

The `altnsubsup` package*

Julien Labbé
Julien.Labbe@univ-grenoble-alpes.fr

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Abstract

A L^AT_EX package to customize subscripts and superscripts. An alternative formatting is used when the subscript or the superscript is written in square brackets. By default, it allows to quickly get an upright format.

Example:

```
$ x_{[roman]}^{\{italic\}} \quad x_{\{italic\}}^{[roman]} $
```

x_{roman}^{italic} x_{italic}^{roman}

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*This document corresponds to `altnsubsup` v1.1, dated 2022/03/15.

1 Introduction

The `altnsubsup` package provides an alternative formatting for subscripts and superscripts when written with square brackets in math mode, like for

```
$ x_{my~subscript} $ \quad or \quad $ x^{my~superscript} $.
```

$x_{my~subscript}$ or $x^{my~superscript}$.

The commands used to typeset the alternative forms of subscripts and superscripts are set, respectively, with `\SetAltSubscriptCommand` and `\SetAltSuperscriptCommand`. By default, the command `\text` (from the `amsmath`/`amstext` package) is used.

This package redefines `_` and `^` symbols (their catcode and mathcode are modified to make them active in math mode). Options allow to redefine `both`^{→P.3} (by default), only `subscript`^{→P.3} `_` symbol, or only `superscript`^{→P.3} `^` symbol.

2 Motivations

Common typographic conventions¹ use italic (sloping) type for physical quantities or mathematical variables and roman (upright) type for words or fixed numbers. For example, the heat capacity at constant pressure should be printed C_p , but the kinetic energy E_k (instead of E_k) and the relative permeability μ_r (instead of μ_r). This can be obtained in L^AT_EX with² `E_{k}` and `μ_{r}`. This package allows to write them simply `$E_{[k]}$` and `$\mu_{[r]}$`.

3 User interface

3.1 Usage

```
\SetAltSubscriptCommand{<command>}
\SetAltSuperscriptCommand{<command>}
```

Set to `<command>` the command used to format the alternative forms of subscript or superscript written with square brackets, like `_{[...]}` or `^{[...]}`.

```
\SetAltSubSupCommands{<command>}
```

Sets to the same `<command>` the commands used to format the subscripts and superscripts written with square brackets.

3.2 Options

To load the `altnsubsup`, simply add in preamble, before the “`\begin{document}`”:

```
\usepackage{altnsubsup}
```

²See, for example: International Organization for Standardization. (2009). *Quantities and units – Part 1: General* (ISO Standard No. 80000-1:2009). <https://www.iso.org/standard/30669.html>.

²Instead of `\mathrm`, a best choice is the `\` macro provided by the `amsmath` package, which, for example, handle spaces. It’s the formatting macro used by default by the `altnsubsup` package.

Options can be given, in a comma-separated list. For example, to redefine only the subscript `_` symbol, write:

```
\usepackage[subscript]{overarrows}
```

3.2.1 Available options

subscript

Redefine only the `_` subscript symbol.

superscript

Redefine only the `^` superscript symbol.

both

Redefine both `_` and `^` symbols (default).

spbmark

Use the `spbmark` package to handle the alternative forms of superscripts and subscripts written in square brackets (see below).

3.2.2 spbmark option

The `spbmark` package (<https://www.ctan.org/pkg/spbmark>), by Qu Yi, allows a complete customisation of subscripts and superscripts. With the macros of the `spbmark` package to handle subscripts and superscripts `spbmark` option, the `altsubsup` package use the `\sub` and `\super` written in square brackets.

These two macros are called with the respective `altsub` and `altsup` `spbmark` styles. These styles are initially created empty, set them to get the desired output. For example, to display subscripts in blue and superscripts in red, use:

```
\defspbstyle{altsub}{cmd=\color{blue}}
\defspbstyle{altsup}{cmd=\color{red}}
```

A major limitation of the `spbmark` option is the bad alignment generated when a subscript and a superscript are simultaneously used (the `spbmark` macro for this is `\supersub`). For example, `x_{sub}^{super}` gives $x_{\text{sub}}^{\text{super}}$ instead of $x_{\text{sub}}^{\text{super}}$.

4 Examples

4.1 Default

```
\[
x_a^b \quad
x_{\{braces-sub\}}^{\{braces-sup\}} \quad
x_{\{brackets-sub\}}^{\{braces-sup\}} \quad
x_{\{braces-sub\}}^{[brackets-sup]} \quad
x_{\{brackets-sub\}}^{[brackets-sup]}
\]
```

$$x_a^b \quad x_{braces\ sub}^{braces\ sup} \quad x_{brackets\ sub}^{braces\ sup} \quad x_{braces\ sub}^{brackets\ sup} \quad x_{brackets\ sub}^{brackets\ sup}$$

4.2 Set new formatting commands

The command `\text` comes from `amstext` package (part of `amsmath`) and the command `\color` from the `xcolor` package.

```
\newcommand{\bluecolor}[1]{\text{\color{blue}#1}}
\newcommand{\redcolor}[1]{\text{\color{red}#1}}
\SetAltSubscriptCommand{\bluecolor}
\SetAltSuperscriptCommand{\redcolor}
\[
x_a^b \quad
x_{\{braces-sub\}}^{\{braces-sup\}} \quad
x_{\{brackets-sub\}}^{\{braces-sup\}} \quad
x_{\{braces-sub\}}^{[brackets-sup]} \quad
x_{\{brackets-sub\}}^{[brackets-sup]}
\]
```

$$x_a^b \quad x_{braces\ sub}^{braces\ sup} \quad x_{brackets\ sub}^{braces\ sup} \quad x_{braces\ sub}^{\text{brackets sup}} \quad x_{brackets\ sub}^{\text{brackets sup}}$$

Setting simultaneously the same command for subscripts and superscripts:

```
\SetAltSubSupCommands{\mathbf}
\[
x_a^b \quad
x_{\{braces-sub\}}^{\{braces-sup\}} \quad
x_{\{brackets-sub\}}^{\{braces-sup\}} \quad
x_{\{braces-sub\}}^{[brackets-sup]} \quad
x_{\{brackets-sub\}}^{[brackets-sup]}
\]
```

$$x_a^b \quad x_{braces\ sub}^{braces\ sup} \quad x_{\mathbf{brackets\ sub}}^{braces\ sup} \quad x_{braces\ sub}^{\mathbf{brackets\ sup}} \quad x_{\mathbf{brackets\ sub}}^{\mathbf{brackets\ sup}}$$

5 Complements

5.1 Known issue

The use of the prime symbol `'` can raise the *Double superscript* error message. This is normally fixed (`x'^2` gives x'^2 correctly). If needed, enclose the expres-

sion with `{...}`. In particular, `x'^[sup]` doesn't work, and should be written: `{x'}^[sup]`.

5.2 Alternative

the **subtext** package (<https://www.ctan.org/pkg/subtext>), by Palle Jørgensen, formats `_ [...]` subscripts with `\text`. The **altnsubsup** package works both for subscripts and superscripts, allows to customise the commands, and re-define symbols only in math mode.

5.3 Changelog

- v1.1**
- Backup standard subscript `_` and superscript `^` commands to handle packages that redefine `\sb` or `\sp` macros, like **spmark**.
 - Add option `spmark`^{P.3} to handle alternative subscripts and superscripts form with the **spmark** package.

v1.0 Initial version.

6 Implementation

Flags declaration

Determine the commands that will be redefined

```
1 \newif\ifaltsbsp@subscript \altsbsp@subscripttrue
2 \newif\ifaltsbsp@superscript \altsbsp@superscripttrue
```

Use the **spmark** mechanism

```
3 \newif\ifaltsbsp@spmark \altsbsp@spmarkfalse
```

Options declarations and processing

```
4 \DeclareOption{subscript} {\altsbsp@subscripttrue \altsbsp@superscriptfalse}
5 \DeclareOption{superscript} {\altsbsp@subscriptfalse \altsbsp@superscripttrue }
6 \DeclareOption{both} {\altsbsp@subscripttrue \altsbsp@superscripttrue }
7 \DeclareOption{spmark} {\altsbsp@spmarktrue}
8 \DeclareOption*{\PackageWarning{altnsubsup}{Unknown option \CurrentOption.}}
9 \ProcessOptions\relax
10 \ifaltsbsp@spmark
11 \RequirePackage{spmark}
12 \fi
```

Backup standard superscript and subscript commands

```
13 \AtBeginDocument{%
14 \begingroup\catcode`\_ =8 \global\let\altsbsp@standardsub=_\endgroup
15 \begingroup\catcode`\^ =7 \global\let\altsbsp@standardsup=^\endgroup
```

Redefine catcodes and make symbols active in mathmode

```
16 \ifaltsbsp@subscript \catcode`\_ =12 \mathcode`\_ ="8000 \fi%
17 \ifaltsbsp@superscript \catcode`\^ =12 \mathcode`\^ ="8000 \fi%
18 }
```

Redefinition of the subscript symbol

```

19 \ifaltsbsp@subscript%
20 \begingroup\lccode`\~=\`\lowercase{\endgroup%
21 \def~}{\ifnextchar[% dummy bracket ]
22 {\altsbsp@subwrapper}% bracket wrapper
23 {\altsbsp@standardsub}% standard form
24 }%
25 \fi

```

Redefinition of the superscript symbol

```

26 \ifaltsbsp@superscript%
27 \begingroup\lccode`\~=\`\lowercase{\endgroup%
28 \def~}{\ifnextchar[% dummy bracket ]
29 {\altsbsp@supwrapper}% bracket wrapper
30 {\altsbsp@standardsup}% standard form
31 }%
32 \fi

```

User macros

```

\SetAltSubscriptCommand
33 \def\SetAltSubscriptCommand#1{\let\altsbsp@altsubcmd#1}%

34 \ifaltsbsp@spbmark%
35 \defspbstyle{altsub}{%
36 \def\altsbsp@subwrapper[#1]{\sub[style=altsub]{\altsbsp@altsubcmd{#1}}}%
37 \else
38 \def\altsbsp@subwrapper[#1]{\altsbsp@standardsub{\altsbsp@altsubcmd{#1}}}%
39 \fi

\SetAltSuperscriptCommand
40 \def\SetAltSuperscriptCommand#1{\let\altsbsp@altsupcmd#1}%

41 \ifaltsbsp@spbmark%
42 \defspbstyle{altsup}{%
43 \def\altsbsp@supwrapper[#1]{\super[style=altsup]{\altsbsp@altsupcmd{#1}}}%
44 \else
45 \def\altsbsp@supwrapper[#1]{\altsbsp@standardsup{\altsbsp@altsupcmd{#1}}}%
46 \fi

\SetAltSubSupCommands
47 \newcommand{\SetAltSubSupCommands}[1]{%
48 \SetAltSubscriptCommand{#1}%
49 \SetAltSuperscriptCommand{#1}%
50 }

```

Set default commands

```

51 \RequirePackage{amstext}%
52 \SetAltSubSupCommands{\text}%

```

Fix prime symbol

```

53 \ifaltsbsp@superscript%
54 \begingroup \catcode`\^=12%
55 \gdef\altsbsp@pr@ms{% copy of \@pr@ms code from latex.ltx
56 \ifx'\@let@token
57 \expandafter\pr@@@s
58 \else
59 \ifx~\@let@token
60 \expandafter\expandafter\expandafter\pr@@@t
61 \else
62 \egroup
63 \fi
64 \fi}

```

```
65 \endgroup
66 \let\pr@ms\altssbp@pr@ms
67 \fi
```

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Change History

v1.0	General: Initial version.	1	Backup standard superscript and superscript commands . . .	5
v1.1	General: Add sbpmark option	5		