

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 enough 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*}
```

<code>\fnbelowfloat</code>	Puts footnotes below the bottom floats
<code>\fnunderfloat</code>	(default and standard) Puts footnotes under the bottom floats.
<code>\setbaselinefloat</code>	Allows <code>\baselineskip</code> to stretch and shrink if the <code>\baselineskip</code> is set internally with command <code>\@setfontsize</code> (<code>\linespread</code> and <code>\fontsize</code> at user level). The settings are calculated and activated with command <code>\selectfont</code> (<code>\size@update</code>).

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

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

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

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

```
2 \newcount\@dblbotnum
3 \newcount\c@dblbotnumber
4 \setcounter{dblbotnumber}{2}
```

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

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

`\@dblfloatplacement` With adds to support `dblfloat(s)` placement at the page bottom. From L^AT_EX release 2015/01/01 `\f@depth` is used in `\@testwrongwidth` to look for either column or `dblcolumn` floats. A value of 1sp signals the latter.

```
6 \def\@dblfloatplacement{%
7   \global\@dbltopnum\c@dbltopnumber
8   \global\@dblbotnum\c@dblbotnumber
9   \global\@dbltoproom\dbltopfraction\@colht
10  \textmin\@colht
11  \advance\@textmin -\@dbltoproom
12  \fpmmin\dblfloatpagefraction\textheight
13  \fptop\@dblftop
14  \fpsep\@dblfpsep
15  \fpbot\@dblfpbot
16  \def\f@depth{1sp}%
17 }
```

`\if@before@latex@release` This conditional code is used to check the L^AT_EX release age.

```
18 \newif\if@before@latex@release
19 \def\tmp@reserved@a#1/#2/#3\@nil{%
20   \ifnum #1<2015\relax
21     \@before@latex@releasetrue
22   \else
23     \@before@latex@releasefalse
24   \fi
25 }
26 \expandafter\tmp@reserved@a\fmtversion\@nil
```

L^AT_EX release version before 2015/01/01 support goes here.

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

```

27 \if@before@latex@release
28   %% < 2015 start
29   \def\@addtodblcol{%
30     \begingroup
31       \@insertfalse
32       \@setfloattypescounts
33       \@getfpsbit \tw@
34       \ifodd\@tempcnta
35         \@flsetnum \@dbltopnum
36         \ifnum \@dbltopnum>\z@
37           \@tempswafalse
38           \ifdim \@dbltoproom>\ht\@currbox
39             \@tempwattrue
40           \else
41             \ifnum \@fpstype<\sist@@n
42               \advance\@dbltoproom \@textmin
43               \ifdim \@dbltoproom>\ht\@currbox
44                 \@tempwattrue
45               \fi
46               \advance\@dbltoproom -\@textmin
47             \fi
48           \fi
49           \if@tempswa
50             \@bitor \@currtype \@dbldeferlist
51             \if@test
52             \else
53               \@bitor \@currtype \@dblbotlist
54               \if@test
55             \else
56               \@tempdima -\ht\@currbox
57               \advance\@tempdima
58               -\ifx \@dbltoplist\@empty \dbltextfloatsep \else
59                 \dblfloatsep \fi
60               \global \advance \@dbltoproom \@tempdima
61               \global \advance \@colht \@tempdima
62               \global \advance \@dbltopnum \m@ne
63               \@cons \@dbltoplist \@currbox
64               \@inserttrue
65             \fi
66           \fi
67         \fi
68       \fi
69     \fi
70     \if@insert
71     \else
72       \@getfpsbit 4\relax
73       \ifodd\@tempcnta

```

```

74         \@flsetnum \@dblbotnum
75         \ifnum \@dblbotnum>\z@
76             \@tempwafalse
77             \ifdim \@dbltoproom>\ht\@currbox
78                 \@tempwattrue
79             \else
80                 \ifnum \@fpstype<\sist@@n
81                     \advance \@dbltoproom \@textmin
82                     \ifdim \@dbltoproom>\ht\@currbox
83                         \@tempwattrue
84                     \fi
85                     \advance \@dbltoproom -\@textmin
86                 \fi
87             \fi
88             \if@tempswa
89                 \@bitor \@currtype \@dbldeferlist
90                 \if@test
91                     \else
92                         \@tempdima -\ht\@currbox
93                         \advance\@tempdima
94                         -\ifx \@dblbotlist\@empty \dbltextfloatsep \else
95                             \dblfloatsep \fi
96                         \global \advance \@dbltoproom \@tempdima
97                         \global \advance \@colht \@tempdima
98                         \global \advance \@dblbotnum \m@ne
99                         \@cons \@dblbotlist \@currbox
100                        \@inserttrue
101                    \fi
102                \fi
103            \fi
104        \fi
105        \if@insert
106        \else
107            \@cons\@dbldeferlist\@currbox
108        \fi
109    \fi
110 \endgroup
111 }

```

`\@docclearpage` With adds to support dblfloat(s) placement at the page bottom.

```

112 \def\@docclearpage{%
113     \ifvoid\footins
114         \ifvbox\@kludgeins
115             {\setbox \@tempboxa \box \@kludgeins}%
116         \fi
117         \setbox\@tempboxa\vsplit\@cclv to\z@ \unvbox\@tempboxa
118         \setbox\@tempboxa\box\@cclv
119         \xdef\@deferlist{\@toplist\@botlist\@deferlist}%
120         \global \let \@toplist \@empty
121         \global \let \@botlist \@empty

```

```

122      \global \@colroom \@colht
123      \ifx \@currlist\@empty
124      \else
125          \@latexerr{Float(s) lost}\@ehb
126          \global \let \@currlist \@empty
127      \fi
128      \@makefcolumn\@deferlist
129      \@whiles\if@fcolmade \fi{\@opcol\@makefcolumn\@deferlist}%
130      \if@twocolumn
131          \if@firstcolumn
132              \xdef\@dbldeferlist{\@dbltoplist\@dblbotlist\@dbldeferlist}%
133              \global \let \@dbltoplist \@empty
134              \global \let \@dblbotlist \@empty
135              \global \@colht \textheight
136              \begingroup
137                  \@dblfloatplacement
138                  \@makefcolumn\@dbldeferlist
139                  \@whiles\if@fcolmade \fi{\@outputpage
140                      \@makefcolumn\@dbldeferlist}%
141              \endgroup
142          \else
143              \vbox{}\clearpage
144          \fi
145      \fi
146      \else
147          \setbox\@cclv\vbox{\box\@cclv\vfil}%
148          \@makecol\@opcol
149          \clearpage
150      \fi
151      }
152      %%% < 2015 end
153 \else

```

Newer L^AT_EX release version from 2015/01/01 support goes here.

```

154      %%% > 2015 start

```

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

```

155      \def\@addtodblcol{%
156          \begingroup
157              \@insertfalse
158              \@setfloattypescounts
159              \@getfpsbit \tw@
160              \ifodd\@tempcnta
161                  \@flsetnum \@dbltopnum
162                  \ifnum \@dbltopnum>\z@
163                      \@tempswafalse
164                      \ifdim \@dbltoproom>\ht\@currbox
165                          \@tempswatrue

```

```

166         \else
167             \ifnum \@fpstype<\sist@@n
168                 \advance \@dbltoproom \@textmin
169                 \ifdim \@dbltoproom>\ht\@currbox
170                     \@tempwattrue
171                 \fi
172                 \advance \@dbltoproom -\@textmin
173             \fi
174         \fi
175     \if@tempswa
176         \@bitor \@currtype \@deferlist
177         \@testwrongwidth\@currbox
178         \if@test
179             \else
180                 \@bitor \@currtype \@dblbotlist
181                 \if@test
182                     \else
183                         \@tempdima -\ht\@currbox
184                         \advance\@tempdima
185                         -\ifx \@dbltoplist\@empty \dbltextfloatsep \else
186                             \dblfloatsep \fi
187                         \global \advance \@dbltoproom \@tempdima
188                         \global \advance \@colht \@tempdima
189                         \global \advance \@dbltopnum \m@ne
190                         \@cons \@dbltoplist \@currbox
191                         \inserttrue
192                     \fi
193                 \fi
194             \fi
195         \fi
196     \fi
197     \if@insert
198     \else
199         \@getfpsbit 4\relax
200         \ifodd\@tempcnta
201             \@flsetnum \@dblbotnum
202             \ifnum \@dblbotnum>\z@
203                 \@tempwafalse
204                 \ifdim \@dbltoproom>\ht\@currbox
205                     \@tempwattrue
206                 \else
207                     \ifnum \@fpstype<\sist@@n
208                         \advance \@dbltoproom \@textmin
209                         \ifdim \@dbltoproom>\ht\@currbox
210                             \@tempwattrue
211                         \fi
212                         \advance \@dbltoproom -\@textmin
213                     \fi
214                 \fi
215             \if@tempswa

```

```

216                \@bitor \@currtype \@deferlist
217                \@testwrongwidth\@currbox
218                \if@test
219                \else
220                    \@tempdima -\ht\@currbox
221                    \advance\@tempdima
222                    -\ifx \@dblbotlist\@empty \dbltextfloatsep \else
223                                            \dblfloatsep \fi
224                    \global \advance \@dbltoproom \@tempdima
225                    \global \advance \@colht \@tempdima
226                    \global \advance \@dblbotnum \m@ne
227                    \@cons \@dblbotlist \@currbox
228                    \@inserttrue
229                \fi
230            \fi
231        \fi
232    \fi
233    \if@insert
234    \else
235        \@cons\@deferlist\@currbox
236    \fi
237    \fi
238    \endgroup
239    }

```

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

```

240    \def\@addtocurcol{%
241        \@insertfalse
242        \@setfloattypes
243        \ifnum \@fpstype=8
244        \else
245            \ifnum \@fpstype=24
246            \else
247                \@flsettextmin
248                \advance \@textmin \@textfloatsheight
249                \@reqcolroom \@pageht
250                \ifdim \@textmin>\@reqcolroom
251                    \@reqcolroom \@textmin
252                \fi
253                \advance \@reqcolroom \ht\@currbox
254                \ifdim \@colroom>\@reqcolroom
255                    \@flsetnum \@colnum
256                    \ifnum \@colnum>\z@
257                        \@bitor\@currtype\@deferlist
258                        \if@test
259                        \else
260                            \@testwrongwidth\@currbox
261                        \if@test
262                            \if@firstcolumn

```

```

263 \getfpsbit \tw@
264 \ifodd\@tempcnta
265 \flsetnum \dbltopnum
266 \ifnum \dbltopnum>\z@
267 \tempswafalse
268 \ifdim \dbltoproom>\ht\currbox
269 \tempwatrue
270 \else
271 \ifnum \fpstype<\sist@n
272 \advance \dbltoproom \textmin
273 \ifdim \dbltoproom>\ht\currbox
274 \tempwatrue
275 \fi
276 \advance \dbltoproom -\textmin
277 \fi
278 \fi
279 \if@tempswa
280 \bitor\currtype{\@toplist\@midlist\@botlist}
281 \if@test
282 \else
283 \tempdima -\ht\currbox
284 \advance\tempdima
285 -\ifx \dbltoplist\empty \dbltextfloatsep \fi
286 \global \advance \dbltoproom \tempdima
287 \global \advance \colht \tempdima
288 \global \advance \colroom \tempdima
289 \global \advance \dbltopnum \m@ne
290 \cons \dbltoplist \currbox
291 \inserttrue
292 \fi
293 \fi
294 \fi
295 \fi
296 \else
297 \getfpsbit 4\relax
298 \ifodd\@tempcnta
299 \flsetnum \dblbotnum
300 \ifnum \dblbotnum>\z@
301 \tempswafalse
302 \ifdim \dbltoproom>\ht\currbox
303 \tempwatrue
304 \else
305 \ifnum \fpstype<\sist@n
306 \advance \dbltoproom \textmin
307 \ifdim \dbltoproom>\ht\currbox
308 \tempwatrue
309 \fi
310 \advance \dbltoproom -\textmin
311 \fi
312 \fi

```



```

313                                     \if@tempswa
314                                     \@tempdima -\ht\@currbox
315                                     \advance\@tempdima
316                                     -\ifx \@dblbotlist\@empty \dbltextfloatsep \fi
317                                     \dblfloatsep \fi
318                                     \global \advance \@dbltoproom \@tempdima
319                                     \global \advance \@colht \@tempdima
320                                     \global \advance \@colroom \@tempdima
321                                     \global \advance \@dblbotnum \m@ne
322                                     \@cons \@dblbotlist \@currbox
323                                     \@inserttrue
324                                     \fi
325                                 \fi
326                             \fi
327                         \fi
328                     \fi
329                 \else
330                     \@bitor\@currtype\@botlist
331                     \if@test
332                         \@addtobot
333                     \else
334                         \ifodd \count\@currbox
335                             \advance \@reqcolroom \intextsep
336                             \ifdim \@colroom>\@reqcolroom
337                                 \global \advance \@colnum \m@ne
338                                 \global \advance \@textfloatsheight \ht\@currbox
339                                 \global \advance \@textfloatsheight 2\intextsep
340                                 \@cons \@midlist \@currbox
341                                 \if@nobreak
342                                     \nobreak
343                                     \@nobreakfalse
344                                     \everypar{}\%
345                                 \else
346                                     \addpenalty \interlinepenalty
347                                 \fi
348                                 \vskip \intextsep
349                                 \box\@currbox
350                                 \penalty\interlinepenalty
351                                 \vskip\intextsep
352                                 \ifnum\outputpenalty <-\@Mii \vskip -\parskip\fi
353                                 \outputpenalty \z@
354                                 \@inserttrue
355                             \fi
356                         \fi
357                         \if@insert
358                         \else
359                             \@addtotoporbot
360                         \fi
361                     \fi
362                 \fi

```

```

363             \fi
364         \fi
365     \fi
366 \fi
367 \fi
368 \if@insert
369 \else
370     \resetfps
371     \cons\@deferlist\@currbox
372 \fi
373 }%

```

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

```

374 \def\@addtotoporbot{%
375     \getfpsbit \tw@
376     \ifodd \@tempcnta
377         \flsetnum \@topnum
378         \ifnum \@topnum>\z@
379             \tempwafalse
380             \flcheckspace \@toproom \@toplist
381             \if@tempswa
382                 \bitor\@currtype{\@midlist\@botlist\@dblbotlist}%
383                 \if@test
384                 \else
385                     \flupdates \@topnum \@toproom \@toplist
386                     \inserttrue
387             \fi
388         \fi
389     \fi
390 \fi
391 \if@insert
392 \else
393     \@addtobot
394 \fi
395 }

```

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

```

396 \def\@addtobot{%
397     \getfpsbit 4\relax
398     \ifodd \@tempcnta
399         \flsetnum \@botnum
400         \ifnum \@botnum>\z@
401             \tempwafalse
402             \flcheckspace \@botroom \@botlist
403             \if@tempswa
404                 \bitor\@currtype{\@dblbotlist}%
405                 \if@test

```

```

406             \else
407                 \global \maxdepth \z@
408                 \@flupdates \@botnum \@botroom \@botlist
409                 \@inserttrue
410             \fi
411         \fi
412     \fi
413 \fi
414 }

```

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

```

415 \def\@docclearpage{%
416     \ifvoid\footins
417         \ifvbox\@kludgeins
418             {\setbox \@tempboxa \box \@kludgeins}%
419         \fi
420         \setbox\@tempboxa\vsplit\@cclv to\z@ \unvbox\@tempboxa
421         \setbox\@tempboxa\box\@cclv
422         \xdef\@deferlist{\@toplist\@botlist\@deferlist}%
423         \global \let \@toplist \@empty
424         \global \let \@botlist \@empty
425         \global \@colroom \@colht
426         \ifx \@currlist\@empty
427             \else
428                 \@latexerr{Float(s) lost}\@ehb
429                 \global \let \@currlist \@empty
430             \fi
431         \@makefcolumn\@deferlist
432         \@whiles\if@fcolmade \fi{\@opcol\@makefcolumn\@deferlist}%
433         \if@twocolumn
434             \if@firstcolumn
435                 \xdef\@deferlist{\@dbltoplist\@dblbotlist\@deferlist}%
436                 \global \let \@dbltoplist \@empty
437                 \global \let \@dblbotlist \@empty
438                 \global \@colht \textheight
439                 \begingroup
440                     \@dblfloatplacement
441                     \@makefcolumn\@deferlist
442                     \@whiles\if@fcolmade \fi{\@outputpage
443                         \@makefcolumn\@deferlist}%
444                 \endgroup
445             \else
446                 \vbox{}\clearpage
447             \fi
448         \fi
449         \ifx\@deferlist\@empty \else\clearpage \fi
450     \else
451         \setbox\@cclv\vbox{\box\@cclv\vfll}%
452         \@makecol\@opcol

```

```

453          \clearpage
454      \fi
455  }
456  %%% > 2015 end
457 \fi

\@combinedblfloats Combines outputbox with top and bottom placed dblfloat(s).
458 \def\@combinedblfloats{%
459     \ifx \@dbltoplist\@empty \else \@cdblflt \fi
460     \ifx \@dblbotlist\@empty \else \@cdblflb \fi
461 }

\@cdblflt Combines outputbox with top placed dblfloat(s).
462 \def\@cdblflt{%
463     \setbox\@tempboxa \vbox{%
464         \let \@elt \@comdblflt
465         \@dbltoplist
466         \let \@elt \relax
467         \xdef \@freelist {\@freelist\@dbltoplist}%
468         \global\let \@dbltoplist \@empty
469         \setbox\@outputbox \vbox% to\textheight
470             {\boxmaxdepth\maxdepth %% probably not needed, CAR
471             \unvbox\@tempboxa\vskip-\dblfloatsep
472             \ifnum \@dbltopnum>\m@ne
473                 \dblfigrule
474             \fi
475             \vskip \dbltextfloatsep
476             \unvbox \@outputbox
477             }%
478     }

\@cdblflb Combines outputbox with bottom placed dblfloat(s).
479 \def\@cdblflb{%
480     \setbox\@tempboxa \vbox{%
481         \let \@elt \@comdblflt
482         \@dblbotlist
483         \let \@elt \relax
484         \xdef \@freelist {\@freelist\@dblbotlist}%
485         \global\let \@dblbotlist \@empty
486         \setbox\@outputbox \vbox% to\textheight
487             {\boxmaxdepth\maxdepth %% probably not needed, CAR
488             \unvbox\@outputbox
489             \vskip \dbltextfloatsep
490             \ifnum \@dblbotnum>\m@ne
491                 \dblfigrule
492             \fi
493             \unvbox\@tempboxa
494             \vskip -\dblfloatsep
495             }%
496     }

```

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

```
497 \global\let\org@makecol\@makecol
```

\fn@makecol Redefined macro \@makecol which puts footnotes below the bottom floats.

```
498 \gdef\fn@makecol{%
499   \setbox\@outputbox \box\@cclv
500   \let\@elt\relax
501   \xdef\@freelist{\@freelist\@midlist}%
502   \global \let \@midlist \empty
503   \@combinefloats
504   \ifvoid\footins
505   \else
506     \setbox\@outputbox \vbox {%
507       \boxmaxdepth \@maxdepth
508       \unvbox \@outputbox
509       \vskip \skip\footins
510       \color@begingroup
511         \normalcolor
512         \footnoterule
513         \unvbox \footins
514       \color@endgroup
515     }%
516   \fi
517   \ifvbox\@kludgeins
518     \@makespecialcolbox
519   \else
520     \setbox\@outputbox \vbox to\@colht {%
521       \@texttop
522       \dimen@ \dp\@outputbox
523       \unvbox \@outputbox
524       \vskip -\dimen@
525       \@textbottom
526     }%
527   \fi
528   \global \maxdepth \@maxdepth
529 }
```

\fnbelowfloat Switch to put footnotes below the bottom floats.

```
530 \def\fnbelowfloat{\global\let\@makecol\fn@makecol}
```

\fnunderfloat Switch to put footnotes under the bottom floats.

```
531 \def\fnunderfloat{\global\let\@makecol\org@makecol}
```

\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.

```
532 \def\set@floatfontsize#1#2#3{%
533   \@defaultunits\@tempdimb#2\p@\relax\@nnil
534   \edef\f@size{\strip@pt\@tempdimb}%

```

```

535 \@defaultunits\@tempkipa#3\p@\relax\@nnil
536 \edef\f@baselineskip{\the\@tempkipa}%
537 \edef\f@linespread{#1}%
538 \let\baselinestretch\f@linespread
539 \def\size@update{%

```

Saving of the \baselineskip glue.

```

540 \baselineskip\f@baselineskip
541 \@tempkipa\baselineskip\relax\baselineskip=1\baselineskip
542 \advance\@tempkipa by-\baselineskip\baselineskip\f@baselineskip

```

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

```

543 \baselineskip\f@linespread\baselineskip

```

Restoring of the \baselineskip glue.

```

544 \advance\@tempkipa by\baselineskip\baselineskip\@tempkipa
545 \normalbaselineskip\baselineskip
546 \setbox\strutbox\hbox{%
547 \vrule\@height.7\baselineskip
548 \@depth.3\baselineskip
549 \@width\z@}%
550 \let\size@update\relax
551 }%
552 }

```

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

```

553 \let\set@@@fontsize\set@fontsize

```

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

```

554 \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.

```

555 \def\setbaselinefixed{%
556 \@tempdima=\baselinestretch\p@
557 \edef\baselinestretch{\strip@pt\@tempdima}%
558 \let\set@fontsize\set@@@fontsize
559 }

```

\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.

```

560 %\endinput

```