

# Section name references in L<sup>A</sup>T<sub>E</sub>X\*

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<https://github.com/latex3/hyperref/issues>

2021-04-02

## Documentation overview for hyperref

The documentation for package `hyperref` consists of several files:

[Manual](#) The **USER MANUAL** (also available as HTML).

[ChangeLog](#) This file records the version history.

[Bookmark talk, slides](#) Slides for the talk “PDF information and navigation elements with hyperref, pdfTeX and thumbpdf” at EuroT<sub>E</sub>X 1999.

[Bookmark talk, paper](#) The paper version of the talk.

Source code documentation:

[hyperref.dtx](#) This is the source code documentation for hyperref.

[backref.dtx](#) “Back referencing from bibliographical citations”

 [nameref.dtx](#) “Section name references in L<sup>A</sup>T<sub>E</sub>X” (this file)

## Contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
<b>2</b>	<b>History</b>	<b>2</b>

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\*This file has version number v2.47, last revised 2021-04-02.

<b>3</b>	<b>Implementation</b>	<b>3</b>
3.1	<code>\label</code> stuff	3
3.2	Changes of section macros	5
3.2.1	Class beamer	8
3.2.2	Theorems	9
3.3	Referencing stuff	9
3.4	Usage and frontend	12
3.5	Package <code>ifthen</code> support	13
3.6	Compatibility with <code>varioref</code>	13
3.7	Support for package listings	16
<b>4</b>	<b>Index</b>	<b>16</b>

## 1 Introduction

Cross-referencing to include the *name* of the section, rather than just the number or page. This works by redefining some of the inside  $\text{\LaTeX}$  macros, so it is vulnerable to future changes.

## 2 History

Sebastian Rahtz, for Lou Burnard, March 15th 1994;  
 SPQR CERN July 1994;  
 Last mod. Sept. 3th MG;  
 Sept. 19th SPQR;  
 April 11th 1995 SPQR (added section formatting hook);  
 April 14th 1995 SPQR (compatibility with `hyperref`);  
 June 22 1995 SPQR (removed typeout from `Sectionformat`);  
 September 22 1997 added `varioref` hacks by Corey Minyard;  
 September 28th changes by David Carlisle.  
 More recent changes are recorded in `ChangeLog`.

The versions before 2009/11/27 v2.32 did not expand the title strings (of `\section`, `\caption`, ...). Then the behaviour switched to expanding, because this allows to remove unwanted macros (`\label`, ...). Despite this method is used in package `titleref` and class `memoir`, the first feedbacks let me conclude that this is not robust enough. Therefore I wrote package `getttitlestring` that uses the non-expanding method as default. It also allows me to use this package in package `zref-titleref`. See the package documentation of package `getttitlestring` how to change the method. It also provides a hook to remove additional unwanted macros, not supported by the package. Example:

```

\usepackage{getttitlestring}
\GetTitleStringDisableCommands{%
  \let\mylabel\@gobble
  \renewcommand\myindex[2]{}%
}

```

### 3 Implementation

```

1 (*package)
2 \RequirePackage{refcount}[2006/02/12]
3 \RequirePackage{getttitlestring}[2009/12/18]
4 \RequirePackage{ltxcmds}[2009/12/12]

```

We redefine `\label` so that it also writes the name of the current section to the `.aux` file; if the name ends in a dot, we zap it. To allow for the `hyperref` package, also write fourth and fifth fields (empty by default; used for cross-ref name, and file).

`\NR@strip@period`

```

5 \def\NR@strip@period#1.\ltx@empty#2\@nil{#1}

```

`\strip@period` Macro `\strip@period` was removed in `nameref` 2012/07/28 v2.41 and reinserted in 2012/07/31 v2.42 for compatibility reasons with package `subfig`.

```

6 \def\strip@period#1.\relax#2\@@{#1}

7 \def\NR@sanitize@labelname{%
8   \onelevel@sanitize\@currentlabelname
9   \edef\@currentlabelname{%
10     \expandafter\NR@strip@period\@currentlabelname
11     \ltx@empty.\ltx@empty\@nil
12   }%
13 }

```

#### 3.1 `\label` stuff

Here is tested, whether package `showkeys` is loaded. But if option `final` is used, the macros of `showkeys` are not defined, so we have to check an additional test.

`\ifNR@showkeys`

```

14 \newif\ifNR@showkeys
15 \NR@showkeysfalse
16 \@ifpackageloaded{showkeys}{%
17   \begingroup
18     \@ifundefined{SK@@label}{%
19       }{%
20         \global\NR@showkeystrue
21       }%
22   \endgroup
23 }{}

```

`\label@hook`

```

24 \providecommand*\label@hook{}
25 \ltx@GlobalAppendToMacro{\label@hook}{%
26   \NR@sanitize@labelname
27 }

```

```

\label
28 \def\label#1{%
29   \@bsphack
30   \begingroup
31     \def\label@name{#1}%
32     \label@hook
33     \protected@write\@auxout{}{%
34       \string\newlabel{#1}{%
35         {\@currentlabel}%
36         {\thepage}%
37         {\@currentlabelname}%
38         {\@currentHref}{}}%
39     }%
40   }%
41   \endgroup
42   \@esphack
43 }%
44 \ifNR@showkeys
45   \def\label#1{%
46     \@bsphack
47     \SK@\SK@@label{#1}%
48     \begingroup
49       \def\label@name{#1}%
50       \label@hook
51       \protected@write\@auxout{}{%
52         \string\newlabel{#1}{%
53           {\@currentlabel}%
54           {\thepage}%
55           {\@currentlabelname}%
56           {\@currentHref}{}}%
57       }%
58     }%
59   \endgroup
60   \@esphack
61 }%
62 \fi

```

\ltx@label

```
63 \let\ltx@label\label
```

Needed for the *subeqnarray* package.

\slabel

```

64 \@ifundefined{slabel}{}{%
65   \def\slabel#1{%
66     \@bsphack
67     \if@filesw
68       \begingroup
69         \def\label@name{#1}%
70         \label@hook

```

```

71      \let\thepage\relax
72      \def\protect{\noexpand\noexpand\noexpand}%
73      \edef\@tempa{%
74          \write\@auxout{%
75              \string\newlabel{#1}{%
76                  {\thesubequation}%
77                  {\thepage}%
78                  {\@currentlabelname}%
79                  {\@currentHref}{}}%
80          }%
81      }%
82      }%
83      \expandafter\endgroup
84      \@tempa
85      \if@nobreak\ifvmode\nobreak\fi\fi
86  \fi
87  \@esphack
88  }%
89  }

```

Overload an AMS L<sup>A</sup>T<sub>E</sub>X command, which uses `\newlabel`. Sigh!

```

\@writetocindent@
90 \def\@writetocindent@{%
91     \begingroup
92     \@for\@tempa:=-1,0,1,2,3\do{%
93         \immediate\write\@auxout{%
94             \string\newlabel{tocindent\@tempa}{%
95                 \csname r@tocindent\@tempa\endcsname}{-}{-}{-}}%
96         }%
97     }%
98     }%
99     \endgroup
100 }

```

### 3.2 Changes of section macros

Add to the underlying section heading macros so that they note the section name for use by label.

If a section heading or the like has a `\label` in it, we need to extract it, or subsequent processing breaks.

```

\NR@getttitle
101 \def\NR@getttitle#1{%
102     \GetTitleString{#1}%
103     \let\@currentlabelname\GetTitleStringResult
104 }

```

First the numbered sections. While we are about it, put in a useful section formatting macro.

\NR@sect

```
105 \let\NR@sect\@sect
```

```
106 \newcounter{section@level}
```

\@sect

```
107 \def\@sect#1#2#3#4#5#6[#7]#8{%
```

```
108   \setcounter{section@level}{#2}%
```

```
109   \NR@getttitle{#7}%
```

```
110   \NR@sect{#1}{#2}{#3}{#4}{#5}{#6}[#{#7}]{\Sectionformat{#8}{#2}}%
```

```
111 }
```

and now the unnumbered ones

\NR@ssect

```
112 \let\NR@ssect\@ssect
```

\NR@ssect

```
113 \def\@ssect#1#2#3#4#5{%
```

```
114   \NR@getttitle{#5}%
```

```
115   \NR@ssect{#1}{#2}{#3}{#4}{\Sectionformat{#5}{#1}}%
```

```
116 }
```

Support for class memoir.

```
117 \ltx@ifundefined{ifheadnameref}{%
```

```
118 }{%
```

```
119   \ltx@ifundefined{M@sect}{%
```

```
120 }{%
```

```
121   \let\NRorg@M@sect\M@sect
```

```
122   \def\M@sect#1#2#3#4#5#6[#7][#8]{%
```

```
123     \ifheadnameref
```

```
124       \NR@getttitle{#8}%
```

```
125     \else
```

```
126       \NR@getttitle{#7}%
```

```
127     \fi
```

```
128     \NRorg@M@sect{#1}{#2}{#3}{#4}{#5}{#6}[#{#7}][#{#8}]%
```

```
129   }%
```

```
130 }%
```

```
131 }
```

Parts and chapters are treated differently. sigh. \@part and \@spart are \long because of class memoir.

```
132 \let\NR@part\@part
```

```
133 \long\def\@part[#1]#2{%
```

```
134   \NR@getttitle{#1}%
```

```
135   \NR@part[#{#1}]{#2}%
```

```
136 }
```

```
137 \let\NR@spart\@spart
```

```
138 \long\def\@spart#1{%
```

```

139 \NR@getttitle{#1}%
140 \NR@spart{#1}%
141 }
142 \let\NR@chapter\@chapter
143 \def\@chapter[#1]#2{%
144 \NR@getttitle{#1}%
145 \NR@chapter[{#1}]{#2}%
146 }
147 \@ifclassloaded{memoir}{%
148 \ltx@ifundefined{ifheadnameref}{%
149 }{%
150 \def\@chapter[#1]#2{%
151 \ltx@ifundefined{ch@pt@c}{%
152 \NR@getttitle{#1}%
153 }{%
154 \ifx\ch@pt@c\ltx@empty
155 \NR@getttitle{#2}%
156 \else
157 \def\NR@temp{#1}%
158 \ifx\NR@temp\ltx@empty
159 \expandafter\NR@getttitle\expandafter{\ch@pt@c}%
160 \else
161 \ifheadnameref
162 \NR@getttitle{#1}%
163 \else
164 \expandafter\NR@getttitle\expandafter{\ch@pt@c}%
165 \fi
166 \fi
167 \fi
168 }%
169 \NR@chapter[{#1}]{#2}%
170 }%
171 }%
172 }{}
173 \let\NR@schapter\@schapter
174 \def\@schapter#1{%
175 \NR@getttitle{#1}%
176 \NR@schapter{#1}%
177 }

```

## Captions

```

178 \AtBeginDocument{%
179 \@ifpackageloaded{hyperref}{%
180 \@ifpackagelater{hyperref}{2009/12/05}\@gobble\@firstofone
181 }\@firstofone
182 {%
183 \let\NR@@caption\@caption
184 \long\def\@caption#1[#2]{%
185 \NR@getttitle{#2}%
186 \NR@@caption{#1}[{#2}]%

```

```

187 }%
188 }%
189 \@ifpackageloaded{longtable}{%
190   \let\NRorg@LT@cc@ption\LT@cc@ption
191   \def\LT@cc@ption#1[#2]#3{%
192     \NRorg@LT@cc@ption{#1}[{#2}]{#3}%
193   \def\@tempa{#2}%
194   \ifx\@tempa\@empty
195     \else
196       \NR@getttitle{#2}%
197     \fi
198   }%
199 }{}%

```

Environment ‘description’.

```

200 \ltx@ifundefined{descriptionlabel}{%
201 }{%
202   \let\NRorg@descriptionlabel\descriptionlabel
203   \def\descriptionlabel#1{%
204     \NR@getttitle{#1}%
205     \NRorg@descriptionlabel{#1}%
206   }%
207 }%
208 }

```

Compatibility for package titlesec.

```

209 \AtBeginDocument{%
210   \@ifpackageloaded{titlesec}{%
211     \let\NRorg@ttl@sect@i\ttl@sect@i
212     \def\ttl@sect@i#1#2[#3]#4{%
213       \NR@getttitle{#4}%
214       \NRorg@ttl@sect@i{#1}{#2}[{#3}]{#4}%
215     }%
216   }{}%
217 }

```

### 3.2.1 Class beamer

```

218 \@ifclassloaded{beamer}{%
219   \def\NR@PatchBeamer#1{%
220     \expandafter\let\csname NRorg@beamer@#1\expandafter\endcsname
221       \csname beamer@#1\endcsname
222     \begingroup
223     \edef\x{\endgroup
224       \long\def\expandafter\noexpand\csname beamer@#1\endcsname
225         [####1]{% hash-ok
226           \noexpand\NR@getttitle{####1}%
227           \expandafter\noexpand\csname NRorg@beamer@#1\endcsname
228             [{####1]}%
229         }%

```



```

230     }%
231     \x
232 }%
233 \NR@PatchBeamer{section}%
234 \NR@PatchBeamer{subsection}%
235 \NR@PatchBeamer{subsubsection}%

Theorem names.
236 \addtobeamertemplate{theorem begin}{%
237     \expandafter\NR@getttitle\expandafter{\inserttheoremaddition}%
238 }{}%
239 \@ifdefinable{\NRorg@beamer@descriptionitem}{%
240     \let\NRorg@beamer@descriptionitem\beamer@descriptionitem
241     \renewcommand{\beamer@descriptionitem}[1]{%
242         \NR@getttitle{#1}%
243         \NRorg@beamer@descriptionitem{#1}%
244     }%
245 }%
246 }{}

```

### 3.2.2 Theorems

```

247 \ltx@ifundefined{@opargbegintheorem}{}{%
248     \let\NRorg@opargbegintheorem\@opargbegintheorem
249     \def\@opargbegintheorem#1#2#3{%
250         \NR@getttitle{#3}%
251         \NRorg@opargbegintheorem{#1}{#2}{#3}%
252     }%
253 }
254 \AtBeginDocument{%
255     \@ifpackageloaded{amsthm}{%
256         \let\NRorg@begintheorem\@begintheorem
257         \begingroup
258             \edef\x{macro:\string#1\string#2[\string#3]}%
259             \@onelevel@sanitize\x
260             \def\y#1->#2\@nil{#1}%
261             \edef\z{\expandafter\y\meaning\@begintheorem->\@nil}%
262             \@onelevel@sanitize\z
263         \expandafter\endgroup
264         \ifx\x\z
265             \def\@begintheorem#1#2[#3]{%
266                 \NR@getttitle{#3}%
267                 \NRorg@begintheorem{#1}{#2}[#3]}%
268             }%
269         \fi
270     }{}%
271 }

```

### 3.3 Referencing stuff

We default the label and hypertext reference to be empty.

```

272 \providecommand*{\@currentlabelname}{}
273 \providecommand*{\@currentHref}{}

```

Since the second part of the preserved reference now has five parts (number, page, name, hypertext reference and file), we need extra utility macros:

```

\@firstoffive
274 \long\def\@firstoffive#1#2#3#4#5{#1}

\@secondoffive
275 \long\def\@secondoffive#1#2#3#4#5{#2}

\@thirdoffive
276 \long\def\@thirdoffive#1#2#3#4#5{#3}

\@fourthoffive
277 \long\def\@fourthoffive#1#2#3#4#5{#4}

\@offive
278 \long\def\@fifthoffive#1#2#3#4#5{#5}

```

We have to redefine `\ref` and `\pageref` to know about extra reference elements. Make them robust, and compatible with Babel. The Babel switch is mimicked if not already defined. Some support for package `showkeys` is implemented. If option `notref` of that package is set, `\SK@ref` has the meaning of `\@empty`.

```

\@safe@activestruer
279 \providecommand*\@safe@activestruer{}%

\@safe@activesfalse
280 \providecommand*\@safe@activesfalse{}%

\NR@setref
281 \def\NR@setref#1{%
282   \begingroup
283     \@safe@activestruer
284     \expandafter
285   \endgroup
286   \expandafter\NR@@setref\csname r@#1\endcsname
287 }

\NR@@setref
288 \def\NR@@setref#1{%
289   \ifx\@undefined#1%
290     \let#1\relax
291   \fi
292   \@setref#1%
293 }

```

```

\T@ref
294 \def\T@ref#1{%
295   \NR@setref{#1}\@firstoffive{#1}%
296 }%

\T@pageref
297 \def\T@pageref#1{%
298   \NR@setref{#1}\@secondoffive{#1}%
299 }%

300 \ifNR@showkeys
301   \ifx\SK@ref\@empty
302   \else

\T@ref
303   \def\T@ref#1{%
304     \@safe@activetrue
305     \SK@\SK@@ref{#1}%
306     \@safe@activetrue
307     \NR@setref{#1}\@firstoffive{#1}%
308   }%

\T@pageref
309   \def\T@pageref#1{%
310     \@safe@activetrue
311     \SK@\SK@@ref{#1}%
312     \@safe@activetrue
313     \NR@setref{#1}\@secondoffive{#1}%
314   }%

315   \fi
316 \fi

Package hyperref uses its own definitions of \ref and \pageref because it extends
the syntax by the star form. \DeclareRobustCommand is used by hyperref. Pack-
age nameref can be loaded before, after hyperref or after hyperref's definitions in
\AtBeginDocument.

317 \ifpackageloaded{hyperref}{%
318 }{%

\ref
319   \DeclareRobustCommand{\ref}{\T@ref}%

\pageref
320   \DeclareRobustCommand{\pageref}{\T@pageref}%

321 }

```

### 3.4 Usage and frontend

Access the (third) name part with `\nameref`;

`\T@nameref`

```

322 \def\T@nameref#1{%
323   \begingroup
324     \let\label\@gobble
325     \NR@setref{#1}\@thirdoffive{#1}%
326   \endgroup
327 }%
328 \ifNR@showkeys
329   \ifx\SK@ref\@empty
330   \else
331     \def\T@nameref#1{%
332       \@safe@activestrue
333       \SK@\SK@@ref{#1}%
334       \@safe@activesfalse
335       \begingroup
336         \let\label\@gobble
337         \NR@setref{#1}\@thirdoffive{#1}%
338       \endgroup
339     }%
340   \fi
341 \fi

342 %\@ifclassloaded{memoir}{%
343 %  \ltx@ifundefined{@mem@titlerefno link}\ltx@secondoftwo{%
344 %    \ltx@ifundefined{@mem@titleref}\ltx@secondoftwo\ltx@firstoftwo
345 %  }%
346 %}\ltx@secondoftwo
347 %}%
348 % \DeclareRobustCommand*\nameref{%
349 %   \@ifstar\@mem@titlerefno link\@mem@titleref
350 % }%
351 %}%

```

`\nameref`

```

352 \DeclareRobustCommand*\nameref{%
353   \@ifstar\T@nameref\T@nameref
354 }%
355 %}

```

`\Nameref` An extended form which gives title and page number.

```

356 \def\Nameref#1{\nameref{#1}' on page~\pageref{#1}}

```

`\Sectionformat` The default for `\Sectionformat`

```

357 \providecommand\Sectionformat[2]{#1}

```

### 3.5 Package ifthen support

Package ifthen's \isodd does not work with \pageref because of the extra link and the star form. Therefore we need an expandable variant.

Unfortunately there is no hook in \ifthenelse in order to provide expandable versions without link of \ref and \pageref. As possible target I could only find \begingroup:

```

358 \@ifpackageloaded{ifthen}{%
359   \let\NROrg@ifthenelse\ifthenelse
360   \def\ifthenelse{%
361     \let\begingroup\NR@TE@begingroup
362     \NROrg@ifthenelse
363   }%
364   \let\NROrg@begingroup\begingroup
365   \def\NR@TE@begingroup{%
366     \let\begingroup\NROrg@begingroup
367     \begingroup
368     \def\ref##1{\getrefbykeydefault{##1}{}}{??}}%
369     \def\pageref##1{\getrefbykeydefault{##1}{page}{0}}%
370   }%
371 }{}

```

### 3.6 Compatibility with varioref

[This section was derived by Corey Minyard minyard@acm.org from the varioref package] Changed in 2019-09-12 by Frank Mittelbach to adapt to changes in varioref

```

372 \AtBeginDocument{%
373   \ifx\csname @vpageref\endcsname\relax
374   \else
375   %FMi
376   Test if we are using the new varioref ...
377   \ifdefined\vp@gerefstar
378   \let\NR@@vpageref\@vpageref
379   if not then old patching code
380   \else
381     \def\NR@@vpageref#1[#2]#3{%
382       \leavevmode\unskip
383       \global\advance\c@vrcnt\@ne
384       \ifundefined{r@the\c@vrcnt @vr}%
385       {\@namedef{r@the\c@vrcnt @vr}{??}{??}{-}{-}}}%
386       \edef\@tempa{%
387         \expandafter\expandafter\expandafter
388         \@secondoffive\csname r@the\c@vrcnt @vr\endcsname
389       }%
390       \ifundefined{r@the\c@vrcnt @xvr}%
391       {\@namedef{r@the\c@vrcnt @xvr}{??}{??}{-}{-}}}%
392       \edef\@tempb{%

```

```

391     \expandafter\expandafter\expandafter
392     \@secondoffive\csname r@\the\c@vrcnt @xvr\endcsname
393 }%
394 {%
395     \let\@currentlabel\@empty
396     \expandafter\label\expandafter{\the\c@vrcnt @xvr}%
397 }%
398 \ifx\@tempa\@tempb
399 \else
400     \vref@err{%
401         \noexpand\vref at page boundary %
402         \@tempb-\@tempa\space (may loop)%
403     }%
404 \fi
405 \@ifundefined{r@#3}{\@namedef{r@#3}{??}{??}{}}{}%
406 \edef\thevpagerefnum{%
407     \expandafter\expandafter\expandafter
408     \@secondoffive\csname r@#3\endcsname
409 }%
410 \ifx\vref@space\@undefined
411     \space
412 \else
413     \vref@space
414 \fi
415 \ifx\@tempa\thevpagerefnum
416     #1%
417 \else
418     #2%
419     \is@pos@number\thevpagerefnum{%
420         \is@pos@number\@tempa{%
421             \@tempcnta\@tempa
422             \advance\@tempcnta\@ne
423         }{%
424             \@tempcnta\maxdimen
425         }%
426         \ifnum \thevpagerefnum =\@tempcnta
427             \ifodd\@tempcnta
428                 \if@twoside
429                     \reftextfaceafter
430                 \else
431                     \reftextafter
432                 \fi
433             \else
434                 \reftextafter
435             \fi
436         \else
437             \advance\@tempcnta-2 %
438             \ifnum \thevpagerefnum =\@tempcnta
439                 \ifodd\@tempcnta
440                     \reftextbefore

```

```

441         \else
442         \if@twoside
443         \reftextfacebefore
444         \else
445         \reftextbefore
446         \fi
447         \fi
448         \else
449         \reftextfaraway{#3}%
450         \fi
451         \fi
452     }{%
453         \reftextfaraway{#3}%
454     }%
455 \fi
456 {%
457     \let\@currentlabel\@empty
458     \expandafter\label\expandafter{\the\c@vrcnt @vr}%
459 }%
460 }%
461 \fi
462 %FM - end mod
463 \def\@vpageref#1[#2]#3{%
464     \begingroup
465     \csname @safe@activetrue\endcsname
466     \edef\x{#3}%
467     \@onelevel@sanitize\x
468     \toks@{%
469         \NR@vpageref{#1}[{#2}]%
470     }%
471     \edef\x{\endgroup
472         \the\toks@{\x}%
473     }%
474     \x
475 }%
476 \DeclareRobustCommand\vnameref[1]{%
477     \unskip~\nameref{#1}%
478     \@vpageref[\unskip]{#1}%
479 }%
480 \fi
481 }
482 \ifundefined{@Refstar}{%
483     \def\T@Ref#1{%
484         \NR@setref{#1}\NR@MakeUppercaseFirstOfFive{#1}%
485     }%
486     \def\NR@MakeUppercaseFirstOfFive#1#2#3#4#5{%
487         \MakeUppercase#1%
488     }%
489 }{}%

```

```

490 \AtBeginDocument{%
491   \@ifpackageloaded{varioref}{%
492     \@ifundefined{@Refstar}{%
493       \DeclareRobustCommand*{\Ref}[1]{%
494         \T@Ref{#1}%
495       }%
496     }{}%
497   }{}%
498 }%

```

### 3.7 Support for package listings

```

499 \AtBeginDocument{%
500   \@ifpackageloaded{listings}{%
501     \let\NROrg@lst@MakeCaption\lst@MakeCaption
502     \def\lst@MakeCaption{%
503       \ifx\lst@label\@empty
504       \else
505         \let\@currentlabelname\lst@caption
506       \fi
507       \NROrg@lst@MakeCaption
508     }%
509   }{}%
510 }
511 \</package>

```

## 4 Index

Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in *roman* refer to the code lines where the entry is used.

Symbols		
\@@@ . . . . . 6	\@empty . . . 194, 301, 189, 210, 255,	
\@@vpageref .. 377, 463	329, 395, 457, 503	317, 358, 491, 500
\@auxout .. 33, 51, 74, 93	\@esphack . . . 42, 60, 87	\@ifstar . . . . . 349, 353
\@begintheorem . . . . .	\@fifthoffive . . . . . 278	\@ifundefined . . . . .
.... 256, 261, 265	\@firstoffive . . . . .	.... 18, 64, 382,
\@bsphack . . . 29, 46, 66	.... <u>274</u> , 295, 307	388, 405, 482, 492
\@caption . . . . . 183, 184	\@firstofone . . 180, 181	\@mem@titleref . . . . . 349
\@chapter . 142, 143, 150	\@for . . . . . 92	\@mem@titlerefno link
\@currentHref . . . . .	\@fourthoffive . . . . . <u>277</u>	..... 349
... 38, 56, 79, 273	\@gobble .. 180, 324, 336	\@namedef . 383, 389, 405
\@currentlabel . . . . .	\@ifclassloaded . . . . .	\@one . . . . . 381, 422
.. 35, 53, 395, 457	.... 147, 218, 342	\@nil . . . . . 5, 11, 260, 261
\@currentlabelname	\@ifdefinable . . . . . 239	\@offive . . . . . <u>278</u>
... 8, 9, 10, 37,	\@ifpackagelater .. 180	\@onelevel@sanitize
55, 78, 103, 272, 505	\@ifpackageloaded .	... 8, 259, 262, 467
	..... 16, 179,	



<code>\@opargbegintheorem</code>	<code>\ch@pt@c</code> .. 154, 159, 164	220, 224, 227,
..... 248, 249	<code>\csname</code> ..... 95,	237, 261, 263,
<code>\@part</code> ..... 132, 133	220, 221, 224,	284, 286, 385,
<code>\@safe@activesfalse</code>	227, 286, 373,	391, 396, 407, 458
. 280, 306, 312, 334	386, 392, 408, 465	
<code>\@safe@activetrue</code>		<b>F</b>
..... 279,	<b>D</b>	<code>\fi</code> . 62, 85, 86, 127,
283, 304, 310, 332	<code>\DeclareRobustCommand</code>	165, 166, 167,
<code>\@schapter</code> ... 173, 174	..... 319, 320,	197, 269, 291,
<code>\@secondoffive</code> ....	348, 352, 476, 493	315, 316, 340,
..... 275, 298,	<code>\def</code> ..... 5, 6,	341, 404, 414,
313, 386, 392, 408	7, 28, 31, 45, 49,	432, 435, 446,
<code>\@sect</code> ..... 105, 107	65, 69, 72, 90,	447, 450, 451,
<code>\@setref</code> ..... 292	101, 107, 113,	455, 461, 480, 506
<code>\@spart</code> ..... 137, 138	122, 133, 138,	
<code>\@sssect</code> ..... 112, 113	143, 150, 157,	<b>G</b>
<code>\@tempa</code> ..... 73, 84,	174, 184, 191,	<code>\getrefbykeydefault</code>
92, 94, 95, 193,	193, 203, 212,	..... 368, 369
194, 384, 398,	219, 224, 249,	<code>\GetTitleString</code> ... 102
402, 415, 420, 421	260, 265, 274,	<code>\GetTitleStringResult</code>
<code>\@tempb</code> ... 390, 398, 402	275, 276, 277,	..... 103
<code>\@tempcnta</code> .... 421,	278, 281, 288,	<code>\global</code> ..... 20, 381
422, 424, 426,	294, 297, 303,	
427, 437, 438, 439	309, 322, 331,	<b>I</b>
<code>\@thirdoffive</code> ....	356, 360, 365,	<code>\if@filesw</code> ..... 67
..... 276, 325, 337	368, 369, 379,	<code>\if@nobreak</code> ..... 85
<code>\@undefined</code> .. 289, 410	463, 483, 486, 502	<code>\if@twoside</code> .. 428, 442
<code>\@vpageref</code> ..... 478	<code>\descriptionlabel</code> .	<code>\ifdefined</code> ..... 376
<code>\@writetocindent@</code> . 90	..... 202, 203	<code>\ifheadnameref</code> 123, 161
	<code>\do</code> ..... 92	<code>\ifNR@showkeys</code> ....
<b>A</b>		.. 14, 44, 300, 328
<code>\addtobeamertemplate</code>	<b>E</b>	<code>\ifnum</code> ..... 426, 438
..... 236	<code>\edef</code> .... 9, 73, 223,	<code>\ifodd</code> ..... 427, 439
<code>\advance</code> .. 381, 422, 437	258, 261, 384,	<code>\ifthenelse</code> .. 359, 360
<code>\AtBeginDocument</code> ..	390, 406, 466, 471	<code>\ifvmode</code> ..... 85
..... 178, 209,	<code>\else</code> .. 125, 156, 160,	<code>\ifx</code> ..... 154, 158,
254, 372, 490, 499	163, 195, 302,	194, 264, 289,
<b>B</b>	330, 374, 378,	301, 329, 373,
<code>\beamer@descriptionitem</code>	399, 412, 417,	398, 410, 415, 503
..... 240, 241	430, 433, 436,	<code>\immediate</code> ..... 93
<code>\begingroup</code> .... 17,	441, 444, 448, 504	<code>\inserttheoremaddition</code>
30, 48, 68, 91,	<code>\endcsname</code> ..... 95,	..... 237
222, 257, 282,	220, 221, 224,	<code>\is@pos@number</code> 419, 420
323, 335, 361,	227, 286, 373,	
364, 366, 367, 464	386, 392, 408, 465	<b>L</b>
<b>C</b>	<code>\endgroup</code> 22, 41, 59,	<code>\label</code> ..... 28, 63,
<code>\c@vrcnt</code> .. 381, 382,	83, 99, 223, 263,	324, 336, 396, 458
383, 386, 388,	285, 326, 338, 471	<code>\label@hook</code> 24, 32, 50, 70
389, 392, 396, 458	<code>\expandafter</code> ....	<code>\label@name</code> . 31, 49, 69
	10, 83, 159, 164,	<code>\leavevmode</code> ..... 380

<code>\let</code> ..... 63, 71, 103, 105, 112, 121, 132, 137, 142, 173, 183, 190, 202, 211, 220, 240, 248, 256, 290, 324, 336, 359, 361, 364, 366, 377, 395, 457, 501, 505	<code>\NR@getttitle</code> .. 101, 109, 114, 124, 126, 134, 139, 144, 152, 155, 159, 162, 164, 175, 185, 196, 204, 213, 226, 237, 242, 250, 266	<code>\protect</code> ..... 72 <code>\protected@write</code> 33, 51 <code>\providecommand</code> ... ..... 24, 272, 273, 279, 280, 357
<code>\long</code> ..... 133, 138, 184, 224, 274, 275, 276, 277, 278	<code>\NR@MakeUppercaseFirstOffFive</code> ..... 484, 486 <code>\NR@part</code> ..... 132, 135 <code>\NR@PatchBeamer</code> ... ..... 219, 233, 234, 235	<b>R</b> <code>\Ref</code> ..... 493 <code>\ref</code> ..... 319, 368 <code>\reftextafter</code> . 431, 434 <code>\reftextbefore</code> 440, 445 <code>\reftextfaceafter</code> . 429 <code>\reftextfacebefore</code> 443 <code>\reftextfaraway</code> 449, 453 <code>\relax</code> ... 6, 71, 290, 373 <code>\renewcommand</code> ..... 241 <code>\RequirePackage</code> . 2, 3, 4
<code>\lst@caption</code> ..... 505 <code>\lst@label</code> ..... 503 <code>\lst@MakeCaption</code> .. ..... 501, 502 <code>\LT@c@ption</code> .. 190, 191 <code>\ltx@empty</code> 5, 11, 154, 158 <code>\ltx@firstoftwo</code> ... 344 <code>\ltx@GlobalAppendToMacro</code> ..... 25 <code>\ltx@ifUndefined</code> 117, 119, 148, 151, 200, 247, 343, 344 <code>\ltx@label</code> ..... 63 <code>\ltx@secondoftwo</code> .. .... 343, 344, 346	<code>\NR@sanitize@labelname</code> ..... 7, 26 <code>\NR@schapter</code> . 173, 176 <code>\NR@ssect</code> ..... 105, 110 <code>\NR@setref</code> .... 281, 295, 298, 307, 313, 325, 337, 484 <code>\NR@showkeysfalse</code> .. 15 <code>\NR@showkeystrue</code> ... 20 <code>\NR@spart</code> ..... 137, 140 <code>\NR@ssect</code> ..... 112, 113 <code>\NR@strip@period</code> . 5, 10 <code>\NR@TE@begingroup</code> . ..... 361, 365 <code>\NR@temp</code> ..... 157, 158 <code>\NRorg@beamer@descriptionitem</code> ..... 239, 240, 243 <code>\NROrg@begingroup</code> . ..... 364, 366 <code>\NRorg@begintheorem</code> ..... 256, 267 <code>\NRorg@descriptionlabel</code> ..... 202, 205 <code>\NROrg@ifthenelse</code> . ..... 359, 362 <code>\NROrg@lst@MakeCaption</code> ..... 501, 507 <code>\NRorg@LT@c@ption</code> . ..... 190, 192 <code>\NRorg@M@ssect</code> . 121, 128 <code>\NRorg@opargbegintheorem</code> ..... 248, 251 <code>\NRorg@ttl@ssect@i</code> . ..... 211, 214	<b>S</b> <code>\Sectionformat</code> .... ..... 110, 115, 357 <code>\setcounter</code> ..... 108 <code>\SK@</code> .. 47, 305, 311, 333 <code>\SK@@label</code> ..... 47 <code>\SK@@ref</code> .. 305, 311, 333 <code>\SK@ref</code> ..... 301, 329 <code>\slabel</code> ..... 64 <code>\space</code> ..... 402, 411 <code>\string</code> 34, 52, 75, 94, 258 <code>\strip@period</code> ..... 6
<b>M</b> <code>\M@ssect</code> ..... 121, 122 <code>\MakeUppercase</code> .... 487 <code>\maxdimen</code> ..... 424 <code>\meaning</code> ..... 261	<b>N</b> <code>\Nameref</code> ..... 356 <code>\nameref</code> ..... ..... 348, 352, 356, 477 <code>\newcounter</code> ..... 106 <code>\newif</code> ..... 14 <code>\newlabel</code> . 34, 52, 75, 94 <code>\nobreak</code> ..... 85 <code>\noexpand</code> ..... 72, 224, 226, 227, 401 <code>\NR@@caption</code> . 183, 186 <code>\NR@@setref</code> .. 286, 288 <code>\NR@@vpageref</code> ..... ..... 377, 379, 469 <code>\NR@chapter</code> 142, 145, 169	<b>T</b> <code>\T@nameref</code> ... 322, 353 <code>\T@pageref</code> 297, 309, 320 <code>\T@Ref</code> ..... 483, 494 <code>\T@ref</code> .... 294, 303, 319 <code>\the</code> ..... 382, 383, 386, 388, 389, 392, 396, 458, 472 <code>\thepage</code> .. 36, 54, 71, 77 <code>\thesubequation</code> .... 76 <code>\thevpagerefnum</code> 406, 415, 419, 426, 438 <code>\toks@</code> ..... 468, 472 <code>\ttl@ssect@i</code> .. 211, 212
<b>P</b> <code>\pageref</code> .. 320, 356, 369	<b>U</b> <code>\unskip</code> ... 380, 477, 478	<b>V</b> <code>\vnameref</code> ..... 476

<code>\vp@gerefstar</code>	.....	376			<b>X</b>			<b>Z</b>
<code>\vref</code>	.....	401	<code>\x</code>	....	223, 231, 258,		<code>\z</code>	..... 261, 262, 264
<code>\vref@err</code>	.....	400			259, 264, 466,			
<code>\vref@space</code>	..	410, 413			467, 471, 472, 474			
			<b>W</b>		<b>Y</b>			
<code>\write</code>	.....	74, 93	<code>\y</code>	.....	260, 261			