

# The **mëtrix** package

Tobias Weh\*

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## Abstract

— — — — — | — ∪ ∪ — ∪ ∪ —  
et quod temptābam | scribere vërsus 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 brëvis and a lōnga accent<sup>1</sup> and a bow 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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\*URL: <http://tobiw.de/en>, Mail: [mail@tobiw.de](mailto:mail@tobiw.de)

<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 and report bugs or send me an e-mail ([mail@tobiw.de](mailto:mail@tobiw.de)).

Please note that I don't speak latin myself and so that the examples in this manual may be wrong—as long as they show how to use the package I don't consider such errors as bugs ;-).

## 4 Metric symbols

### 4.1 Syntax for symbols

Before I'll show you the central macros for typesetting the symbols, you need to “learn” the syntax for the symbols. All symbols are represented by a single or a combination of characters. The list with all available abbreviations can be found in table 1. Please keep in mind that **mëtrix** uses spaces to separate the abbreviations and something like `_ ' x` will cause an error, the correct input is `_ ' x`.

### 4.2 Stand alone metric symbols

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<code>\metricsymbols</code> ★	<code>\metricsymbols(*)[\langle highlighting \rangle]{\langle symbols \rangle}</code>
-------------------------------	---

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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. `\langle symbols \rangle` must be a list of abbreviations as explained in section 4.1; the 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_ }
```

— ∪ — ∪ ∪ | × — ∪ ∪ — × ∪

Table 1: Symbol abbreviations

abbreviation		symbol	explanation
e			empty (= invisible) symbol
u		◡	elementum breve
_	<i>under score</i>	—	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	<i>two lowercase o's</i>	OO	aeolic base
	<i>pipe</i>		break (see 4.4)
	<i>two pipes</i>		verse break (see 4.4)
'	<i>apostrophe</i>		shorter break (see 4.4)

### 4.3 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 argument works as in `\metricsymbols`, the second argument `⟨syllables⟩` takes the hyphenated verse.

#### 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 `oo` 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 _ _ _ | _ _ 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  $\varpi$  shows an *elementum biceps*.

## 4.4 Adding symbols for breaks

As seen in the examples above you can use pipes, i.e. `|` or `||`, to mark breaks. In `\metrics` the markers must appear in `<symbols>` and `<syllables>`.

#### Example

```
\metrics{ _ u u _ _ _ | _ _ u u _ || }
          {flos ve-te-ris vi-ni | meis na-ri-bus ob ||}
_ ^ ^ _ _ _ | _ _ ^ ^ _ ||
flos veteris vini | meis naribus ob ||
```

If you want the breaks to be shown in the symbol line only you can use the shorter break which is represented by an apostrophe, i.e. `'`. This mark must be used in `<symbols>` only and is kind of special:

- It *can't* be highlighted and thus doesn't count for the numbers used for highlights,
- it is ignored at the beginning and the end of `<symbols>`,
- in `\metricsymbols` it is treated like the pipe, and
- $\text{\TeX}$  needs at least one additional run to get the right positions.

#### Example

```
\metrics{ _ u u ' _ u u ' _ _ ' _ _ | _ u u | _ _ || }
          {Ar-ma vi-rum-que ca-no Tro-iae qui | pri-mus ab | o-ris ||}
_ ^ ^ | _ ^ ^ | _ _ | _ _ | _ ^ ^ | _ _ ||
Arma virumque cano Troiae qui | primus ab | oris ||
```

## 4.5 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.)

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

- **bold highlight**

flos veteris vini | meis naribus ob ||      ∪ ∞ × — | ∪ — ∩ ||

- **colored highlight=<color>**

flos veteris vini | meis naribus ob ||      ∪ ∞ × — | ∪ — ∩ ||

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`.

- **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>      ∪ ∞ × — |<sup>a</sup> ∪ — ∩ ||<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 Accents and bows

---

<code>\brv</code>	★	<code>\brv{⟨vowel⟩}</code>	<code>\lng{⟨vowel⟩}</code>	<code>\acct{⟨vowel⟩}</code>
<code>\lng</code>	★	The first commands offer an alternative to the standard accent macros <code>\u</code> and <code>\=</code> . The difference is that <code>\brv</code> centers the accent above the vowel or diphthong and <code>\lng</code> stretches the bar across the whole vowel or diphthong. <code>\acct</code> adds an accent dot below a vowel or diphthong. <sup>2</sup>		
<code>\acct</code>	★			

---

### 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
āmīcūs prōfūgūs
```

**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	æ æ æ	ű ű ű	ï ï ï	ǣ ǣ ǣ
ū ū ū	ī ī ī	ā ē āē	ū ū ū	ī ī ī	ā ē āē
ұ ұ ұ	і і і	ә ә ә	ұ ұ ұ	і і і	ә ә ә

### Fine Tuning

To make some fine tuning for a certain accent possible the three macros actually got some additional, *optional* arguments:

```
\brv(⟨coordinate⟩){⟨vowel⟩}
\lng(⟨coordinate⟩)[⟨left length⟩]{⟨vowel⟩}[⟨right length⟩]
\acct(⟨coordinate⟩){⟨vowel⟩}
```

Where `⟨coordinate⟩` must be a valid TikZ coordinate and can be used to move the accent. In addition to that the accent produced by `\lng` can be extended with `⟨left/right length⟩` by a certain amount.

### Example

Prevent collision between accent and descender of an *f*.

```
\itshape somn\acct(-0.05em,-0.45ex){i}fero
somniafero
```

---

<sup>2</sup>Actually you can use any vowel, diphthong, syllable or word as `⟨vowel⟩`, it makes no difference as long as it is text.

---

`\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
```

#### Fine Tuning

To make some fine tuning for a certain bow possible the macro actually has some additional, *optional* arguments:

`\bow(<coordinate>)[<left length>]{<syllable>}[<right length>]`

Where `<left/right length>` can be used to shorten the bow by a certain amount.

#### Example

Prevent collision between accent and bow.

```
c\acct{oe}-1\bow{um \acct{e}}[2pt]st  
coe-lum est
```

## 6 Environments

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`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_}  
\end{sybolline}  
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
  ^  ^  ^  ^  ^  ^  |  me  ^  ^  ^  ^  ^  ^  ^  ^  ^
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  _  _  }
           {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

Plaut. *Curc.* 96f

Text text text ...

## 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 }{ \glqq si me\grqq }% with \usepackage[<lang>]{babel}
\metrics{ _ u }{ "‘si me'" }% with \usepackage[ngerman]{babel}
_ _      _ _      _ _
“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 } \quad 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_u x _ || u _ n x}  
  
⌘ 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}  
  
— ∪ ∩ — — —  
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
```

Table 2: Variables

variable	default	explanation
<code>sympollinewidth</code>	<code>0.04em</code>	line width of symbols above syllables and small stand alone symbols
<code>bigsympollinewidth</code>	<code>0.06em</code>	line width of big stand alone symbols
<code>accentlinewidth</code>	<code>0.03em</code>	line width of accents ( <code>\lng</code> and <code>\brv</code> )
<code>bowlinewidth</code>	<code>0.03em</code>	line width of bows ( <code>\bow</code> )
<code>symbolsep</code>	<code>0.4em</code>	gap between symbols in stand alone lists
<code>baseunit</code>	<code>0.9em</code>	length of the base vector for drawing symbols above syllables, small stand alone symbols, accents and bows
...		

variable	default	explanation
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)

## 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.



<hr/> every metrix symbol every metrix big symbol every metrix symbol node <hr/>	These three styles define the apperance of the metric symbols. They define the line width, the color, the basis vectors and other things.
<hr/> every metrix syllable node every metrix break node <hr/>	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.
<hr/> every metrix accent <hr/>	This style defines the apperance of accents created by <code>\lng</code> and <code>\brv</code> .
<hr/> every metrix bow <hr/>	This style defines the apperance of bows below symbols.
<hr/> bold highlight colored highlight dashed highlight filled highlight superscript <hr/>	These styles can be used to highlight a certain symbol.
<hr/> every superscript picture every superscript node every superscript label <hr/>	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`.

<code>\g__metrix_variable_symbollinewidth_tl</code>	<p>This variable stores the line width for all metric symbols above (or below) syllables.</p> <pre> 11 \tl_new:N \g__metrix_variable_symbollinewidth_tl 12 \tl_set:Nn \g__metrix_variable_symbollinewidth_tl { 0.04em } </pre> <p>(End definition for <code>\g__metrix_variable_symbollinewidth_tl</code>.)</p>
<code>\g__metrix_variable_bigsymbollinewidth_tl</code>	<p>This variable stores the line width for all stand alone metric symbols.</p> <pre> 13 \tl_new:N \g__metrix_variable_bigsymbollinewidth_tl 14 \tl_set:Nn \g__metrix_variable_bigsymbollinewidth_tl { 0.06em } </pre> <p>(End definition for <code>\g__metrix_variable_bigsymbollinewidth_tl</code>.)</p>
<code>\g__metrix_variable_accentlinewidth_tl</code>	<p>This variable stores the line width of the accent like symbols.</p> <pre> 15 \tl_new:N \g__metrix_variable_accentlinewidth_tl 16 \tl_set:Nn \g__metrix_variable_accentlinewidth_tl { 0.04em } </pre> <p>(End definition for <code>\g__metrix_variable_accentlinewidth_tl</code>.)</p>
<code>\g__metrix_variable_bowlinewidth_tl</code>	<p>This variable stores the line width of the bow.</p> <pre> 17 \tl_new:N \g__metrix_variable_bowlinewidth_tl 18 \tl_set:Nn \g__metrix_variable_bowlinewidth_tl { 0.04em } </pre> <p>(End definition for <code>\g__metrix_variable_bowlinewidth_tl</code>.)</p>
<code>\g__metrix_variable_symbolsep_tl</code>	<p>This variable stores the gap between two or more stand alone metric symbols.</p> <pre> 19 \tl_new:N \g__metrix_variable_symbolsep_tl 20 \tl_set:Nn \g__metrix_variable_symbolsep_tl { 0.4em } </pre> <p>(End definition for <code>\g__metrix_variable_symbolsep_tl</code>.)</p>
<code>\g__metrix_variable_baseunit_tl</code>	<p>This variable stores the length of the basis vector for all metric symbols above (or below) syllables and accent like symbols.</p> <pre> 21 \tl_new:N \g__metrix_variable_baseunit_tl 22 \tl_set:Nn \g__metrix_variable_baseunit_tl { 0.9em } </pre> <p>(End definition for <code>\g__metrix_variable_baseunit_tl</code>.)</p>
<code>\g__metrix_variable_bigbaseunit_tl</code>	<p>This variable stores the length of the basis vector for all stand alone metric symbols.</p> <pre> 23 \tl_new:N \g__metrix_variable_bigbaseunit_tl 24 \tl_set:Nn \g__metrix_variable_bigbaseunit_tl { 1.4em } </pre> <p>(End definition for <code>\g__metrix_variable_bigbaseunit_tl</code>.)</p>
<code>\g__metrix_variable_gap_tl</code>	<p>Length for small gaps in the symbols, e.g. the gap between the two bows of an elementum biceps.</p> <pre> 25 \tl_new:N \g__metrix_variable_gap_tl 26 \tl_set:Nn \g__metrix_variable_gap_tl { 0.09em } </pre> <p>(End definition for <code>\g__metrix_variable_gap_tl</code>.)</p>

`\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_symbols_seq` This list stores the short breaks of `\metrics`.

70 `\seq_new:N \l__metrix_short_breaks_seq`

(End definition for `\l__metrix_symbols_seq`.)

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

71 `\prop_new:N \l__metrix_highlights_prop`

(End definition for `\l__metrix_highlights_prop`.)

`\l__metrix_highlight_seq` This lists are used to evaluate a highlight style.

`\l__metrix_highlight_pos_seq` 72 `\seq_new:N \l__metrix_highlight_seq`

73 `\seq_new:N \l__metrix_highlight_pos_seq`

(End definition for `\l__metrix_highlight_seq` and `\l__metrix_highlight_pos_seq`.)

`\q__metrix_space_marker` This is the marker for spaces inside of the `\l__metrix_words_tl` list.

74 `\quark_new:N \q__metrix_space_marker`

(End definition for `\q__metrix_space_marker`.)

`\l__metrix_process_int` This process counter is used to combine the symbols and syllables.

75 `\int_new:N \l__metrix_process_int`

(End definition for `\l__metrix_process_int`.)

`\l__metrix_short_syllable_bool` This boolean can be used to store that a syllable is short, e.g. *li* will be defined as short  
`\l__metrix_syllable_box` whereas *man* is long. That will be used to shorten the `|_|` symbol. Furthermore we'll need  
`\g__metrix_variable_shortsyllablelimit_tl` a box to measure the length of a syllable and a variable to save the limit for short syllables.

76 `\bool_new:N \l__metrix_short_syllable_bool`

77 `\box_new:N \l__metrix_syllable_box`

78 `\tl_new:N \g__metrix_variable_shortsyllablelimit_tl`

79 `\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`.)

### 9.3 Variants

Later we'll need the following variant.

```
80 \cs_generate_variant:Nn \prop_item:Nn { No , Nf , NV , Nx }
81 \cs_generate_variant:Nn \prop_put:Nnn { Nnx , Nxx , Nff , Noo }
82 \cs_generate_variant:Nn \seq_item:Nn { Nf , NV , Nx }
83 \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>3</sup>

```
84 \cs_new_protected:Npn \__metrix_metrics:nn #1 #2
85 {
86   \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.

```
87   \tl_replace_all:Nnn \l__metrix_words_tl { ~ } { - \q__metrix_space_marker - }
```

Then split the word list at hypens.

```
88   \seq_set_split:NnV \l__metrix_syllables_seq { - } \l__metrix_words_tl
```

Split the symbol list at spaces.

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

Search for the short breaks and remove them afterwards.

```
90   \int_zero:N \l__metrix_process_int
91   \seq_clear:N \l__metrix_short_breaks_seq
92   \seq_map_inline:Nn \l__metrix_symbols_seq {
93     \int_incr:N \l__metrix_process_int
94     \tl_if_eq:nnT { ##1 } { ' } {
95       \seq_put_right:Nx \l__metrix_short_breaks_seq { \int_use:N \l__metrix_process_int }
96       \int_decr:N \l__metrix_process_int
97     }
98   \seq_remove_all:Nn \l__metrix_symbols_seq { ' }
99 }
```

Test whether both lists got the same length:

```
100  \int_zero:N \l__metrix_process_int
101  \seq_map_inline:Nn \l__metrix_syllables_seq
102  {
103    \tl_if_eq:nnT { ##1 } { \q__metrix_space_marker }
104    { \int_incr:N \l__metrix_process_int }
105  }
106  \int_compare:nTF
107  {
108    \seq_count:N \l__metrix_syllables_seq -
```

---

<sup>3</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>

```

109     \seq_count:N \l__metrix_symbols_seq = \l__metrix_process_int
110   }
111   {

```

continue with list processing, if the numbers are equal:

```

112     \int_zero:N \l__metrix_process_int
113     \seq_map_inline:Nn \l__metrix_syllables_seq
114     {
115         \int_incr:N \l__metrix_process_int
116         \tl_if_eq:nnTF { ##1 } { \q__metrix_space_marker }
117         {

```

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

```

118             \int_add:Nn \l__metrix_process_int { -1 }
119             \c_space_token
120         }
121     }

```

Finally typeset the syllable and it's symbol.

```

122     \str_case:nnF { ##1 }
123     {
124         { | }
125         {
126             \__metrix_break_node:n { \__metrix_l_break: }
127         }
128         { || }
129         {
130             \__metrix_break_node:n { \__metrix_ll_break: }
131         }
132     }
133     {
134         \__metrix_print_syllable:n { ##1 }
135     }
136 }
137 }

```

And add the short break symbols if necessary:

```

138     \seq_if_empty:NF \l__metrix_short_breaks_seq {
139         \seq_map_inline:Nn \l__metrix_short_breaks_seq {
140             \int_set:Nn \l_tmpa_int { ##1 - 1 }
141             \bool_if:nF {
142                 \int_compare_p:n
143                 { 0 = \l_tmpa_int }
144                 ||
145                 \int_compare_p:n
146                 { \seq_count:N \l__metrix_symbols_seq = \l_tmpa_int }
147             } {
148                 \tikz [remember~picture, overlay] {
149                     \node [every~metrix~symbol~node] at
150                     ($(\l__metrix_symbol_node\int_use:N \l_tmpa_int.east)!
151                     0.5!(\l__metrix_symbol_node_##1.west)$)

```

```

152         { \_metrix_short_break: };
153     }
154 }
155 }
156 }
157 }

```

Send an error, else.

```

158 {
159     \_metrix_error_msg:n
160     {
161         Numbers~of~symbols~(\seq_count:N \l__metrix_symbols_seq)~and~syllables~
162         (\int_eval:n
163         {
164             \seq_count:N \l__metrix_syllables_seq - \l__metrix_process_int
165         }
166         )~mismatch.
167     }
168 }
169 }

```

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

`\_metrix_metricsymbols:n` This macro works like `\_metrix_metrics` but is used to print stand alone metric symbols via `\metricsymbols`.

```

170 \cs_new_protected:Npn \_metrix_metricsymbols:n #1
171 {
172     \seq_set_split:Nnx \l__metrix_symbols_seq { ~ } { \tl_trim_spaces:n { #1 } }
173     \int_zero:N \l__metrix_process_int
174     \seq_map_inline:Nn \l__metrix_symbols_seq
175     {
176         \int_incr:N \l__metrix_process_int
177         \int_compare:nT { \l__metrix_process_int > 1 }
178         {
179             \hspace{\usemetrixvar{symbolsep}}
180         }
181         \str_case:nnF { ##1 }
182         {
183             { ' }
184             {
185                 \_metrix_break_gap:
186                 \_metrix_align_symbol:n { \_metrix_l_bigmark: }
187                 \_metrix_break_gap:
188             }
189             { | }
190             {
191                 \_metrix_break_gap:
192                 \_metrix_align_symbol:n { \_metrix_l_bigmark: }
193                 \_metrix_break_gap:
194             }

```



```

195 { '' }
196 {
197   \__metrix_break_gap:
198   \__metrix_align_symbol:n { \__metrix_ll_bigmark: }
199   \__metrix_break_gap:
200 }
201 { || }
202 {
203   \__metrix_break_gap:
204   \__metrix_align_symbol:n { \__metrix_ll_bigmark: }
205   \__metrix_break_gap:
206 }
207 }
208 {
209   \__metrix_align_symbol:n { \__metrix_print_symbol: }
210 }
211 }
212 }

```

(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.

```

213 \cs_new_protected:Npn \__metrix_print_syllable:n #1
214 {
215   \group_begin:

```

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

```

216   \hbox_set:Nn \l__metrix_syllable_box { #1 }
217   \dim_compare:nTF
218     { \box_wd:N \l__metrix_syllable_box < \g__metrix_variable_shortsyllablelimit_tl }
219     { \bool_set_true:N \l__metrix_short_syllable_bool }
220     { \bool_set_false:N \l__metrix_short_syllable_bool }

```

Set up the current highlight if it is defined

```

221   \cs_set:Npx \__metrix_current_highlight: {
222     \prop_item:NV \l__metrix_highlights_prop \l__metrix_process_int
223   }
224   \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.

```

225   \hbox_set:Nn \l_tmpa_box { \__metrix_print_symbol: }
226   \begin{tikzpicture}
227   [
228     remember~picture,
229     baseline=(l__metrix_syllable_node.base),
230   ]
231   \node [every~metrix~syllable~node] (l__metrix_syllable_node) {#1};
232   \begin{pgfinterruptboundingbox}
233     \node [every~metrix~symbol~node]

```

```

234     (l__metrix_symbol_node_\int_use:N \l__metrix_process_int)
235     at {$(l__metrix_syllable_node.base)+(0,\usemetrixvar{symbolshift})
236     +(\tl_use:N \l__metrix_internal_itcorrection_tl,0)$}
237     { \box_use:N \l_tmpa_box };
238     \end{pgfinterruptboundingbox}
239     \end{tikzpicture}
240   \group_end:
241 }

```

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

**\\_\_metrix\_print\_symbol:** This command selects the right symbol by it's abbreviation.

```

242 \cs_new_protected:Npn \__metrix_print_symbol:
243 {
244   \cs_if_exist_use:cF
245   {
246     __metrix_\seq_item:Nn \l__metrix_symbols_seq
247     { \l__metrix_process_int }_mark:
248   }
249   {
250     \__metrix_error_msg:n
251     {
252       Unknown~symbol~abbreviation~'\seq_item:Nn
253       \l__metrix_symbols_seq { \l__metrix_process_int }'.
254     }
255   }
256 }

```

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

## 9.5 Internal auxiliary macros

**\\_\_metrix\_error\_msg:n** An abbreviation to throw an error message.

```

257 \cs_new_protected:Npn \__metrix_error_msg:n #1
258 {
259   \PackageError{ \metrixFileName } { #1 }
260   {
261     Please take a look at the manual or send an email.
262   }
263 }

```

*(End definition for \\_\_metrix\_error\_msg:n.)*

**\\_\_metrix\_warning\_msg:n** An abbreviation to throw an error message.

```

264 \cs_new_protected:Npn \__metrix_warning_msg:n #1
265 {
266   \PackageWarning{ \metrixFileName } { #1 }
267 }

```

*(End definition for \\_\_metrix\_warning\_msg:n.)*

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

```

268 \cs_new_protected:Npn \__metrix_align_symbol:n #1
269 {
270   \group_begin:
271   \cs_set:Npx \__metrix_current_highlight: {
272     \prop_item:NV \l__metrix_highlights_prop \l__metrix_process_int
273   }
274   \expandafter\tikzset\expandafter{\__metrix_current_highlight:}
275   \begin{tikzpicture}
276     [
277       baseline={(0,-0.25*\usemetrixvar{baseunit})},
278     ]
279     \node [every~metrix~symbol~node] {#1};
280   \end{tikzpicture}
281   \group_end:
282 }

```

*(End definition for \\_\_metrix\_align\_symbol:n.)*

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

```

283 \cs_new_protected:Npn \__metrix_break_gap:
284 {
285   \hspace{\usemetrixvar{breakgap}}
286 }

```

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

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

```

287
288 \cs_new:Npn \__metrix_break_node:n #1
289 {
290   \group_begin:
291   \cs_set:Npx \__metrix_current_highlight: {
292     \prop_item:NV \l__metrix_highlights_prop \l__metrix_process_int
293   }
294   \expandafter\tikzset\expandafter{\__metrix_current_highlight:}
295   \tikz[baseline=(l__metrix_break_node.base)]
296     \node (l__metrix_break_node) [every~metrix~break~node] { #1 }
297   ;
298   \group_end:
299 }
300
301
302

```

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

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

```

303 \cs_new_protected:Npn \__metrix_e_gap:
304 {

```

```

305 \hspace*{\usemetrixvar{emptywidth}}
306 }

```

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

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

```

307 \cs_new_protected:Npn \_metrix_evaluate_highlights:n #1
308 {

```

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

```

309 \prop_clear:N \l__metrix_highlights_prop

```

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

```

310 \clist_map_inline:nn { #1 }
311 {

```

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`.

```

312 \seq_set_split:Nnn \l__metrix_highlight_seq { = } { ##1 }
313 \seq_set_split:Nnf \l__metrix_highlight_pos_seq { + }
314 {
315 \seq_item:Nn \l__metrix_highlight_seq { 1 }
316 }

```

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

```

317 \seq_map_inline:Nn \l__metrix_highlight_pos_seq
318 {
319 \prop_put:Nnx \l__metrix_highlights_prop

```

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

```

320 {
321 ###1
322 }
323 {

```

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

```

324 \seq_item:Nn \l__metrix_highlight_seq { 2 }
325 }
326 }
327 }
328 }

```

*(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.

```
329 \xpretocmd { \itshape }
330 {
331   \tl_set_eq:NN
332   \l__metrix_internal_itcorrection_tl
333   \g__metrix_variable_itcorrection_tl
334 }
335 { }
336 {
337   \__metrix_warning_msg:n { Could-not-patch~\string\itshape. }
338 }
339 \xpretocmd { \slshape }
340 {
341   \tl_set_eq:NN
342   \l__metrix_internal_itcorrection_tl
343   \g__metrix_variable_itcorrection_tl
344 }
345 { }
346 {
347   \__metrix_warning_msg:n { Could-not-patch~\string\slshape. }
348 }
349 \xpretocmd { \upshape }
350 {
351   \tl_set_eq:NN
352   \l__metrix_internal_itcorrection_tl
353   \g__metrix_internal_itcorrection_zero_tl
354 }
355 { }
356 {
357   \__metrix_warning_msg:n { Could-not-patch~\string\upshape. }
358 }
359 \xpretocmd { \normalfont }
360 {
361   \tl_set_eq:NN
362   \l__metrix_internal_itcorrection_tl
363   \g__metrix_internal_itcorrection_zero_tl
364 }
365 { }
366 {
367   \__metrix_warning_msg:n { Could-not-patch~\string\normalfont. }
368 }
```

## 9.7 Internal macros for metric symbols

`\__metrix_e_mark:` The empty symbol.

```
369 \cs_new:Npn \__metrix_e_mark: { \__metrix_e_gap: }
```

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

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

```

370 \cs_new:Npn \__metrix_u_mark:
371 {
372   \begin{tikzpicture}[every~metrix~symbol]
373     \draw (0,0) arc [start~angle=0, end~angle=180, radius=-0.225];
374   \end{tikzpicture}
375 }

```

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

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

```

376 \cs_new:Npn \__metrix__mark:
377 {
378   \bool_if:NTF \l__metrix_short_syllable_bool
379   {
380     \begin{tikzpicture}[every~metrix~symbol]
381       \draw (0,0) -- ++(0.4,0);
382     \end{tikzpicture}
383   }
384   {
385     \begin{tikzpicture}[every~metrix~symbol]
386       \draw (0,0) -- ++(0.75,0);
387     \end{tikzpicture}
388   }
389 }

```

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

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

```

390 \cs_new:Npn \__metrix_uu_mark:
391 {
392   \begin{tikzpicture}[every~metrix~symbol]
393     \draw (0,0) arc [start~angle=0, end~angle=180, radius=-0.2];
394     \draw ($ (0.4,0) + (\pgflinewidth,0) + (\usemetrixvar{gap},0) $) arc
395       [start~angle=0, end~angle=180, radius=-0.2];
396   \end{tikzpicture}
397 }

```

*(End definition for \\_\_metrix\_uu\_mark:.)*

`\__metrix_uu__mark:` The biceps symbol  $\text{¨}$ .

```

398 \cs_new:Npn \__metrix_uu__mark:
399 {
400   \begin{tikzpicture}[every~metrix~symbol]
401     \draw (0,0) arc [start~angle=0, end~angle=180, radius=-0.2];
402     \draw ($ (0.4,0) + (\pgflinewidth,0) + (\usemetrixvar{gap},0) $) arc
403       [start~angle=0, end~angle=180, radius=-0.2];
404     \draw ($ (0,-0.2) + (-0.5\pgflinewidth,-\pgflinewidth) - (0,\usemetrixvar{gap}) $) --
405       ($ (0.8,-0.2) + (1.5\pgflinewidth,-\pgflinewidth)
406         + (\usemetrixvar{gap},-\usemetrixvar{gap}) $);

```

```

407 \end{tikzpicture}
408 }

(End definition for \_metrix_uu\_mark:.)

```

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

```

409 \cs_new:Npn \_metrix\_uu\_mark:
410 {
411   \begin{tikzpicture}[every-metrix-symbol]
412     \draw (0,0) arc [start-angle=0, end-angle=180, radius=-0.2];
413     \draw ($(0.4,0)+(\pgflinewidth,0)+(\usemetrixvar{gap},0)$) arc
414       [start-angle=0, end-angle=180, radius=-0.2];
415     \draw ($(0,0)+(-0.5\pgflinewidth,0.5\pgflinewidth)+(0,\usemetrixvar{gap})$) --
416       ($(0.8,0)+(1.5\pgflinewidth,0.5\pgflinewidth)
417         +(\usemetrixvar{gap},\usemetrixvar{gap})$);
418   \end{tikzpicture}
419 }

(End definition for \_metrix\_uu\_mark:.)

```

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

```

420 \cs_new:Npn \_metrix\_u\_uu\_mark:
421 {
422   \begin{tikzpicture}[every-metrix-symbol]
423     \draw (0,0) arc [start-angle=0, end-angle=180, radius=-0.2];
424     \draw ($(0.4,0)+(\pgflinewidth,0)+(\usemetrixvar{gap},0)$) arc
425       [start-angle=0, end-angle=180, radius=-0.2];
426     \draw ($(0,0)+(-0.5\pgflinewidth,0.5\pgflinewidth)+(0,\usemetrixvar{gap})$) --
427       ($(0.8,0)+(1.5\pgflinewidth,0.5\pgflinewidth)
428         +(\usemetrixvar{gap},\usemetrixvar{gap})$);
429     \draw ($(0.2,0.2)+(0.5\pgflinewidth,1.5\pgflinewidth)
430       +(0.5*\usemetrixvar{gap},2*\usemetrixvar{gap})$)
431       arc [start-angle=0, end-angle=180, radius=-0.2];
432   \end{tikzpicture}
433 }

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

```

\\_metrix\\_x\\_mark: The anceps symbol  $\times$ .

```

434 \cs_new:Npn \_metrix\_x\_mark:
435 {
436   \begin{tikzpicture}[every-metrix-symbol]
437     \draw (-0.2,0.2) -- (0.2,-0.2);
438     \draw (-0.2,-0.2) -- (0.2,0.2);
439   \end{tikzpicture}
440 }

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

```

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

```

441 \cs_new:Npn \__metrix_oo_mark:
442 {
443   \begin{tikzpicture}[every~metrix~symbol]
444     \draw (0,0) circle [radius=0.2];
445     \draw ($ (0.4,0)+(1\pgflinewidth,0)+(\usemetrixvar{gap},0)$ ) circle [radius=0.2];
446   \end{tikzpicture}
447 }

(End definition for \__metrix_oo_mark:.)

```

`\__metrix_u_mark:` The indifferent symbol  $\simeq$ .

```

448 \cs_new:Npn \__metrix_u_mark:
449 {
450   \begin{tikzpicture}[every~metrix~symbol]
451     \draw (0,0) arc [start~angle=0, end~angle=180, radius=-0.2];
452     \draw ($ (0,-0.2)+(-0.5\pgflinewidth,-\pgflinewidth)-(0,\usemetrixvar{gap})$ ) --
453       ($ (0.4,-0.2)+(0.5\pgflinewidth,-\pgflinewidth)
454         +(0,-\usemetrixvar{gap})$ );
455   \end{tikzpicture}
456 }

(End definition for \__metrix_u_mark:.)

```

`\__metrix_n_mark:` An alternative indifferent symbol  $\simeq$ .

```

457 \cs_new:Npn \__metrix_n_mark:
458 {
459   \begin{tikzpicture}[every~metrix~symbol]
460     \draw (0,0) arc [start~angle=0, end~angle=180, radius=0.225];
461     \fill (-0.225,0.75*\usemetrixvar{sybollinewidth})
462       circle [radius=0.7\pgflinewidth];
463   \end{tikzpicture}
464 }

(End definition for \__metrix_n_mark:.)

```

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

```

465 \cs_new:Npn \__metrix_l_mark:
466 {
467   \begin{tikzpicture}[every~metrix~symbol]
468     \draw (0,0) -- (0,0.5);
469   \end{tikzpicture}
470 }

(End definition for \__metrix_l_mark:.)

```

`\__metrix_ll_mark:` The verse break symbol  $\parallel$  (above syllables).

```

471 \cs_new:Npn \__metrix_ll_mark:
472 {
473   \begin{tikzpicture}[every~metrix~symbol]

```



```

474 \draw (0,0) -- (0,0.5);
475 \draw ($(\pgflinewidth,0)+(1.5*\usemetrixvar{gap},0)$) -- ++(0,0.5);
476 \end{tikzpicture}
477 }

```

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

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

```

478 \cs_new:Npn \_metrix_l\_bigmark:
479 {
480 \begin{tikzpicture}[every~metrix~symbol]
481 \draw (0,0) -- (0,0.8);
482 \end{tikzpicture}
483 }

```

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

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

```

484 \cs_new:Npn \_metrix_ll\_bigmark:
485 {
486 \begin{tikzpicture}[every~metrix~symbol]
487 \draw (0,0) -- (0,0.8);
488 \draw ($(\pgflinewidth,0)+(1.5*\usemetrixvar{gap},0)$) -- ++(0,0.8);
489 \end{tikzpicture}
490 }

```

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

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

```

491 \cs_new:Npn \_metrix_l\_break:
492 {
493 \begin{tikzpicture}[every~metrix~symbol,baseline=0.05em]
494 \draw (0,\usemetrixvar{symbolshift}+0.325em)
495 -- (0,-0.05em) -- (0,0.8em) -- (0,\usemetrixvar{symbolshift});
496 \end{tikzpicture}
497 }

```

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

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

```

498 \cs_new:Npn \_metrix_ll\_break:
499 {
500 \begin{tikzpicture}[every~metrix~symbol,baseline=0.05em]
501 \draw (0,\usemetrixvar{symbolshift}+0.325em)
502 -- (0,-0.05em) -- (0,0.8em) -- (0,\usemetrixvar{symbolshift});
503 \draw
504 [
505 shift={($(\pgflinewidth,0)+(1.5*\usemetrixvar{gap},0)$)},
506 ]
507 (0,\usemetrixvar{symbolshift}+0.325em) -- (0,-0.05em) -- (0,0.8em)
508 -- (0,\usemetrixvar{symbolshift});

```

```

509 \end{tikzpicture}
510 }

(End definition for \_metrix_ll_break.)

```

`\_metrix_short_break:` The shorter break symbol.

```

511 \cs_new:Npn \_metrix_short_break:
512 {
513   \begin{tikzpicture}[every-metrix-symbol]
514     \draw (0,0.3) -- (0,-0.3);
515   \end{tikzpicture}
516 }

(End definition for \_metrix_short_break:.)

```

## 9.8 User level macros

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

```

517 \NewDocumentCommand{ \setmetrixvar }{ m m }
518 {
519   \tl_if_exist:cTF { g__metrix_variable_#1_tl } {
520     \tl_set:cn { g__metrix_variable_#1_tl } { #2 }
521   }
522   {
523     \_metrix_error_msg:n { Unknown-variable~'#1'. }
524   }
525 }

(End definition for \setmetrixvar. This function is documented on page 14.)

```

`\usemetrixvar` With this command one can access the value of an internal variable.<sup>4</sup>

```

526 \DeclareExpandableDocumentCommand{ \usemetrixvar }{ m }
527 {
528   \tl_if_exist:cTF { g__metrix_variable_#1_tl } {
529     \tl_use:c { g__metrix_variable_#1_tl }
530   }
531   {
532     \_metrix_error_msg:n { Unknown-variable~'#1'. }
533   }
534 }

(End definition for \usemetrixvar. This function is documented on page 14.)

```

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

```

535 \NewDocumentCommand { \metrics } { 0{} m m }
536 {
537   \_metrix_evaluate_highlights:n { #1 }
538   \_metrix_metrics:nn { #2 } { #3 }
539 }

```

---

<sup>4</sup>Marco Daniel showed me this hint at <http://tex.stackexchange.com/q/124600/4918>.

(End definition for `\metrics`. This function is documented on page 3.)

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

```

540 \NewDocumentCommand { \metricsymbols } { s O{} m }
541 {
542   \group_begin:
543   \IfBooleanF { #1 } { \tikzset{every-metrix-symbol/.style={every-metrix-big-symbol}} }
544   \__metrix_evaluate_highlights:n { #2 }
545   \__metrix_metricsymbols:n { #3 }
546   \group_end:
547 }

```

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

**`\lng`** This macro prints the longa accent above its argument.

```

548 \NewDocumentCommand { \lng } { D(){} O{0pt} m O{0pt} }
549 {
550   \begin{tikzpicture}[baseline=(l__metrix_syllable_node.base),every-metrix-accent]
551     \node [every-metrix-syllable-node] (l__metrix_syllable_node) {#3};
552     \begin{pgfinterruptboundingbox}
553       \draw [shorten-< = -#2, shorten-> = -#4]
554         ($ (l__metrix_syllable_node.north)
555           - (\usemetrixvar{lngminlength}/2,0)
556           + (\usemetrixvar{accentxshift},\usemetrixvar{lngshift})
557           + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)
558           + (#1)$)
559         --
560         ($ (l__metrix_syllable_node.north)
561           + (\usemetrixvar{lngminlength}/2,0)
562           + (\usemetrixvar{accentxshift},\usemetrixvar{lngshift})
563           + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)
564           + (#1)$)
565       ;
566       \draw [shorten-< = -#2, shorten-> = -#4]
567         ($ (l__metrix_syllable_node.north-west)
568           + (\usemetrixvar{lngshortening}+\usemetrixvar{accentxshift},\usemetrixvar{lngshift})
569           + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)
570           + (#1)$)
571         --
572         ($ (l__metrix_syllable_node.north-east)
573           + (-\usemetrixvar{lngshortening}+\usemetrixvar{accentxshift},\usemetrixvar{lngshift})
574           + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)
575           + (#1)$)
576       ;
577     \end{pgfinterruptboundingbox}
578   \end{tikzpicture}%
579 }

```

(End definition for `\lng`. This function is documented on page 7.)

**\brv** This macro prints the brevis accent above its argument.

```

580 \NewDocumentCommand { \brv } { D() {0,0} m }
581 {
582   \begin{tikzpicture}[baseline=(l__metrix_syllable_node.base),every~metrix~accent]
583     \node [every~metrix~syllable~node] (l__metrix_syllable_node) {#2};
584     \begin{pgfinterruptboundingbox}
585       \draw ($(l__metrix_syllable_node.north)+(-0.15,0)
586         + (\usemetrixvar{accentxshift},\usemetrixvar{brvshift})
587         + (\tl_use:N \l__metrix_internal_itcorrection_tl,0)
588         + (#1)$)
589         arc [start~angle=0, end~angle=180, radius=-0.15];
590     \end{pgfinterruptboundingbox}
591   \end{tikzpicture}
592 }

```

(End definition for \brv. This function is documented on page 7.)

**\acct** This macro prints the dot accent below its argument.

```

593 \NewDocumentCommand { \acct } { D() {0,0} m }
594 {
595   \begin{tikzpicture}[baseline=(l__metrix_syllable_node.base),every~metrix~accent]
596     \node [every~metrix~syllable~node] (l__metrix_syllable_node) {#2};
597     \begin{pgfinterruptboundingbox}
598       \fill ($(l__metrix_syllable_node.south)
599         + (0,\usemetrixvar{dotshift})
600         + (#1)$)
601         circle [radius=1.25\pgflinewidth];
602     \end{pgfinterruptboundingbox}
603   \end{tikzpicture}
604 }

```

(End definition for \acct. This function is documented on page 7.)

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

```

605 \NewDocumentCommand { \bow } { 0{0pt} m 0{0pt} }
606 {
607   \begin{tikzpicture}[baseline=(l__metrix_syllable_node.base),every~metrix~bow]
608     \node [every~metrix~syllable~node] (l__metrix_syllable_node) {#2};
609     \draw [shorten~< = #1, shorten~> = #3]
610       ($(l__metrix_syllable_node.base~west)+
611         (\usemetrixvar{bowshortening},\usemetrixvar{bowshift})$)
612       to [out=-45, in=225, looseness=\usemetrixvar{bowlooseness}] ($(l__metrix_syllable_node.base~
613         (-\usemetrixvar{bowshortening},\usemetrixvar{bowshift})$);
614   \end{tikzpicture}
615 }

```

(End definition for \bow. This function is documented on page 8.)

## 9.9 TikZ styles

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

```
616 \ExplSyntaxOff
617 \tikzset {
618   every metrix symbol/.style={
619     line width=\usemetrixvar{symbollinewidth},
620     color=\usemetrixvar{symbolcolor},
621     x=\usemetrixvar{baseunit},y=\usemetrixvar{baseunit},
622   },
623   every metrix big symbol/.style={
624     line width=\usemetrixvar{bigsymbollinewidth},
625     color=\usemetrixvar{symbolcolor},
626     x=\usemetrixvar{bigbaseunit},y=\usemetrixvar{bigbaseunit},
627   },
628   every metrix symbol node/.style={
629     inner sep=0pt, anchor=center,
630   },
631   every metrix break node/.style={
632     inner sep=0pt, anchor=base,
633   },
634   every metrix syllable node/.style={
635     inner sep=0pt, anchor=base,
636   },
637   every metrix bow/.style={
638     line width=\usemetrixvar{bowlinewidth},
639     color=\usemetrixvar{bowcolor},
640     x=\usemetrixvar{baseunit},y=\usemetrixvar{baseunit},
641   },
642   every metrix accent/.style={
643     line width=\usemetrixvar{accentlinewidth},
644     color=\usemetrixvar{accentcolor},
645     x=\usemetrixvar{baseunit},y=\usemetrixvar{baseunit},
646   },
647   bold highlight/.style={
648     every metrix symbol/.append style={line width=2\pgflinewidth},
649     every metrix syllable node/.append style={font=\bfseries},
650     every superscript node/.append style={font/.expand once=\tikz@textfont\bfseries},
651   },
652   colored highlight/.style={
653     every metrix symbol/.append style={draw=#1},
654     every metrix syllable node/.append style={text=#1},
655     every superscript node/.append style={text=#1},
656   },
657   colored highlight/.default={
658     \usemetrixvar{highlightcolor}
659   },
660   dashed highlight/.style={
661     every metrix symbol/.append style={dash pattern=on 1pt off 0.4pt},
662   },
```

```

663 filled highlight/.style={
664   every metrix symbol node/.append style={inner sep=2pt,fill=#1},
665 },
666 filled highlight/.default={
667   \usemetrixvar{fillcolor},
668 },
669 every superscript picture/.style={
670   baseline=-3ex,
671 },
672 every superscript node/.style={
673   inner sep=0pt,
674   font=\scriptsize,
675 },
676 every superscript label/.style={
677   inner xsep=0pt,
678   inner ysep=-3ex,
679   label distance=0.5pt,
680 },
681 add superscript/.style={
682   label={[every superscript label]right:{%
683     \tikz[every superscript picture]\node at (0,0) [every superscript node] {#1};%
684   }},
685 },
686 superscript/.style={
687   every metrix symbol node/.append style={
688     add superscript=#1,
689   },
690   every metrix break node/.append style={
691     add superscript=#1,
692   },
693 },
694 superscript/.value required,
695 }
696 \ExplSyntaxOn

```

## 9.10 Environments

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

```

697 \NewDocumentEnvironment{symbolline} { }
698 {
699   \par\addvspace{\baselineskip}
700   \centering
701 }
702 {
703   \par\vspace{\baselineskip}
704   \noindent\ignorespacesafterend
705 }

```

*(End definition for symbolline. This function is documented on page 8.)*

`\__metrix_print_vers_ref:n` The internal macro to print the verse reference inside of `{metricvers}`

```

706 \cs_new:Npn \__metrix_print_vers_ref:n #1
707 {
708     \hspace*{\fill}\nolinebreak[1] \quad \hspace*{\fill} \mbox{\footnotesize #1}
709 }

(End definition for \__metrix_print_vers_ref:n.)

```

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

```

710 \NewDocumentCommand { \verseref } { m }
711 {
712     \__metrix_error_msg:n {
713         \string\verseref\space can~only~be~used~in~{metricverses}~env.
714     }
715 }
716 \NewDocumentEnvironment{metricverses} { }
717 {
718     \RenewDocumentCommand { \verseref } { m }
719     {
720         \__metrix_print_vers_ref:n { ##1 }
721     }
722     \par
723     \addvspace{0.7\baselineskip}
724     \fp_compare:nT { \usemetrixvar{symbolshift} < 0.0 }
725     {
726         \vspace{\usemetrixvar{symbolshift}}
727     }
728     \addtolength{\baselineskip}{0.6\baselineskip}
729 }
730 {
731     \par
732     \addtolength{\baselineskip}{-0.6\baselineskip}
733     \vspace{\baselineskip}
734     \noindent\ignorespacesafterend
735 }

(End definition for metricverses and \verseref. These functions are documented on page 9.)

736 \</package>

```

# 10 Change History

v1.0	longer . . . . .	33
General: Initial version . . . . .	\__metrix_ll_break: Made lines	
v1.0a	slightly longer . . . . .	33
General: Added cw1 file for TeXstudio . . . . .	\__metrix_metrics:nn: Made short	
v1.1	breaks available . . . . .	22
\__metrix_l_break: Made line slightly	\__metrix_print_syllable:n: Symbol	

nodes get individual names now. . .	25	placed deprecated <code>\str_case:nnn</code>	
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