The `altsubsup` package*

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Abstract

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

Typical use:

\[
\begin{array}{c}
x_{\text{roman}}^{\text{italic}} \rightarrow x_{\text{roman}}^{\text{italic}} \\
x_{\text{italic}}^{\text{roman}} \rightarrow x_{\text{italic}}^{\text{roman}}
\end{array}
\]

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

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

\[
x_{\text{my subscript}} \quad \text{or} \quad x^{\text{my superscript}}.
\]

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

\[
x_{\text{my subscript}} \quad \text{or} \quad x^{\text{my superscript}}.
\]

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

2 Motivations

Common typographic conventions\textsuperscript{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 \textit{C\textsubscript{p}}, but kinetic energy \textit{E\textsubscript{k}} (instead of \textit{E\textsubscript{k}}) and relative permeability \textit{\mu\textsubscript{r}} (instead of \textit{\mu\textsubscript{r}}). This can be obtained in \LaTeX with\textsuperscript{2} \texttt{E\_\{\texttt{mathrm}(k)\}} and \texttt{\mu\_\{\texttt{mathrm}(r)\}}. This package allows to write them simply \texttt{E\_k} and \texttt{\mu\_r}.

3 User interface

3.1 Usage

\texttt{\SetAltSubscriptCommand\{\texttt{cmd}\}}

Set the command \texttt{\{cmd\}} used to format square brackets subscripts \texttt{\_\{\ldots\\}}. By default, \texttt{\{cmd\}} is the \texttt{text} command, provided by the \texttt{amstext} package (part of \texttt{amsmath} package).

\texttt{\SetAltSuperscriptCommand\{\texttt{cmd}\}}

Set the command \texttt{\{cmd\}} used to format square brackets superscripts \texttt{\^{\ldots\ldots}}. By default, \texttt{\{cmd\}} is the \texttt{text} command, provided by the \texttt{amstext} package (part of \texttt{amsmath} package).

\texttt{\SetAltSubSupCommands\{\texttt{cmd}\}}

Set both square brackets subscripts and square brackets superscripts, with the same command \texttt{\{cmd\}}.


\textsuperscript{2}Instead of \texttt{\texttt{mathrm}}, a best choice is the \texttt{text} macro provided by \texttt{amsmath} package, which, for example, handle spaces. It’s the formatting macro used by default by the \texttt{altsubsup} package.
3.2 Options

To load the package, add in your preamble:

\usepackage[⟨option⟩]{altsubsup}

Available values for ⟨option⟩:

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 bracket form of superscripts and superscripts (see below).

spbmark option

The spbmark package (https://www.ctan.org/pkg/spbmark), by Qu Yi, allows a complete customisation of subscripts and superscripts. With the spbmark option, the altsubsup package use the \sub and \super macros of the spbmark package to handle subscripts and superscripts in place of the standard _ and ^ commands.

Theses two macros are called with the respective altsub and altsup styles, allowing simple customization (these styles are initially created empty). 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 is that using simultaneously a subscript and a superscript gives bad formatting (the spbmark macro for this is \supersub). For example, \texttt{x_{[sub]^{super}}} gives \texttt{x_{sub^{super}}} instead of \texttt{x_{sub}^{super}}.
4 Example

The following input:

Default:
\begin{displaymath}
  x_{a^b} \quad x_{\{braces\}^{sup}} \quad x_{[brackets\}^{sup}} \\
  x_{\{braces\}^{sup}[brackets\} \\
\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\}^{sup}} \quad x_{[brackets\}^{sup}} \\
  x_{\{braces\}^{sup}[brackets\} \\
\end{displaymath}

Same command for subscripts and superscripts:
$\SetAltSubSupCommands{\mathbf}$
\begin{displaymath}
  x_{a^b} \quad x_{\{braces\}^{sup}} \quad x_{[brackets\}^{sup}} \\
  x_{\{braces\}^{sup}[brackets\} \\
\end{displaymath}

gives:

Default:
\begin{align*}
  x_a^b & x^{bracessup} x_{bracessub} x^{bracessup} x_{bracessub} \\
  x_{bracessub}^{bracessup} & x_{bracessub}^{bracessup} x_{bracessub}^{bracessup} x_{bracessub}^{bracessub}
\end{align*}

New formats:
\begin{align*}
  x_a^b & x^{bracessup} x_{bracessub} x^{bracessup} x_{bracessub} \\
  x_{bracessub}^{bracessup} & x_{bracessub}^{bracessup} x_{bracessub}^{bracessup} x_{bracessub}^{bracessub}
\end{align*}

Same command for subscripts and superscripts:
\begin{align*}
  x_a^b & x^{bracessup} x_{bracessub} x^{bracessup} x_{bracessub} \\
  x_{bracessub}^{bracessup} & x_{bracessub}^{bracessup} x_{bracessub}^{bracessup} x_{bracessub}^{bracessub}
\end{align*}
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 expression 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 differences, is that the altsubsup package works both for subscripts and superscripts, allows to customise the commands, and redefine 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, as spbmark.
  • Add option spbmark to format subscripts and superscripts with the spbmark package.

v1.0 Initial version.

6 Implementation

Package declaration
1 \ProvidesPackage{altsubsup}[2022/03/15, v1.1, Alternative and customisable 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

Use the spbmark mechanism
5 \newif\ifaltsbsp@spbmark \altsbsp@spbmarkfalse

Options declarations and processing
6 \DeclareOption{subscript} {\altsbsp@subscripttrue \altsbsp@superscriptfalse}
7 \DeclareOption{superscript} {\altsbsp@subscriptfalse \altsbsp@superscripttrue}
8 \DeclareOption{both} {\altsbsp@subscripttrue \altsbsp@superscripttrue}
9 \DeclareOption{spbmark} {\altsbsp@spbmarktrue}
10 \ProcessOptions\relax
11 \ifaltsbsp@spbmark
12 \RequirePackage{spbmark}
13 \fi

Backup standard superscript and subscript commands
Redefine catcodes and make symbols active in mathmode

\ifaltsbsp@subscript \catcode`\_=12 \mathcode`\_=8000 \fi%
\ifaltsbsp@superscript \catcode`\^=12 \mathcode`\^=8000 \fi%

Redefinition of the subscript symbol
\ifaltsbsp@subscript%
\begingroup\lccode`\~=`\/_\lowercase{\endgroup%
\def~}{\@ifnextchar[\dummy bracket \]
{\altsbsp@subwrapper}% bracket wrapper
{\altsbsp@standardsub}% standard form
\fi

Redefinition of the superscript symbol
\ifaltsbsp@superscript%
\begingroup\lccode`\~=`\^\lowercase{\endgroup%
\def~}{\@ifnextchar[\dummy bracket \]
{\altsbsp@supwrapper}% bracket wrapper
{\altsbsp@standardsup}% standard form
\fi

User macros
\SetAltSubscriptCommand
\def\SetAltSubscriptCommand#1{\let\altsbsp@altsubcmd#1}%
\ifaltsbsp@spbmark%
\def\altsbsp@subwrapper[^1]{\sub[style=altsub]{\altsbsp@altsubcmd[^1]}}%
\else
\def\altsbsp@subwrapper[^1]{\altsbsp@standardsub{\altsbsp@altsubcmd[^1]}}%
\fi

\SetAltSuperscriptCommand
\def\SetAltSuperscriptCommand#1{\let\altsbsp@altsupcmd#1}%
\ifaltsbsp@spbmark%
\def\altsbsp@supwrapper[^1]{\super[style=altsup]{\altsbsp@altsupcmd[^1]}}%
\else
\def\altsbsp@supwrapper[^1]{\altsbsp@standardsup{\altsbsp@altsupcmd[^1]}}%
\fi

\SetAltSubSupCommands
\newcommand{\SetAltSubSupCommands}[1]{%
\SetAltSubscriptCommand{#1}%
\SetAltSuperscriptCommand{#1}%

\SetAltSubSupCommands
Set default commands
53 \RequirePackage{amstext}%%
54 \SetAltSubSupCommands{\text}%%

Fix prime symbol
55 \ifaltsbsp@superscript%%
56 \begingroup \catcode\^=12%%
57 \gdef\altsbsp@pr@m@s{% copy of \@pr@m@s code from latex.ltx
58 \ifx\@let@token
59 \expandafter\pr@@@s
60 \else
61 \ifx\@let@token
62 \expandafter\expandafter\expandafter\pr@@@t
63 \else
64 \egroup
65 \fi
66 \fi)
67 \endgroup
68 \let\pr@m@s\altsbsp@pr@m@s
69 \fi

End of the package
70 \endinput

Change History

v1.0
General: Initial version. .......... 1
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v1.1
General: Add sbpmark option ... 5

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\RequirePackage \RequirePackage ...

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