

spbmark package

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Customize superscripts and subscripts

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<https://github.com/texno3/spbmark>

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spbmark provides three commands `\super`, `\sub` and `\supersub` to improve the layout of superscripts and subscripts 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 \LaTeX kernel. If you do not specify the values of boolean options, they default to `true`. These options can also be changed in the preamble area and main body using the global control command `\spbset`.

`text = true` | `false`

`\textsuperscript` and `\textsubscript` are equivalent to the `\super` and `\sub` commands. The command `\defspbstyle` can be used to define the style `textsp` and `textsb` to change the format of the text superscripts and subscripts.

`math = true` | `false`

`\sp` and `\sb` are equivalent to the `\super` and `\sub` commands. The command `\defspbstyle` can be used to define the style `mathsp` and `mathsb` to change the format of the math superscripts and subscripts.

`math* = true` | `false`

The `^` and `_` tokens in the math mode are equivalent to the `\super` and `\sub` commands. The command `\defspbstyle` can be used to define the style `mathsp*` and `mathsb*` to change the format of the math superscripts and subscripts.

Exp
v1.46j

2. User commands

`foot = true` | `false`

The format of the footnote mark match the superscripts global move and format settings. `\defspbstyle` can be used to define the superscripts style `fnmark` to change the format of the footnote mark.

```
\defspbstyle{textsp}{vmove=-1pt,cmd=\bfseries}
\defspbstyle{mathsb}{hmove=0.5em}
\defspbstyle{fnmark}{cmd=\small\color{red}}
```

`both = true` | `false`

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

`all = true` | `false`

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

```
\usepackage[both]{spbmark}
\usepackage[text,foot=true]{spbmark}
\spbset{all=false,math}
```

`spcore = trad` | none

New
v1.46k

Kernel command case for text and math modes superscripts. If none is selected, support for the superscripts kernel command is removed, and the `cmd` and `vmove` options need to be set to control the size and offset of the superscripts.

```
\usepackage[spcore=none]{spbmark}
\usepackage{graphicx}
\spbset{spcmd=\scalebox{0.6},spvmove=5pt}
```

`sbcore = trad` | none

New
v1.46k

Option for subscripts kernel command case, similar to the `spcore` option.

2. User commands

There are currently three commands to print superscripts and subscripts. Their format can be set locally using the optional parameter 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.

When the horizontal movement distance of the marker is **non-negative**, since the `\super` and `\sub` commands put the marker in a horizontal box, the horizontal position is staggered when using superscript and subscript **consecutively**, which is a different mechanism than the sequential use of `^` and `_` symbols in math mode. The following three commands save the width of the previous marker, use it for negative move of the `hmove` option of the next marker, and provide the corresponding alignment.

It should be noted that the following commands should save the longer width of the marker, that is, the longer width of the marker in the front, the shorter width of the marker in the back. This is due to the fact that horizontal movement uses a negative distance to leave the marker in a zero-width box state.

`\llastwd`

Save the width of the previous marker and provide left alignment. This is actually the width of the previous marker, and is the same as the value of `\rlastwd` after the next command is used.

`\clastwd`

Save the width of the previous marker and provide center alignment.

2. User commands

`\rlastwd`

Save the width of the previous marker and provide right alignment. Actually this is the width of the next marker.

<code>1A\super{bcd}\sub{e}B \\ 2A\super{bcd}\sub[hmove=-\llastwd]{e}B \\ 3A\sub{e}\super{bcd}[hmove=-\llastwd]B \\ 4A\super{bcd}\sub[hmove=-\clastwd]{e}B \\ 5A\super{bcd}\sub[hmove=-\rlastwd]{e}B</code>	<code>1A^{bcd}_eB 2A^{bcd}_eB 3A_e^{bcd}B 4A^{bcd}_eB 5A^{bcd}_eB</code>
--	--

`\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.

`\superwd`

Save the width of the superscript in the previous super-subscript command.

`\subwd`

Save the width of the subscript in the previous super-subscript command.

`\maxwd`

Save the maximum width of superscript and subscript in the previous super-subscript command. That is, it is the larger of the `\superwd` and `\subwd` commands.

If horizontally move is negative and its absolute value is **less** than the maximum width of the marker, then the marker overlaps the subsequent text. To avoid this use the command with the **asterisk** parameter or adjust the horizontal distance with the marker length commands.

<code>\spbset{spvmove=5pt,vsep=1.8ex,spcmd=\color{blue}} 1A\super[hmove=-8pt]{super}B \\ 2A\supersub[hmove=-8pt]{examsuper}{sub}B \\ 3A\super*[hmove=-8pt]{super}B \\ 4A\supersub*[hmove=-8pt]{examsuper}{sub}B \\ 5A\super[hmove=-8pt]{super}\hspace{\dimexpr(\llastwd-8pt)}B \\ 6A\supersub[hmove=-8pt]{examsuper}{sub}\hspace{\dimexpr(\maxwd-8pt)}B</code>	<code>super 1A^{super}B examsuper 2A^{examsuper}_{sub}B sub super 3A^{super}_{sub}B examsuper 4A^{examsuper}_{sub}B sub super 5A^{super}_{sub}B examsuper 6A^{examsuper}_{sub}B sub</code>
--	--

`\defspbstyle{<style name>}{<kv list>}`

Defines the style of the superscripts or subscripts 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.

<code>\spbshortkv{x}{sphmove=#1} \defspbstyle{fancy}{sbcmd=\color{blue},mode=math} \spbshortkv{mysb}{style=fancy} 1A\super[x=2pt]{b} \\ 2A\sub{b}[mysb]</code>	<code>1A^b 2A_b</code>
--	--

The options common to `<kv list>` of the three commands are as follows. They can also be used in `<key-value list>` 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.

3. Global control interface

`vmove = {⟨fixed length⟩}` Default: 0pt
 Vertical move of superscripts or subscripts. Represents the extra vertical distance `vsep` between superscript and subscript in super-subscript command. The vertical movement starts at the marker horizontal baseline position.

`hmove = {⟨fixed length⟩}` Default: 0pt
 Horizontal move of superscripts or subscripts. Represents the **common** move of superscript and subscript in super-subscript command. The starting point for horizontal movement is to the left of the marker. Moved values can be expressed mathematically:

```
1A\super{b}[vmove=0.4ex+4pt/2,hmove=2pt*3-11.5pt] \\  
2A\supersub[vsep={3pt,6pt-2bp}]{examsuper}{sub}
```

`cmd = {⟨format cmds⟩}`
 The format commands of superscripts or subscripts. The last command can take a parameter, which accepts superscript or subscript. Represents the format `spbcmd` of superscript and subscript in super-subscript command.

`cmd+ = {⟨format cmds⟩}`
 Add code to the previous option `cmd`.

`height = {⟨fixed length⟩}`
 The height of the marker box above the baseline. It is recommended that the superscript adjusts the height and the subscript adjusts the depth.

`depth = {⟨fixed length⟩}`
 The depth of the marker box below the baseline.

`style = {⟨style name⟩}`
 Use the `⟨style name⟩` defined by the `\defspbstyle` command to make it work global or local.

`mode = text|math|match`
 The mode of superscripts or subscripts output can be text or math mode. The `match` option automatically matches output modes according to the current mode.

`thiswd = auto|keep`
 Sets how the length of the this marker is handled after this command is used. If it is `keep`, the width of the previous marker remains the same. If it is `auto`, if the next token is a marker command and the upper or lower position is the **opposite** of the this command, the width of the this marker is maintained, otherwise the width automatically returns to **zero**.

```
\spbset{sbhmove=-\llastwd,sbthiswd=auto,sbcmd=\color{red}}  
1A\super{bcd}\sub[thiswd=keep]{e}Some texts\sub{e} \\  
3A\super{bcd}\sub{e}Some texts\sub{e} \\  
3A\sub{bcd}[thiswd=keep]\sub{e}Some texts\sub{e} \\  
4A\sub{bcd}\sub{e}Some texts\sub{e}
```

`regex = {⟨regular expression⟩}`
 After using a superscript or subscript command, this option is used to determine whether the **following** tokens match the `⟨regular expression⟩`. If it does **not**, the width of the this marker returns to zero.

```
\newcommand{\mysp}[2][\super[regex=\c{mysb},#1]{#2}]  
\newcommand{\mysb}[2][\sub[regex=\c{mysp},#1]{#2}]
```

3. Global control interface

`\spbset{⟨key-value list⟩}`

3. Global control interface

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

Note that the relative length units in the options such as `ex` and `em` are for the `body` font size, not the marker itself.

The following list of keys control the format both of superscripts or subscripts. They can also be used in the optional parameter of the `\super` or `\sub` command.

<code>spvmove = {$\langle fixed length \rangle$}</code>	Default: 0pt
Extra vertical move of the superscripts.	
<code>sphmove = {$\langle fixed length \rangle$}</code>	Default: 0pt
Extra horizontal move of the superscripts.	
<code>sbvmove = {$\langle fixed length \rangle$}</code>	Default: 0pt
Extra vertical move of the subscripts.	
<code>sbhmove = {$\langle fixed length \rangle$}</code>	Default: 0pt
Extra horizontal move of the subscripts.	
<code>nohmove</code>	
Cancel the horizontal move of superscripts and subscripts at the same time.	
<code>novmove</code>	
Cancel the vertical move of superscripts and subscripts at the same time.	
<code>spcmd = {$\langle format cmds \rangle$}</code>	
The format commands of superscripts. The last command in the code can take an argument, which is a superscripts.	
<code>spcmd+ = {$\langle format cmds \rangle$}</code>	
Add code to the previous option <code>spcmd</code> .	
<code>sbcmd = {$\langle format cmds \rangle$}</code>	
The format commands of subscripts. Similar to the <code>spcmd</code> option, but for subscripts.	
<code>sbcmd+ = {$\langle format cmds \rangle$}</code>	
Add code to the previous option <code>sbcmd</code> .	
<code>spheight = {$\langle fixed length \rangle$}</code>	
The height of the superscript box above the baseline.	
<code>spdepth = {$\langle fixed length \rangle$}</code>	
The depth of the superscript box below the baseline.	
<code>sbheight = {$\langle fixed length \rangle$}</code>	
The height of the subscript box above the baseline.	
<code>sbdepth = {$\langle fixed length \rangle$}</code>	
The depth of the subscript box below the baseline.	
<code>spthiswd = auto keep</code>	
Width processing mode after using this superscripts. See Section 2 for the meaning of this option.	
<code>sbthiswd = auto keep</code>	
Width processing mode after using this subscripts. See Section 2 for the meaning of this option.	
<code>sprege = {$\langle regular expression \rangle$}</code>	
After the superscripts command is used, the regular expression rules of the following tokens are matched. See Section 2 for the meaning of this option.	
<code>sbrege = {$\langle regular expression \rangle$}</code>	
Similar to the <code>sprege</code> option, but for subscripts.	

4. Marker hooks

If `spbmove` is positive, the superscripts or subscripts moves to the right, conversely it moves to the left. The positive direction of vertical offset of subscripts and superscripts is **opposite**. For superscripts, if `spvmove` is positive, the superscripts moves up, conversely it moves down. For subscripts, if `spvmove` is positive, the subscripts moves down, conversely it moves up.

The following list of keys control the format of superscripts **and** subscripts. They can also be used in the optional parameter of the `\supersub` command.

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

Extra vertical move of the superscripts and the subscripts.

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

The format commands of superscripts and subscripts. The first part is in superscripts format, and the latter part is in subscripts 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 option `spbcmd`.

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

The height of the superscript box above the baseline.

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

The depth of the subscript box below the baseline.

`vsep` = $\{\langle super\ move\rangle, \langle sub\ move\rangle\}$

Default: 0.6ex

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

`halign` = $\boxed{l|c|r}$

The alignment of superscripts and subscripts, which contains `l`, `c`, and `r` parameter respectively for left, center, and right alignment.

4. Marker hooks

```
\AddToHookWithArguments{spb/super/before}[\langle label\rangle]{\langle code\rangle}
```

```
\AddToHookWithArguments{spb/super/after}[\langle label\rangle]{\langle code\rangle}
```

```
\AddToHookWithArguments{spb/sub/before}[\langle label\rangle]{\langle code\rangle}
```

```
\AddToHookWithArguments{spb/sub/after}[\langle label\rangle]{\langle code\rangle}
```

New v1.46r `spbmark` gives hooks to markers with arguments in front and back positions, this feature requires support in the L^AT_EX kernel after **2023/06/01**. Argument #1 in the $\langle code\rangle$ represents super or sub, and argument #2 represents the marker content itself.

```
\AddToHookWithArguments{spb/super/before}{\spbifmath{(#1-#2)}{[#1-#2]}}
```

```
 $\super{a}$\super{b}
```

```
\RemoveFromHook{spb/super/before}
```

```
(super - a)a[super-b]b
```

5. Examples of use

Here is a list of the three commands, please pay attention to the usage of optional parameter. 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}}}
1A\super[vmove=0.2ex,hmove=0.2em,cmd=\textcolor{red}]{exam}B \
2$A\sub[style=fancy,cmd+=\mathsf,mode=math]{exam}B$ \
3A\supersub[vsep=0.6ex,halign=c]{examsuper}{sub}B \
4A\super{c}[vmove=5pt,hmove=-5.5pt]B\sub[vmove=5pt,hmove=-5pt]{d}AB \
5A\super{c}\super{d}B

```

```

1AexamB
2AexamB
3AexamsubB
4AcBd
5AcdB

```

5.1. siunitx

It can also be used with the siunitx package to output superscripts and subscripts in the unit:

```

\spbset{spcmd=\spbifmath}{\color{purple}}
\sisetup{text-superscript-command=\super}
1-\qty[mode=text]{10}{A^2} \
2-\unit[mode=math]{kg.m/s\super[vmove=-1pt]{2}} \
3-\qty[mode=text]{30}{A\supersub[hmove=1pt,cmd=\color{blue}]{b}{c}} \
4-\spbset{sbhmove=2pt}\unit[mode=text]{A\sub{b}}

```

```

1-10 A2
2-kg m/s2
3-30 Acb
4-Ab

```

5.2. realscripts

If the OpenType text font you are using does not have optical sizes, the superscripts and subscripts may not appear correctly. Loading the realscripts package before the spbmark package fixes this behavior.

```
\usepackage{realscripts,spbmark}
```

5.3. altsubsup

The altsubsup package allows to write alternate superscripts and subscripts in math mode with $\overset{\langle mark \rangle}$ and $\underset{\langle mark \rangle}$ dimensions. When the package is loaded using the spbmark option, the superscripts and subscripts mechanism of spbmark is used, you can use `\defspbstyle` to define its superscripts style `altsup` and subscripts style `altsub`.

```

\defspbstyle{altsup}{sphmove=-\llastwd,sphthiswd=auto,spvmove=1pt}
$A_{bcd}^eB$

```

 $A_{bcd}^e B$

5.4. footnote

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.

6. 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 superscripts in the text mode.

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

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

`\spb@math@super@save{⟨content⟩}`

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

`\spb@math@sub@save{⟨content⟩}`

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

7. 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.

A. Changelog

1.46j (2024/05/19)

- Add option `math*`: The `^` and `_` tokens in the math mode are equivalent to the `\super` and `\sub` commands.

1.46k (2024/06/21)

- Add options `spcore` and `sbcore`: Set kernel commands for superscripts and subscripts of text and math modes.

1.46r (2024/10/29) — Give hooks to markers with parameters at the front and back positions.

B. References

[Lab22] Julien Labbé. `altsubsup`. version 1.1, Mar. 15, 2022 (or newer).

URL: <https://ctan.org/pkg/altsubsup>.

[Rob16] Will Robertson. `realscripts`. version 0.3d, Feb. 13, 2016 (or newer).

URL: <https://www.ctan.org/pkg/realscripts>.

[Tea23] The L^AT_EX Project Team.

The L^AT_EX3 Interfaces. version 2023-12-11, Dec. 11, 2023 (or newer).

URL: <https://ctan.org/pkg/l3kernel>.

[Wri22] Joseph Wright. `siunitx`. version 3.0.48, Feb. 7, 2022 (or newer).

URL: <https://www.ctan.org/pkg/siunitx>.

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