

THE SPBMARK PACKAGE

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Customize superscript and subscript

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<https://github.com/texl3/spbmark>

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spbmark provides three commands `\super`, `\sub` and `\supersub` to improve the layout of superscript and subscript which can be adjusted the relative position and format, and can be used in text and math mode.

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1 Macro package options

The following macro package options will redefine the script commands of the \TeX kernel. If you do not specify the values of boolean options, they default to true.

`text = true|false` Default: false
`\textsuperscript` and `\textsubscript` are equivalent to the `\super` and `\sub` commands.

`math = true|false` Default: false
`\sp` and `\sb` are equivalent to the `\super` and `\sub` commands.

`foot = true|false` Default: false
The format of the footnote mark match the superscript move and format of the `\spbset` global setting.

`both`
The values of `text` and `math` two options are true at the same time.

all

The values of `text`, `math` and `foot` three options are true at the same time.

```
\usepackage[both]{spbmark}
\usepackage[text,foot=true]{spbmark}
```

2 User commands

There are currently three commands to set superscript and subscript. Their format can be set temporarily using the optional parameters of the command, or set globally using a key-value list, see section 3.

`\super[⟨kv list⟩]{⟨content⟩}[⟨kv list⟩]`

This is a superscript output command. The two `⟨kv list⟩` are equivalent.

`\sub[⟨kv list⟩]{⟨content⟩}[⟨kv list⟩]`

This is a subscript output command. The two `⟨kv list⟩` are equivalent.

`\supersub[⟨kv list⟩]{⟨super cont⟩}{⟨sub cont⟩}[⟨kv list⟩]`

This is a command that outputs both superscript and subscript at the same time. You can also use the shorter command `\spb` instead of it. The two `⟨kv list⟩` are equivalent.

`\defspbstyle{⟨style name⟩}{⟨kv list⟩}`

Defines the style of the superscript or subscript used for the `style` option.

`\spbifmath{⟨math code⟩}{⟨text code⟩}`

In some cases, math or text output modes require different code for format or move. This command can be used when using the `match` option or changing the output mode locally, which should be used in the `move` or `format` options. It can switch the corresponding code according to different output modes.

`\spbshortkv{⟨short opt⟩}{⟨key value⟩}`

Converts any existing key-value pair to a shorthand option. The value of key #1 indicates that the shorthand option needs to be assigned a value.

```
\spbshortkv{x}{sphmove=#1}
\defspbstyle{fancy}{sbcmd=\color{blue},mode=math}
\spbshortkv{mysb}{style=fancy}
A\super[x=2pt]{b} \
A\sub{b}[mysb]
```

☆ New

$$A^b$$

$$A_b$$

Since the `\super` and `\sub` commands enclose the scripts in a horizontal box, the horizontal positions are staggered when using both superscript and subscript, which is different from the simultaneous use of `^` and `_` symbols in math mode. In this case, you need to adjust the horizontal offset of the latter command or use the `\supersub` command.

The options common to $\langle kv \text{ list} \rangle$ of the three commands are as follows. They can also be used in $\langle key\text{-}value \text{ list} \rangle$ of the `\spbset` command. In this situation, in addition to `style` and `mode`, they will be set according to the type of the previous most recent command.

`vmove` = $\{\langle fixed \text{ length} \rangle\}$ Default: 0pt
 Vertical move of superscript or subscript. Represents the extra vertical distance `vsep` between superscript and subscript in the superscript and subscript commands.

`hmove` = $\{\langle fixed \text{ length} \rangle\}$ Default: 0pt
 Horizontal move of superscript or subscript. Represents the common move in the superscript and subscript commands.

`cmd` = $\{\langle format \text{ cmds} \rangle\}$
 The format commands of superscript or subscript. The last command can take a parameter, which accepts superscript or subscript. Represents the format of superscript and subscript in the superscript and subscript commands.

`cmd+` = $\{\langle format \text{ cmds} \rangle\}$
 Add code to the previous global superscript or subscript format commands.

`height` = $\{\langle fixed \text{ length} \rangle\}$
 The distance between the superscript or subscript baseline and the previous line.

`depth` = $\{\langle fixed \text{ length} \rangle\}$
 The distance between the superscript or subscript baseline and the next line.

`style` = $\{\langle style \text{ name} \rangle\}$
 Use the $\langle style \text{ name} \rangle$ defined by the `\defspbstyle` command to make it work global or local.

`mode` = `text` | `math` | `match` Default: `match`
 The mode of superscript or subscript output can be `text` or `math` mode. The `match` option automatically matches output modes according to the current mode.

3 Global control interface

`\spbset` $\{\langle key\text{-}value \text{ list} \rangle\}$
`spbmark` uses the `\spbset` command to control the global default format of superscript and subscript. These options also apply to $\langle kv \text{ list} \rangle$ of the above commands. The values set by it will be overwritten by the optional parameters of the superscript and other commands.

3 Global control interface

The following list of keys control the format both of superscript **or** subscript.

spvmove = { $\langle fixed\ length \rangle$ } Default: 0pt
Extra vertical move of the superscript.

sphmove = { $\langle fixed\ length \rangle$ } Default: 0pt
Extra horizontal move of the superscript.

sbvmove = { $\langle fixed\ length \rangle$ } Default: 0pt
Extra vertical move of the subscript.

sbhmove = { $\langle fixed\ length \rangle$ } Default: 0pt
Extra horizontal move of the subscript.

nohmove
Cancel the horizontal move of superscript and subscript at the same time.

novmove
Cancel the vertical move of superscript and subscript at the same time.

spcmd = { $\langle format\ cmds \rangle$ }
The format commands of superscript. The last command in the code can take an argument, which is a superscript.

spcmd+ = { $\langle format\ cmds \rangle$ }
Add code to the previous global superscript format commands.

sbcmd = { $\langle format\ cmds \rangle$ }
The format commands of subscript. The last command in the code can take an argument, which is a subscript.

sbcmd+ = { $\langle format\ cmds \rangle$ }
Add code to the previous global subscript format commands.

spheight = { $\langle fixed\ length \rangle$ }
The distance between the superscript baseline and the previous line.

spdepth = { $\langle fixed\ length \rangle$ }
The distance between the superscript baseline and the next line.

sbheight = { $\langle fixed\ length \rangle$ }
The distance between the subscript baseline and the previous line.

sbdepth = { $\langle fixed\ length \rangle$ }
The distance between the subscript baseline and the next line.

If **sphmove** is positive, the superscript or subscript moves to the right, conversely it moves to the left. The positive direction of vertical offset of subscript and superscript is opposite. For superscript, if **spvmove** is positive, the superscript moves up, conversely it moves down. For subscript, if **spvmove** is positive, the subscript moves down, conversely it moves up.

The following list of keys control the format of superscript **and** subscript.

`spbhmove` = { \langle fixed length \rangle } Default: 0pt

Extra vertical move of the superscript and the subscript.

`spbcmd` = { \langle super cmds \rangle , \langle sub cmds \rangle }

The format commands of superscript and subscript. The first part is in superscript format, and the latter part is in subscript format. They are separated by commas, or only the first part exists.

`spbcmd+` = { \langle super cmds \rangle , \langle sub cmds \rangle }

Add code to the previous global superscript and subscript format commands.

`spbheight` = { \langle fixed length \rangle }

The distance between the superscript baseline and the previous line.

`spbdepth` = { \langle fixed length \rangle }

The distance between the subscript baseline and the next line.

`vsep` = { \langle super move \rangle , \langle sub move \rangle } Default: 0.6ex

☆ Changed

The extra vertical distance between superscript and subscript. The front part is the movement amount of the superscript, and the latter part is the movement amount of the subscript. If only the front part means that both are vertically shifted by one-half of the current value.

`halign` = l | c | r

Default: l

The alignment of superscript and subscript, which contains l, c, and r parameters respectively for left, center, and right alignment.

4 Examples of use

Here is a list of the three commands, please pay attention to the usage of optional parameters. Note when the horizontal move is negative, the starting point is at the right end of the mark.

```
\defspbstyle{fancy}{cmd=\color{purple}}
\spbset{spbcmd={\spbifmath{\mathtt{\ttfamily}},\color{blue}}}
A\super[vmove=0.2ex,hmove=0.2em,cmd=\textcolor{red}]{exam}B \
$A\sub[style=fancy,cmd+=\mathsf,mode=math]{exam}B$ \
A\supersub[vsep=0.6ex,halign=c]{examsuper}{sub}B \
A\super{c}[vmove=5pt,hmove=-5.5pt]B\sub[vmove=5pt,hmove=-5pt]{d}AB
```

A ^{exam}B
A_{exam}B
A_{exam}^{super}B
A_c_{sub}B
ABAB_d

It can also be used with the `siunitx` package to output superscript and subscript in the unit:

```
\unit[mode=math]{kg.m/s\super[vmove=-1pt]{2}} \\  
\qty[mode=text]{30}{A\supersub[hmove=1pt,cmd=\color{red}]{b}{c}} \\  
\spbset{sbhmove=2pt}\unit[mode=text]{A\sub{b}}
```

kg m/s²
30 A^b_c
A_b

`spbmark` also patches the footer markers for standard document class and KOMA-Script. You can format the footer markers by redefining the `\fnmarkfont` command. Note that extra horizontal move does not work with footnote markers.

5 Developer commands

If you need to use the original definitions of `\textsuperscript`, `\textsubscript`, `\sp` and `\sb` after using the `text` or `math` option, then you can use the following commands:

`\spb@textsuperscript@save{<content>}`

Save the original definition of the `\textsuperscript` command, output superscript in the text mode.

`\spb@textsubscript@save{<content>}`

Save the original definition of the `\textsubscript` command, output subscript in the text mode.

`\spb@math@super@save{<content>}`

Save the original definition of the `\sp` command, output superscript in the math mode.

`\spb@math@sub@save{<content>}`

Save the original definition of the `\sb` command, output subscript in the math mode.

6 Known issues

At present, the vertical and horizontal move are effective for the unit commands in the `siunitx` macro package. However, due to the special mechanism that the decimal point is not recognized correctly because it's converted to a space in the `\unit` command, it's recommended to use `pt` as the unit of move.

References

- [Rob16] Will ROBERTSON. realscripts. version 0.3d, Feb. 13, 2016 (or newer).
URL: <https://ctan.org/pkg/realscripts>.
- [Wri21] Joseph WRIGHT. siunitx. version 3.0.22, July 22, 2021 (or newer).
URL: <https://ctan.org/pkg/siunitx>.

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