

# The **footnotehyper** package

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Package version: v0.99 (2017/02/16)

From source file footnotehyper.dtx of Time-stamp: <16-02-2017 at 20:01:27 CET>.

## Abstract

The footnote package by MARK WOODING (1997/01/28 1.13) allows to gather footnotes (`\begin{savenotes}`) and later insert them (after `\end{savenotes}`) at the bottom of the page, even if the intervening material consists of tabulars, minipages or framed contents for example. One can also use the `\savenotes/\spewnotes` syntax.

Also, `footnote.sty` provides a footnote environment which allows to insert verbatim material.

Earlier releases of the present **footnotehyper** package added patches for `hyperref` compatibility and some bugfixes, addressing in particular the incompatibility with `color/xcolor`, and with `babel-frenchb`, and also fixing the footnote environment with optional argument [NUM]. Since v0.99 all macros are defined internally and the footnote package is not loaded at all.

The same user interface is kept. In case `hyperref` is absent, or is loaded with `hyperfootnotes=false` option, **footnotehyper** deactivates itself. The order of loading of **footnotehyper** and `hyperref` is inconsequential.

## 1 License

```
% Package: footnotehyper
% Version: 0.99 (2017/02/16)
% License: LPPL 1.3c
% Copyright (C) 2016-2017 Jean-Francois Burnol <jfbu at free dot fr>.
%
% This Work may be distributed and/or modified under the conditions
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% The Author of this Work is: Jean-Francois Burnol `<jfbu at free dot fr>`
%
% This Work consists of the main source file footnotehyper.dtx and the
% derived files footnotehyper.sty, footnotehyper.ins, footnotehyper.tex,
% footnotehyper.pdf, footnotehyper.dvi.
```

## 2 Usage

You *must* load `hyperref`<sup>1</sup>, but it does not matter if before or after `footnotehyper`. Since v0.99, `footnotehyper` does not load package `footnote.sty`<sup>2</sup> anymore, and is even incompatible with it at it uses the same user interface.

The package thus provides:

- a `savenotes` environment which re-routes footnotes and delivers them at the end (there is also the `\savenotes/\spewnotes` syntax; it does create a group like the environment),
- `footnote` and `footnotetext` environments to allow footnotes with verbatim material.

But the constructability of the `footnote/footnotetext` environments depends on how `\@makefnctext` has been customized by the class or other packages; a warning is issued if the situation appears to be desperate.<sup>3</sup>

It should be recalled that in case of `\footnotemark[N]` and `\footnotetext[N]{...}` mark-up `hyperref` creates no hyperlink. This is not changed by `footnotehyper` and applies also to the `\begin{footnotetext}[N]` case. Without optional argument the link is created, and the link is created also for `\footnote[N]` or `\begin{footnote}[N]`.

This package does not handle especially floating environments, except that one can always surround them in the source in a `savenotes` environment and one knows that the footnotes will be delivered at the `\end{savenotes}...` which may well be one page earlier than the actual location of the floating material in the produced document !

Environments typesetting multiple times their contents are the most hostile to footnotes. Currently, `footnotehyper` only handles especially the `amsmath` environments (as in `footnote.sty`.)

Finally there is a `\makesavenoteenv` command which takes as argument an environment name and patches it to do the `\savenotes/\spewnotes` automatically.<sup>4</sup> It is safer to avoid it, as one never knows what happens with such patches: for example the `[H]` specifier provided by the `float` package overwrites the `\end{table}` definition during the execution of `\begin{table}...` !

Inside <sup>5</sup> a	tabular <sup>6</sup>
-----------------------	----------------------

An example:

```
\begin{savenotes}
\begin{framed}
  Please refer to the documentation of the |footnote| package.%
  \footnote{\url{http://ctan.org/pkg/footnote}}
```

```
  Particularly you may check its |savenotes| environment.%
```

<sup>1</sup>Since v0.9e `footnotehyper` deactivates itself gracefully if `hyperref` is not loaded, or under `hyperref` option `hyperfootnotes=false`.

<sup>2</sup><http://ctan.org/pkg/footnote>

<sup>3</sup>original `footnote.sty` could end up in a low level  $\TeX$  error.

<sup>4</sup>For the record the syntax is either `\makesavenoteenv{foo}` which patches environment `foo` or `\makesavenoteenv[bar]{foo}` which defines environment `bar` as this patched version of `foo`.

## 2 Usage

```
\footnote{It doesn't bring any
feature to especially handle the issues related to footnotes in floating
environments, though.}
\end{framed}
\end{savenotes}
```

and the present frame has `\footnote`'s from inside a `tabular` and is inside a `savenotes` environment.<sup>7</sup> Let's test an `amsmath` environment with `\intertext`. As

$$E = mc^2, \tag{1}$$

was too easy<sup>8</sup>, let's try:

$$a^n + b^n = c^n. \tag{2}$$

And a footnote with some verbatim material<sup>9</sup>.

The last one was coded as:

```
And a footnote with some verbatim material%
\begin{footnote}
  \verb|&$^%\[]$|
\end{footnote}.
```

<sup>5</sup>Notice that as frame extended to the next page, the end of the `savenotes` environment delivered its footnotes only here.

<sup>6</sup>Alternatively a `\savenotes/\spewnotes` pair could have been used.

<sup>7</sup>Here is an issue which has nothing (as I finally figured out) to do with `footnote`, and only indirectly with  $\text{\LaTeX}$ : if you embed a *full-width* `minipage` (with initial `\noindent`) in any environment not doing `\ignorespacesafterend`, be careful to add a `%` either immediately after the `\end{minipage}` (or a `\relax` or a `\par`) or after the surrounding environment `\end{foo}` or use `\end{minipage}\end{foo}` else the output may have an extra blank line if the source has a blank line after the `foo` environment. Here is a typical example, with a `tabular` rather:

```
\newenvironment{foo}{}{}

\noindent\begin{tabular}{p{\dimexpr\linewidth-2\tabcolsep\relax}}
  A\dotfill B
\end{tabular}

C

\begin{foo}
\noindent\begin{tabular}{p{\dimexpr\linewidth-2\tabcolsep\relax}}
  A\dotfill B
\end{tabular}
\end{foo}

C
```

If you try it out you will see an extra blank line in PDF output above the second C. Starting with v0.99 the `\end{savenotes}` emits an `\ignorespacesafterend` which avoids this generic  $\text{\TeX}/\text{\LaTeX}$  problem. For good measure there is now an `\ignorespaces` in `\begin{savenotes}`.

<sup>8</sup>There is also  $E = h\nu$ .

<sup>9</sup>`&$^%\[]$`

Now some use of `\footnotemark`<sup>10</sup> followed by a `footnotetext` environment. And use of `\footnotemark[99]`<sup>99</sup> in association with a `footnotetext` environment using the same optional argument [99]. No hyperfootnote link was inserted. And a final footnote, done with `\begin{footnote}[57]`<sup>57</sup>. There is no problem with the hyperlink, then.

### 3 Notes

A few items worth of mention:

- the footnote package patches the L<sup>A</sup>T<sub>E</sub>X kernel `\parbox`. **footnotehyper** doesn't (but the code can be found commented-out at the end of the present file).
- the footnote package defines a `minipage*` environment which is `minipage` patched by `\makesavenoteenv`, **footnotehyper** doesn't.
- the footnote environment from `footnote.sty` does a `\leavevmode\unskip` which **footnotehyper** doesn't: hence if one locates `\begin{footnote}` at start of a line in the L<sup>A</sup>T<sub>E</sub>X source, one will typically need a % at end of text on previous line to avoid the end-of-line space.
- the hyperref package inserts no hyperlink in case of `\footnotemark[N]/\footnotetext[N]`. This is not modified by **footnotehyper**.
- side-note: there is an interference between hyperref and frenchb regarding the footnote marker when using the syntax `\footnotemark[NUM]`. For the record here is a patch (last tested briefly with hyperref 2016/06/24 v6.83q and frenchb 2017/01/30 v3.2g):

```
\AtBeginDocument{%
  \let\xfootnotemarkORIFB \xfootnotemark
  \def\xfootnotemarkFB {\leavevmode\unskip\unkern\,\xfootnotemarkORIFB }%
  \ifHy@hyperfootnotes\ifFB@AutoSpaceFootnotes
    \let\xfootnotemark\xfootnotemarkFB
  \fi\fi
}%
```

- some environments typeset multiple times their contents, which causes issues; **footnotehyper** takes provisions only to handle the `amsmath` measuring step.

<sup>10</sup>This one uses the normal footnote counter and the hyperlink works.

<sup>99</sup>hyperref creates no hyperlink in this case, or in the `\footnotemark[N]/\footnotetext[N]{<foo>}` case. It does when the [N] is absent or when it is used with a `\footnote` command (or a `footnote` environment.)

By the way, **footnotehyper** v0.9f's `\footnotetext[N]` and `\begin{footnotetext}[N]` each had a bug and they were unusable *inside* the `savenotes` environment. There was no issue *outside*.

<sup>57</sup>

**footnotehyper** deactivates itself if `hyperfootnotes=false` option to hyperref is detected, or if hyperref is not loaded at all.

## 4 Implementation

```

1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage{footnotehyper}%
3 [2017/02/16 v0.99 hyperref aware footnote.sty (JFB)]

```

no options The package has no options.

```

4 \DeclareOption*%
5   {\PackageWarning{footnotehyper}{Option '\CurrentOption' is unknown}}%
6 \ProcessOptions\relax

```

Versions up to v0.9f loaded `footnote.sty`, with lots of patching afterwards. Starting with v0.99, **footnotehyper** does everything by itself with `FNH@` prefix. Brief overview of some of the fixed issues:

- there was incompatibility with `hyperref`,
- and with `color`,
- if the `\@makefn` at the time of loading of `footnote.sty` does not have its argument visible at top level in its meaning, or is used multiple times there, then the footnote environment will lead to low level  $\TeX$  error,
- `footnote.sty` modifies `\parbox`,
- `footnote.sty` does some too early `\let`,
- the footnote environment from `footnote.sty` does not work if used with optional argument `[N]`.

```

7 \newbox\FNH@notes
8 \newdimen\FNH@width
9 \let\FNH@colwidth\columnwidth
10 \newif\ifFNH@savingnotes
11 \AtBeginDocument {%
12   \@ifpackageloaded{hyperref}
13   {\ifHy@hyperfootnotes
14     \let\FNH@latex@footnote \footnote
15     \let\FNH@latex@footnotetext\footnotetext
16     \newenvironment{savenotes}
17       {\FNH@savenotes\ignorespaces}\FNH@spewnotes\ignorespacesafterend}%
18     \let\spewnotes \FNH@spewnotes
19     \let\footnote \FNH@footnote
20     \let\footnotetext \FNH@footnotetext
21     \let\endfootnote \FNH@endfn
22     \let\endfootnotetext\FNH@endfn
23   }
24   \PackageInfo{footnotehyper}%
25   {inactive due to hyperfootnotes=false option}%
26   \fi}%
27 {\PackageWarning{footnotehyper}{^^J\@spaces\@spaces*****^^J}%
28  \space deactivating myself as hyperref is not detected !^^J}}%
29 }%

```

```

\FNH@hyper@fntext
\FNH@nohyp@fntext
\FNH@fntext

```

These are the **footnotehyper** replacement for `\@footnotetext` inside the `savenotes` environment. There is a version creating an hyperlink and another one not creating an hyperlink. The `\FNH@fntext` macro serves as general dispatch. This may be a place to customize if one wants to handle environments doing multiple passes: but the footnote counter must have been taken care of elsewhere. The code currently handles only the case of `amsmath` environments.

```

30 \def\FNH@hyper@fntext{\FNH@fntext\FNH@hyper@fntext@i}%

```

## 4 Implementation

```

31 \def\FNH@nohyp@fntext{\FNH@fntext\FNH@nohyp@fntext@i}%
32 \def\FNH@fntext #1{\ifx\ifmeasuring@\@undefined
33   \expandafter\@secondoftwo\else\expandafter\@firstofone\fi
34   {\ifmeasuring@\expandafter\@gobbletwo\fi}#1%
35 }%

```

`\FNH@hyper@fntext@i` We do the `\ifHy@nesting` test although `hyperref`'s manual says "Allows links to be nested; no drivers currently support this."

```

36 \long\def\FNH@hyper@fntext@i#1{%
37   \global\setbox\FNH@notes\vbox
38   {\unvbox\FNH@notes
39     \FNH@startnote
40     \@makefntext
41     {\rule\z@\footnotesep\ignorespaces
42       \ifHy@nesting\expandafter\ltx@firstoftwo
43       \else\expandafter\ltx@secondoftwo
44       \fi
45       {\expandafter\hyper@@anchor\expandafter{\Hy@footnote@currentHref}{#1}}%
46       {\Hy@raisedlink
47         {\expandafter\hyper@@anchor\expandafter{\Hy@footnote@currentHref}%
48         {\relax}}}%
49       \let\@currentHref\Hy@footnote@currentHref
50       \let\@currentlabelname\@empty
51       #1}%
52   \@finalstrut\strutbox
53   }%
54   \FNH@endnote
55 }%
56 }%

```

`\FNH@nohyp@fntext@i` The original `\fn@fntext` had no `\long`.

```

57 \long\def\FNH@nohyp@fntext@i#1{%
58   \global\setbox\FNH@notes\vbox
59   {\unvbox\FNH@notes
60     \FNH@startnote
61     \@makefntext{\rule\z@\footnotesep\ignorespaces#1\@finalstrut\strutbox}%
62     \FNH@endnote
63   }%
64 }%

```

`\FNH@startnote` Same as original (the code comment is kept from original.)

```

65 \def\FNH@startnote{%
66   \hsize\FNH@colwidth
67   \interlinepenalty\interfootnotelinepenalty
68   \reset@font\footnotesize
69   \floatingpenalty\@MM% Is this right???
70   \@parboxrestore
71   \protected@edef\@currentlabel{\csname p@\@mpfn\endcsname\@thefnmark}%
72   \color@begingroup
73 }%

```

`\FNH@endnote` Fixed from original.

```

74 \def\FNH@endnote{\color@endgroup}%

```

## 4 Implementation

`\FNH@savenotes` Same as original apart from using `hyperref-aware \FNH@hyper@fntext`, and taking into account `hyperref's` custom `\@xfootnotetext`. This was missed by v0.9f hence `\footnotetext[N]{...}` did not work inside `savenotes` environment. Fixed for v0.99.

Maybe I should change the way `\@minipagerestore` is handled.

```

75 \def\FNH@savenotes{%
76   \begingroup
77   \ifFNH@savingnotes\else
78     \FNH@savingnotestruer
79     \let\@footnotetext \FNH@hyper@fntext
80     \let\@mpfootnotetext \FNH@hyper@fntext
81     \let\H@@mpfootnotetext\FNH@nohyp@fntext % fool hyperref's \@xfootnotetext
82     \FNH@width\columnwidth
83     \let\FNH@colwidth\FNH@width
84     \global\setbox\FNH@notes\box\voidb@x
85     \let\FNH@thempfn\thempfn
86     \let\FNH@mpfn\@mpfn
87     \ifx\@minipagerestore\relax\let\@minipagerestore\@empty\fi
88     \expandafter\def\expandafter\@minipagerestore\expandafter{%
89       \@minipagerestore
90       \let\thempfn\FNH@thempfn
91       \let\@mpfn\FNH@mpfn
92     }%
93   \fi
94 }%
```

`\FNH@spewnotes` This uses `\H@@footnotetext` which is the preserved original meaning of `\@footnotetext` not creating a link target.

```

95 \def\FNH@spewnotes {%
96   \endgroup
97   \ifFNH@savingnotes\else
98     \ifvoid\FNH@notes\else
99       \begingroup
100        \let\@makefntext\@empty
101        \let\@finalstrut\@gobble
102        \let\rule\@gobbletwo
103        \H@@footnotetext{\unvbox\FNH@notes}%
104      \endgroup
105    \fi
106  \fi
107 }%
```

`\FNH@footnote` We now take care of `footnote.sty's` `footnote` environment. The original `\fn@endfntext` is lacking a `\fn@endnote`, and this meant that `footnote.sty` was incompatible with `color/xcolor` packages. Also this `\fn@endnote` was `\let to \color@endgroup` which is wrong.

Furthermore, independently of presence of the `\color/xcolor` issue, the `footnote.sty's` `footnote` environment raised an error if used with an optional argument. v0.9f addresses this issue.

The `footnotetext` environment adds a complication, in case of optional argument we should not try to set up a link due to the fact that `hyperref` does not support it for the `\footnotemark[N]/\footnotetext[N]` syntax. And we need to make sure that the `footnote` and `footnotetext` environments obey the `\savenotes/\spewnotes` mechanism.

To handle all of this we code things completely differently from `footnote.sty`.

## 4 Implementation

The v0.9f `\begin{footnotetext}[N]` inside `savenotes` tried to create an `hyperref` target. Fixed for v0.99.

Note: the `footnote.sty` code did a `\leavevmode\unskip` at entrance of footnote environment, which **footnotehyper** has not kept.

```
108 \def\FNH@footnote@envname    {footnote}%
109 \def\FNH@footnotetext@envname{footnotetext}%
110 \def\FNH@footnote{%
111     \ifx\@currentenv\FNH@footnote@envname
112         \expandafter\FNH@footnoteenv
113     \else
114         \expandafter\FNH@latex@footnote
115     \fi
116 }%
117 \def\FNH@footnoteenv{%
118     \@ifnextchar[%
119         \FNH@footnoteenv@i %]
120     {\stepcounter\@mpfn
121     \protected@xdef\@thefnmark{\thempfn}%
122     \@footnotemark
123     \def\FNH@endfntext@fntext{\@footnotetext}%
124     \FNH@startfntext}%
125 }%
126 \def\FNH@footnoteenv@i[#1]{%
127     \begingroup
128     \csname c@\@mpfn\endcsname #1\relax
129     \unrestored@protected@xdef\@thefnmark{\thempfn}%
130     \endgroup
131     \@footnotemark
132     \def\FNH@endfntext@fntext{\@footnotetext}%
133     \FNH@startfntext
134 }%
135 \def\FNH@footnotetext{%
136     \ifx\@currentenv\FNH@footnotetext@envname
137         \expandafter\FNH@footnotetextenv
138     \else
139         \expandafter\FNH@latex@footnotetext
140     \fi
141 }%
142 \def\FNH@footnotetextenv{%
143     \@ifnextchar[%
144         \FNH@footnotetextenv@i %]
145     {\protected@xdef\@thefnmark{\thempfn}%
146     \def\FNH@endfntext@fntext{\@footnotetext}%
147     \FNH@startfntext}%
148 }%
149 \def\FNH@footnotetextenv@i[#1]{%
150     \begingroup
151     \csname c@\@mpfn\endcsname #1\relax
152     \unrestored@protected@xdef\@thefnmark{\thempfn}%
153     \endgroup
154     \ifFNH@savingnotes
155         \def\FNH@endfntext@fntext{\FNH@nohyp@fntext}%
156     \else
```



## 4 Implementation

```

157 \def\FNH@endfntext@fntext{\H@@footnotetext}%
158 \fi
159 \FNH@startfntext
160 }%

\FNH@startfntext This is used for the environmental form of the footnote environments. The use of \box\z@ originates in
\FNH@endfntext footnote.sty, should I change that ?
\FNH@endfntext@fntext Both of \endfootnote and \endfootnotetext are aliases for \FNH@endfntext.
The \FNH@endfntext@fntext may be \@footnotetext (which will be \FNH@hyper@fntext in
savingnotes environment), or \H@@footnotetext, or \FNH@nohyp@fntext if in savingnotes scope.

161 \def\FNH@startfntext{%
162 \setbox\z@\vbox\bgroup
163 \FNH@startnote
164 \FNH@prefntext
165 \rule\z@\footnotesep\ignorespaces
166 }%
167 \def\FNH@endfntext {%
168 \@finalstrut\strutbox
169 \FNH@postfntext
170 \FNH@endnote
171 \egroup
172 \beginingroup
173 \let\@makefntext\empty\let\@finalstrut\@gobble\let\rule\@gobbletwo
174 \FNH@endfntext@fntext {\unvbox\z@}%
175 \endgroup
176 }%

\@makefntext The definitions of \FNH@prefntext and \FNH@postfntext (which are needed for the footnote environment,
\FNH@prefntext \FNH@startfntext and \FNH@endfntext) are extracted from a somewhat daring analysis of \@makefntext.
\FNH@postfntext Contrarily to footnote.sty's original code (which may cause low level TEX errors in bad cases) the method
here will alert the user if the argument of \@makefntext is not visible at top level in its meaning or is used
there multiple times. We also insert here some code to handle especially the case of babel-frenchb.

177 \AtBeginDocument{\let\FNH@@makefntext\@makefntext
178 \ifx\FNH@@makefntextFB\undefined
179 \expandafter\@gobble\else\expandafter\@firstofone\fi
180 {\ifFBFrenchFootnotes \let\FNH@@makefntext\FNH@@makefntextFB \else
181 \let\FNH@@makefntext\FNH@@makefntextORI\fi}%
182 \expandafter\FNH@check@a\FNH@@makefntext{1.2!3?4,}%
183 \FNH@@@1.2!3?4,\FNH@@@relax
184 }%
185 \long\def\FNH@check@a #1.2!3?4,#2\FNH@@@#3{%
186 \ifx\relax#3\expandafter\@firstoftwo\else\expandafter\@secondoftwo\fi
187 \FNH@bad@makefntext@alert
188 {\def\FNH@prefntext{#1}\def\FNH@postfntext{#2}\FNH@check@b}%
189 }%
190 \def\FNH@check@b #1\relax{%
191 \expandafter\expandafter\expandafter\FNH@check@c
192 \expandafter\meaning\expandafter\FNH@prefntext
193 \meaning\FNH@postfntext1.2!3?4,\FNH@check@c\relax
194 }%
195 \def\FNH@check@c #1.2!3?4,#2#3\relax{%
196 \ifx\FNH@check@c#2\expandafter\@gobble\fi\FNH@bad@makefntext@alert

```

## 4 Implementation

```

197 }%
198 \def\FNH@bad@makefntext@alert{%
199   \PackageWarningNoLine{footnotehyper}%
200   {^^} The footnote environment will not be fully functional, sorry.^^}
201   You may try to email the author with the following information:}%
202   \typeout{\meaning\@makefntext}%
203   \let\FNH@prefntext\@empty\let\FNH@postfntext\@empty
204 }%

```

`\makesavenoteenv` Same as original. Not recommended. Safer to use explicitly `savenotes` environment.

```

205 \def\makesavenoteenv{\@ifnextchar[\FNH@msne@ii\FNH@msne@i]}
206 \def\FNH@msne@i #1{%
207   \expandafter\let\csname FNH$#1\expandafter\endcsname %$
208   \csname #1\endcsname
209   \expandafter\let\csname endFNH$#1\expandafter\endcsname %$
210   \csname end#1\endcsname
211   \FNH@msne@ii[#1]{FNH$#1}%$
212 }%
213 \def\FNH@msne@ii[#1]#2{%
214   \expandafter\edef\csname#1\endcsname{%
215     \noexpand\savenotes
216     \expandafter\noexpand\csname#2\endcsname
217   }%
218   \expandafter\edef\csname end#1\endcsname{%
219     \expandafter\noexpand\csname end#2\endcsname
220     \noexpand\expandafter
221     \noexpand\spewnotes
222     \noexpand\if@endpe\noexpand\@endpetrue\noexpand\fi
223   }%
224 }%

```

Original `footnote.sty` patches `\parbox`, we don't touch it. Also it defines a `minipage*` environment, we don't do it.

```

225 % \makesavenoteenv[minipage*]{minipage}
226 % \let\fn@parbox\parbox
227 % \def\parbox{\@ifnextchar[\fn@parbox@i]{\fn@parbox@ii}}
228 % \def\fn@parbox@i#1[#2]{%
229 %   \@ifnextchar[\fn@parbox@i{#1[#2]}\fn@parbox@ii{#1[#2]}}%
230 % }
231 % \long\def\fn@parbox@ii#1#2#3{\savenotes\fn@parbox#1{#2}{#3}\spewnotes}
232 \endinput

```