# The **footnotehyper** package

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### 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. Since v1.0 it is possible to use **footnotehyper** also in absence of hyperref or when the latter is loaded with its hyperfootnotes=false option. The order of loading of **footnotehyper** and hyperref is inconsequential.

# 1 License

```
% Package: footnotehyper
% Version: 1.0 (2017/03/07)
% License: LPPL 1.3c
% Copyright (C) 2016-2017 Jean-Francois Burnol <jfbu at free dot fr>.
%
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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

Since `v0.99`, **footnotehyper** does not load package `footnote.sty`[1] anymore, and is even incompatible with it at it uses the same user interface.

Since `v1.0`, **footnotehyper** is usable also in absence of `hyperref` or when the latter was passed `hyperfootnotes=false` option.

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 `\@makefntext` has been customized by the class or other packages; a warning is issued if the situation appears to be desperate.[2]

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.[3] 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[4] a | tabular[5] |
|---|---|

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.%
```

---

[1] http://ctan.org/pkg/footnote

[2] original `footnote.sty` could end up in a low level TeX error.

[3] 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`.

```
    \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.[6] Let's test an `amsmath` environment with `\intertext`. As

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

was too easy[7], let's try:

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

And a footnote with some verbatim material[8].

The last one was coded as:

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

---

[4] Notice that as frame extended to the next page, the end of the `savenotes` environment delivered its footnotes only here.

[5] Alternatively a `\savenotes`/`\spewnotes` pair could have been used.

[6] Here is an issue which has nothing (as I finally figured out) to do with `footnote`, and only indirectly with 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 TeX/LaTeX problem. For good measure there is now an `\ignorespaces` in `\begin{savenotes}`.

[7] There is also $E = h\nu$.

[8] `&$^%\[}$`

Now some use of \footnotemark[9] followed by a footnotetext environment. And use of \footnotemark[99][99] 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][57]. There is no problem with the hyperlink, then.

## 3 Notes

A few items worth of mention:
- the footnote package patches the LaTeX 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 LaTeX 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\ifFBAutoSpaceFootnotes
     \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.

---

[9]This one uses the normal footnote counter and the hyperlink works.

[99]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*.

[57]

| **footnotehyper** works since v1.0 also in absence of hyperref or when the latter was passed hyperfootnotes=false option. |

## 4 Implementation

```
1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage{footnotehyper}%
3   [2017/03/07 v1.0 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 \@makefntext 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].

Starting with v1.0, **footnotehyper** may be used also in absence of hyperref.

```
 7 \newbox\FNH@notes
 8 \newdimen\FNH@width
 9 \let\FNH@colwidth\columnwidth
10 \newif\ifFNH@savingnotes
11 \AtBeginDocument {%
12     \let\FNH@latex@footnote    \footnote
13     \let\FNH@latex@footnotetext\footnotetext
14     \let\FNH@H@@footnotetext    \@footnotetext
15     \newenvironment{savenotes}
16        {\FNH@savenotes\ignorespaces}{\FNH@spewnotes\ignorespacesafterend}%
17     \let\spewnotes        \FNH@spewnotes
18     \let\footnote         \FNH@footnote
19     \let\footnotetext     \FNH@footnotetext
20     \let\endfootnote      \FNH@endfntext
21     \let\endfootnotetext\FNH@endfntext
22     \@ifpackageloaded{hyperref}
23      {\ifHy@hyperfootnotes
24         \let\FNH@H@@footnotetext\H@@footnotetext
25       \else
26         \let\FNH@hyper@fntext\FNH@nohyp@fntext
27       \fi}%
28      {\let\FNH@hyper@fntext\FNH@nohyp@fntext}%
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}%
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}%

\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@savingnotestrue
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 \FNH@H@@footnotetext which is the \H@@footnotetext hyperref's 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       \FNH@H@@footnotetext{\unvbox\FNH@notes}%
104      \endgroup
105    \fi
106   \fi
107 }%
```

\FNH@footnote
\FNH@footnotetext
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.

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\@currenvir\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\@currenvir\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
157          \def\FNH@endfntext@fntext{\FNH@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
savenotes environment), or \FNH@H@@footnotetext, or \FNH@nohyp@fntext if in savenotes 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   \begingroup
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 envi-
\FNH@prefntext  ronment, \FNH@startfntext and \FNH@endfntext) are extracted from a somewhat daring analysis of
\FNH@postfntext  \@makefntext. Contrarily to footnote.sty's original code (which may result in low level TeX errors when
the footnote environment is executed) 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\@makefntextFB\undefined
179   \expandafter\@gobble\else\expandafter\@firstofone\fi
180   {\ifFBFrenchFootnotes \let\FNH@@makefntext\@makefntextFB \else
181                        \let\FNH@@makefntext\@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 #11.2!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 #11.2!3?4,#2#3\relax{%
196     \ifx\FNH@check@c#2\expandafter\@gobble\fi\FNH@bad@makefntext@alert
197 }%
198 \def\FNH@bad@makefntext@alert{%
199     \PackageWarningNoLine{footnotehyper}%
200       {^^J The footnote environment will not be fully functional, sorry.^^J
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
```