,capWidth=n, capPos=right,capVPos=bottom]{figure}{A caption for a \texttt{doublePage} object, which will be placed on the right side of the right-hand part of the image. The image begins on the left edge of the

\begin{figure}[h]
\centering
\includegraphics[width=1\textwidth]{images/seiser}
\caption{A caption on the inner side of a two-side and two-column document (capPos=inner). This can be an even or odd page. And some more text with no real meaning because it merely fills the space for a long caption.}
\end{figure}

\hfloat[doublePage,capWidth=n, capPos=right,capVPos=bottom]{figure}{A caption for a \texttt{doublePage} object, which will be placed on the right side of the right-hand part of the image. The image begins on the left edge of the

\begin{figure}[h]
\centering
\includegraphics[width=1\textwidth]{images/seiser}
\caption{A caption on the inner side of a two-side and two-column document (capPos=inner). This can be an even or odd page. And some more text with no real meaning because it merely fills the space for a long caption.}
\end{figure}
paper [...] The photo was taken [...]\{fig:dP}

In some cases it makes sense to have some whitespace, a binding correction, between the two split parts of the object. With the keyword bindCorr you can define a length value for the whitespace to be added both to the right of the left part and to the left of the right part (so the total whitespace added is $2 \times \text{bindCorr}$).

The source for Figure 9 is the same as Figure 13, except for the addition of the setting bindCorr=1cm (and the label name).

Figure 9. A doublePage object (the same image as Figure 13) with a binding correction of 1 cm. Pages 14–15 of example document doublepage2s2c.tex.

6.2. Keyword doublePAGE

A doublePage object appears alone on two facing pages, except for an optional caption. No additional document text will be printed on these two pages; this is the only difference between doublePage and doublePAGE. Figure 10 shows an example. The caption is below the object in the first column of the right (odd) page.

Figure 10 also shows an example of using the optional keyword bindCorr to specify whitespace between the parts of the split object. In this case, we use the inner margin for the binding correction to get the two images exactly fitting the textwidth. The value for the inner margin is computed internally:

**bindCorr=inner**

Here is the source for Figure 10:

\hvFloat[doublePAGE,capWidth=n, bindCorr=inner]{figure} 
{\includegraphics[width=2\textwidth] 
{images/sonne-meer}} 
[A doublepage image with a caption ...] 
(A caption for a double-sided image ... The parameter is 
\texttt{doublePAGE}) 
{fig:doublePAGE3}

6.3. Keyword doubleFULLPAGE

A floating object specified with the keyword doubleFULLPAGE always starts in the upper left corner of the left (even) page. The defined text area has no meaning, it will be completely ignored for these two floating pages. The caption can be printed before, after, below, or superimposed on the object.

Table 3 on page 31 lists the corresponding two optional keywords for the command \includegraphics, namely doubleFULLPAGE and doubleFULLPAGEbindCorr, with a preset of keepaspectratio to false. These keywords may make code more readable but have otherwise no special meaning.
Figure 11. A doubleFULLPAGE object with capPos=after, so the caption is on the following page. Pages 80–82 of example document doublefullpage2s2c.tex.

Figure 12. A doubleFULLPAGE object with capPos=right, so the caption appears on the right page. Pages 72–73 of example document doublefullpage2s2c.tex.

for any objects other than images, e.g. a tabular or something else.

The object can have any width and height but it should be at least as wide as the given \paperwidth and not less than 50% of the \paperheight. For smaller objects, use one of the other two possibilities, doublePage or doublePAGE.

The caption can be superimposed on the object or, as an alternative, printed on the bottom of the page preceding or following the doublepage (left–right) object. For a two-column document there exists the keyword twoColCaption which can be used to span both columns. This will only work for twocolumn documents which define the column mode using \twocolumn, such as the TUGboat document class. The multicol package is not supported.

Figure 12 shows two pages with an image spread across the double page which is small enough to get a rotated caption on the right of the page which, for our demonstration, is printed in red as usual. The page layout is also printed as frames, which makes it easier to understand and choose values for the full page mode. These frames are shown by loading the package showframe.

The code for Figure 12 is:

\hfloat[doubleFULLPAGE,capPos=right]
{figure}
{\includegraphics[height=\paperheight]{images/rheinsberg}}
[A doublepage image ...]
{A caption for a double-sided image ...}
The parameter is \texttt{doubleFULLPAGE}}
{fig:doubleFULLPAGE0n}
If the image has nearly the same ratio as the current \paperwidth/\paperheight, then a caption can reasonably appear at the bottom of the following page. This is specified with capPos=after; Figure 11 on the previous page shows the result. Similarly, the setting capPos=before would put the caption on the preceding page.

Here is the code for Figure 11, specifying the option doubleFULLPAGE option to both \hvFloat and \includegraphics:
\hvFloat[doubleFULLPAGE, capPos=after, twoColumnCaption]{figure}\includegraphics[doubleFULLPAGE]{rheinsberg}
{A caption for a double-sided image ... The parameter is\texttt{doubleFULLPAGE}}
{fig:doubleFULLPAGE02ndnn}

7. Subfloats and multifloats

A floating environment can have any content except another floating environment. The only requirement for the content is that it must be smaller than one page spread. The content itself can be any combination of text, equations, tabulars, and/or images. We call it a subfloat if the content has one main caption and several subcaptions for any object. We call it a multifloat if the content has no main caption of its own, but the objects have their own captions.

Table 4 on the facing page gives the two keywords, subFloat and multiFloat, which introduce such special content. They can be placed as a default floating environment, full column, full page, or full doublepage.

The syntax for the macro which defines such sub- or multifloats is somewhat complex. Only the keyword defines whether the float is a multifloat or subfloat; the syntax of the macro shows no difference. With the optional argument vFill the objects in a column (two column) or a page (one column) are stretched over the given height \texttt{theheight}. The default is no stretching so that extra whitespace appears at the bottom of the column/page.
Figure 13. A caption for a doublePage object, which will be placed on the right side of the right-hand part of the image. The image begins on the left edge of the paper. A short form can be used for the LoF. The photo was taken in the Italian Alps at the Alpe di Siusi (Seiser Alm).

Table 4. Keywords subFloat and multiFloat for multiple objects in a float.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>subFloat</td>
<td>For multiple objects with one main caption and several subcaptions.</td>
</tr>
<tr>
<td>multiFloat</td>
<td>For multiple objects, each with its own caption.</td>
</tr>
</tbody>
</table>

7.1. Subfloats

A subfloat page can have only one type of object which will have one main caption and individual subcaptions. (For completeness: If you define no subcaption then it does not matter what kind of object we have.) The syntax for subfloats and multifloats is similar, but some arguments are ignored for a subfloat, so can be left empty.

The first line defines only the floating type and the main caption, the object entry is ignored! All additional lines will have the same float type; this is why the float type entry is ignored.

The + symbol defines an additional object which will be part of the same floating environment. It’s up to the user to be sure that one page or one column can hold all defined objects.

The code for Figure 14 on the next page, which comprises the subfigures 14a to 14e, is as follows:

```
\hffloat[subFloat,...]
+{main float type}{}[short caption]
{long caption}(label)
+{(sub floating object)}[short caption]
{long caption}(label)
; ...
+{(sub floating object)}[short caption]
{long caption}(label)
```

numero33 · aprile 2022
The keyword `subfloat` defines the following images or tabulars as subfloats. The keyword `figure` in the second line of the code defines the main type of the floating environment; all subobjects must be of the same type. This is the reason why all following arguments are empty: `+{}{...}`.

The package `subcaption` is loaded by default and is usually activated with `\captionsetup[sub][singlelinecheck].`

**Figure 14.** The main caption of a fullpage subfloat, which appears in the left or right column. This can be an even or odd page. The `vFill` option is set, so vertical space is distributed between the subobjects.
The main label of the subfloat is `sub:demo`, which points to the object column on page 40. In this case the internal label `sub:demo-cap` points to the same page 40, because object and caption are in different columns but on the same page. Both refer to the same object: 
\ref{sub:demo} → 14 and 
\ref{sub:demo-cap} → 14.

### 7.2. Multifloats

With a `multiFloat` object, no main caption is given. Every object gets its own caption, which is the reason that figures, tabulars, etc., can be mixed. All individual captions are listed before or after the full column/page, at the bottom of the column/page (see example on the following page).

The + symbol defines an additional object which will be part of the same floating environment. For a multifloat object all parameters are valid. It’s up to the user to be sure that one page or one column can hold all defined objects.

The captions of Figures 15–18 and of Tables 5 and 6 are on page 41, and all objects also appear on the same page. All of these figures and tables are part of the same multifloat. Here is the code of the multifloat example:

```latex
\captionsetup{singlelinecheck=false}
\hvFloat[multiFloat,...]
\{\text{floating object}\}
  \{\text{long caption}\}
\{\text{label}\}
+\{\text{floating object}\}
  \{\text{long caption}\}
\{\text{label}\}
: ...
+\{\text{floating object}\}
  \{\text{long caption}\}
\{\text{label}\}
```

Figure 15. Caption A of a fullpage multifloat object, which follows in the left or right column. This can be an even or odd page. And some more text with no real meaning because it merely fills the space for a long caption.

```latex
\captionsetup{singlelinecheck=false}
\hvFloat[multiFloat,vFill,fullpage,\text{capPos=before}]
\{\text{floating object}\}
  \{\text{long caption}\}
\{\text{label}\}
```

Table 5. Caption B of a fullpage object, a tabular in this case.

Figure 16. Caption C of a fullpage object.

Figure 17. Caption D of a fullpage object.

Figure 18. Caption E of a fullpage object.

Table 6. Caption B2 of a fullpage object, another tabular repeating Table 5.
8. Splitting tables across two pages

By default a table can only be split in the vertical direction, as a so-called longtable. Large tables can be rotated on a page (see Table 2 on page 28), but splitting it automatically in the horizontal direction is currently (\TeX Live 2022) not supported by core \TeX.

However, saving a table without page breaks into a box is no problem and such a box can be handled like an image, which is also like a box. The only problem is that the table must be split horizontally between two columns, as a split column may likely be unreadable.

The package \texttt{hvfloat} provides the box \texttt{hvOBox} for public use. We can save a table into this box:

\begin{verbatim}
\savebox{hvOBox}{% \begin{tabular}{l r r r} ... the table ...
\end{tabular}}
\end{verbatim}
and then use it in the same way as a double-page image, with the table split in two pieces. If the split occurs at an unfavorable point in the table, e.g. in the middle of a column, then insert some horizontal space between the two columns with \@{\hspace{...}}. For example (the output is shown in Table 7):

\begin{tabular}{lll@{\hspace{1cm}}ll}
1 & 2 & 3 & 4 & 5 \\
1 & 2 & 3 & 4 & 5 \\
1 & 2 & 3 & 4 & 5 \\
1 & 2 & 3 & 4 & 5 \\
\end{tabular}

Figure 19. The table column 1985 appears between the two pages and would not be readable.

\begin{tabular}
{\textbackslash(l{1\textbackslash cm})lll}\hline
1 & 2 & 3 & 4 & 5 \ \ \\
1 & 2 & 3 & 4 & 5 \ \ \\
1 & 2 & 3 & 4 & 5 \ \ \\
1 & 2 & 3 & 4 & 5 \ \ \hline
\end{tabular}

Figure 19 shows how the table looks in the middle of the doublepage (the text shown at the bottom of the page is just filler). The column with 1985 will be cut and not readable. There are two solutions to split the table at a better position: insert some space before this column, or use the \texttt{bindCorr} key word to insert a binding correction space. For Table 8 on the following page both possibilities are used. Inserting more space:

\begin{tabular}
{\textbackslash{l@{}}*{13}{\textbackslash r @{\quad}*8{\textbackslash r}}}
\end{tabular}

and using 8 mm for the binding correction (shown below) which was found by trial and error.

The code for the split table on a double page is:

\begin{tabular}
\texttt{\{}l@{}*{13}{\textbackslash r @{\quad}*8{\textbackslash r}}\}
\end{tabular}

\begin{tabular}
\texttt{\{}l@{}*{13}{\textbackslash r @{\quad}*8{\textbackslash r}}\}
\end{tabular}

\texttt{\.Begin{table}}

\texttt{\{table\}}

\texttt{\}no need for an object}

\texttt{\{A doublepage \texttt{tabular} \texttt{.}\}}

\texttt{\}A caption for a doublePage \texttt{tabular} that}

\texttt{\ will be placed on the right side of the}

\texttt{\ right-hand part of the \texttt{tabular}. The}

\texttt{\ table begins on the left edge of the}

\texttt{\ text area of the left page. The}

\texttt{\ additional space between the columns}

\texttt{\ 1984 and 1985 is \texttt{\textbackslash texttt{\textbackslash textbackslash slash quad}},}

\texttt{\ which is the same as 1\textbackslash em. The}

\texttt{\ binding correction is set to 8\textbackslash mm,}

\texttt{\ which gives additional whitespace of}

\texttt{\ 16\textbackslash mm.\{}tab:dP\}}

\texttt{\textbackslash End{tabular}}

\texttt{\texttt{\{}tab:dP\}}

and the output is Table 8 on pages 44 and 45. It depends on the way the document is printed whether more or less space between the two pages makes sense.
9. **Todo list**

The macro `\hvFloat` only checks the position of its definition if it is defined on an odd or even page. This is done with the help of the macro `\checkoddpage` from the package `ifoddpage`. Together with the internal `\if@firstcolumn` of the `ifoddpage` package it knows exactly the position of its definition in the source of the document: left or right page, first or second column. But it doesn’t know if the current page is completely empty, which is the case if `\hvFloat` is the first command on a new page. If this is also an even page, then a doublepage object can be placed immediately. But the current code always uses the `next` even–odd page combination. In a future release there should be a test like `\if@newpage`.

More checks for the correct use of the parameters would be useful. For example: if one uses the keyword `doubleFULLPAGE` with an object which is narrower than the `\textwidth`, then the output will be rubbish.

The optional argument `wide` as shown in Figure 21 on page 46 works only in oneside mode if you also use twocolumn mode (see Figure 20 on the facing page). For twoside mode we have different margins for a possible wide float in the first or the second column; this is not recognized by `hvfloat`. However, if you need wide floats in a twoside and twocolumn mode you can move the macro `\hvFloat` to places in the source where the output is always in the outer column, which uses the marginpar width. Using the argument `nonFloat`, as shown in Figure 20 on the next
page, the float appears exactly at the place of
the definition.

In some cases the option useOBox for a
predefined savebox \hvOBox does not work.
One can use instead (\usebox\hvOBox) as the
argument for the object, which has the same
effect. However, the box \hvOBox must have
valid contents, and be set before it is used.

10. Conclusion

The package hvfloat should work with all kinds
of documents, oneside in one- or twocolumn
mode, twoside in one- or twocolumn mode. It
is much easier to place doublepage objects in a
onecolumn document than a twocolumn doc-
ument. Internally, \LaTeX{} puts two single pages
together to one page with two columns. Only
the optional header and footer are printed
across these “two” pages.

Table 8. A caption for a
doublePage tabular that
will be placed on the right
side of the right-hand
part of the tabular. The
table begins on the left
eye of the text area of
the left page. The addi-
tional space between the
columns 1984 and 1985 is
\quad, which is the same
as 1 em. The binding cor-
rection is set to 8 mm,
which gives additional
whitespace of 16 mm.

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<td>3</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

5  23  10  8  15  13  1  32  51  1

Figure 20. Pages 2–3 of example document
wide1s2c.tex, oneside with twocolumn and the
wide option.
The package \texttt{hvfloat} makes intensive use of the macro \texttt{afterpage} Carlisle and The \LaTeX Team 2014. If one defines a doublepage object in the first column of a left (even) page, \texttt{hvFloat} needs three nested \texttt{afterpage} commands, one for each column, to let an object or a caption start on the next left (even) page. Until \LaTeX reaches this page for the object/caption, nearly two pages have to be filled with text or other objects which are defined after the macro \texttt{hvFloat}. Especially in two-column mode you can expect problems, if you have too little text, images, tables or other simple objects to fill up these two pages until the doublepage object will be set. Such problems can only be solved by adding some text or moving the macro \texttt{hvFloat} to another column of the document.

Just as with the standard floating environments \texttt{figure} and \texttt{table}, it is left to the user to ensure that the contents of the environment (object and caption) fit the page. If an object is wider than $2 \times \text{\texttt{paperwidth}}$ or higher than \texttt{paperheight} it cannot be placed on a doublepage and the output may be useless.

\begin{center}
\begin{tabular}{ll}
\texttt{hvFloat} & \texttt{wide, capPos=inner, capVPos=top} \\
\end{tabular}
\end{center}

\texttt{Caption at top inner beside the float ...}
and the option \texttt{\texttt{texttt}}(\texttt{wide})\{fig:wide\}

The list of figures and list of tables are not affected by package \texttt{hvFloat} and should work as usual. For example, here is the list of tables for this article:

Another feature is that simple and non-floating objects can be placed by the environment \texttt{hvFloatEnv}, which has only one optional argument, giving the horizontal width. For the caption one has to use the defined macro \texttt{\texttt{captionof(type)}}\{\ldots\} or the (usually internal) macro \texttt{\texttt{tabcaption}}\{\ldots\} mentioned on page 26:

\begin{center}
\begin{tabular}{ll}
\textbf{List of Tables} \\
1 & A caption with no object \ldots \cdot 2 \\
2 & The optional keywords for the \texttt{hvFloat} macro \ldots \ldots \ldots \ldots \cdot 4 \\
3 & Additional keywords for the \texttt{includegraphics} macro \ldots \cdot 7 \\
4 & Keywords \texttt{subFloat} and \texttt{multiFloat} for multiple objects in a float \ldots \ldots \ldots \ldots \cdot 15 \\
5 & Short example caption B1 \ldots \cdot 17 \\
6 & Short example caption B2 \ldots \cdot 17 \\
7 & Adding space between two columns \ldots \ldots \ldots \ldots \ldots \cdot 19 \\
8 & A doublepage tabular \ldots \ldots \cdot 21 \\
9 & A short nonfloating table \ldots \ldots \cdot 23 \\
\end{tabular}
\end{center}

\begin{center}
\begin{tabular}{ll}
\end{tabular}
\end{center}
Table 9. A short nonfloating table.

<table>
<thead>
<tr>
<th>left</th>
<th>center</th>
<th>right</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>C</td>
<td>R</td>
</tr>
</tbody>
</table>

But pay attention to references if floating and non-floating environments are mixed on one page; they can point to wrong numbers. Moving the floating environment to another place in the document is one workaround for such a problem. Alternatively, using only floating environments is preferred, if your document is mainly text, with only some figures and/or tables.

References


Herbert Voß
Wasgenstrasse 21
14129 Berlin, Germany
Herbert.Voss@fu-berlin.de