The stfloats package

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1 Introduction

The package improves dblfloat(s) and footnotes placements mechanism and baselineskip glue settings.

With newer LaTeX release from 2015/01/01 using this package two improvements are available out of the box:

1. Float output keeps order for the same type of floats even with top or bottom dblfloat items.
2. Dblfloats will appear on the same page where they are defined if they are defined on left column and enought free place is available on the current column/page.

2 Usage

To place dblfloat(s) on top or bottom of the page just use optional [t] or [b].
Example (to place figure at the page bottom):

```
\begin{figure*}[b]
...
\end{figure*}
```

`\fnbelowfloat` Puts footnotes below the bottom floats

`\fnunderfloat` (default and standard) Puts footnotes under the bottom floats.

`\setbaselinefloat` Allows `\baselineskip` to stretch and shrink if the `\baselineskip` is set internally with command `\@setfontsize` (`\linespread` and `\fontsize` at user level). The settings are calculated and activated with command `\selectfont` (`\size@update`).

Example:

```
\@setfontsize\normalsize\@xpt{12pt plus .1pt minus .1pt}\normalsize
```

`\setbaselinefixed` (default and standard) Disables baselineskip to stretch and shrink even if the `\baselineskip` is set with command `\@setfontsize` as in the previous example in case that `\baselinestretch` is not empty.

Then line spreading is not used `\baselineskip` glue can be controlled by ordinary `\baselinestretch` definition:

- `\def\baselinestretch{1}` - removes `\baselineskip` glue.
- `\def\baselinestretch{}` - keeps `\baselineskip` glue.

3 Implementation

`\if@kernel@version@MMXXV` This conditional code is used to check for the 2025 LaTeX release.

```
\newif\if@kernel@version@MMXXV
\@ifundefined{@makespecialcolbox}{\@kernel@version@MMXXVtrue}{}
```

`\@dblbotlist` Used for dblfloat(s) to be placed at the page bottom.

```
\gdef\@dblbotlist{}
```

Additional counters for dblfloat(s) support at the page bottom.

```
\newcount\@dblbotnum
\newcount\c@dblbotnumber
```

This code is used to check the LaTeX release is too old.

```
\@defaultunits\expandafter\c@dblbotnumber\fmtversion\relax\@nnil
\ifnum\c@dblbotnumber<2015\relax
    \@latex@error{Too old LaTeX format (<2015)!\MessageBreak
                  Update LaTeX system!}\@ehd
\fi
\setcounter{dblbotnumber}{2}
```

`\@dbflt` With extended set of default args: `[tp] -> [tbp]`

```
\def\@dbflt#1{\@ifnextchar[{\@xdblfloat{#1}}{\@xdblfloat{#1}[tbp]}}
```

`\@dblfloatplacement`

```
\g@addto@macro\@dblfloatplacement{\global\@dblbotnum\c@dblbotnumber}
```

`\@addtodblcol` With adds to support dblfloat(s) placement on the current page and at the page bottom.

```
\def\@addtodblcol{%
    \begingroup
        \@insertfalse
        \@setfloattypecounts
        \@getfpsbit \tw@
        \ifodd\@tempcnta
            \@flsetnum \@dbltopnum
            \ifnum \@dbltopnum>\z@
                \@tempswafalse
                \ifdim \@dbltoproom>\ht\@currbox
                    \@tempswatrue
                \else
                    \ifnum \@fpstype<\sixt@@n
                        \advance \@dbltoproom \@textmin
                        \ifdim \@dbltoproom>\ht\@currbox
                            \@tempswatrue
                        \fi
                        \advance \@dbltoproom -\@textmin
                    \fi
```

```
            \fi
            \if@tempswa
                \@bitor \@currtype \@deferlist
                \@testwrongwidth\@currbox
                \if@test
                \else
                    %% [[ stfloats adds
                    \@bitor \@currtype \@dblbotlist
                    \if@test
                    \else
                    %% stfloats adds ]]
                        \@tempdima -\ht\@currbox
                        \advance\@tempdima
                          -\ifx \@dbltoplist\@empty \dbltextfloatsep \else
                                                    \dblfloatsep \fi
                        \global \advance \@dbltoproom \@tempdima
                        \global \advance \@colht \@tempdima
                        \global \advance \@dbltopnum \m@ne
                        \@cons \@dbltoplist \@currbox
                        \@inserttrue
                    %% [[ stfloats adds
                    \fi
                    %% stfloats adds ]]
                \fi
            \fi
        \fi
    \fi
    \if@insert
    \else
        %% [[ stfloats adds
        \@getfpsbit 4\relax
        \ifodd\@tempcnta
            \@flsetnum \@dblbotnum
            \ifnum \@dblbotnum>\z@
                \@tempswafalse
                \ifdim \@dbltoproom>\ht\@currbox
                    \@tempswatrue
                \else
                    \ifnum \@fpstype<\sixt@@n
                      \advance \@dbltoproom \@textmin
                      \ifdim \@dbltoproom>\ht\@currbox
                          \@tempswatrue
                      \fi
                      \advance \@dbltoproom -\@textmin
                    \fi
                \fi
                \if@tempswa
                    \@bitor \@currtype \@deferlist
                    \@testwrongwidth\@currbox
                    \if@test
                    \else
                        \@tempdima -\ht\@currbox
                        \advance\@tempdima
                          -\ifx \@dblbotlist\@empty \dbltextfloatsep \else
```

```
                                                \dblfloatsep \fi
                            \global \advance \@dbltoproom \@tempdima
                            \global \advance \@colht \@tempdima
                            \global \advance \@dblbotnum \m@ne
                            \@cons \@dblbotlist \@currbox
                            \@inserttrue
                        \fi
                    \fi
                \fi
            \fi
            \if@insert
            \else
            %% stfloats adds ]]
                \@cons\@deferlist\@currbox
            %% [[ stfloats adds
            \fi
            %% stfloats adds ]]
        \fi
    \endgroup
    }
```

`\@addtocurcol` With adds to support dblfloat(s) placement on the current page and at the page bottom.

```
\def\@addtocurcol{%
    \@insertfalse
    \@setfloattypecounts
    \ifnum \@fpstype=8
    \else
        \ifnum \@fpstype=24
        \else
            \@flsettextmin
            \advance \@textmin \@textfloatsheight
            \@reqcolroom \@pageht
            \ifdim \@textmin>\@reqcolroom
                \@reqcolroom \@textmin
            \fi
            \advance \@reqcolroom \ht\@currbox
            \if@kernel@version@MMXXV \saved@reqcolroom \@reqcolroom\fi %% stfloats adds
            \ifdim \@colroom>\@reqcolroom
                \@flsetnum \@colnum
                \ifnum \@colnum>\z@
                    \@bitor\@currtype\@deferlist
                    %% \@testwrongwidth\@currbox % moved deeper
                    \if@test
                    \else
                        %% [[ stfloats adds
                        \@testwrongwidth\@currbox
                        \if@test
                            \if@firstcolumn
                                \@getfpsbit \tw@
                                \ifodd\@tempcnta
                                    \@flsetnum \@dbltopnum
                                    \ifnum \@dbltopnum>\z@
                                        \@tempswafalse
```

```
            \ifdim \@dbltoproom>\ht\@currbox
                \@tempswatrue
            \else
                \ifnum \@fpstype<\sixt@@n
                    \advance \@dbltoproom \@textmin
                    \ifdim \@dbltoproom>\ht\@currbox
                        \@tempswatrue
                    \fi
                    \advance \@dbltoproom -\@textmin
                \fi
            \fi
            \if@tempswa
                \@bitor\@currtype{\@toplist\@midlist\@botlist\@dbl
                \if@test
                \else
                    \@tempdima -\ht\@currbox
                    \advance\@tempdima
                      -\ifx \@dbltoplist\@empty \dbltextfloatsep \
                                          \dblfloatsep \fi
                    \global \advance \@dbltoproom \@tempdima
                    \global \advance \@colht \@tempdima
                    \global \advance \@colroom \@tempdima
                    \global \advance \@dbltopnum \m@ne
                    \@cons \@dbltoplist \@currbox
                    \@inserttrue
                \fi
            \fi
        \fi
    \else
        \@getfpsbit 4\relax
        \ifodd\@tempcnta
            \@flsetnum \@dblbotnum
            \ifnum \@dblbotnum>\z@
                \@tempswafalse
                \ifdim \@dbltoproom>\ht\@currbox
                    \@tempswatrue
                \else
                    \ifnum \@fpstype<\sixt@@n
                        \advance \@dbltoproom \@textmin
                        \ifdim \@dbltoproom>\ht\@currbox
                            \@tempswatrue
                        \fi
                        \advance \@dbltoproom -\@textmin
                    \fi
                \fi
                \if@tempswa
                    \@tempdima -\ht\@currbox
                    \advance\@tempdima
                      -\ifx \@dblbotlist\@empty \dbltextfloatsep \
                                          \dblfloatsep \fi
                    \global \advance \@dbltoproom \@tempdima
                    \global \advance \@colht \@tempdima
                    \global \advance \@colroom \@tempdima
                    \global \advance \@dblbotnum \m@ne
```

```
                                        \@cons \@dblbotlist \@currbox
                                        \@inserttrue
                                    \fi
                                \fi
                            \fi
                        \fi
                    \fi
                \else
                %% stfloats adds ]]
                    \@bitor\@currtype\@botlist
                    \if@test
                        \@addtobot
                    \else
                        \ifodd \count\@currbox
                            \advance \@reqcolroom \intextsep
                            \ifdim \@colroom>\@reqcolroom
                                \global \advance \@colnum \m@ne
                                \global \advance \@textfloatsheight \ht\@currbox
                                \global \advance \@textfloatsheight 2\intextsep
                                \@cons \@midlist \@currbox
                                \if@nobreak
                                    \nobreak
                                    \@nobreakfalse
                                    \everypar{}%
                                \else
                                    \addpenalty \interlinepenalty
                                \fi
                                \vskip \intextsep
                                \box\@currbox
                                \penalty\interlinepenalty
                                \vskip\intextsep
                                \ifnum\outputpenalty <-\@Mii \vskip -\parskip\fi
                                \outputpenalty \z@
                                \@inserttrue
                            \fi
                        \fi
                        \if@insert
                        \else
                            \@addtotoporbot
                        \fi
                    \fi
                \fi
            \fi
        \fi
    \fi
\fi
\if@insert
\else
    \@resethfps
    \@cons\@deferlist\@currbox
\fi
}%
```

`\@addtotoporbot` With adds to support dblfoat(s) placement on the current page and at the page bottom.

```
\def\@addtotoporbot{%
    \@getfpsbit \tw@
    \ifodd \@tempcnta
        \@flsetnum \@topnum
        \ifnum \@topnum>\z@
            \@tempswafalse
            \@flcheckspace \@toproom \@toplist
            \if@tempswa
                %% [[ stfloats adds
                %% \@bitor\@currtype{\@midlist\@botlist}%
                \@bitor\@currtype{\@midlist\@botlist\@dblbotlist}%
                %% stfloats adds ]]
                \if@test
                \else
                    \@flupdates \@topnum \@toproom \@toplist
                    \@inserttrue
                \fi
            \fi
        \fi
    \fi
    \if@insert
    \else
        \@addtobot
    \fi
    }
```

`\@addtobot` With adds to support dblfoat(s) placement on the current page and at the page bottom.

```
\def\@addtobot{%
    \@getfpsbit 4\relax
    \ifodd \@tempcnta
        \@flsetnum \@botnum
        \ifnum \@botnum>\z@
            \@tempswafalse
            \@flcheckspace \@botroom \@botlist
            \if@tempswa
                %% [[ stfloats adds
                \@bitor\@currtype{\@dblbotlist}%
                \if@test
                \else
                    \if@kernel@version@MMXXV\else \global \maxdepth \z@\fi
                %% stfloats adds ]]
                    \@flupdates \@botnum \@botroom \@botlist
                    \@inserttrue
                %% [[ stfloats adds
                \fi
                %% stfloats adds ]]
            \fi
        \fi
    \fi
    }
```

`\@doclearpage` With adds to support dblfloat(s) placement on the current page and at the page bottom.

```
\def\@doclearpage{%
    \ifvoid\footins
        \ifvbox\@kludgeins
            {\setbox \@tempboxa \box \@kludgeins}%
        \fi
        \setbox\@tempboxa\vsplit\@cclv to\z@ \unvbox\@tempboxa
        \setbox\@tempboxa\box\@cclv
        \xdef\@deferlist{\@toplist\@botlist\@deferlist}%
        \global \let \@toplist \@empty
        \global \let \@botlist \@empty
        \global \@colroom \@colht
        \ifx \@currlist\@empty
        \else
            \@latexerr{Float(s) lost}\@ehb
            \global \let \@currlist \@empty
        \fi
        \@makefcolumn\@deferlist
        \@whilesw\if@fcolmade \fi{\@opcol\@makefcolumn\@deferlist}%
        \if@twocolumn
            \if@firstcolumn
                %% [[ stfloats adds
                %%\xdef\@deferlist{\@dbltoplist\@deferlist}%
                \xdef\@deferlist{\@dbltoplist\@dblbotlist\@deferlist}%
                \global \let \@dblbotlist \@empty
                %% stfloats adds ]]
                \global \let \@dbltoplist \@empty
                \global \@colht \textheight
                \begingroup
                    \@dblfloatplacement
                    \@makefcolumn\@deferlist
                    \@whilesw\if@fcolmade \fi{\@outputpage
                                              \@makefcolumn\@deferlist}%
                \endgroup
            \else
                \vbox{}\clearpage
            \fi
        \fi
        \ifx\@deferlist\@empty \else\clearpage \fi
    \else
        \setbox\@cclv\vbox{\box\@cclv\vfil}%
        \@makecol\@opcol
        \clearpage
    \fi
    }
```

`\@combinedblfloats` Combines outputbox with top and bottom placed dblfloat(s).

```
\def\@combinedblfloats{%
    \ifx \@dbltoplist\@empty \else \@cdblflt \fi %% kernel \@combinedblfloats version
    \ifx \@dblbotlist\@empty \else \@cdblflb \fi
    }
```

`\@cdblflt` Combines outputbox with top placed dblfloat(s).

```
\def\@cdblflt{%
    \setbox\@tempboxa \vbox{}%
    \let \@elt \@comdblflelt
    \@dbltoplist
    \let \@elt \relax
    \xdef \@freelist {\@freelist\@dbltoplist}%
    \global\let \@dbltoplist \@empty
    %% [[ stfloats adds
    %% \setbox\@outputbox \vbox to\textheight
    \setbox\@outputbox \vbox% to\textheight
    %% stfloats adds ]]
        {%
         \unvbox\@tempboxa\vskip-\dblfloatsep
         \ifnum \@dbltopnum>\m@ne
             \dblfigrule
         \fi
         \vskip \dbltextfloatsep
         \unvbox \@outputbox
        }%
    }
```

`\@cdblflb` Combines outputbox with bottom placed dblfloat(s).

```
\def\@cdblflb{%
    \setbox\@tempboxa \vbox{}%
    \let \@elt \@comdblflelt
    \@dblbotlist
    \let \@elt \relax
    \xdef \@freelist {\@freelist\@dblbotlist}%
    \global\let \@dblbotlist \@empty
    \setbox\@outputbox \vbox% to\textheight
        {%
         \unvbox\@outputbox
         \vskip \dbltextfloatsep
         \ifnum \@dblbotnum>\m@ne
             \dblfigrule
         \fi
         \unvbox\@tempboxa
         \vskip -\dblfloatsep
         }%
    }
```

Makes `\@makecol` current definition copy to `\org@makecol@stfloats`.

```
\global\let\org@makecol@stfloats\@makecol
```

`\fn@makecol` Redefined macro `\@makecol` which puts footnotes below the bottom floats for the LaTeX release prior 2025.

```
\gdef\fn@makecol{%
    \setbox\@outputbox \box\@cclv
    \let\@elt\relax
    \xdef\@freelist{\@freelist\@midlist}%
    \global \let \@midlist \@empty
    \@combinefloats
    \ifvoid\footins
    \else
```

```
        \setbox\@outputbox \vbox {%
            \boxmaxdepth \@maxdepth
            \unvbox \@outputbox
            \vskip \skip\footins
            \color@begingroup
                \normalcolor
                \footnoterule
                \unvbox \footins
            \color@endgroup
            }%
    \fi
    \ifvbox\@kludgeins
        \@makespecialcolbox
    \else
        \setbox\@outputbox \vbox to\@colht {%
            \@texttop
            \dimen@ \dp\@outputbox
            \unvbox \@outputbox
            \vskip -\dimen@
            \@textbottom
            }%
    \fi
    \global \maxdepth \@maxdepth
    }
```

`\fnbelowfloat` Switch to put footnotes below the bottom floats.

```
\def\fnbelowfloat{%
    %% available Socket Plugs: floats-space-footnotes, space-floats-footnotes
    \kernel@ifnextchar[{\fn@below@float}{\fn@below@float[floats-footnotes]}%
    }
\def\fn@below@float[#1]{%
    \if@kernel@version@MMXXV
        \AssignSocketPlug{build/column/outputbox}{#1}%
     \else
        \global\let\@makecol\fn@makecol
    \fi
    }
```

`\fnunderfloat` Switch to put footnotes under the bottom floats.

```
\def\fnunderfloat{%
    %% available Socket Plugs: space-footnotes-floats, footnotes-space-floats, footnotes-float
    \kernel@ifnextchar[{\fn@under@float}{\fn@under@float[footnotes-floats-legacy]}%
    }
\def\fn@under@float[#1]{%
    \if@kernel@version@MMXXV
        \AssignSocketPlug {build/column/outputbox}{#1}%
    \else
        \global\let\@makecol\org@makecol@stfloats
    \fi
    }
```

With 2025 LaTeX release optional arguments are available to choose appropriate Socket Plugins. `floats-space-footnotes`, `space-floats-footnotes` or `floats-footnotes` (default) in the case of `\fnbelowfloat` and `space-footnotes-floats`,

`footnotes-space-floats`, `footnotes-floats` or `footnotes-floats-legacy` (default) in the case of `\fnunderfloat`.

`\set@floatfontsize` Such definition `\baselineskip\f@linespread\baselineskip` removes any glue from the `\baselineskip` in the case `\f@linespread` is not empty. To prevent this `\size@update` is redefined.

```
\def\set@floatfontsize#1#2#3{%
    \@defaultunits\@tempdimb#2\p@\relax\@nnil
    \edef\f@size{\strip@pt\@tempdimb}%
    \@defaultunits\@tempskipa#3\p@\relax\@nnil
    \edef\f@baselineskip{\the\@tempskipa}%
    \edef\f@linespread{#1}%
    \let\baselinestretch\f@linespread
    \def\size@update{%
```

Saving of the `\baselineskip` glue.

```
        \baselineskip\f@baselineskip
        \@tempskipa\baselineskip\relax\baselineskip=1\baselineskip
        \advance\@tempskipa by-\baselineskip\baselineskip\f@baselineskip
```

Removes the `\baselineskip` glue in case `\f@linespread` not empty.

```
         \baselineskip\f@linespread\baselineskip
```

Restoring of the `\baselineskip` glue.

```
         \advance\@tempskipa by\baselineskip\baselineskip\@tempskipa
         \normalbaselineskip\baselineskip
         \setbox\strutbox\hbox{%
             \vrule\@height.7\baselineskip
                  \@depth.3\baselineskip
                  \@width\z@}%
         \let\size@update\relax
        }%
    }
```

Simple copy of the previous original `\set@fontsize` definition in `\set@@@fontsize`.

```
\let\set@@@fontsize\set@fontsize
```

`\setbaselinefloat` It allows `\baselineskip` to be set to the value with glue.

```
\def\setbaselinefloat{\let\set@fontsize\set@floatfontsize}
```

`\setbaselinefixed` It is used to restore macro definition `\set@fontsize` to the original one. It means that `\baselineskip` is set to the value without glue in the case `\baselinestretch` is not empty.

```
\def\setbaselinefixed{%
    \@tempdima=\baselinestretch\p@
    \edef\baselinestretch{\strip@pt\@tempdima}%
    \let\set@fontsize\set@@@fontsize
    }
```

`\output` It is removed from this package as the duplicate of the same definition in kernel since the macro definition change v.1.2c at 1997/11/09 in `ltoutput`.

```
%\endinput
```