The **altsubsup** package[*]

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Abstract

A LaTeX package to write alternative and customisable subscripts and superscripts, with square brackets.

Typical use:

$$\texttt{x\_[roman]\^{}\{italic\}} \quad \longrightarrow \quad x_{\mathrm{roman}}^{italic}$$

$$\texttt{x\_\{italic\}\^{}[roman]} \quad \longrightarrow \quad x_{italic}^{\mathrm{roman}}$$

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[*]This document corresponds to **altsubsup** v1.0, dated 2022/01/23.

1 Introduction

The altsubsup package allows to write alternate subscripts and superscripts, in math mode, with square brackets :

x_[my subscript]   or   x^[my superscript].

These alternate superscripts and superscripts are formatted by the commands set, respectively, with \SetAltSubscriptCommand and \SetAltSuperscriptCommand. By default, the \text command, from amstext (part of amsmath) is used. This gives:

$x_{\text{my subscript}}$ or $x^{\text{my superscript}}$.

This package redefine _ and ^ symbols. Options allow to redefine both (by default), only subscript _ symbol, or only superscript ^ symbol.

2 Motivations

Common typographic conventions[1] use italic (sloping) type for physical quantities or mathematical variables and roman (upright) type for words or fixed numbers. For example, heat capacity at constant pressure should be printed C_P, but kinetic energy E_{k} (instead of E_k) and relative permeability μ_{r} (instead of μ_r). This can be obtainted in LaTeX with E_{\mathrm{k}} and \mu_{\mathrm{r}}. This package allows to write them simply E_[k] and \mu_[r].

3 Usage

\SetAltSubscriptCommand{⟨cmd⟩}

Set the command ⟨cmd⟩ used to format square brackets subscripts _[...]. By default, ⟨cmd⟩ is the \text command, provided by the amstext package (part of amsmath package).

\SetAltSuperscriptCommand{⟨cmd⟩}

Set the command ⟨cmd⟩ used to format square brackets superscripts ^[...]. By default, ⟨cmd⟩ is the \text command, provided by the amstext package (part of amsmath package).

\SetAltSubSupCommands{⟨cmd⟩}

Set both square brackets subscripts and square brackets superscripts, with the same command ⟨cmd⟩.

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[1]See, 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.

4 Options

To load the package, add in your preamble:

$$\text{\texttt{\char92 usepackage[}}\langle option\rangle\text{\texttt{]\{altsubsup\}}}$$

Available values for $\langle option\rangle$:

subscript redefine only the _ subscript symbol.

superscript redefine only the ^ superscript symbol.

both redefine both _ and ^ symbols (default).

5 Example

The following input:

```
Default:
\begin{displaymath}
  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]
\end{displaymath}

New formats:
% \text from amstext package
% \color from xcolor package
\newcommand{\bluecolor}[1]{\text{\color{blue}#1}}
\newcommand{\redcolor}[1] {\text{\color{red}#1}}
\SetAltSubscriptCommand{\bluecolor}
\SetAltSuperscriptCommand{\redcolor}
\begin{displaymath}
  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]
\end{displaymath}

Same command for subscripts and superscripts:
\SetAltSubSupCommands{\mathbf}
\begin{displaymath}
  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]
\end{displaymath}
```

gives:

Default:

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

New formats:

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

Same command for subscripts and superscripts:

$x_a^b \quad x_{bracessub}^{bracessup} \quad x_{\mathbf{bracketssub}}^{bracessup} \quad x_{bracessub}^{\mathbf{bracketssup}} \quad x_{\mathbf{bracketssub}}^{\mathbf{bracketssup}}$

6 Known issues

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

7 Alternatives

Two other packages give similar functionalities:

the subtext package (https://www.ctan.org/pkg/subtext), by Palle Jørgensen, formats _[...] subscripts with \text (the differences, is that the altsubsup package works both for subscripts and superscripts, allows to customise the commands, and redefine symbols only in math mode);

the spbmark package (https://www.ctan.org/pkg/spbmark), by Qu Yi, allows a complete customisation of subscripts and superscripts.

8 Implementation

Package declaration

```
1 \ProvidesPackage{altsubsup}[2022/01/23, v1.0, Alternative and customisable
2 subscripts and superscripts, with  square brackets.]
```

Flags declaration

Determine the commands that will be redefined.

```
3 \newif\ifaltsbsp@subscript     \altsbsp@subscripttrue
4 \newif\ifaltsbsp@superscript   \altsbsp@superscripttrue
```

Options declarations and processing

```
5 \DeclareOption{subscript}   {\altsbsp@subscripttrue   \altsbsp@superscriptfalse}
6 \DeclareOption{superscript} {\altsbsp@subscriptfalse  \altsbsp@superscripttrue }
7 \DeclareOption{both}        {\altsbsp@subscripttrue   \altsbsp@superscripttrue }
8 \DeclareOption*{\PackageWarning{altsubsup}{Unknown option \CurrentOption.}}
9 \ProcessOptions\relax
```

Redefine catcodes and make symbols active in mathmode

```
10 \AtBeginDocument{%
11   \ifaltsbsp@subscript    \catcode`\_=12 \mathcode`\_="8000 \fi%
12   \ifaltsbsp@superscript  \catcode`\^=12 \mathcode`\^="8000 \fi%
13 }
```

Redefinition of the subscript symbol

```
14 \ifaltsbsp@subscript%
15 \begingroup\lccode`\~=`\_\lowercase{\endgroup%
16   \def~}{\@ifnextchar[% dummy bracket ]
17   {\altsbsp@subwrapper}% bracket wrapper
18   {\sb}% standard form
19 }%
20 \fi
```

Redefinition of the superscript symbol

```
21 \ifaltsbsp@superscript%
22 \begingroup\lccode`\~=`\^\lowercase{\endgroup%
23   \def~}{\@ifnextchar[% dummy bracket ]
24   {\altsbsp@supwrapper}% bracket wrapper
25   {\sp}% standard form
26 }%
27 \fi
```

User macros

\SetAltSubscriptCommand

```
28 \def\SetAltSubscriptCommand#1{\let\altsbsp@altsubcmd#1}%
29 \def\altsbsp@subwrapper[#1]{\sb{\altsbsp@altsubcmd{#1}}}%
```

\SetAltSuperscriptCommand

```
30 \def\SetAltSuperscriptCommand#1{\let\altsbsp@altsupcmd#1}%
31 \def\altsbsp@supwrapper[#1]{\sp{\altsbsp@altsupcmd{#1}}}%
```

\SetAltSubSupCommands

```
32 \newcommand{\SetAltSubSupCommands}[1]{%
33   \SetAltSubscriptCommand{#1}%
34   \SetAltSuperscriptCommand{#1}%
35 }
```

Set default commands

```
36 \RequirePackage{amstext}%
37 \SetAltSubSupCommands{\text}%
```

Fix prime symbol

```
38 \ifaltsbsp@superscript%
39 \begingroup \catcode'\^=12%
40 \gdef\altsbsp@pr@m@s{% copy of \@pr@m@s code from latex.ltx
41   \ifx'\@let@token
42     \expandafter\pr@@@s
43   \else
44     \ifx^\@let@token
45       \expandafter\expandafter\expandafter\pr@@@t
46     \else
47       \egroup
48     \fi
49   \fi}
50 \endgroup
51 \let\pr@m@s\altsbsp@pr@m@s
52 \fi
```

End of the package

```
53 \endinput
```

Change History

v1.0
    General: Initial version 1

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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.