

# The **mëtrix** package

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## Abstract

— — — — — | — ∪ ∪ — ∪ ∪ —  
et quod temptābam | scribere versus erat

The **mëtrix** package can be used to print the prosodics/metrics of (latin) verses. It provides macros to typeset the symbols stand alone and in combination with syllables (including automatic alignment like seen above). Furthermore it defines a new brēvis and a lōnga accent<sup>1</sup> and a how to contract syllables.

*Thanks to David Carlisle, Marco Daniel, Enrico Gregorio, Bruno Le Floch and Joseph Wright who helped me with starting in L<sup>A</sup>T<sub>E</sub>X3 programming. The verse above is by Ovid in his Tristia 4,10,26.*

## 1 Prerequisites

**mëtrix** relies only on a few packages: tikz (including the calc library), xpatch and xparse, which stand for the whole L<sup>A</sup>T<sub>E</sub>X3 bundle.

## 2 Package loading

Load **mëtrix** as usual with `\usepackage{metrix}`. At the moment it has no options.

A CWL file `metrix.cwl` for autocompletion in TeXstudio is available in the GitHub repo. To install the CWL file copy it to `~/.config/texstudio/` on Linux and OS X and to `c:\Documents and Settings\User\AppData\Roaming\texstudio/`. See section 1.5 of the TeXstudio manual for more information.

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<sup>1</sup>I know that these signs are no accents in the linguistic sense, but they are in the T<sub>E</sub>X tradition ...

## 3 Bugs and feedback

### 3.1 Known issues

- At the moment the escaping of hyphen chars is not that good (see section 7.3).
- Unfortunately you can't use the active quotes of `csquotes` inside of `\metrics` syllable list (see section 7.4).

I'm sure there are more bugs and issues let me know if you find them ...

### 3.2 Feedback

Any feedback on **mëtrix** is appreciated. You may use its GitHub repository at <https://github.com/tweh/metrix> to request features or report bugs or send me an e-mail ([mail@tweh.de](mailto:mail@tweh.de)).

## 4 Metric symbols

### 4.1 Stand alone metric symbols

---

`\metricsymbols` ★ `\metricsymbols<*>[<highlighting>]{<symbols>}`

---

This macro typesets stand alone versions of the symbols, i.e. without syllables below (or above) of them. Use the starred version for smaller (in line) symbols and the normal version for bigger symbols. `<symbols>` must be a list of abbreviations as listed in table 1;<sup>2</sup> the single abbreviations must be separated by one (or more spaces).

#### Example

The *diphilius* can be shown with this code.

```
\metricsymbols{ _ _uu _ _uu u_ | x _ u u _ x u_ }
```

— ∪ — ∪ ∪ | × — ∪ ∪ — × ∪

### 4.2 Metric symbols above (or below) syllables

---

`\metrics` ★ `\metrics[<highlighting>]{<symbols>}{<syllables>}`

---

This command can be used to align the symbols above (or below) syllables. The first `<symbols>` argument works as before. The second argument `<syllables>` takes the hyphenated verse.

---

<sup>2</sup>The break symbols cannot be used above syllables, they must be used together with break symbols in the syllable list, only!

#### Example

```
\metrics{ _   u u   _ _ _ | _   _ u u   _ _ _ }
          {flos ve-te-ris vi-ni | meis na-ri-bus ob-iec-tust}

_   ∪ ∪ _ _ _ | _   _ ∪ ∪ _ _ _
flos veteris vini | meis naribus obiectust
```

You may use multiple spaces to align the abbreviations above the syllables but this is not mandatory and does not affect the output. But mind that the number of syllables equals the number of symbols. If you use the  $\infty$  symbol you may omit the hyphen between the two syllables belonging to this symbol. You can merge multiple words by *embracing* them.

#### Example

```
\metrics{ _   u u   _   _ _ _ _ }
          {mol-ta quo-{que et} bel-lo pas-sus}

_   ∪ ∪   _   _ _ _ _
molta quoque et bello passus
```

The macros `\metrics` and `\metricsymbols` can also be used to typeset single symbols or symbol syllable combinations.

#### Example

The `\metricsymbols*{_uu}` shows an `\emph{elementum biceps}`.

The  $\infty$  shows an *elementum biceps*.

### 4.3 Highlight certain symbols/syllables

As you can see above `\metrics` and `\metricsymbols` got an optional argument taking some options to highlight a certain symbol/syllable. The *highlighting* list must contain one or more comma separated pairs of *numbers*=*style*, where *numbers* is the number of a symbol/syllable (e.g. 3) or a list of numbers separated by plus signs (e.g. 2+3+5) in the list and *style* is any TikZ style (other TikZ options may not work properly, so you maybe must create your own style, see section 7.9.)

**métrix** comes with several predefined highlighting styles:

- **bold highlight**

$\overline{\text{flos}} \overline{\text{veteris}} \overline{\text{vini}} | \overline{\text{meis}} \overline{\text{naribus}} \overline{\text{ob}} ||$        $\cup \infty \times - | \cup - \infty ||$

- **colored highlight=*color***

$\overline{\text{flos}} \overline{\text{veteris}} \overline{\text{vini}} | \overline{\text{meis}} \overline{\text{naribus}} \overline{\text{ob}} ||$        $\cup \infty \times - | \cup - \infty ||$

This style has an *optional* argument to change the highlighting color on the fly. To change the color in general change the value of the variable `highlightcolor`.

abbreviation	symbol	explanation
e		empty symbol
u	∪	elementum breve
_ (under score)	—	elementum longum
uu	∪∪	double breve
uu_	∪∪	elementum biceps
_uu	∪∪	elementum biceps
u_uu	∪∪	elementum anceps
x	×	elementum anceps
n	∩	elementum indifferens
u_	∪	elementum indifferens
oo (two lowercase o's)	OO	aeolic base
(pipe)		break
(two pipes)		verse break

Table 1: Symbol abbreviations

- **dashed highlight**

flos veteris vini | meis naribus ob ||

- **filled highlight=*color***

flos veteris vini | meis naribus ob ||

This style has an *optional* argument to change the filling color on the fly. To change the color in general change the value of the variable `fillcolor`.

- **superscript=*text***

flos veteris vini |<sup>a</sup> meis naribus ob ||<sup>b</sup>

This style takes a *mandatory* argument to add a superscript letter or a number to a symbol. It is designed to work with the break symbols, but works with others too.

**Sytlles with an agrument must be set in braces (see the examples)!**

#### Example

Highlight some syllables with color.

```
\metrics
[
```

```

2=colored highlight,
4={colored highlight=orange},
5={colored highlight=blue},
7=colored highlight,
11=colored highlight
]
{ _ u u _ _ _ | _ _ u u _ }
{flos ve-te-ris vi-ni | meis na-ri-bus ob}
- ~ ~ - - - | - - ~ ~ -
flos veteris vini | meis naribus ob

```

### Example

The shorter version using the + syntax.

```

\metrics[2+5+9=bold highlight]
{ _ u u _ _ _ | _ _ u u _ }
{flos ve-te-ris vi-ni | meis na-ri-bus ob}
- ~ ~ - - - | - - ~ ~ -
flos veteris vini | meis naribus ob

```

### Example

Mixing and combining styles is possible too.

```

\metricsymbols[1+4=bold highlight, 3=colored highlight]
{u_uu x _ || u _ n ||} \
\metricsymbols[2={bold highlight,colored highlight}]
{u_uu x _ || u _ n ||}

```

$\text{u} \times \text{—} \parallel \text{u} \text{—} \text{u} \parallel$   
 $\text{u} \times \text{—} \parallel \text{u} \text{—} \text{u} \parallel$

### Example

Add some superscripts to the breaks.

```

\metricsymbols[6={superscript=5},10={colored highlight,superscript=bD}]
{ _ _uu _ _uu _ | _uu _ _uu || _ uu _ u_ }
- ~ - ~ - |5 ~ - ~ ||bD - ~ - ~

```

## 5 Accents and bows

---

`\brv` ★ `\brv{⟨vowel⟩}`    `\lng{⟨vowel⟩}`    `\acct{⟨vowel⟩}`

`\lng` ★ The first commands offer an alternative to the standard accent macros `\u` and `\=`. The difference is that `\brv` centers the accent above the vowel or diphthong and `\lng` stretches the bar across the whole vowel or diphthong. `\acct` adds an accent dot below a vowel or diphthong.<sup>3</sup>

---

### Example

Add accents to all vowels.

```
\brv{a}m\acct{\lng{i}}c\brv{u}s pr\acct{\brv{o}}f\brv{u}g\brv{u}s
ămîcûs pröfûgûs
```

**mëtrix** also tries to do some kind of italic correction, and shifts the accents a little to the right when an italic or slanted font is used.

ũ ũ ũ	ĩ ĩ ĩ	ǣ ǣ ǣ	ű ű ű	ÿ ŷ ŷ	ǽ ǽ ǽ
ū ū ū	ī ī ī	ā ē ā ē	ū ū ū	ī ī ī	ā ē ā ē
ұ ұ ұ	ị ị ị	ǣ ǣ ǣ	ұ ұ ұ	ị ị ị	ǣ ǣ ǣ

---

`\bow` ★ `\bow{⟨syllables⟩}`

---

`\bow` can be used to show the contraction of two vowels or syllables.

### Example

```
mult\bow{um i}lle or d\bow{ei}nde
multum ille or deinde
```

## 6 Environments

---

`sybolline` This environment can be used to display a line of stand alone symbols.

---

### Example

```
Text text text ...
\begin{sybolline}
  \metricsymbols{oo e _ u u _ e u _ e u _ u_}
```

<sup>3</sup>Actually you can use any vowel, diphthong, syllable or word as `⟨vowel⟩`, it makes no difference as long as it is text.

```

\end{symbolline}
Text text text ...

Text text text ...

      OO   — ∪ ∪ —   ∪ —   ∪ — ∪

Text text text ...

```

---

**metricverses**    `\begin{metricverses}[\langle source \rangle]`  
                   `\langle content optional \verseref{\langle reference \rangle} \rangle`  
                   `\end{metricverses}`

---

Use this environment to display a verse with metric symbols, separate multiple verses by a blank line.

**Example**

```

Text text text ...
\begin{metricverses}
  \metrics{ _   u u _ _ _ | _   _ u u _ _ _ }
           {flos ve-te-ris vi-ni | meis na-ri-bus ob-iec-tust}

  \metrics{ _   u u _   u u _   | _               _   u u
           {ei-us a-mor cu-pi-dam | {m\bow{e h}uc} pro-li-cit
                                           per te-ne-bras}
\end{metricverses}
Text text text ...

Text text text ...

      _   ∪ ∪ — — — | _   _ ∪ ∪ — — —
    flos veteris vini | meis naribus obiectust
      _ ∪ ∪ — ∪ ∪ — | _   _ — ∪ ∪ — — —
    eius amor cupidam | me huc prolicit per tenebras

Text text text ...

```

---

**\verseref**    `\verseref{\langle reference \rangle}`

---

Inside of `{metricverses}` you may use `\verseref` to print a reference.

**Example**

```

Text text text ...
\begin{metricverses}
  \metrics{ _   u u _ _ _ | _   _ u u _ _ _ }
           {flos ve-te-ris vi-ni | meis na-ri-bus ob-iec-tust}

```

```

\verseref{Plaut. \emph{Curc.} 96f}

\metrics{ _ u u _ u u _ | _ _ _ u u
          _ u u _ }
        {ei-us a-mor cu-pi-dam | {m\bow{e h}uc} pro-li-cit
                                                per te-ne-bras}

\end{metricverses}
Text text text ...

Text text text ...

      _  _  _  _  _  _  _  _  _  _  _  _  _  _  _  _
      flos veteris vini | meis naribus obiectust
      _  _  _  _  _  _  _  _  _  _  _  _  _  _  _  _
      eius amor cupidam | me huc prolicit per tenebras

Text text text ...

```

Plaut. *Curc.* 96f

## 7 FAQs

### 7.1 How can I display the symbols below the syllables?

Change the variable `symbolshift` to a negative value.

#### Example

```

\setmetrixvar{symbolshift}{-0.6em}
% later ...
\metrics{ _ u u _ _ _ | _ _ _ u u _ _ _ }
          {flos ve-te-ris vi-ni | meis na-ri-bus ob-iec-tust}

flos veteris vini | meis naribus obiectust
_  _  _  _  _  _  _  _  _  _  _  _  _  _  _  _

```

### 7.2 How can I combine two words below one symbol?

Use braces `{}` in the lists to keep them processed as one element.

#### Example

```

\metrics{u u _ | _ _ _ u u }
          {cu-pi-dam | {m\bow{e h}uc} pro-li-cit }

_  _  _  _  _  _  _  _  _  _  _  _  _  _  _  _
cupidam | me huc prolicit

```

### 7.3 How can I show a hyphen character?

To escape a hyphen - put it inside braces, but you must still add an unbraced hyphen to show **mētrix** where your syllables split.



### Example

If you enclose the hyphen in braces together with a syllable, the symbol gets centered above both.

```
\metrics{ _ _ }
          {vi-{-ni}}
```

— —  
vi-ni

You can enclose only the hyphen in braces and treat it as a syllable but then you must add an empty symbol e too.

```
\metrics{ _ e _ }
          {vi-{-}-ni}
```

— —  
vi-ni

## 7.4 How can I use quotes in `\metrics`?

It should be possible to use all shorthands (or direct input with Unicode) etc. for quotation marks except the active quotes of `csquotes`, which won't work inside the `\metrics` syllable list. It is possible to use `csquotes` besides **mëtrix** though.

### Example

```
\metrics{ _ u }{ ‘ ‘si me’ ’ }
\metrics{ _ u }{ “ “si me” ” }
\metrics{ _ u }{ \glqq si me\grqq }% with \usepackage[<lang>]{babel}
\metrics{ _ u }{ " "si me" "}% with \usepackage[ngerman]{babel}
```

— — — —  
“si me” “si me” „si me” „si me”

## 7.5 How can I add a superscript letter to a certain symbol?

Use the `|superscript|` highlighting style as described above.

## 7.6 How can I make subscripts instead of superscripts?

The easiest way is to use the `superscript` style and change a part of its definition to shift the superscripts to subscript positions.

### Example

```
\metricsymbols[2={superscript=x}]{ u || u } \qquad vs. \quad
% ...
\tikzset{
  every superscript picture/.style={
    baseline=1ex,
```

```

    },
  }
  % ...
  \metricsymbols[2={superscript=x}]{ u || u }

  ∪ ||x ∪ vs. ∪ ||x ∪

```

Normally the `\tikzset` should be part of your preamble, I used it this way to show the differences.

## 7.7 How can I highlight all symbols/syllables?

**Way 1** Just call your desired highlighting style before using on of the macros `\metrics` or `\metricsymbols`. You may enclose this in a group to not affect the other following sequences. Mind that the highlighting styles must be in a way changing the `every ...` styles to make this way work.

### Example

```

{% begin group
  \tikzset{colored highlight}
  \metrics{ _ u u _ _ _ }
            {flos ve-te-ris vi-ni}
}% end group
— ∪ ∪ — — —
flos veteris vini

```

**Way 2** Change the `every metrix ...` styles.

### Example

```

{% begin group
  \tikzset{every metrix symbol/.append style={red}}
  \metrics{ _ u u _ _ _ }
            {flos ve-te-ris vi-ni}
}% end group
— ∪ ∪ — — —
flos veteris vini

```

Leave out the grouping (and put this to your preamble) if you want to highlight the symbols in your whole document.

## 7.8 How can I change the size of a symbol?

Change the two base vector units.

### Example

```
\setmetrixvar{baseunit}{1em}
\setmetrixvar{bigbaseunit}{1.6em}
```

If you want to change the size of a single symbol to highlight it you must create your own highlighting style.

#### Example

```
\tikzset{
  bigger highlight/.style={
    every metrix symbol/.append style={x=2.5em,y=2.5em,line width=1.5pt},
  },
}
% later
\metricsymbols[2=bigger highlight]{u_uu x _ || u _ n x}
```

u uu x \_ || u \_ n x

## 7.9 How can I stop highlighting the syllables too?

**Way 1** Change the highlight styles (in your preamble).

#### Example

```
\tikzset{
  colored highlight/.style={
    every metrix symbol/.append style={
      draw=\usemetrixvar{highlightcolor},
    },
  },
}
% later ...
\metrics[3=colored highlight]{_ u u _ _ _ }
{flos ve-te-ris vi-ni}

_ u u _ _ _
flos veteris vini
```

**Way 2** Create your own highlighting style, which is very similar to way 1, as the following example shows. Every own style should change the appearance by appending the settings to one of the every ... styles.

#### Example

```
\tikzset{
  my highlight/.style={
    every metrix symbol/.append style={draw=blue,line width=0.07em},
  }
}
```

```

}
\metrics[5=my highlight]{_ u u _ _ _ }
                        {flos ve-te-ris vi-ni}

— ◡ ◡ — — —
flos veteris vini

```

## 7.10 Why got the highlight styles that long names?

To prevent conflict with other packages.

### Example

If you want to shorten it create your own style as described above or use

```

\tikzset{
  hl/.style={colored highlight}
}

```

to map the style to a shorter name. Then you can use it like in

```

\metricsymbols[2=hl]{u _ _ u}

```

## 7.11 How can I change the font of all syllables?

Extend the every metrix syllable node style

### Example

Print all syllables in italic with the following extension.

```

\tikzset{
  every metrix syllable node/.append style={font=\itshape},
}

```

# 8 Customization

Some hints were already given in the FAQ section (see section 7) but here I will list all variables and TikZ styles that are in use and can be changed to customize **mëtrix** easily.

## 8.1 Variables

---

```

\setmetrixvar \setmetrixvar{<variable>}{<value>}

```

---

```

\usemetrixvar

```

To customize the rendering of the symbols, accents and bow **mëtrix** has some variables that you can change. Use `\setmetrixvar` to change a value. The variables and the default values are listed in table 2. To access a value you can use `\usemetrixvar{<variable>}`.

It is highly recommended to use font size depending units, i.e. `em` or `ex`, for all lengthen to keep the symbols usable in different font sizes, for example in headlines or footnotes.

#### Example

Change the highlighting color to blue.

```
\setmetrixvar{highlightcolor}{blue}
% later
\metrics[5=colored highlight]{_ u u _ _ _ }
                                {flos ve-te-ris vi-ni}

_ ˘ ˘ _ _ _
flos veteris vini
```

#### Example

Create your own highlighting style but use the default highlighting color.

```
\tikzset{
  my highlight/.style={
    every metrix symbol/.append style={
      draw=\usemetrixvar{highlightcolor},
      line width=0.15em
    },
  },
}
\metrics[5=my highlight]{_ u u _ _ _ }
                                {flos ve-te-ris vi-ni}

_ ˘ ˘ _ _ _
flos veteris vini
```

## 8.2 TikZ styles

Beside the variables you may change the TikZ styles used by **mētrix**. But please mind that all styles are not empty by default so you should prefer `/ .append style` against `/ .style`. Otherwise it may cause strange effects. Remind that you can use `\usemetrixvar` to access a variable.

---

```
every metrix symbol
every metrix big symbol
every metrix symbol node
```

---

These three styles define the apperance of the metric symbols. They define the line width, the color, the basis vectors and other things.

---

```
every metrix syllable node
every metrix break node
```

---

These styles defines the nodes in which a syllable or a break symbol (the ones spanning across the symbol and the syllable line) is typeset, e.g. it aligns these nodes at their base line.

variable	default	explanation
symbollinewidth	0.04em	line width of symbols above syllables and small stand alone symbols
bigsymbollinewidth	0.06em	line width of big stand alone symbols
accentlinewidth	0.03em	line width of accents (\lng and \brv)
bowlinewidth	0.03em	line width of bows (\bow)
symbolsep	0.4em	gap between symbols in stand alone lists
baseunit	0.9em	length of the base vector for drawing symbols above syllables, small stand alone symbols, accents and bows
bigbaseunit	1.4em	length of the base vector for drawing stand alone symbols
shortsyllablelimit	0.8em	all syllables shorter than this can be treated specially, e.g. they'll get a shorter elementum longum.
gap	0.09em	small gap between lines of the symbols, e.g. the distance between the two lines of a verse break
symbolshift	1.1em	length to shift the symbols above or below the syllables (try -0.6em to display the symbols below the base line)
lngshift	0.8em	length to shift the longa accent
lngshortening	0.075em	length to shorten the longa accent a little
lngminlength	0.25em	minimum width of a longa accent
brvshift	0.9em	length to shift the brevis accent
dotshift	-0.15em	length to shift the dot accent
itcorrection	0.11em	length to shift the accents above italic/slanted letters
accentxshift	-0.025em	length to shift the accents horizontally
bowshift	-0.15em	length to shift the bow below the base line
bowshortening	0.15em	length to shrink the bow a little
bowlooseness	0.75	value to influence the bending of the bow
symbolcolor	black	color of metric symbols
accentcolor	black	color of accents (\lng and \brv)
bowcolor	black	color of bows (\bow)
highlightcolor	red	color of highlighted symbols and syllables used in colored highlight style
fillcolor	yellow	color of filled symbol nodes used in filled highlight style
breakgap	0.6em	gap before and after a (verse) break
emptywidth	1em	gap replacing an empty symbol (abbreviation e)

Table 2: Variables

---

every metrix accent

---

This style defines the apperance of accents created by `\lng` and `\brv`.

---

every metrix bow

---

This style defines the apperance of bows below symbols.

---

bold highlight  
colored highlight  
dashed highlight  
filled highlight  
superscript

---

These styles can be used to highlight a certain symbol.

---

every superscript picture  
every superscript node  
every superscript label

---

These styles are used to define the superscript highlighting style.

## 9 Implementation

```
1 <*package>
2 <@@=metrix>
3 \ProvidesExplPackage
4   {\metrixFileName}{\metrixFileDate}{\metrixFileVersion}{\metrixFileDescription}
```

### 9.1 Required packages

```
5 \RequirePackage{xparse}
6 \RequirePackage{xpatch}
7 \RequirePackage{tikz}
8 \ExplSyntaxOff
9 \usetikzlibrary{calc}
10 \ExplSyntaxOn
```

### 9.2 Variables

All variables are internal. The user can change them via `\setmetrixvar` and use them via `\usemetrixvar`.

`\g__metrix_variable_symbollinewidth_tl`

This variable stores the line width for all metric symbols above (or below) syllables.

```
11 \tl_new:N \g__metrix_variable_symbollinewidth_tl
12 \tl_set:Nn \g__metrix_variable_symbollinewidth_tl { 0.04em }
(End definition for \g__metrix_variable_symbollinewidth_tl.)
```

`\g__metrix_variable_bigsymbollinewidth_tl`

This variable stores the line width for all stand alone metric symbols.

```
13 \tl_new:N \g__metrix_variable_bigsymbollinewidth_tl
14 \tl_set:Nn \g__metrix_variable_bigsymbollinewidth_tl { 0.06em }
```

(End definition for `\g__metrix_variable_bigsymbollinewidth_tl`.)

`\g__metrix_variable_accentlinewidth_tl` This variable stores the line width of the accent like symbols.

```
15 \tl_new:N \g__metrix_variable_accentlinewidth_tl
16 \tl_set:Nn \g__metrix_variable_accentlinewidth_tl { 0.04em }
(End definition for \g__metrix_variable_accentlinewidth_tl.)
```

`\g__metrix_variable_bowlinewidth_tl` This variable stores the line width of the bow.

```
17 \tl_new:N \g__metrix_variable_bowlinewidth_tl
18 \tl_set:Nn \g__metrix_variable_bowlinewidth_tl { 0.04em }
(End definition for \g__metrix_variable_bowlinewidth_tl.)
```

`\g__metrix_variable_symbolsep_tl` This variable stores the gap between two or more stand alone metric symbols.

```
19 \tl_new:N \g__metrix_variable_symbolsep_tl
20 \tl_set:Nn \g__metrix_variable_symbolsep_tl { 0.4em }
(End definition for \g__metrix_variable_symbolsep_tl.)
```

`\g__metrix_variable_baseunit_tl` This variable stores the length of the basis vector for all metric symbols above (or below) syllables and accent like symbols.

```
21 \tl_new:N \g__metrix_variable_baseunit_tl
22 \tl_set:Nn \g__metrix_variable_baseunit_tl { 0.9em }
(End definition for \g__metrix_variable_baseunit_tl.)
```

`\g__metrix_variable_bigbaseunit_tl` This variable stores the length of the basis vector for all stand alone metric symbols.

```
23 \tl_new:N \g__metrix_variable_bigbaseunit_tl
24 \tl_set:Nn \g__metrix_variable_bigbaseunit_tl { 1.4em }
(End definition for \g__metrix_variable_bigbaseunit_tl.)
```

`\g__metrix_variable_gap_tl` Length for small gaps in the symbols, e.g. the gap between the two bows of an elementum biceps.

```
25 \tl_new:N \g__metrix_variable_gap_tl
26 \tl_set:Nn \g__metrix_variable_gap_tl { 0.09em }
(End definition for \g__metrix_variable_gap_tl.)
```

`\g__metrix_variable_symbolshift_tl` This variable stores the value to shift metric symbols above (or below) syllables. Set this variable to approx 1.1em to draw the symbols above the syllable and to -0.6em to draw them below.

```
27 \tl_new:N \g__metrix_variable_symbolshift_tl
28 \tl_set:Nn \g__metrix_variable_symbolshift_tl { 1.1em }
(End definition for \g__metrix_variable_symbolshift_tl.)
```

`\g__metrix_variable_lngshift_tl` This variable stores the value to shift the longa accent.

```
29 \tl_new:N \g__metrix_variable_lngshift_tl
30 \tl_set:Nn \g__metrix_variable_lngshift_tl { 0.15em }
(End definition for \g__metrix_variable_lngshift_tl.)
```



`\g__metrix_variable_lngshortening_tl` This variable stores the value to shorten the longa accent.

```

31 \tl_new:N \g__metrix_variable_lngshortening_tl
32 \tl_set:Nn \g__metrix_variable_lngshortening_tl { 0.075em }
(End definition for \g__metrix_variable_lngshortening_tl.)

```

`\g__metrix_variable_lngminlength_tl` This variable stores the value to shorten the longa accent.

```

33 \tl_new:N \g__metrix_variable_lngminlength_tl
34 \tl_set:Nn \g__metrix_variable_lngminlength_tl { 0.25em }
(End definition for \g__metrix_variable_lngminlength_tl.)

```

`\g__metrix_variable_brvshift_tl` This variable stores the value to shift the brevis accent.

```

35 \tl_new:N \g__metrix_variable_brvshift_tl
36 \tl_set:Nn \g__metrix_variable_brvshift_tl { 0.25em }
(End definition for \g__metrix_variable_brvshift_tl.)

```

`\g__metrix_variable_dotshift_tl` This variable stores the value to shift the brevis accent.

```

37 \tl_new:N \g__metrix_variable_dotshift_tl
38 \tl_set:Nn \g__metrix_variable_dotshift_tl { -0.15em }
(End definition for \g__metrix_variable_dotshift_tl.)

```

`\g__metrix_variable_itcorrection_tl` These variables are used to set the italic correction of accents.

`\l__metrix_internal_itcorrection_tl`

`\g__metrix_internal_itcorrection_zero_tl`

```

39 \tl_new:N \g__metrix_variable_itcorrection_tl
40 \tl_set:Nn \g__metrix_variable_itcorrection_tl { 0.11em }
41 \tl_new:N \l__metrix_internal_itcorrection_tl
42 \tl_set:Nn \l__metrix_internal_itcorrection_tl { 0em }
43 \tl_new:N \g__metrix_internal_itcorrection_zero_tl
44 \tl_set:Nn \g__metrix_internal_itcorrection_zero_tl { 0em }
(End definition for \g__metrix_variable_itcorrection_tl, \l__metrix_internal_itcorrection_tl, and
\g__metrix_internal_itcorrection_zero_tl.)

```

`\g__metrix_variable_accentxshift_tl` This variable is used to shift the accents horizontally.

```

45 \tl_new:N \g__metrix_variable_accentxshift_tl
46 \tl_set:Nn \g__metrix_variable_accentxshift_tl { -0.025em }
(End definition for \g__metrix_variable_accentxshift_tl.)

```

`\g__metrix_variable_bowshift_tl` This variable stores the value to shift the bow.

```

47 \tl_new:N \g__metrix_variable_bowshift_tl
48 \tl_set:Nn \g__metrix_variable_bowshift_tl { -0.15em }
(End definition for \g__metrix_variable_bowshift_tl.)

```

`\g__metrix_variable_bowshortening_tl` This variable stores the value to shrink the bow.

```

49 \tl_new:N \g__metrix_variable_bowshortening_tl
50 \tl_set:Nn \g__metrix_variable_bowshortening_tl { 0.15em }
(End definition for \g__metrix_variable_bowshortening_tl.)

```

`\g__metrix_variable_bowlooseness_tl` This variable stores the value to shrink the bow.

```

51 \tl_new:N \g__metrix_variable_bowlooseness_tl
52 \tl_set:Nn \g__metrix_variable_bowlooseness_tl { 0.75 }

```

(End definition for `\g__metrix_variable_bowlooseness_tl`.)

`\g__metrix_variable_symbolcolor_tl` These variables store the color of symbols, accents and bows.

```
\g__metrix_variable_accentcolor_tl 53 \tl_new:N \g__metrix_variable_symbolcolor_tl
g__metrix_variable_bowcolor_tl      54 \tl_set:Nn \g__metrix_variable_symbolcolor_tl { black }
                                     55 \tl_new:N \g__metrix_variable_accentcolor_tl
                                     56 \tl_set:Nn \g__metrix_variable_accentcolor_tl { black }
                                     57 \tl_new:N \g__metrix_variable_bowcolor_tl
                                     58 \tl_set:Nn \g__metrix_variable_bowcolor_tl { black }
```

(End definition for `\g__metrix_variable_symbolcolor_tl`, `\g__metrix_variable_accentcolor_tl`, and `\g__metrix_variable_bowcolor_tl`.)

`\g__metrix_variable_highlightcolor_tl` These variable stores the color used in the colored highlight style.

```
59 \tl_new:N \g__metrix_variable_highlightcolor_tl
60 \tl_set:Nn \g__metrix_variable_highlightcolor_tl { red }
(End definition for \g__metrix_variable_highlightcolor_tl.)
```

`\g__metrix_variable_fillcolor_tl` These variable stores the color used in the filled highlight style.

```
61 \tl_new:N \g__metrix_variable_fillcolor_tl
62 \tl_set:Nn \g__metrix_variable_fillcolor_tl { yellow }
(End definition for \g__metrix_variable_fillcolor_tl.)
```

`\g__metrix_variable_breakgap_tl` This variable stores the width of the gap around the two break symbols.

```
63 \tl_new:N \g__metrix_variable_breakgap_tl
64 \tl_set:Nn \g__metrix_variable_breakgap_tl { 0.6em }
(End definition for \g__metrix_variable_breakgap_tl.)
```

`\g__metrix_variable_emptywidth_tl` This variable stores the width of the gap caused by an empty symbol (abbreviation e).

```
65 \tl_new:N \g__metrix_variable_emptywidth_tl
66 \tl_set:Nn \g__metrix_variable_emptywidth_tl { 1em }
(End definition for \g__metrix_variable_emptywidth_tl.)
```

`\l__metrix_words_tl` This list stores the words of the `\metrics` macro.

```
67 \tl_new:N \l__metrix_words_tl
(End definition for \l__metrix_words_tl.)
```

`\l__metrix_syllables_seq` This list stores the words of the `\l__metrix_words_tl` list.

```
68 \seq_new:N \l__metrix_syllables_seq
(End definition for \l__metrix_syllables_seq.)
```

`\l__metrix_symbols_seq` This list stores the metric symbols of `\metrics` and `\metricsymbols`.

```
69 \seq_new:N \l__metrix_symbols_seq
(End definition for \l__metrix_symbols_seq.)
```

`\l__metrix_highlights_prop` This list stores the highlighting styles of `\metrics` and `\metricsymbols`.

```
70 \prop_new:N \l__metrix_highlights_prop
(End definition for \l__metrix_highlights_prop.)
```

<code>\l__metrix_highlight_seq</code> <code>\l__metrix_highlight_pos_seq</code>	<p>This lists are used to evaluate a highlight style.</p> <pre> 71 \seq_new:N \l__metrix_highlight_seq 72 \seq_new:N \l__metrix_highlight_pos_seq (End definition for \l__metrix_highlight_seq and \l__metrix_highlight_pos_seq) </pre>
<code>\q__metrix_space_marker</code>	<p>This is the marker for spaces inside of the <code>\l__metrix_words_tl</code> list.</p> <pre> 73 \quark_new:N \q__metrix_space_marker (End definition for \q__metrix_space_marker.) </pre>
<code>\l__metrix_process_int</code>	<p>This process counter is used to combine the symbols and syllables.</p> <pre> 74 \int_new:N \l__metrix_process_int (End definition for \l__metrix_process_int.) </pre>
<code>\l__metrix_short_syllable_bool</code> <code>\l__metrix_syllable_box</code> <code>\g__metrix_variable_shortsyllablelimit_tl</code>	<p>This boolean can be used to store that a syllable is short, e.g. <i>li</i> will be defined as short whereas <i>man</i> is long. That will be used to shorten the <code> _ </code> symbol. Furthermore we'll need a box to measure the length of a syllable and a variable to save the limit for short syllables.</p> <pre> 75 \bool_new:N \l__metrix_short_syllable_bool 76 \box_new:N \l__metrix_syllable_box 77 \tl_new:N \g__metrix_variable_shortsyllablelimit_tl 78 \tl_set:Nn \g__metrix_variable_shortsyllablelimit_tl { 0.8em } (End definition for \l__metrix_short_syllable_bool, \l__metrix_syllable_box, and \g__metrix_variable_shortsyllablelimit_tl) </pre>

### 9.3 Variants

Later we'll need the following variant.

```

79 \cs_generate_variant:Nn \prop_get:Nn { No , Nf , NV , Nx }
80 \cs_generate_variant:Nn \prop_put:Nnn { Nnx , Nxx , Nff , Noo }
81 \cs_generate_variant:Nn \seq_item:Nn { Nf , NV , Nx }
82 \cs_generate_variant:Nn \seq_set_split:Nnn { Nnf , NnV , Nnx }

```

### 9.4 Internal main macros

`\__metrix_metrics:nn` This macro processes the two lists of `\metrics` and combines the symbols and syllables.<sup>4</sup>

```

83 \cs_new_protected:Npn \__metrix_metrics:nn #1 #2
84 {
85   \tl_set:Nx \l__metrix_words_tl { \tl_trim_spaces:n { #2 } }

```

First replace the spaces by a special marker `\q__metrix_space_marker` and add hyphens: a space becomes a syllable.

```

86   \tl_replace_all:Nnn \l__metrix_words_tl { ~ } { - \q__metrix_space_marker - }

```

Then split the word list at hypens.

```

87   \seq_set_split:NnV \l__metrix_syllables_seq { - } \l__metrix_words_tl

```

---

<sup>4</sup>The framing of this macro was provided by Enrico Gregorio at <http://tex.stackexchange.com/q/124528/4918>, a follow up question was <http://tex.stackexchange.com/q/124698/4918>. David Carlisle and Bruno Le Floch lead me to the implementation of the highlighting mechanism, see <http://tex.stackexchange.com/q/124782/4918>

Split the symbol list at spaces

```
88 \seq_set_split:Nnx \l__metrix_symbols_seq { ~ } { \tl_trim_spaces:n { #1 } }
```

Test whether both lists got the same length:

```
89 \int_zero:N \l__metrix_process_int
90 \seq_map_inline:Nn \l__metrix_syllables_seq
91 {
92   \tl_if_eq:nnT { ##1 } { \q__metrix_space_marker }
93   { \int_incr:N \l__metrix_process_int }
94 }
95 \int_compare:nTF
96 {
97   \seq_count:N \l__metrix_syllables_seq -
98   \seq_count:N \l__metrix_symbols_seq = \l__metrix_process_int
99 }
100 {
```

continue with list processing, if the numbers are equal:

```
101 \int_zero:N \l__metrix_process_int
102 \seq_map_inline:Nn \l__metrix_syllables_seq
103 {
104   \int_incr:N \l__metrix_process_int
105   \tl_if_eq:nnTF { ##1 } { \q__metrix_space_marker }
106   {
```

If the syllable is a space the process counter must be decremented and a space is typeset.

```
107   \int_add:Nn \l__metrix_process_int { -1 }
108   \c_space_token
109 }
110 {
```

Finally typeset the syllable and it's symbol.

```
111   \str_case:nnn { ##1 }
112   {
113     { | }
114     {
115       \__metrix_break_node:n { \__metrix_l_break: }
116     }
117     { || }
118     {
119       \__metrix_break_node:n { \__metrix_ll_break: }
120     }
121   }
122   {
123     \__metrix_print_syllable:n { ##1 }
124   }
125 }
126 }
127 }
```

send an error, else.

```

128 {
129   \__metrix_error_msg:n
130   {
131     Numbers~of~symbols~(\seq_count:N \l__metrix_symbols_seq)~and~syllables~
132     (\int_eval:n
133     {
134       \seq_count:N \l__metrix_syllables_seq - \l__metrix_process_int
135     }
136     )~mismatch.
137   }
138 }
139 }

```

(End definition for \\_\_metrix\_metrics:nn.)

\\_\_metrix\_metricsymbols:n This macro works like \@\_metrics but is used to print stand alone metric symbols via \metricsymbols.

```

140 \cs_new_protected:Npn \__metrix_metricsymbols:n #1
141 {
142   \seq_set_split:Nnx \l__metrix_symbols_seq { ~ } { \tl_trim_spaces:n { #1 } }
143   \int_zero:N \l__metrix_process_int
144   \seq_map_inline:Nn \l__metrix_symbols_seq
145   {
146     \int_incr:N \l__metrix_process_int
147     \int_compare:nT { \l__metrix_process_int > 1 }
148     {
149       \hspace{\usemetrixvar{symbolsep}}
150     }
151     \str_case:nnn { ##1 }
152     {
153       { | }
154       {
155         \__metrix_break_gap:
156         \__metrix_align_symbol:n { \__metrix_l_bigmark: }
157         \__metrix_break_gap:
158       }
159       { || }
160       {
161         \__metrix_break_gap:
162         \__metrix_align_symbol:n { \__metrix_ll_bigmark: }
163         \__metrix_break_gap:
164       }
165     }
166     {
167       \__metrix_align_symbol:n { \__metrix_print_symbol: }
168     }
169   }
170 }

```

(End definition for \\_\_metrix\_metricsymbols:n.)

`\__metrix_print_syllable:n` This macro combines a single syllable and the corresponding metric symbol taken from the symbol list index with the process counter.

```

171 \cs_new_protected:Npn \__metrix_print_syllable:n #1
172 {
173   \group_begin:

```

Check whether the current syllable is short or long and set the corresponding `bbol`.

```

174   \hbox_set:Nn \l__metrix_syllable_box { #1 }
175   \dim_compare:nTF { \box_wd:N \l__metrix_syllable_box < \g__metrix_variable_shortsyllablelimit }
176     { \bool_set_true:N \l__metrix_short_syllable_bool }
177     { \bool_set_false:N \l__metrix_short_syllable_bool }

```

Set up the current highlight if it is defined

```

178   \cs_set:Npx \__metrix_current_highlight: {
179     \prop_get:NV \l__metrix_highlights_prop \l__metrix_process_int
180   }
181   \expandafter\tikzset\expandafter{\__metrix_current_highlight:}

```

Finally print the syllable and the symbol above. Use `{pgfinterruptboundingbox}` so that the symbol doesn't take space and doesn't cause gaps between the syllables.

```

182   \begin{tikzpicture}
183   [
184     baseline=(\l__metrix_syllable_node.base),
185   ]
186   \node [every~metrix~syllable~node] (\l__metrix_syllable_node) {#1};
187   \begin{pgfinterruptboundingbox}
188   \node [every~metrix~symbol~node]
189     at ($(\l__metrix_syllable_node.base)+(0,\usemetrixvar{symbolshift})
190       +(\tl_use:N \l__metrix_internal_itcorrection_tl,0)$)
191     { \__metrix_print_symbol: };
192   \end{pgfinterruptboundingbox}
193   \end{tikzpicture}
194   \group_end:
195 }

```

*(End definition for `\__metrix_print_syllable:n`)*

`\__metrix_print_symbol:` This command selects the right symbol by its abbreviation.

```

196 \cs_new_protected:Npn \__metrix_print_symbol:
197 {
198   \cs_if_exist_use:cF
199   {
200     __metrix\_seq_item:Nn \l__metrix_symbols_seq
201     { \l__metrix_process_int }_mark:
202   }
203   {
204     \__metrix_error_msg:n
205     {
206       Unknown~symbol~abbreviation~'\seq_item:Nn
207       \l__metrix_symbols_seq { \l__metrix_process_int }'.
208     }

```

```

209     }
210 }
(End definition for \_metrix_print_symbol:.)

```

## 9.5 Internal auxiliary macros

`\_metrix_error_msg:n` An abbreviation to throw an error message.

```

211 \cs_new_protected:Npn \_metrix_error_msg:n #1
212 {
213   \PackageError{ \metrixFileName } { #1 }
214   {
215     Please take a look at the manual or send an email.
216   }
217 }
(End definition for \_metrix_error_msg:n.)

```

`\_metrix_warning_msg:n` An abbreviation to throw an error message.

```

218 \cs_new_protected:Npn \_metrix_warning_msg:n #1
219 {
220   \PackageWarning{ \metrixFileName } { #1 }
221 }
(End definition for \_metrix_warning_msg:n.)

```

`\_metrix_align_symbol:n` This macro aligns the metric symbols in a stand alone list.

```

222 \cs_new_protected:Npn \_metrix_align_symbol:n #1
223 {
224   \group_begin:
225   \cs_set:Npx \_metrix_current_highlight: {
226     \prop_get:NV \l__metrix_highlights_prop \l__metrix_process_int
227   }
228   \expandafter\tikzset\expandafter{\_metrix_current_highlight:}
229   \begin{tikzpicture}
230     [
231       baseline={ (0,-0.25*\usemetrixvar{baseunit}) },
232     ]
233     \node [every~metrix~symbol~node] {#1};
234   \end{tikzpicture}
235   \group_end:
236 }
(End definition for \_metrix_align_symbol:n.)

```

`\_metrix_break_gap:` This macro typsets the gap around the two break symbols.

```

237 \cs_new_protected:Npn \_metrix_break_gap:
238 {
239   \hspace{\usemetrixvar{breakgap}}
240 }
(End definition for \_metrix_break_gap:.)

```

`\__metrix_break_node:n` This macro typsets the gap around the two break symbols.

```

241
242 \cs_new:Npn \__metrix_break_node:n #1
243 {
244   \group_begin:
245   \cs_set:Npx \__metrix_current_highlight: {
246     \prop_get:NV \l__metrix_highlights_prop \l__metrix_process_int
247   }
248   \expandafter\tikzset\expandafter{\__metrix_current_highlight:}
249   \tikz[baseline=(l__metrix_break_node.base)]
250     \node (l__metrix_break_node) [every~metrix~break~node] { #1 }
251   ;
252   \group_end:
253 }
254
255
256

```

*(End definition for \\_\_metrix\_break\_node:n.)*

`\__metrix_e_gap:` This macro typsets the gap around the two break symbols.

```

257 \cs_new_protected:Npn \__metrix_e_gap:
258 {
259   \hspace*{\usemetrixvar{emptywidth}}
260 }

```

*(End definition for \\_\_metrix\_e\_gap:.)*

`\__metrix_evaluate_highlights:N` This macro typsets the gap around the two break symbols.

```

261 \cs_new_protected:Npn \__metrix_evaluate_highlights:n #1
262 {

```

Start with clearing the property list, otherwise the highlights from the last time will survive.

```

263   \prop_clear:N \l__metrix_highlights_prop

```

Then spilt and process the argument as a comma separated list.

```

264   \clist_map_inline:nn { #1 }
265   {

```

The result is a sequence of key value pairs that we store in `\l__metrix_highlight_seq`. The first part of this sequence must be split again at the plus sign—store it in `\l__metrix_highlight_pos_seq`.

```

266     \seq_set_split:Nnn \l__metrix_highlight_seq { = } { ##1 }
267     \seq_set_split:Nnf \l__metrix_highlight_pos_seq { + }
268     {
269       \seq_item:Nn \l__metrix_highlight_seq { 1 }
270     }

```

Process the `\l__metrix_highlight_pos_seq` list and set up the property list:

```

271     \seq_map_inline:Nn \l__metrix_highlight_pos_seq
272     {
273       \prop_put:Nnx \l__metrix_highlights_prop

```



The key is the current item of `\l__metrix_highlight_pos_seq`.

```
274     {
275         #####1
276     }
277     {
```

The value is the second item of `\l__metrix_highlight_seq`.

```
278         \seq_item:Nn \l__metrix_highlight_seq { 2 }
279     }
280 }
281 }
282 }
```

*(End definition for `\__metrix_evaluate_highlights:N`.)*

## 9.6 Patching font macros

To apply the italic correction of the accents we need to patch the font switches.

```
283 \xpretocmd { \itshape }
284 {
285     \tl_set_eq:NN
286     \l__metrix_internal_itcorrection_tl
287     \g__metrix_variable_itcorrection_tl
288 }
289 { }
290 {
291     \__metrix_warning_msg:n { Could-not-patch~\string\itshape. }
292 }
293 \xpretocmd { \slshape }
294 {
295     \tl_set_eq:NN
296     \l__metrix_internal_itcorrection_tl
297     \g__metrix_variable_itcorrection_tl
298 }
299 { }
300 {
301     \__metrix_warning_msg:n { Could-not-patch~\string\slshape. }
302 }
303 \xpretocmd { \upshape }
304 {
305     \tl_set_eq:NN
306     \l__metrix_internal_itcorrection_tl
307     \g__metrix_internal_itcorrection_zero_tl
308 }
309 { }
310 {
311     \__metrix_warning_msg:n { Could-not-patch~\string\upshape. }
312 }
313 \xpretocmd { \normalfont }
314 {
```

```

315 \tl_set_eq:NN
316 \l__metrix_internal_itcorrection_tl
317 \g__metrix_internal_itcorrection_zero_tl
318 }
319 { }
320 {
321 \__metrix_warning_msg:n { Could-not~patch~\string\normalfont. }
322 }

```

## 9.7 Internal macros for metric symbols

`\__metrix_e_mark:` The empty symbol.

```

323 \cs_new:Npn \__metrix_e_mark: { \__metrix_e_gap: }
(End definition for \__metrix_e_mark:.)

```

`\__metrix_u_mark:` The brevis symbol  $\upsilon$ .

```

324 \cs_new:Npn \__metrix_u_mark:
325 {
326 \begin{tikzpicture}[every~metrix~symbol]
327 \draw (0,0) arc [start~angle=0, end~angle=180, radius=-0.225];
328 \end{tikzpicture}
329 }
(End definition for \__metrix_u_mark:.)

```

`\__metrix__mark:` The longa symbol  $\text{—}$ .

```

330 \cs_new:Npn \__metrix__mark:
331 {
332 \bool_if:NTF \l__metrix_short_syllable_bool
333 {
334 \begin{tikzpicture}[every~metrix~symbol]
335 \draw (0,0) -- ++(0.4,0);
336 \end{tikzpicture}
337 }
338 {
339 \begin{tikzpicture}[every~metrix~symbol]
340 \draw (0,0) -- ++(0.75,0);
341 \end{tikzpicture}
342 }
343 }
(End definition for \__metrix__mark:.)

```

`\__metrix_uu_mark:` The biceps symbol  $\text{⋈}$ .

```

344 \cs_new:Npn \__metrix_uu_mark:
345 {
346 \begin{tikzpicture}[every~metrix~symbol]
347 \draw (0,0) arc [start~angle=0, end~angle=180, radius=-0.2];
348 \draw ($(0.4,0)+(\pgflinewidth,0)+(\usemetrixvar{gap},0)$) arc
349 [start~angle=0, end~angle=180, radius=-0.2];

```

```

350 \end{tikzpicture}
351 }
(End definition for \_metrix_uu\_mark:.)

```

\\_metrix\_uu\\_mark: The biceps symbol  $\curvearrowright$ .

```

352 \cs_new:Npn \_metrix_uu\_mark:
353 {
354 \begin{tikzpicture}[every-metrix-symbol]
355 \draw (0,0) arc [start-angle=0, end-angle=180, radius=-0.2];
356 \draw ($(0.4,0)+(\pgflinewidth,0)+(\usemetrixvar{gap},0)$) arc
357 [start-angle=0, end-angle=180, radius=-0.2];
358 \draw ($(0,-0.2)+(-0.5\pgflinewidth,-\pgflinewidth)-(0,\usemetrixvar{gap})$) --
359 ($(0.8,-0.2)+(1.5\pgflinewidth,-\pgflinewidth)
360 +(\usemetrixvar{gap},-\usemetrixvar{gap})$);
361 \end{tikzpicture}
362 }
(End definition for \_metrix_uu\_mark:.)

```

\\_metrix\_uu\\_mark: Another biceps symbol  $\curvearrowleft$ .

```

363 \cs_new:Npn \_metrix_uu\_mark:
364 {
365 \begin{tikzpicture}[every-metrix-symbol]
366 \draw (0,0) arc [start-angle=0, end-angle=180, radius=-0.2];
367 \draw ($(0.4,0)+(\pgflinewidth,0)+(\usemetrixvar{gap},0)$) arc
368 [start-angle=0, end-angle=180, radius=-0.2];
369 \draw ($(0,0)+(-0.5\pgflinewidth,0.5\pgflinewidth)+(0,\usemetrixvar{gap})$) --
370 ($(0.8,0)+(1.5\pgflinewidth,0.5\pgflinewidth)
371 +(\usemetrixvar{gap},\usemetrixvar{gap})$);
372 \end{tikzpicture}
373 }
(End definition for \_metrix_uu\_mark:.)

```

\\_metrix\_u\\_uu\\_mark: An another biceps symbol  $\curvearrowright\curvearrowleft$ .

```

374 \cs_new:Npn \_metrix_u\_uu\_mark:
375 {
376 \begin{tikzpicture}[every-metrix-symbol]
377 \draw (0,0) arc [start-angle=0, end-angle=180, radius=-0.2];
378 \draw ($(0.4,0)+(\pgflinewidth,0)+(\usemetrixvar{gap},0)$) arc
379 [start-angle=0, end-angle=180, radius=-0.2];
380 \draw ($(0,0)+(-0.5\pgflinewidth,0.5\pgflinewidth)+(0,\usemetrixvar{gap})$) --
381 ($(0.8,0)+(1.5\pgflinewidth,0.5\pgflinewidth)
382 +(\usemetrixvar{gap},\usemetrixvar{gap})$);
383 \draw ($(0.2,0.2)+(0.5\pgflinewidth,1.5\pgflinewidth)
384 +(0.5*\usemetrixvar{gap},2*\usemetrixvar{gap})$)
385 arc [start-angle=0, end-angle=180, radius=-0.2];
386 \end{tikzpicture}
387 }
(End definition for \_metrix_u\_uu\_mark:.)

```

`\_metrix_x_mark:` The anceps symbol  $\times$ .

```

388 \cs_new:Npn \_metrix_x_mark:
389 {
390   \begin{tikzpicture}[every~metrix~symbol]
391     \draw (-0.2,0.2) -- (0.2,-0.2);
392     \draw (-0.2,-0.2) -- (0.2,0.2);
393   \end{tikzpicture}
394 }

```

*(End definition for \\_metrix\_x\_mark:.)*

`\_metrix_oo_mark:` The aeolic symbol  $\circ\circ$ .

```

395 \cs_new:Npn \_metrix_oo_mark:
396 {
397   \begin{tikzpicture}[every~metrix~symbol]
398     \draw (0,0) circle [radius=0.2];
399     \draw ($(0.4,0)+(1\pgflinewidth,0)+(\usemetrixvar{gap},0)$) circle [radius=0.2];
400   \end{tikzpicture}
401 }

```

*(End definition for \\_metrix\_oo\_mark:.)*

`\_metrix_u_mark:` The indifferent symbol  $\surd$ .

```

402 \cs_new:Npn \_metrix_u_mark:
403 {
404   \begin{tikzpicture}[every~metrix~symbol]
405     \draw (0,0) arc [start~angle=0, end~angle=180, radius=-0.2];
406     \draw ($(0,-0.2)+(-0.5\pgflinewidth,-\pgflinewidth)-(0,\usemetrixvar{gap})$) --
407       ($(0.4,-0.2)+(0.5\pgflinewidth,-\pgflinewidth)
408       +(0,-\usemetrixvar{gap})$);
409     \fill [red] circle (0.2pt);
410   \end{tikzpicture}
411 }

```

*(End definition for \\_metrix\_u\_mark:.)*

`\_metrix_n_mark:` An alternative indifferent symbol  $\frown$ .

```

412 \cs_new:Npn \_metrix_n_mark:
413 {
414   \begin{tikzpicture}[every~metrix~symbol]
415     \draw (0,0) arc [start~angle=0, end~angle=180, radius=0.225];
416     \fill (-0.225,0.75*\usemetrixvar{symbollinewidth})
417       circle [radius=0.7\pgflinewidth];
418   \end{tikzpicture}
419 }

```

*(End definition for \\_metrix\_n\_mark:.)*

`\_metrix_l_mark:` The simple break symbol  $\mid$  (above syllables).

```

420 \cs_new:Npn \_metrix_l_mark:
421 {
422   \begin{tikzpicture}[every~metrix~symbol]

```

```

423   \draw (0,0) -- (0,0.5);
424   \end{tikzpicture}
425 }

```

(End definition for `\_metrix_l\_mark`.)

`\_metrix_ll\_mark`: The verse break symbol `||` (above syllables).

```

426 \cs_new:Npn \_metrix_ll\_mark:
427 {
428   \begin{tikzpicture}[every~metrix~symbol]
429     \draw (0,0) -- (0,0.5);
430     \draw ($(\pgflinewidth,0)+(1.5*\usemetrixvar{gap},0)$) -- ++(0,0.5);
431   \end{tikzpicture}
432 }

```

(End definition for `\_metrix_ll\_mark`.)

`\_metrix_l\_bigmark`: The simple break symbol `|` (stand alone version).

```

433 \cs_new:Npn \_metrix_l\_bigmark:
434 {
435   \begin{tikzpicture}[every~metrix~symbol]
436     \draw (0,0) -- (0,0.8);
437   \end{tikzpicture}
438 }

```

(End definition for `\_metrix_l\_bigmark`.)

`\_metrix_ll\_bigmark`: The verse break symbol `||` (stand alone version).

```

439 \cs_new:Npn \_metrix_ll\_bigmark:
440 {
441   \begin{tikzpicture}[every~metrix~symbol]
442     \draw (0,0) -- (0,0.8);
443     \draw ($(\pgflinewidth,0)+(1.5*\usemetrixvar{gap},0)$) -- ++(0,0.8);
444   \end{tikzpicture}
445 }

```

(End definition for `\_metrix_ll\_bigmark`.)

`\_metrix_l\_break`: The simple break symbol `|` (between syllables with symbols).

```

446 \cs_new:Npn \_metrix_l\_break:
447 {
448   \begin{tikzpicture}[every~metrix~symbol,baseline=0.05em]
449     \draw [shorten~<=-0.2em] (0,\usemetrixvar{symbolshift})
450       -- (0,0) -- (0,0.8em) -- (0,\usemetrixvar{symbolshift});
451   \end{tikzpicture}
452 }

```

(End definition for `\_metrix_l\_break`.)

`\_metrix_ll\_break`: The verse break symbol `||` (between syllables with symbols).

```

453 \cs_new:Npn \_metrix_ll\_break:
454 {
455   \begin{tikzpicture}[every~metrix~symbol,baseline=0.05em]

```

```

456 \draw [shorten~<=-0.2em] (0,\usemetrixvar{symbolshift})
457 -- (0,0) -- (0,0.8em) -- (0,\usemetrixvar{symbolshift});
458 \draw
459 [
460   shift={($(\pgflinewidth,0)+(1.5*\usemetrixvar{gap},0)$)},
461   shorten~<=-0.2em,
462 ]
463 (0,\usemetrixvar{symbolshift}) -- (0,0) -- (0,0.8em)
464 -- (0,\usemetrixvar{symbolshift});
465 \end{tikzpicture}
466 }
(End definition for \_metrix_ll_break.)

```

## 9.8 User level macros

**\setmetrixvar** This macro saves the value to an internal variable.

```

467 \NewDocumentCommand{ \setmetrixvar }{ m m }
468 {
469   \tl_if_exist:cTF { g__metrix_variable_#1_tl } {
470     \tl_set:cn { g__metrix_variable_#1_tl } { #2 }
471   }
472   {
473     \_metrix_error_msg:n { Unknown~variable~'#1'. }
474   }
475 }
(End definition for \setmetrixvar. This function is documented on page 12.)

```

**\usemetrixvar** With this command one can access the value of an internal variable.<sup>5</sup>

```

476 \DeclareExpandableDocumentCommand{ \usemetrixvar }{ m }
477 {
478   \tl_if_exist:cTF { g__metrix_variable_#1_tl } {
479     \tl_use:c { g__metrix_variable_#1_tl }
480   }
481   {
482     \_metrix_error_msg:n { Unknown~variable~'#1'. }
483   }
484 }
(End definition for \usemetrixvar. This function is documented on page 12.)

```

**\metrics** This user macro calls \@\_metrics to typeset syllables with symbols.

```

485 \NewDocumentCommand { \metrics } { 0{} m m }
486 {
487   \_metrix_evaluate_highlights:n { #1 }
488   \_metrix_metrics:nn { #2 } { #3 }
489 }
(End definition for \metrics. This function is documented on page 2.)

```

---

<sup>5</sup>Marco Daniel showed me this hint at <http://tex.stackexchange.com/q/124600/4918>.

**\metricsymbols** This command typesets stand alone symbols. The starred version prints smaller versions.

```

490 \NewDocumentCommand { \metricsymbols } { s O{} m }
491 {
492   \group_begin:
493   \IfBooleanF { #1 } { \tikzset{every-metrix-symbol/.style={every-metrix-big-symbol}} }
494   \__metrix_evaluate_highlights:n { #2 }
495   \__metrix_metricsymbols:n { #3 }
496   \group_end:
497 }

```

(End definition for \metricsymbols. This function is documented on page 2.)

**\lng** This macro prints the longa accent above it's argument.

```

498 \NewDocumentCommand { \lng } { m }
499 {
500   \begin{tikzpicture}[baseline=(l__metrix_syllable_node.base),every-metrix-accent]
501   \node [every-metrix-syllable-node] (l__metrix_syllable_node) {#1};
502   \begin{pgfinterruptboundingbox}
503   \draw
504     ($ (l__metrix_syllable_node.north)
505       - (\usemetrixvar{lngminlength}/2,0)
506       + (\usemetrixvar{accentxshift},\usemetrixvar{lngshift})
507       + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)$)
508     --
509     ($ (l__metrix_syllable_node.north)
510       + (\usemetrixvar{lngminlength}/2,0)
511       + (\usemetrixvar{accentxshift},\usemetrixvar{lngshift})
512       + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)$)
513     --
514     ($ (l__metrix_syllable_node.north-west)
515       + (\usemetrixvar{lngshortening}+\usemetrixvar{accentxshift},\usemetrixvar{lngshift})
516       + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)$)
517     --
518     ($ (l__metrix_syllable_node.north-east)
519       + (-\usemetrixvar{lngshortening}+\usemetrixvar{accentxshift},\usemetrixvar{lngshift})
520       + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)$)
521   ;
522   \end{pgfinterruptboundingbox}
523   \end{tikzpicture}%
524 }

```

(End definition for \lng. This function is documented on page 6.)

**\brv** This macro prints the brevis accent above it's argument.

```

525 \NewDocumentCommand { \brv } { m }
526 {
527   \begin{tikzpicture}[baseline=(l__metrix_syllable_node.base),every-metrix-accent]
528   \node [every-metrix-syllable-node] (l__metrix_syllable_node) {#1};
529   \begin{pgfinterruptboundingbox}
530   \draw ($ (l__metrix_syllable_node.north)+(-0.15,0)
531     + (\usemetrixvar{accentxshift},\usemetrixvar{brvshift})

```

```

532     + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)$)
533     arc [start~angle=0, end~angle=180, radius=-0.15];
534     \end{pgfinterruptboundingbox}
535   \end{tikzpicture}
536 }

```

(End definition for `\brv`. This function is documented on page 6.)

**\brv** This macro prints the dot accent below it's argument.

```

537 \NewDocumentCommand { \acct } { m }
538 {
539   \begin{tikzpicture}[baseline=(l__metrix_syllable_node.base),every~metrix~accent]
540     \node [every~metrix~syllable~node] (l__metrix_syllable_node) {#1};
541     \begin{pgfinterruptboundingbox}
542       \fill ($(l__metrix_syllable_node.south)
543         + (0,\usemetrixvar{dotshift}))$)
544         circle [radius=1.25\pgflinewidth];
545     \end{pgfinterruptboundingbox}
546   \end{tikzpicture}
547 }

```

(End definition for `\brv`. This function is documented on page 6.)

**\bow** This macro prints the bow below it's argument.

```

548 \NewDocumentCommand { \bow } { m }
549 {
550   \begin{tikzpicture}[baseline=(l__metrix_syllable_node.base),every~metrix~bow]
551     \node [every~metrix~syllable~node] (l__metrix_syllable_node) {#1};
552     \draw ($(l__metrix_syllable_node.base~west)+
553       (\usemetrixvar{bowshortening},\usemetrixvar{bowshift}))$)
554       to [out=-45, in=225, looseness=\usemetrixvar{bowlooseness}] ($(l__metrix_syllable_node.base~
555         (-\usemetrixvar{bowshortening},\usemetrixvar{bowshift}))$);
556   \end{tikzpicture}
557 }

```

(End definition for `\bow`. This function is documented on page 6.)

## 9.9 TikZ styles

The **mëtrix** package uses several TikZ styles to draw the macros.

```

558 \ExplSyntaxOff
559 \tikzset {
560   every metrix symbol/.style={
561     line width=\usemetrixvar{symbollinewidth},
562     color=\usemetrixvar{symbolcolor},
563     x=\usemetrixvar{baseunit},y=\usemetrixvar{baseunit},
564   },
565   every metrix big symbol/.style={
566     line width=\usemetrixvar{bigsymbollinewidth},
567     color=\usemetrixvar{symbolcolor},
568     x=\usemetrixvar{bigbaseunit},y=\usemetrixvar{bigbaseunit},

```



```

569 },
570 every metrix symbol node/.style={
571   inner sep=0pt, anchor=center,
572 },
573 every metrix break node/.style={
574   inner sep=0pt, anchor=base,
575 },
576 every metrix syllable node/.style={
577   inner sep=0pt, anchor=base,
578 },
579 every metrix bow/.style={
580   line width=\usemetrixvar{bowlinewidth},
581   color=\usemetrixvar{bowcolor},
582   x=\usemetrixvar{baseunit},y=\usemetrixvar{baseunit},
583 },
584 every metrix accent/.style={
585   line width=\usemetrixvar{accentlinewidth},
586   color=\usemetrixvar{accentcolor},
587   x=\usemetrixvar{baseunit},y=\usemetrixvar{baseunit},
588 },
589 bold highlight/.style={
590   every metrix symbol/.append style={line width=2\pgflinewidth},
591   every metrix syllable node/.append style={font=\bfseries},
592   every superscript node/.append style={font/.expand once=\tikz@textfont\bfseries},
593 },
594 colored highlight/.style={
595   every metrix symbol/.append style={draw=#1},
596   every metrix syllable node/.append style={text=#1},
597   every superscript node/.append style={text=#1},
598 },
599 colored highlight/.default={
600   \usemetrixvar{highlightcolor}
601 },
602 dashed highlight/.style={
603   every metrix symbol/.append style={dash pattern=on 1pt off 0.4pt},
604 },
605 filled highlight/.style={
606   every metrix symbol node/.append style={inner sep=2pt,fill=#1},
607 },
608 filled highlight/.default={
609   \usemetrixvar{fillcolor},
610 },
611 every superscript picture/.style={
612   baseline=-3ex,
613 },
614 every superscript node/.style={
615   inner sep=0pt,
616   font=\scriptsize,
617 },
618 every superscript label/.style={

```

```

619   inner xsep=0pt,
620   inner ysep=-3ex,
621   label distance=0.5pt,
622 },
623 add superscript/.style={
624   label={[every superscript label]right:{%
625     \tikz[every superscript picture]\node at (0,0) [every superscript node] {#1};%
626   }},
627 },
628 superscript/.style={
629   every metrix symbol node/.append style={
630     add superscript=#1,
631   },
632   every metrix break node/.append style={
633     add superscript=#1,
634   },
635 },
636 superscript/.value required,
637 }
638 \ExplSyntaxOn

```

## 9.10 Environments

**symbolline** Environment to display stand alone symbols.

```

639 \NewDocumentEnvironment{symbolline} { }
640 {
641   \par\addvspace{\baselineskip}
642   \centering
643 }
644 {
645   \par\vspace{\baselineskip}
646   \noindent\ignorespacesafterend
647 }

```

*(End definition for symbolline. This function is documented on page 6.)*

**\_\_metrix\_print\_source:n** The internal macro to print the verse reference inside of {metricvers}

```

648 \cs_new:Npn \__metrix_print_vers_ref:n #1
649 {
650   \hspace*{\fill}\nolinebreak[1] \quad \hspace*{\fill} \mbox{\footnotesize #1}
651 }

```

*(End definition for \\_\_metrix\_print\_source:n.)*

**metricverses** Environment to display a verse with metric symbols and a source. And a macro to print a right aligned reference.

**\verseref**

```

652 \NewDocumentCommand { \verseref } { m }
653 {
654   \__metrix_error_msg:n {
655     \string\verseref\space can~only~be~used~in~{metricverses}~env.
656   }

```

```

657 }
658 \NewDocumentEnvironment{metricverses} { }
659 {
660   \RenewDocumentCommand { \verseref } { m }
661   {
662     \__metrix_print_vers_ref:n { ##1 }
663   }
664   \par
665   \addvspace{0.7\baselineskip}
666   \fp_compare:nT { \usemetrixvar{symbolshift} < 0.0 }
667   {
668     \vspace{\usemetrixvar{symbolshift}}
669   }
670   \addtolength{\baselineskip}{0.6\baselineskip}
671 }
672 {
673   \par
674   \addtolength{\baselineskip}{-0.6\baselineskip}
675   \vspace{\baselineskip}
676   \noindent\ignorespacesafterend
677 }

```

(End definition for *metricverses* and *\verseref*. These functions are documented on page 7.)

```

678 \endpackage

```

## Change History

v1.0	v1.0a
General: Initial version . . . . . 35	General: Added cw1 file for TeXstudio . 1

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