The atveryend package

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2016/05/16 v1.9

Abstract

This IATEX package provides two hooks for \end{document} that are executed after the hook of \AtEndDocument. \AfterLastShipout can be used for code that is to be executed right after the last \clearpage before the .aux file is closed. \AtVeryEndDocument is used for code after closing and final reading of the .aux file.

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^{*}Please report any issues at https://github.com/ho-tex/oberdiek/issues

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1 Documentation

There are packages (e.g. hyperref [4], lastpage [6]) that want to call code after the typesetting is done, for example to remember the last page number. LATEX provides the hook \AtEndDocument (clsguide [1]). There are packages that use this hook to do their job for typesetting pages (e.g. endfloat emits the floats here [2]). Also a user might provide additional code in \AtEndDocument. Therefore packages have to call \clearpage in \AtEndDocument to get after the last shipout page. But this is not too reliable, because the right timing is important between packages that want or have to do things before the last page is output and packages that only work properly if they can reach the point after the last shipout.

Therefore the task of this package is to provide additional hooks for \end{document}. All hooks are called after the hook of \AtEndDocument.

\BeforeClearDocument $\{\langle code \rangle\}$

The code is called before the final \clearpage in \enddocument. However it is unknown, whether the last page is already shipped out or if this will be triggered by the final \clearpage.

$\Lambda fterLastShipout \{\langle code \rangle\}$

The code is called after the final \clearpage of \enddocument before the main .aux file is closed. This is the right place to remember the last page in the .aux file, for instance.

$\AtVeryEndDocument \{\langle code \rangle\}$

The code is called after the .aux file is closed and read in again. It is the place for final checks, rerun hints, final messages.

$\AtEndAfterFileList \{\langle code \rangle\}$

After the .aux file closing and reading IATEX prints the file list if requested by \listfiles. Then this hook is executed.

$\Lambda t Very Very End \{\langle code \rangle\}$

This code is called right before the final \@@end.

1.1 Related work

Package scrfile: Markus Kohm has written package scrfile (part of KOMA-Script [5]) that provides hooks \BeforeClosingMainAux and after \AfterReading-MainAux. They have the same function as the hooks of this package. In fact this package uses them, if they are available.

Class revtex4-1: This class calls \clear@document in \enddocument that wraps the final call of \clearpage. Thus it can be used as hook to call stuff after that \clearpage. This is also done by this package.

Package etoolbox: It provides \AfterEndDocument, a hook right before \dead-cycles or \@@end [3].

This package tries to combine as many approaches as possible:

- It looks for a known \enddocument and redefines it.
- Hooks that are provided by others are used (package scrlfile or class revtex4-1.
- It redefines \@checkend and \@dofilelist to insert the hooks similar to package scrlfile.
- The hook execution is wrapped in a macro that is redefined by its first call to prevent calling the hook more than once.

2 Implementation

```
1 (*package)
    2 \begingroup\catcode61\catcode48\catcode32=10\relax%
                     \catcode13=5 % ^^M
                     \endlinechar=13 %
   5
                     \catcode123=1 % {
                    \catcode125=2 % }
                     \catcode64=11 % @
    8
                     \def\x{\endgroup
                             \expandafter\edef\csname AtVeryEnd@AtEnd\endcsname{%
    9
                                    \endlinechar=\the\endlinechar\relax
10
                                    \catcode13=\the\catcode13\relax
11
                                    \catcode32=\the\catcode32\relax
12
                                    \catcode35=\the\catcode35\relax
13
                                    \catcode61=\the\catcode61\relax
14
                                    \colored{catcode64} \to \colored{catcode64}
15
                                    \catcode123=\the\catcode123\relax
16
17
                                    \color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\t
18
                           }%
19
                  }%
20 \x \cdot 10^2 \
21 \catcode13=5 % ^^M
22 \endlinechar=13 %
23 \catcode35=6 % #
24 \catcode64=11 % @
25 \catcode123=1 % {
26 \catcode125=2 % }
27 \def\TMP@EnsureCode#1#2{%
28
                    \edef\AtVeryEnd@AtEnd{%
29
                           \AtVeryEnd@AtEnd
                            \color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\the\color=\t
30
                 ት%
31
32
                    \color= 1=\#2\relax
33 }
34 \TMP@EnsureCode{9}{10}% (tab)
```

```
36 \TMP@EnsureCode{40}{12}\% (
                                                                                                                     37 \TMP@EnsureCode{41}{12}%)
                                                                                                                     38 \TMP@EnsureCode{42}{12}% *
                                                                                                                     39 \TMP@EnsureCode{45}{12}% -
                                                                                                                     40 \TMP@EnsureCode{46}{12}\%.
                                                                                                                     41 \TMP@EnsureCode{47}{12}% /
                                                                                                                     42 \TMP@EnsureCode{62}{12}% >
                                                                                                                     43 \TMP@EnsureCode{91}{12}% [
                                                                                                                     44 \TMP@EnsureCode{93}{12}% ]
                                                                                                                      45 \TMP@EnsureCode{96}{12}%
                                                                                                                     46 \edf At Very End @At End \\ \ed Cat End 
                                                                                                                              Package identification.
                                                                                                                     47 \NeedsTeXFormat{LaTeX2e}
                                                                                                                      48 \ProvidesPackage{atveryend}%
                                                                                                                     49 [2016/05/16 v1.9 Hooks at the very end of document (HO)]
                                                                                                                   2.1
                                                                                                                                        Tools
                          \AtVeryEnd@ifundefined
                                                                                                                     50 \def\AtVeryEnd@ifundefined#1{%
                                                                                                                     {\tt 51} \quad \verb|\begingroup| expandafter \verb|\expandafter| expandafter \verb|\expandafter| expandafter| expandafter \verb|\expandafter| expandafter| expandafter|
                                                                                                                     52 \expandafter\ifx\csname #1\endcsname\relax
                                                                                                                    53
                                                                                                                                     \expandafter\@firstoftwo
                                                                                                                     54
                                                                                                                                  \else
                                                                                                                                       \expandafter\@secondoftwo
                                                                                                                     55
                                                                                                                    56 \fi
                                                                                                                     57 }
                                                                                                                   2.2
                                                                                                                                        Hooks
rEnd@BeforeClearDocumentHook
                                                                                                                      58 \let\AtVeryEnd@BeforeClearDocumentHook\@empty
tVeryEnd@AfterLastShipoutHook
                                                                                                                      59 \let\AtVeryEnd@AfterLastShipoutHook\@empty
yEnd@AtVeryEndDocumentHook
                                                                                                                      60 \let\AtVeryEnd@AtVeryEndDocumentHook\@empty
eryEnd@AtEndAfterFileListHook
                                                                                                                      AtVeryEnd@AtVeryVeryEndHook
                                                                                                                      62 \let\AtVeryEnd@AtVeryVeryEndHook\@empty
                                \BeforeClearDocument
                                                                                                                      63 \newcommand*{\BeforeClearDocument}{%
                                                                                                                      {\tt 64 } \verb| \g@addto@macro\\ At VeryEnd@BeforeClearDocumentHook\\
                                                                                                                      65 }
                                               \AfterLastShipout
                                                                                                                      66 \newcommand*{\AfterLastShipout}{%
                                                                                                                                  \verb|\g@addto@macro| AtVeryEnd@AfterLastShipoutHook| \\
                                                                                                                      67
                                                                                                                      68 }
                                  \AtVeryEndDocument
                                                                                                                      69 \newcommand*{\AtVeryEndDocument}{%
                                                                                                                                 \g@addto@macro\AtVeryEnd@AtVeryEndDocumentHook
                                                                                                                      71 }
```

35 \TMP@EnsureCode{39}{12}% '

```
\AtEndAfterFileList
                             72 \newcommand*{\AtEndAfterFileList}{%
                                 \verb|\g@addto@macro|| At VeryEnd@AtEndAfterFileListHook||
                             74 }
           \AtVeryVeryEnd
                             75 \newcommand*{\AtVeryVeryEnd}{%
                             76 \g@addto@macro\AtVeryEnd@AtVeryVeryEndHook
                             77 }
\Call@BeforeClearDocument
                             78 \newcommand*{\Call@BeforeClearDocument}{%
                                 \let\BeforeClearDocument\@firstofone
                                 \ifx\AtVeryEnd@BeforeClearDocumentHook\@empty
                             80
                                   \PackageInfo{atveryend}{Empty hook `BeforeClearDocument'}%
                             81
                             82
                                   \PackageInfo{atveryend}{Executing hook `BeforeClearDocument'}%
                             83
                                  \AtVeryEnd@BeforeClearDocumentHook
                             84
                             85
                                 \verb|\global| let \At Very End @Before Clear Document Hook \@undefined \\
                             86
                                 \global\let\Call@BeforeClearDocument\relax
                             87
                             88 }
    \Call@AfterLastShipout
                             89 \newcommand*{\Call@AfterLastShipout}{%
                                 \let\AfterLastShipout\@firstofone
                                 \verb|\ifx\AtVeryEnd@AfterLastShipoutHook\@empty|
                             91
                                  \PackageInfo{atveryend}{Empty hook `AfterLastShipout'}%
                             92
                                 \else
                             93
                                   \PackageInfo{atveryend}{Executing hook `AfterLastShipout'}%
                             94
                                   \AtVeryEnd@AfterLastShipoutHook
                             95
                             96
                             97
                                 \global\let\AtVeryEnd@AfterLastShipoutHook\@undefined
                             98
                                 \global\let\Call@AfterLastShipout\relax
                             99 }
\Call@AtVeryEndDocument
                             100 \newcommand*{\Call@AtVeryEndDocument}{%
                                 \let\AtVeryEndDocument\@firstofone
                             102
                                 \ifx\AtVeryEnd@AtVeryEndDocumentHook\@empty
                                   \PackageInfo{atveryend}{Empty hook `AtVeryEndDocument'}%
                             103
                             104
                                   \PackageInfo{atveryend}{Executing hook `AtVeryEndDocument'}%
                             105
                                   \verb|\AtVeryEnd@AtVeryEndDocumentHook| \\
                             106
                             107
                                 \verb|\global| let At Very End @ At Very End Document Hook \\| @ undefined \\|
                             108
                                 \global\let\Call@AtVeryEndDocument\relax
                            109
                             110 }
  \Call@AtEndAfterFileList
                            111 \newcommand*{\Call@AtEndAfterFileList}{%
                                 \Call@AtVeryEndDocument
                            113
                                 \let\AtEndAfterFileList\@firstofone
                            114
                                 \ifx\AtVeryEnd@AtEndAfterFileListHook\@empty
                            115
                                   \PackageInfo{atveryend}{Empty hook `AtEndAfterFileList'}%
                            116
                            117
                                   \PackageInfo{atveryend}{Executing hook `AtEndAfterFileList'}%
                            118
                                   \verb|\AtVeryEnd@AtEndAfterFileListHook| \\
                            119
                                 \verb|\global| let \verb|\AtVeryEnd@AtEndAfterFileListHook| @undefined \\
                            120
                                 \global\let\Call@AtEndAfterFileList\relax
                            121
                            122 }
```

\Call@AtVeryVeryEnd

```
123 \newcommand*{\Call@AtVeryVeryEnd}{%
124 \Call@AtEndAfterFileList
125 \let\AtVeryVeryEnd\@firstofone
   \ifx\AtVeryEnd@AtVeryVeryEndHook\@empty
126
127
     \PackageInfo{atveryend}{Empty hook `AtVeryVeryEnd'}%
128
     129
     \verb|\AtVeryEnd@AtVeryVeryEndHook||
130
131
    \verb|\global| let At Very End @ At Very Very End Hook \\| @ undefined \\|
132
    \global\let\Call@AtVeryVeryEnd\relax
133
134 }
```

2.3 Redefining \enddocument

This approach looks for known versions of \enddocument and redefines it. Class seminar and package slidesec are not checked, because there would be too much combinations to check.

2.3.1 LATEX kernel

\AtVeryEnd@test@standard

```
135 \def\AtVeryEnd@test@standard{%
    \let\AtEndDocument\@firstofone
136
     \@enddocumenthook
137
    \@checkend{document}%
138
    \clearpage
139
140
     \begingroup
      \if@filesw
141
        \immediate\closeout\@mainaux
142
143
        \let\@setckpt\@gobbletwo
        \let\@newl@bel\@testdef
144
        \@tempswafalse
145
       \makeatletter
146
        \input\jobname.aux %
147
      \fi
148
      \@dofilelist
149
      \ifdim \font@submax >\fontsubfuzz\relax
150
        \@font@warning{Size substitutions with differences\MessageBreak
151
152
                up to \font@submax\space have occurred.\@gobbletwo}%
153
      \fi
154
      \@defaultsubs
155
      \@refundefined
      \if@filesw
156
        \ifx \@multiplelabels \relax
157
158
         \if@tempswa
           \@latex@warning@no@line{Label(s) may have changed. %
159
             Rerun to get cross-references right}%
160
161
         \fi
162
        \else
         \@multiplelabels
163
164
        \fi
165
      \fi
166
     \endgroup
167
     \deadcycles\z@
    \@@end
168
169 }
```

JeryEnd@enddocument@standard

```
170 \ \texttt{\def} \ \texttt{\AtVeryEnd@enddocument@standard} \{ \% \ \texttt{\def} \ \texttt{\def} \ \texttt{\def} \}
```

171 \let\AtEndDocument\@firstofone

```
\@enddocumenthook
172
     \@checkend{document}%
173
     \Call@BeforeClearDocument
174
175
     \clearpage
     \Call@AfterLastShipout
176
177
     \begingroup
178
      \if@filesw
179
        \immediate\closeout\@mainaux
        \let\@setckpt\@gobbletwo
180
        \let\@newl@bel\@testdef
181
        \@tempswafalse
182
        \makeatletter
183
        \input\jobname.aux %
184
185
      \Call@AtVeryEndDocument
186
187
      \@dofilelist
      \verb|\Call@AtEndAfterFileList| \\
188
      \ifdim \font@submax >\fontsubfuzz\relax
189
        \@font@warning{Size substitutions with differences\MessageBreak
190
191
                up to \font@submax\space have occurred.\@gobbletwo}%
192
      \fi
      \@defaultsubs
193
      \@refundefined
194
      \if@filesw
195
        \ifx \@multiplelabels \relax
196
197
         \if@tempswa
           \ensuremath{\verb|Clatex@warning@no@line{Label(s) may have changed. %}}
198
199
              Rerun to get cross-references right}%
200
         \fi
201
        \else
         \@multiplelabels
202
203
        \fi
204
      \fi
205
     \endgroup
     \deadcycles\z@
207
    \Call@AtVeryVeryEnd
208
    \@@end
209 }
```

2.3.2 IAT_EX kernel 2011/06/27

The LATeX 2_{ε} release 2011/06/27 has changed \enddocument (\input is replaced by \@@input).

VeryEnd@test@standard20110627

```
210 \expandafter\def\csname AtVeryEnd@test@standard20110627\endcsname{%
    \let\AtEndDocument\@firstofone
212
    \@enddocumenthook
213
    \@checkend{document}%
214
    \clearpage
    \begingroup
215
      \if@filesw
216
       \immediate\closeout\@mainaux
217
218
       \let\@setckpt\@gobbletwo
       \let\@newl@bel\@testdef
219
220
       \@tempswafalse
221
       \makeatletter
222
       \@\
223
      \fi
224
      \@dofilelist
      \ifdim \font@submax >\fontsubfuzz\relax
225
       \verb|\QfontQwarning{Size substitutions with differences}| Message Break| \\
226
               up to \font@submax\space have occurred.\@gobbletwo}%
227
```

```
\fi
228
      \@defaultsubs
229
      \@refundefined
230
      \if@filesw
231
232
        \ifx \@multiplelabels \relax
233
         \if@tempswa
234
           \ensuremath{\verb|Clatex@warning@no@line{Label(s) may have changed. %}}
              Rerun to get cross-references right}\%
235
         \fi
236
        \else
237
         \@multiplelabels
238
        \fi
239
      \fi
240
     \endgroup
241
     \deadcycles\z@
242
    \@@end
244 }
245 \verb|\expandafter\def\csname AtVeryEnd@enddocument@standard20110627\endcsname{\%} \\
    \let\AtEndDocument\@firstofone
247 \@enddocumenthook
248 \@checkend{document}%
249 \Call@BeforeClearDocument
250 \clearpage
    \Call@AfterLastShipout
251
252
    \begingroup
      \if@filesw
253
        \immediate\closeout\@mainaux
254
        \let\@setckpt\@gobbletwo
255
        \let\@newl@bel\@testdef
256
        \@tempswafalse
257
258
        \makeatletter
259
        \@\
260
      \verb|\Call@AtVeryEndDocument| \\
261
      \@dofilelist
262
      \Call@AtEndAfterFileList
263
      \ifdim \font@submax >\fontsubfuzz\relax
264
        \verb|\QfontQwarning{Size substitutions with differences}| MessageBreak|
265
266
                up to \font@submax\space have occurred.\@gobbletwo}%
267
268
      \@defaultsubs
269
      \@refundefined
270
      \if@filesw
        \fint \ensuremath{\mbox{\sc Null}}
271
         \ightharpoonup \if@tempswa
272
           \verb|\Clatex@warning@no@line{Label(s) may have changed. } % \\
273
              Rerun to get cross-references right}\%
274
         \fi
275
276
        \else
         \@multiplelabels
277
        \fi
278
279
      \fi
280
     \endgroup
     \deadcycles\z@
    \Call@AtVeryVeryEnd
282
    \@@end
283
```

enddocument@standard20110627

284 }

2.3.3 Package booklet, file 2up.tex $\verb|\AtVeryEnd@test@booklet| \\$ 285 \expandafter\def\expandafter\AtVeryEnd@test@booklet\expandafter{% 286 \expandafter\twoupclearpage $287 \quad \texttt{\AtVeryEnd@test@standard}$ 288 } tVeryEnd@enddocument@booklet $289 \ \texttt{expandafter} \ \texttt{AtVeryEnd@enddocument@booklet} \ \texttt{expandafter} \ \texttt{\%}$ 290 \expandafter\twoclearpage $291 \quad \verb|\AtVeryEnd@enddocument@standard| \\$ 292 } 2.3.4 Class dinbrief \AtVeryEnd@test@dinbrief 293 \def\AtVeryEnd@test@dinbrief{% 294 \@checkend{document} % 295 \newpage 296 \begingroup 297 \if@filesw 298 \ifnum\c@labelgen>0 % $\verb|\immediate|| close out \verb|\immediate|| close out clos$ 299 300 \makeatletter \input \jobname@lbl\relax 301 \clearpage 302 \fi 303 \immediate\closeout\@mainaux 304 305 \fi 306 \endgroup \deadcycles\z@ 307 \@@end 308 309 } tVeryEnd@enddocument@dinbrief 310 \def\AtVeryEnd@enddocument@dinbrief{% 311 \@checkend{document}% 312 \Call@BeforeClearDocument 313 \newpage 314 \Call@AfterLastShipout 315 \begingroup 316 \if@filesw 317 \ifnum\c@labelgen>\z@ \immediate\closeout\@mainlbl 318 \makeatletter 319 \input \jobname@lbl\relax 320 \clearpage 321 322 \fi \immediate\closeout\@mainaux 323 324 325\Call@AtVeryEndDocument 326 \csname @dofilelist\endcsname $\Call@AtEndAfterFileList$

327

328

329

330

331 332 }

\endgroup

\@@end

\deadcycles\z@

 $\verb|\Call@AtVeryVeryEnd||$

2.3.5 Class combine

$\verb|\AtVeryEnd@test@combine||$

VeryEnd@enddocument@combine

\AtVeryEnd@test@c@lenddoca

```
333 \def\AtVeryEnd@test@combine{%
334
    \@enddocumenthook
    \@checkend{document}%
335
    \clearpage
336
    \begingroup
337
      \if@filesw
338
       \immediate\closeout\@mainaux
339
       \immediate\closeout\@partaux
340
341
       \let\@setckpt\@gobbletwo
342
       \let\@newl@bel\@testdef
343
       \@tempswafalse
       \makeatletter \input\c@lmainauxfile %% change here
344
      \fi
345
346
      \c@lenddoca
                                     %% a replacement
      \@refundefined
347
    \endgroup
348
    \deadcycles\z@
349
    \@@end
350
351 }
352 \def\AtVeryEnd@enddocument@combine{%
353
    \@enddocumenthook
    \verb|\document|| %
354
    \Call@BeforeClearDocument
355
    \clearpage
356
    \Call@AfterLastShipout
357
    \begingroup
358
      \if@filesw
359
       \immediate\closeout\@mainaux
360
       \immediate\closeout\@partaux
361
362
       \let\@setckpt\@gobbletwo
363
       \let\@newl@bel\@testdef
364
       \@tempswafalse
       \mbox{\sc Makeatletter \input\c@lmainauxfile}\ \%\%\ \mbox{\c change here}
365
366
      \Call@AtVeryEndDocument
367
      \c@lenddoca
                                     %% a replacement
368
      \@refundefined
369
370
    \endgroup
    \deadcycles\z@
    \Call@AtVeryVeryEnd
373
    \@@end
374 }
375 \long\def\AtVeryEnd@test@c@lenddoca{%
    \@dofilelist
376
    377
      \@font@warning{%
378
       Size substitutions with differences\MessageBreak
379
380
       up to \font@submax\space have occured.\@gobbletwo
381
      }%
382
    \fi
    \@defaultsubs
383
384
    \if@filesw
      \int \mathbb{C}_{\mathbb{C}}\
385
       \if@tempswa
386
         \@latex@warning@no@line{%
387
```

Label(s) may have changed. %

388

```
Rerun to get cross-references right%
                                                                                                       389
                                                                                                       390
                                                                                                                                                 }%
                                                                                                                                          \fi
                                                                                                       391
                                                                                                       392
                                                                                                                                    \else
                                                                                                       393
                                                                                                                                          \@multiplelabels
                                                                                                       394
                                                                                                                                    \fi
                                                                                                       395
                                                                                                                             \fi
                                                                                                       396 }
                                           \c@lenddoca
                                                                                                       397 \ifx\AtVeryEnd@c@lenddoca\c@lenddoca
                                                                                                                             \label{lem:defcollenddoca} $$\def\c\end{mathemath} $$ \def\c\end{mathemath} $$ \def\c\end{math
                                                                                                       399
                                                                                                                                    \@dofilelist
                                                                                                                                    \Call@AtEndAfterFileList
                                                                                                       400
                                                                                                                                    \ifdim\font@submax>\fontsubfuzz\relax
                                                                                                       401
                                                                                                                                          \Gin{array}{c} \Gin
                                                                                                       402
                                                                                                                                                 Size substitutions with differences\MessageBreak
                                                                                                       403
                                                                                                                                                 up to \font@submax\space have occured.\gobbletwo
                                                                                                       404
                                                                                                                                         }%
                                                                                                       405
                                                                                                                                   \fi
                                                                                                       406
                                                                                                                                    \@defaultsubs
                                                                                                       407
                                                                                                       408
                                                                                                                                    \if@filesw
                                                                                                       409
                                                                                                                                          \ifx\@multiplelabels\relax
                                                                                                       410
                                                                                                                                                 \ightharpoonup \if@tempswa
                                                                                                       411
                                                                                                                                                       \verb|\@latex@warning@no@line{%}|
                                                                                                                                                             Label(s) may have changed. %
                                                                                                       412
                                                                                                                                                             Rerun to get cross-references right \%
                                                                                                       413
                                                                                                                                                       }%
                                                                                                       414
                                                                                                                                                 \fi
                                                                                                       415
                                                                                                                                           \else
                                                                                                       416
                                                                                                                                                 \@multiplelabels
                                                                                                       417
                                                                                                       418
                                                                                                       419
                                                                                                                                    \fi
                                                                                                       420 }%
                                                                                                       421 \fi
                                                                                                       2.3.6 Class jpsj2
\AtVeryEnd@test@jpsj
                                                                                                       422 \def\AtVeryEnd@test@jpsj{%
                                                                                                       423
                                                                                                                             \if@lastpagebalancing
                                                                                                                                    \global\let\@outputdblcol=\balancing@outputdblcol
                                                                                                       424
                                                                                                       425
                                                                                                                             \fi
                                                                                                                             \ccheckend{document}%
                                                                                                       426
                                                                                                       427
                                                                                                                             \clearpage
                                                                                                       428
                                                                                                                             \begingroup
                                                                                                       429
                                                                                                                                   \if@filesw
                                                                                                                                           \immediate\closeout\@mainaux
                                                                                                       430
                                                                                                                                          \def\global\@namedef\##1\##2{}\%
                                                                                                       431
                                                                                                                                          432
                                                                                                                                          \def \left( \def \right) 
                                                                                                       433
                                                                                                                                          \@tempswafalse
                                                                                                       434
                                                                                                                                          \makeatletter
                                                                                                       435
                                                                                                                                          \input \jobname.aux %
                                                                                                       436
                                                                                                                                          \if@tempswa
                                                                                                       437
                                                                                                                                                 \@warning{%
                                                                                                       438
                                                                                                       439
                                                                                                                                                       Label(s) may have changed. %
                                                                                                       440
                                                                                                                                                       Rerun to get cross-references right%
                                                                                                                                                 }%
                                                                                                       441
                                                                                                                                          \fi
                                                                                                       442
                                                                                                                                    \fi
                                                                                                       443
```

\endgroup

444

```
\deadcycles\z@
                               445
                                    \@@end
                               446
                               447 }
\AtVeryEnd@enddocument@jpsj
                               448 \def\AtVeryEnd@enddocument@jpsj{%
                                    \if@lastpagebalancing
                               449
                               450
                                     \global\let\@outputdblcol=\balancing@outputdblcol
                               451
                               452
                                    \@checkend{document}%
                               453
                                    \Call@BeforeClearDocument
                               454
                                    \clearpage
                                    \verb|\Call@AfterLastShipout| \\
                               456
                                    \begingroup
                               457
                                     \if@filesw
                                       \verb|\immediate| close out \\| @mainaux|
                               458
                                       459
                                       460
                                       \left( \frac{\color{cond}}{\color{cond}} \right)
                               461
                               462
                                       \@tempswafalse
                                       \makeatletter
                               463
                                       \input \jobname.aux %
                               464
                               465
                                       \if@tempswa
                               466
                                        \@warning{%
                               467
                                         Label(s) may have changed. \%
                               468
                                         Rerun to get cross-references right%
                               469
                                        }%
                                       \fi
                               470
                                     \fi
                               471
                                     \Call@AtVeryEndDocument
                               472
                                     \csname @dofilelist\endcsname
                               473
                                     \Call@AtEndAfterFileList
                               474
                               475
                                    \endgroup
                               476
                                    \deadcycles\z@
                               477
                                    \Call@AtVeryVeryEnd
                               478
                                    \@@end
                               479 }
                               2.3.7 Testing and redefining
             \AtVeryEnd@Test
                               480 \def\AtVeryEnd@Test#1#2{%
                                    \expandafter\ifx\csname AtVeryEnd@test@#2\endcsname#1%
                               481
                                     \expandafter\let\expandafter#1%
                               482
                                     \csname AtVeryEnd@enddocument@#2\endcsname
                               483
                               484
                                     \begingroup
                               485
                                       \let\on@line\@empty
                               486
                                       \PackageInfo{atveryend}{%
                                        \string#1 detected (#2)%
                               487
                                      }%
                               488
                                     \endgroup
                               489
                                     \expandafter\AtVeryEnd@SkipToNil
                               490
                               491
                                    \fi
                               492 }
        \AtVeryEnd@SkipToNil
                               493 \end@SkipToNil\#1\end{\{}
AtVeryEnd@RedefEndDocument
                               494 \def\AtVeryEnd@RedefEndDocument#1{%
                                    \ifx#1\@undefined
```

496

\else

```
\AtVeryEnd@Test#1{standard20110627}%
497
      \AtVeryEnd@Test#1{standard}%
498
      \AtVeryEnd@Test#1{booklet}%
499
      \AtVeryEnd@Test#1{dinbrief}%
500
      \AtVeryEnd@Test#1{combine}%
501
502
      \AtVeryEnd@Test#1{jpsj}%
503
      \AtVeryEnd@SkipToNil
504
      \@nil
    \fi
505
506 }
507 \ \texttt{AtVeryEnd@RedefEndDocument} \ \texttt{enddocument}
508\ \text{AtVeryEnd@RedefEndDocument}\ \text{AP@enddocument}\ \text{\%} afterpage.sty
509 \verb|\AtVeryEnd@RedefEndDocument| hyper@back@cite@enddocument % htx-bc.sty
510 \AtVeryEnd@RedefEndDocument\hyper@enddocument % hyper.sty
511 \AtVeryEnd@RedefEndDocument\hyper@fn@enddocument % hyper.sty
512 \AtVeryEnd@RedefEndDocument\cweb@save@enddocument % cweb.cls
513 \AtVeryEnd@RedefEndDocument\prev@enddocument % flushend.sty
514 \AtVeryEnd@RedefEndDocument\endorigdocument % gaceta.cls
515 \AtVeryEnd@RedefEndDocument\keependdoc % aguplus.sty
516 \AtVeryEnd@RedefEndDocument\EMenddocument % t-angles.sty
517 \ \texttt{AtVeryEnd@RedefEndDocument} \\ \texttt{docmute@enddocument} \ \% \ docmute.sty
518 \text{ } AtVeryEnd@RedefEndDocument }  alatex.sty
519 \AtVeryEnd@RedefEndDocument\enddocumentasusual % frenchle.sty
520\ \text{AtVeryEnd@RedefEndDocument}\ uwthesis.cls
```

2.4 Hack into \enddocument

```
521 \def\AtVeryEnd@document{document}%
522 \def\AtVeryEnd@RedefCheckEnd{%
    \expandafter\def\expandafter\@checkend
524
    \expandafter##\expandafter1\expandafter{%
      \ccheckend{##1}%
      \def\AtVeryEnd@temp{##1}%
526
527
      \ifx\AtVeryEnd@temp\AtVeryEnd@document
528
       \let\AtVeryEnd@OrgClearpage\clearpage
529
       \def\clearpage{%
         \let\clearpage\AtVeryEnd@OrgClearpage
530
         \Call@BeforeClearDocument
531
532
        \clearpage
        \Call@AfterLastShipout
533
       }%
534
535
536
537
    \aftergroup\AtVeryEnd@RedefCheckEnd
538 }%
539 \AtBeginDocument{%
540
    \AtEndDocument{%
      \AtVeryEnd@RedefCheckEnd
541
    7%
542
543 }
544 \AtEndDocument{%
    \@ifundefined{@dofilelist}{%
546
      \gdef\@dofilelist{%
       \Call@AtVeryEndDocument
547
       \Call@AtEndAfterFileList
548
     }%
549
    }{%
550
      \begingroup
551
       \toks@\expandafter{\@dofilelist}%
552
       \xdef\@dofilelist{%
553
        \noexpand\Call@AtVeryEndDocument
554
```

```
\the\toks@
555
556
         \noexpand\Call@AtEndAfterFileList
557
558
      \endgroup
559
     }%
560 }
```

Using hooks of other packages 2.5

Package scrlfile

```
561 \AtBeginDocument{%
    \@ifpackageloaded{scrlfile}{%
562
      \AtVeryEnd@ifundefined{BeforeClosingMainAux}{}{%
563
       \BeforeClosingMainAux{\Call@AfterLastShipout}%
564
565
      \AtVeryEnd@ifundefined{AfterReadingMainAux}{}{\%
566
567
       \AfterReadingMainAux{\Call@AtVeryEndDocument}%
     }%
568
   }{}%
569
```

2.5.2 Package etoolbox

```
\@ifpackageloaded{etoolbox}{%
571
      \AtVeryEnd@ifundefined{AfterEndDocument}{}{\%
       \AfterEndDocument{\Call@AtVeryEndDocument}%
572
     }%
573
574 }{}%
575 }
```

2.6 Class letter

The class letter and some similar classes insert material (\@startlabels) at the end of the document. However, this method violates a precondition of this package that the \clearpage in \enddocument is the final call with no material at later times. Therefore we move the label making from the .aux file to \AtEndDocument.

```
576 \def\AtVeryEnd@temp{%
    \AtBeginDocument{%
577
      \let\@startlabels\startlabels
578
      \let\@mlabel\mlabel
579
580
      \if@filesw
581
       \immediate\write\@mainaux{\string\@startlabels}%
582
      \fi
    7%
583
    \AtEndDocument{%
584
      \if@filesw
585
       \immediate\write\@mainaux{\string\clearpage}%
586
587
    }%
588
589 }
590 \ifx\makelabels\AtVeryEnd@temp
591 \else
    \expandafter\AtVeryEnd@AtEnd
592
593 \fi%
594 \let\AtVeryEnd@PatchLetter=N%
595 \begingroup\expandafter\expandafter\expandafter\endgroup
596 \expandafter\ifx\csname endletter\endcsname\relax
597 \else
    \long\def\AtVeryEnd@TestEndLetter#1\@auxout#2#3\AtVeryEnd@Nil{%
598
      \def\AtVeryEnd@temp{#2}%
599
600
      \ifx\AtVeryEnd@temp\@empty
601
      \else
       \@onelevel@sanitize\AtVeryEnd@temp
602
       \edef\AtVeryEnd@StringMlabel{%
603
```

```
604
        \string\string
        \string\@mlabel
605
        \expandafter\@gobble\string\{%
606
607
608
       \def\AtVeryEnd@CatchFirst##1##2##3##4##5##6##7##8{%
609
        ##1##2##3##4##5##6##7##8\AtVeryEnd@CatchSecond
610
     611
        ##1##2##3##4##5##6##7##8%
612
       }%
613
       \edef\AtVeryEnd@temp{%
614
        \expandafter\AtVeryEnd@CatchFirst\AtVeryEnd@temp
615
        {}{}{}{}
616
        617
        \@nil
618
619
       }%
       \verb|\fixAtVeryEnd@temp\AtVeryEnd@StringMlabel| \\
620
        \expandafter\def\expandafter\endletter\expandafter{%
621
          \endletter
622
623
          \begingroup
           \left\langle -\right\rangle =
624
           \let\protect\@unexpandable@protect
625
           \let\@mlabel=\relax
626
           \edef\x{\endgroup
627
            \noexpand\AtEndDocument{%
628
629
              \@gobble#2%
630
            }%
           }%
631
632
          /x
        }%
633
        \let\AtVeryEnd@PatchLetter=Y%
634
635
       \fi
636
     \fi
637
    \expandafter\AtVeryEnd@TestEndLetter\endletter
638
639
     \@auxout{}\AtVeryEnd@Nil
640 \fi
641 \ifx\AtVeryEnd@PatchLetter Y%
642
    \begingroup
     \let\on@line\@empty
643
     \PackageInfo{atveryend}{%
644
       \C backslashchar makelabels detected. \%
645
       Moving labels\MessageBreak
646
647
       from `.aux' file to \@backslashchar AtEndDocument%
648
     }%
649
    \endgroup
650
    \def\makelabels{%
651
     \AtBeginDocument{%
652
       \let\@startlabels\startlabels
653
       \let\@mlabel\mlabel
     }%
654
    }%
655
    \AtEndDocument{%
656
     \verb|\AtVeryEnd@ifundefined{@startlabels}{{}}|
657
658
659
       \clearpage
660
       \@startlabels
661
     }%
662
    }%
    \AfterLastShipout{%
663
     \let\@startlabels\relax
664
     \left( \mathbb{Q} \right)
```

665

```
666 }%
667 \else
668 \PackageWarningNoLine{atveryend}{%
669 \@backslashchar makelabels detected, but labels cannot\MessageBreak
670 be moved to \@backslashchar AtEndDocument, because\MessageBreak
671 \@backslashchar endletter is not in expected form%
672 }%
673 \fi
674 \AtVeryEnd@AtEnd%
675 \( /package \)
```

3 Test

3.1 Catcode checks for loading

```
676 (*test1)
677 \color= 1 \%
678 \catcode`\}=2 %
679 \catcode`\#=6 %
680 \catcode`\@=11 %
681 \expandafter\ifx\csname count@\endcsname\relax
682 \countdef\count@=255 %
683 \fi
684 \exp and after if x \csname @gobble \endcsname \relax
685 \long\def\@gobble#1{}\%
686 \fi
687 \expandafter\ifx\csname \text{Ofirstofone} endcsname\relax
688 \long\def\@firstofone#1{#1}%
689 \fi
690 \expandafter\ifx\csname loop\endcsname\relax
    \expandafter\@firstofone
692 \else
693 \expandafter\@gobble
694 \fi
695 {%
    696
      \def\body{\#1}\%
697
      \iterate
698
    }%
699
    \def\iterate{%
700
701
      \body
       \let\next\iterate
702
703
      \else
704
       \let\next\relax
705
      \fi
706
      \next
    }%
707
    \left| \right| 
708
709 }%
710 \def\RestoreCatcodes{}
711 \count@=0 %
712 \loop
    \edef\RestoreCatcodes{%
713
714
      \RestoreCatcodes
      \catcode\the\count@=\the\catcode\count@\relax
715
716 }%
717 \ifnum\count@<255 \%
718 \advance\count@ 1 %
719 \repeat
721 \def\RangeCatcodeInvalid#1#2{%
```

```
\count@=#1\relax
722
723
    \loop
     \catcode\count@=15 %
724
    \index(0) = \frac{2\pi}{2}
725
726
     \advance\count@ 1 %
727
    \repeat
728 }
729 \def\RangeCatcodeCheck#1#2#3{\%
    \count@=#1\relax
730
    \loop
731
      \ifnum#3=\catcode\count@
732
      \else
733
734
       \errmessage{%
        Character \the\count@\space
735
        with wrong catcode \the\catcode\count@\space
736
737
        instead of \number#3%
738
       }%
739
     \fi
    740
741
     \advance\count@ 1 %
742
    \repeat
743 }
744 \def\space{}
745 \expandafter\ifx\csname LoadCommand\endcsname\relax
    \def\LoadCommand{\input atveryend.sty\relax}%
747 \fi
748 \def\Test{%
    \RangeCatcodeInvalid{0}{47}%
749
750
    \RangeCatcodeInvalid{58}{64}%
751
    \RangeCatcodeInvalid{91}{96}%
    \RangeCatcodeInvalid{123}{255}%
752
    \catcode`\@=12 %
753
    \color=0 \%
754
    \catcode`\%=14 %
755
756 \LoadCommand
757 \RangeCatcodeCheck{0}{36}{15}%
    \RangeCatcodeCheck{37}{37}{14}%
759 \RangeCatcodeCheck{38}{47}{15}%
760
    \RangeCatcodeCheck{48}{57}{12}%
761
    \RangeCatcodeCheck{58}{63}{15}%
    \RangeCatcodeCheck{64}{64}{12}%
762
    \RangeCatcodeCheck{65}{90}{11}\%
763
    \RangeCatcodeCheck{91}{91}{15}%
764
765
    \RangeCatcodeCheck{92}{92}{0}%
766
    \RangeCatcodeCheck{93}{96}{15}%
    \RangeCatcodeCheck{97}{122}{11}%
    \RangeCatcodeCheck{123}{255}{15}%
769
    \RestoreCatcodes
770 }
771 \Test
772 \csname @@end\endcsname
773 \end
774 \langle / \text{test1} \rangle
```

4 Installation

4.1 Download

Package. This package is available on CTAN¹:

CTAN:macros/latex/contrib/oberdiek/atveryend.dtx The source file.

¹http://ctan.org/pkg/atveryend

CTAN:macros/latex/contrib/oberdiek/atveryend.pdf Documentation.

Bundle. All the packages of the bundle 'oberdiek' are also available in a TDS compliant ZIP archive. There the packages are already unpacked and the documentation files are generated. The files and directories obey the TDS standard.

CTAN:install/macros/latex/contrib/oberdiek.tds.zip

TDS refers to the standard "A Directory Structure for TeX Files" (CTAN:tds/tds.pdf). Directories with texmf in their name are usually organized this way.

4.2 Bundle installation

Unpacking. Unpack the oberdiek.tds.zip in the TDS tree (also known as texmf tree) of your choice. Example (linux):

```
unzip oberdiek.tds.zip -d ~/texmf
```

Script installation. Check the directory TDS:scripts/oberdiek/ for scripts that need further installation steps. Package attachfile2 comes with the Perl script pdfatfi.pl that should be installed in such a way that it can be called as pdfatfi. Example (linux):

```
chmod +x scripts/oberdiek/pdfatfi.pl
cp scripts/oberdiek/pdfatfi.pl /usr/local/bin/
```

4.3 Package installation

Unpacking. The .dtx file is a self-extracting docstrip archive. The files are extracted by running the .dtx through plain T_FX:

```
tex atveryend.dtx
```

TDS. Now the different files must be moved into the different directories in your installation TDS tree (also known as texmf tree):

```
atveryend.sty \rightarrow tex/latex/oberdiek/atveryend.sty atveryend.pdf \rightarrow doc/latex/oberdiek/atveryend.pdf test/atveryend-test1.tex \rightarrow doc/latex/oberdiek/test/atveryend-test1.tex atveryend.dtx \rightarrow source/latex/oberdiek/atveryend.dtx
```

If you have a docstrip.cfg that configures and enables docstrip's TDS installing feature, then some files can already be in the right place, see the documentation of docstrip.

4.4 Refresh file name databases

If your TEX distribution (teTEX, mikTEX, ...) relies on file name databases, you must refresh these. For example, teTEX users run texhash or mktexlsr.

4.5 Some details for the interested

Unpacking with IATEX. The .dtx chooses its action depending on the format: plain TEX: Run docstrip and extract the files.

LATEX: Generate the documentation.

If you insist on using \LaTeX for docstrip (really, docstrip does not need \LaTeX), then inform the autodetect routine about your intention:

```
latex \let\install=y\input{atveryend.dtx}
```

Do not forget to quote the argument according to the demands of your shell.

Generating the documentation. You can use both the .dtx or the .drv to generate the documentation. The process can be configured by the configuration file ltxdoc.cfg. For instance, put this line into this file, if you want to have A4 as paper format:

\PassOptionsToClass{a4paper}{article}

An example follows how to generate the documentation with pdfIATEX:

```
pdflatex atveryend.dtx
makeindex -s gind.ist atveryend.idx
pdflatex atveryend.dtx
makeindex -s gind.ist atveryend.idx
pdflatex atveryend.dtx
```

5 Catalogue

The following XML file can be used as source for the TEX Catalogue. The elements caption and description are imported from the original XML file from the Catalogue. The name of the XML file in the Catalogue is atveryend.xml.

```
775 (*catalogue)
776 <?xml version='1.0' encoding='us-ascii'?>
777 <!DOCTYPE entry SYSTEM 'catalogue.dtd'>
778 <entry datestamp='$Date$' modifier='$Author$' id='atveryend'>
    <name>atvervend</name>
779
    <caption>Hooks at the very end of a document.
780
    <authorref id='auth:oberdiek'/>
781
    <copyright owner='Heiko Oberdiek' year='2009-2011'/>
    <license type='lppl1.3'/>
    <version number='1.9'/>
785
    <description>
      This LaTeX packages provides two hooks for <tt>\end{document}</tt>
786
      that are executed after the hook of <tt>\AtEndDocument</tt>:
787
      <tt>\AfterLastShipout</tt> can be used for code that is to be executed
788
      right after the last <tt>\clearpage</tt> before the `<tt>.aux</tt>' file
789
      is closed. <tt>\AtVeryEndDocument</tt> is used for code after closing
790
791
      and final reading of the `<tt>.aux</tt>' file.
792
      The package is part of the xref refid='oberdiek'>oberdiek bundle.
794 </description>
795 <documentation details='Package documentation'
       href='ctan:/macros/latex/contrib/oberdiek/atveryend.pdf'/>
796
797 <ctan file='true' path='/macros/latex/contrib/oberdiek/atveryend.dtx'/>
798 <miktex location='oberdiek'/>
799 <texlive location='oberdiek'/>
800 <install path='/macros/latex/contrib/oberdiek/oberdiek.tds.zip'/>
801 </entry>
802 (/catalogue)
```

6 Acknowledgement

Arthur Ogawa: He proposed the new API with \AfterLastShipout and gave me much feedback, comprehensive class/package lists, many suggestions and comments.

7 References

[1] The LATEX3 Project: LATEX2e for class and package writers 2006/02/15; CTAN:macros/latex/doc/clsguide.pdf.

- [2] James Darrell McCauley, Jeff Goldberg: The endfloat package; 1995/10/11 v2.4i; CTAN:macros/latex/contrib/endfloat/endfloat.pdf.
- [3] Philipp Lehmann: The etoolbox package; 2009/08/06 v1.8; CTAN:macros/latex/contrib/etoolbox/etoolbox.pdf.
- [4] Sebastian Rahtz, Heiko Oberdiek: *The hyperref package*; 2009/12/05 v6.79l; CTAN:macros/latex/contrib/hyperref/.
- [5] Markus Kohm: KOMA-Script; 2009/07/24 v3.04a; http://www.komascript.de/.
- [6] Jeff Goldberg: The lastpage package; 1994/07/20 v0.1b; CTAN:macros/latex/contrib/lastpage/lastpage.pdf.
- [7] APS, AIP, Arthur Orgawa; ReVTeX 4.1; 2009/10/13 v4.1; http://authors.aps.org/revtex4/.

8 History

[2009/12/06 v1.0]

• The first version.

[2009/12/07 v1.1]

· Bug fixes.

[2009/12/09 v1.2]

• Additional support of classes and packages.

[2009/12/11 v1.3]

- Patch for letter like classes that puts label into the 'aux' file.
- Hook \BeforeClearDocument added (request from Arthur Ogawa).
- Patch of \clear@document removed (Arthur Ogawa).
- A nested \AtBeginDocument removed.

[2010/01/25 v1.4]

• Moved from TDS:*/generic/* to TDS:*/latex/*.

[2010/03/24 v1.5]

• \Call@BeforeClearDocument fixed (Ahmed Musa).

[2011/04/15 v1.6]

• \Call@AtEndAfterFileList and \Call@AtVeryVeryEnd added.

[2011/04/23 v1.7]

 Some fix for \AtVeryEnd@RedefCheckEnd to avoid error because of undefined control sequence in some circumstances (thanks to D.P. Story for bug report).

[2011/06/30 v1.8]

- Support of changed \enddocument of IATEX $2_{\mathcal{E}} \ 2011/06/27.$

[2016/05/16 v1.9]

• Documentation updates.

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