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:

1

- \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.

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

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

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

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

```
4 \newcount\@dblbotnum
5 \newcount\c@dblbotnumber
```

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

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

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

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

\@dblfloatplacement

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

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

```
14 \def\@addtodblcol{%
15     \begingroup
16         \@insertfalse
17         \@setfloattypecounts
18         \@getfpsbit \tw@
19         \ifodd\@tempcnta
20             \@flsetnum \@dbltopnum
21             \ifnum \@dbltopnum>\z@
22                 \@tempswafalse
23                 \ifdim \@dbltoproom>\ht\@currbox
24                     \@tempswatrue
25                 \else
26                     \ifnum \@fpstype<\sixt@@n
27                         \advance \@dbltoproom \@textmin
28                         \ifdim \@dbltoproom>\ht\@currbox
29                             \@tempswatrue
30                         \fi
31                         \advance \@dbltoproom -\@textmin
32                     \fi
```

```
33                      \fi
34                  \if@tempswa
35                      \@bitor \@currtype \@deferlist
36                      \@testwrongwidth\@currbox
37                      \if@test
38                      \else
39                          %% [[ stfloats adds
40                          \@bitor \@currtype \@dblbotlist
41                          \if@test
42                          \else
43                          %% stfloats adds ]]
44                              \@tempdima -\ht\@currbox
45                              \advance\@tempdima
46                                -\ifx \@dbltoplist\@empty \dbltextfloatsep \else
47                                                       \dblfloatsep \fi
48                              \global \advance \@dbltoproom \@tempdima
49                              \global \advance \@colht \@tempdima
50                              \global \advance \@dbltopnum \m@ne
51                              \@cons \@dbltoplist \@currbox
52                              \@inserttrue
53                          %% [[ stfloats adds
54                          \fi
55                          %% stfloats adds ]]
56                      \fi
57                  \fi
58              \fi
59          \fi
60          \if@insert
61          \else
62              %% [[ stfloats adds
63              \@getfpsbit 4\relax
64              \ifodd\@tempcnta
65                  \@flsetnum \@dblbotnum
66                  \ifnum \@dblbotnum>\z@
67                      \@tempswafalse
68                      \ifdim \@dbltoproom>\ht\@currbox
69                          \@tempswatrue
70                      \else
71                          \ifnum \@fpstype<\sixt@@n
72                              \advance \@dbltoproom \@textmin
73                              \ifdim \@dbltoproom>\ht\@currbox
74                                  \@tempswatrue
75                              \fi
76                              \advance \@dbltoproom -\@textmin
77                          \fi
78                      \fi
79                      \if@tempswa
80                          \@bitor \@currtype \@deferlist
81                          \@testwrongwidth\@currbox
82                          \if@test
83                          \else
84                              \@tempdima -\ht\@currbox
85                              \advance\@tempdima
86                                -\ifx \@dblbotlist\@empty \dbltextfloatsep \else
```

3

```
87                                                          \dblfloatsep \fi
88                              \global \advance \@dbltoproom \@tempdima
89                              \global \advance \@colht \@tempdima
90                              \global \advance \@dblbotnum \m@ne
91                              \@cons \@dblbotlist \@currbox
92                              \@inserttrue
93                          \fi
94                      \fi
95                  \fi
96              \fi
97              \if@insert
98              \else
99              %% stfloats adds ]]
100                 \@cons\@deferlist\@currbox
101             %% [[ stfloats adds
102             \fi
103             %% stfloats adds ]]
104         \fi
105     \endgroup
106     }
```

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

```
107 \def\@addtocurcol{%
108     \@insertfalse
109     \@setfloattypecounts
110     \ifnum \@fpstype=8
111     \else
112         \ifnum \@fpstype=24
113         \else
114             \@flsettextmin
115             \advance \@textmin \@textfloatsheight
116             \@reqcolroom \@pageht
117             \ifdim \@textmin>\@reqcolroom
118                 \@reqcolroom \@textmin
119             \fi
120             \advance \@reqcolroom \ht\@currbox
121             \if@kernel@version@MMXXV \saved@reqcolroom \@reqcolroom\fi %% stfloats adds
122             \ifdim \@colroom>\@reqcolroom
123                 \@flsetnum \@colnum
124                 \ifnum \@colnum>\z@
125                     \@bitor\@currtype\@deferlist
126                     %% \@testwrongwidth\@currbox % moved deeper
127                     \if@test
128                     \else
129                         %% [[ stfloats adds
130                         \@testwrongwidth\@currbox
131                         \if@test
132                             \if@firstcolumn
133                                 \@getfpsbit \tw@
134                                 \ifodd\@tempcnta
135                                     \@flsetnum \@dbltopnum
136                                     \ifnum \@dbltopnum>\z@
137                                         \@tempswafalse
```

4

```
138              \ifdim \@dbltoproom>\ht\@currbox
139                  \@tempswatrue
140              \else
141                  \ifnum \@fpstype<\sixt@@n
142                      \advance \@dbltoproom \@textmin
143                      \ifdim \@dbltoproom>\ht\@currbox
144                          \@tempswatrue
145                      \fi
146                      \advance \@dbltoproom -\@textmin
147                  \fi
148              \fi
149              \if@tempswa
150                  \@bitor\@currtype{\@toplist\@midlist\@botlist\@dbl
151                  \if@test
152                  \else
153                      \@tempdima -\ht\@currbox
154                      \advance\@tempdima
155                        -\ifx \@dbltoplist\@empty \dbltextfloatsep \
156                                          \dblfloatsep \fi
157                      \global \advance \@dbltoproom \@tempdima
158                      \global \advance \@colht \@tempdima
159                      \global \advance \@colroom \@tempdima
160                      \global \advance \@dbltopnum \m@ne
161                      \@cons \@dbltoplist \@currbox
162                      \@inserttrue
163                  \fi
164              \fi
165          \fi
166      \else
167          \@getfpsbit 4\relax
168          \ifodd\@tempcnta
169              \@flsetnum \@dblbotnum
170              \ifnum \@dblbotnum>\z@
171                  \@tempswafalse
172                  \ifdim \@dbltoproom>\ht\@currbox
173                      \@tempswatrue
174                  \else
175                      \ifnum \@fpstype<\sixt@@n
176                          \advance \@dbltoproom \@textmin
177                          \ifdim \@dbltoproom>\ht\@currbox
178                              \@tempswatrue
179                          \fi
180                          \advance \@dbltoproom -\@textmin
181                      \fi
182                  \fi
183                  \if@tempswa
184                      \@tempdima -\ht\@currbox
185                      \advance\@tempdima
186                        -\ifx \@dblbotlist\@empty \dbltextfloatsep \
187                                          \dblfloatsep \fi
188                      \global \advance \@dbltoproom \@tempdima
189                      \global \advance \@colht \@tempdima
190                      \global \advance \@colroom \@tempdima
191                      \global \advance \@dblbotnum \m@ne
```

```
192                                           \@cons \@dblbotlist \@currbox
193                                             \@inserttrue
194                                         \fi
195                                       \fi
196                                     \fi
197                                   \fi
198                                 \fi
199                             \else
200                             %% stfloats adds ]]
201                                 \@bitor\@currtype\@botlist
202                                 \if@test
203                                     \@addtobot
204                                 \else
205                                     \ifodd \count\@currbox
206                                         \advance \@reqcolroom \intextsep
207                                         \ifdim \@colroom>\@reqcolroom
208                                             \global \advance \@colnum \m@ne
209                                             \global \advance \@textfloatsheight \ht\@currbox
210                                             \global \advance \@textfloatsheight 2\intextsep
211                                             \@cons \@midlist \@currbox
212                                             \if@nobreak
213                                                 \nobreak
214                                                 \@nobreakfalse
215                                                 \everypar{}%
216                                             \else
217                                                 \addpenalty \interlinepenalty
218                                             \fi
219                                             \vskip \intextsep
220                                             \box\@currbox
221                                             \penalty\interlinepenalty
222                                             \vskip\intextsep
223                                             \ifnum\outputpenalty <-\@Mii \vskip -\parskip\fi
224                                             \outputpenalty \z@
225                                             \@inserttrue
226                                         \fi
227                                     \fi
228                                     \if@insert
229                                     \else
230                                         \@addtotoporbot
231                                     \fi
232                                 \fi
233                             \fi
234                         \fi
235                     \fi
236                 \fi
237             \fi
238     \fi
239     \if@insert
240     \else
241         \@resethfps
242         \@cons\@deferlist\@currbox
243     \fi
244     }%
```

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

```
245 \def\@addtotoporbot{%
246     \@getfpsbit \tw@
247     \ifodd \@tempcnta
248         \@flsetnum \@topnum
249         \ifnum \@topnum>\z@
250             \@tempswafalse
251             \@flcheckspace \@toproom \@toplist
252             \if@tempswa
253                 %% [[ stfloats adds
254                 %% \@bitor\@currtype{\@midlist\@botlist}%
255                 \@bitor\@currtype{\@midlist\@botlist\@dblbotlist}%
256                 %% stfloats adds ]]
257                 \if@test
258                 \else
259                     \@flupdates \@topnum \@toproom \@toplist
260                     \@inserttrue
261                 \fi
262             \fi
263         \fi
264     \fi
265     \if@insert
266     \else
267         \@addtobot
268     \fi
269     }
```

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

```
270 \def\@addtobot{%
271     \@getfpsbit 4\relax
272     \ifodd \@tempcnta
273         \@flsetnum \@botnum
274         \ifnum \@botnum>\z@
275             \@tempswafalse
276             \@flcheckspace \@botroom \@botlist
277             \if@tempswa
278                 %% [[ stfloats adds
279                 \@bitor\@currtype{\@dblbotlist}%
280                 \if@test
281                 \else
282                     \if@kernel@version@MMXXV\else \global \maxdepth \z@\fi
283                 %% stfloats adds ]]
284                     \@flupdates \@botnum \@botroom \@botlist
285                     \@inserttrue
286                 %% [[ stfloats adds
287                 \fi
288                 %% stfloats adds ]]
289             \fi
290         \fi
291     \fi
292     }
```

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

```
293 \def\@doclearpage{%
294     \ifvoid\footins
295         \ifvbox\@kludgeins
296             {\setbox \@tempboxa \box \@kludgeins}%
297         \fi
298         \setbox\@tempboxa\vsplit\@cclv to\z@ \unvbox\@tempboxa
299         \setbox\@tempboxa\box\@cclv
300         \xdef\@deferlist{\@toplist\@botlist\@deferlist}%
301         \global \let \@toplist \@empty
302         \global \let \@botlist \@empty
303         \global \@colroom \@colht
304         \ifx \@currlist\@empty
305         \else
306             \@latexerr{Float(s) lost}\@ehb
307             \global \let \@currlist \@empty
308         \fi
309         \@makefcolumn\@deferlist
310         \@whilesw\if@fcolmade \fi{\@opcol\@makefcolumn\@deferlist}%
311         \if@twocolumn
312             \if@firstcolumn
313                 %% [[ stfloats adds
314                 %%\xdef\@deferlist{\@dbltoplist\@deferlist}%
315                 \xdef\@deferlist{\@dbltoplist\@dblbotlist\@deferlist}%
316                 \global \let \@dblbotlist \@empty
317                 %% stfloats adds ]]
318                 \global \let \@dbltoplist \@empty
319                 \global \@colht \textheight
320                 \begingroup
321                     \@dblfloatplacement
322                     \@makefcolumn\@deferlist
323                     \@whilesw\if@fcolmade \fi{\@outputpage
324                                             \@makefcolumn\@deferlist}%
325                 \endgroup
326             \else
327                 \vbox{}\clearpage
328             \fi
329         \fi
330         \ifx\@deferlist\@empty \else\clearpage \fi
331     \else
332         \setbox\@cclv\vbox{\box\@cclv\vfil}%
333         \@makecol\@opcol
334         \clearpage
335     \fi
336     }
```

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

```
337 \def\@combinedblfloats{%
338     \ifx \@dbltoplist\@empty \else \@cdblflt \fi %% kernel \@combinedblfloats version
339     \ifx \@dblbotlist\@empty \else \@cdblflb \fi
340     }
```

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

```
341 \def\@cdblflt{%
342     \setbox\@tempboxa \vbox{}%
343     \let \@elt \@comdblflelt
344     \@dbltoplist
345     \let \@elt \relax
346     \xdef \@freelist {\@freelist\@dbltoplist}%
347     \global\let \@dbltoplist \@empty
348     %% [[ stfloats adds
349     %% \setbox\@outputbox \vbox to\textheight
350     \setbox\@outputbox \vbox% to\textheight
351     %% stfloats adds ]]
352         {%
353         \unvbox\@tempboxa\vskip-\dblfloatsep
354         \ifnum \@dbltopnum>\m@ne
355             \dblfigrule
356         \fi
357         \vskip \dbltextfloatsep
358         \unvbox \@outputbox
359         }%
360     }
```

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

```
361 \def\@cdblflb{%
362     \setbox\@tempboxa \vbox{}%
363     \let \@elt \@comdblflelt
364     \@dblbotlist
365     \let \@elt \relax
366     \xdef \@freelist {\@freelist\@dblbotlist}%
367     \global\let \@dblbotlist \@empty
368     \setbox\@outputbox \vbox% to\textheight
369         {%
370         \unvbox\@outputbox
371         \vskip \dbltextfloatsep
372         \ifnum \@dblbotnum>\m@ne
373             \dblfigrule
374         \fi
375         \unvbox\@tempboxa
376         \vskip -\dblfloatsep
377         }%
378     }
```

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

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

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

```
380 \gdef\fn@makecol{%
381     \setbox\@outputbox \box\@cclv
382     \let\@elt\relax
383     \xdef\@freelist{\@freelist\@midlist}%
384     \global \let \@midlist \@empty
385     \@combinefloats
386     \ifvoid\footins
387     \else
```

```
388          \setbox\@outputbox \vbox {%
389              \boxmaxdepth \@maxdepth
390              \unvbox \@outputbox
391              \vskip \skip\footins
392              \color@begingroup
393                  \normalcolor
394                  \footnoterule
395                  \unvbox \footins
396              \color@endgroup
397              }%
398      \fi
399      \ifvbox\@kludgeins
400          \@makespecialcolbox
401      \else
402          \setbox\@outputbox \vbox to\@colht {%
403              \@texttop
404              \dimen@ \dp\@outputbox
405              \unvbox \@outputbox
406              \vskip -\dimen@
407              \@textbottom
408              }%
409      \fi
410      \global \maxdepth \@maxdepth
411      }
```

\fnbelowfloat Switch to put footnotes below the bottom floats.

```
412 \def\fnbelowfloat{%
413     %% available Socket Plugs: floats-space-footnotes, space-floats-footnotes
414     \kernel@ifnextchar[{\fn@below@float}{\fn@below@float[floats-footnotes]}%
415     }
416 \def\fn@below@float[#1]{%
417     \if@kernel@version@MMXXV
418         \AssignSocketPlug{build/column/outputbox}{#1}%
419      \else
420         \global\let\@makecol\fn@makecol
421     \fi
422     }
```

\fnunderfloat Switch to put footnotes under the bottom floats.

```
423 \def\fnunderfloat{%
424     %% available Socket Plugs: space-footnotes-floats, footnotes-space-floats, footnotes-float
425     \kernel@ifnextchar[{\fn@under@float}{\fn@under@float[footnotes-floats-legacy]}%
426     }
427 \def\fn@under@float[#1]{%
428     \if@kernel@version@MMXXV
429         \AssignSocketPlug {build/column/outputbox}{#1}%
430     \else
431         \global\let\@makecol\org@makecol@stfloats
432     \fi
433     }
```

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`,

\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.

```
434 \def\set@floatfontsize#1#2#3{%
435     \@defaultunits\@tempdimb#2\p@\relax\@nnil
436     \edef\f@size{\strip@pt\@tempdimb}%
437     \@defaultunits\@tempskipa#3\p@\relax\@nnil
438     \edef\f@baselineskip{\the\@tempskipa}%
439     \edef\f@linespread{#1}%
440     \let\baselinestretch\f@linespread
441     \def\size@update{%
```

Saving of the \baselineskip glue.

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

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

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

Restoring of the \baselineskip glue.

```
446         \advance\@tempskipa by\baselineskip\baselineskip\@tempskipa
447         \normalbaselineskip\baselineskip
448         \setbox\strutbox\hbox{%
449             \vrule\@height.7\baselineskip
450                 \@depth.3\baselineskip
451                 \@width\z@}%
452         \let\size@update\relax
453     }%
454     }
```

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

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

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

```
456 \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.

```
457 \def\setbaselinefixed{%
458     \@tempdima=\baselinestretch\p@
459     \edef\baselinestretch{\strip@pt\@tempdima}%
460     \let\set@fontsize\set@@@fontsize
461     }
```

\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.

```
462 %\endinput
```