

# THE SPBMARK PACKAGE

v1.2B      2021/12/16

Customize superscript and subscript

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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 scripts 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 offsets and format of the `\spbset` global setting.

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

**all** (norequired)

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**[ $\langle kv list \rangle$ ][ $\langle height \rangle$ , $\langle depth \rangle$ ]{ $\langle content \rangle$ }[ $\langle kv list \rangle$ ]

This is a superscript output command. The two  $\langle kv list \rangle$  are equivalent.

**\sub**[ $\langle kv list \rangle$ ][ $\langle height \rangle$ , $\langle depth \rangle$ ]{ $\langle content \rangle$ }[ $\langle kv list \rangle$ ]

This is a subscript output command. The two  $\langle kv list \rangle$  are equivalent.

**\supersub**[ $\langle kv list \rangle$ ]{ $\langle super cont \rangle$ }{ $\langle sub cont \rangle$ }[ $\langle kv list \rangle$ ]

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  $\langle kv list \rangle$  are equivalent.

The optional parameter  $\langle height \rangle$ , $\langle depth \rangle$  generally does not need to be used. The  $\langle height \rangle$  and  $\langle depth \rangle$  are separated by commas. Only the front part indicates the  $\langle height \rangle$  of the superscript or subscript, and only the back part indicates the  $\langle depth \rangle$ .

The options common to  $\langle kv list \rangle$  of the three commands are as follows. They can be used in  $\langle key-value list \rangle$  for the **\spbset** command. If **vshift**, **hshift** and **cmd** are used in the **\spbset** command, it is set according to the type of the previous nearest command.

**vshift** = { $\langle fixed length \rangle$ } Default: 0pt

Vertical shift of superscript or subscript. Represents the vertical distance **vsep** between superscript and subscript in the superscript and subscript commands.

**hshift** = { $\langle fixed length \rangle$ } Default: 0pt

Horizontal shift of superscript or subscript. Represents the common shift in the superscript and subscript commands.

**cmd** = { $\langle format cmds \rangle$ } (initially empty)

The format command 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.

**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-value list $\rangle$ }

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

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

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

Extra vertical shift of the superscript.

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

Extra horizontal shift of the superscript.

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

Extra vertical shift of the subscript.

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

Extra horizontal shift of the subscript.

`nohshift` (norequired)

Cancel the horizontal offset of superscript and subscript at the same time.

`novshift` (norequired)

Cancel the vertical offset of superscript and subscript at the same time.

`spcmd` = { $\langle$ format cmds $\rangle$ } (initially empty)

Control the format of superscript, the last command in the code can take an argument, which is a superscript.

`sbcmd` = { $\langle$ format cmds $\rangle$ } (initially empty)

Control the format of subscript, the last command in the code can take an argument, which is a subscript.

If `sphshift` is positive, the superscript or subscript moves to the right, and if it is negative, it moves to the left. However, for superscript, if `spvshift` is positive, the superscript moves up, and if `spvshift` is negative, it moves down. For subscripts, if `spvshift` is positive, the subscript moves down, and if `spvshift` is negative, it moves up.

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

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

Extra vertical shift of the superscript and the subscript.

`spbcmd` = { $\langle$ super cmds $\rangle$ ,  $\langle$ sub cmds $\rangle$ } (initially empty)

Control the format of superscript or 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.

`vsep = {⟨fixed length⟩}`

Default: 0.3ex

The distance between superscript and subscript, its default value is 0.3ex.

`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 offset is negative, the starting point is at the right end of the mark.

```
\spbset{spbcmd={\ttfamily,\color{blue}}}
A\super[vshift=0.2ex,hshift=0.2em,cmd=\textcolor{red}]{exam}B \
$A\sub[cmd=\mathsf,mode=math]{exam}B$ \
A\supersub[vsep=0.3ex,halign=c]{examsuper}{sub}B \
A\super{c}[vshift=5pt,hshift=-1.5pt]B\sub[vshift=5pt,hshift=-1pt]{d}AB
```

---

A <sup>exam</sup>B  
 $A_{\text{exam}}B$   
 $A_{\text{examsuper}}^{\text{sub}}B$   
 $A_{\text{c}}^{\text{sub}}B$   
 $A_{\text{d}}^{\text{b}}$

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

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

---

kg m/s<sup>2</sup>  
30 A<sub>c</sub><sup>b</sup>  
A<sub>b</sub>

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 shift 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 offsets 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 offset.

## 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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