

# The **mathastext** package

JEAN-FRANÇOIS BURNOL  
jfbu (at) free (dot) fr  
Package version: 1.3u (2019/08/20)

The **mathastext** package changes the fonts which are used in math mode for letters, digits and a few other punctuation and symbol signs to replace them with the font as used for the document text. Thus, the package makes it possible to use a quite arbitrary font without worrying too much that it does not have specially designed accompanying math fonts. Also, **mathastext** provides a simple mechanism in order to use more than one math-as-text font in the same document.

``mathastext' is a LaTeX package`

`\usepackage{mathastext}`

The document will use in math mode the text font as configured at package loading time, for these characters:

`abcdefghijklmnopqrstuvwxyz  
ABCDEFGHIJKLMNOPQRSTUVWXYZ  
0123456789  
!?,.,;+==() [] /#%&<>|{} \`

The command `\MTsetmathskips` allows to set up extra spacings around each given letter.

Use multiple `\Mathastext[name]`'s to define in the preamble various math versions using each a given text font, to be later activated in the document body via the command `\MTversion{name}`.

With the subdued option, **mathastext** will be active only inside such math versions distinct from the normal and bold.

Main options: `italic`, `defaultmathsizes`, `subdued`, `asterisk`, `LGRgreek`.

## Contents

<b>What <code>mathastext</code> does</b> . . .	<b>1, p. 2</b>	Unicode engines . . . . .	1.10, p. 21
Examples . . . . .	1.1, p. 2	Caveat emptor—The unicodeminus option—Two examples.	
Overview . . . . .	1.2, p. 4	Compatibility issues . . . . .	1.11, p. 23
Basic use—always load <code>mathastext</code> last—sans in math—using <code>mathastext</code> with beamer—option LGRgreek—avoid OT1 encoding.		<b>Package options and commands</b> . . . . .	<b>2, p. 25</b>
Main options . . . . .	1.3, p. 7	Summary of main options . . . . .	2.1, p. 25
The italic option—The defaultmathsizes option—The subdued option.		Miscellaneous . . . . .	2.2, p. 26
Math versions . . . . .	1.4, p. 9	Commands . . . . .	2.3, p. 29
Extra spaces around letters . . . . .	1.5, p. 11	Preamble-only commands—Commands usable only outside of math mode—Commands usable only in math mode—Commands usable everywhere—Body-only commands.	
Italic corrections . . . . .	1.6, p. 12	Complete list of options . . . . .	2.4, p. 40
Extra glue after <code>\exists</code> , <code>\forall</code> , and before the prime glyph . . . . .	1.7, p. 15	<b>Change log</b> . . . . .	<b>3, p. 43</b>
Extended scope of the math alphabets commands . . . . .	1.8, p. 16	<b>Implementation</b> . . . . .	<b>4, p. 48</b>
Greek letters . . . . .	1.9, p. 19		
Shape of Greek letters.			

## 1 What `mathastext` does

For changes see [section 3](#).

### 1.1 Examples

`mathastext`'s basic aim is to have the same font for text and mathematics. With hundreds of free text fonts packaged for L<sup>A</sup>T<sub>E</sub>X and only a handful of math ones, chances are your favorite text font does not mix so well with the available math ones; `mathastext` may then help. Note that `mathastext` was initially developed for the traditional T<sub>E</sub>X fonts and engines, and that compatibility with Unicode engines and OpenType fonts is partial.

Here is an example with Latin Modern typewriter proportional:

Let  $(X, Y)$  be two functions of a variable  $a$ . If they obey the differential system  $(VI_{v,n})$ :

$$\begin{aligned} a \frac{d}{da} X &= vX - (1 - X^2) \frac{2na}{1 - a^2} \frac{aX + Y}{1 + aXY} \\ a \frac{d}{da} Y &= -(v + 1)Y + (1 - Y^2) \frac{2na}{1 - a^2} \frac{X + aY}{1 + aXY} \end{aligned}$$

then the quantity  $q = a \frac{aX+Y}{X+aY}$  satisfies as function of  $b = a^2$  the

$P_{VI}$  differential equation:

$$\frac{d^2q}{db^2} = \frac{1}{2} \left\{ \frac{1}{q} + \frac{1}{q-1} + \frac{1}{q-b} \right\} \left( \frac{dq}{db} \right)^2 - \left\{ \frac{1}{b} + \frac{1}{b-1} + \frac{1}{q-b} \right\} \frac{dq}{db} + \frac{q(q-1)(q-b)}{b^2(b-1)^2} \left\{ \alpha + \frac{\beta b}{q^2} + \frac{\gamma(b-1)}{(q-1)^2} + \frac{\delta b(b-1)}{(q-b)^2} \right\}$$

with parameters  $(\alpha, \beta, \gamma, \delta) = (\frac{(v+n)^2}{2}, \frac{-(v+n+1)^2}{2}, \frac{n^2}{2}, \frac{1-n^2}{2})$ .

Notice that the Latin (and Greek letters) are in upright shape. But perhaps we insist on obeying the standardized habits:

Let  $(X, Y)$  be two functions of a variable  $a$ . If they obey the differential system  $(VI_{v,n})$ :

$$\begin{aligned} a \frac{d}{da} X &= vX - (1 - X^2) \frac{2na}{1 - a^2} \frac{aX + Y}{1 + aXY} \\ a \frac{d}{da} Y &= -(v+1)Y + (1 - Y^2) \frac{2na}{1 - a^2} \frac{X + aY}{1 + aXY} \end{aligned}$$

then the quantity  $q = a \frac{aX+Y}{X+aY}$  satisfies as function of  $b = a^2$  the  $P_{VI}$  differential equation:

$$\frac{d^2q}{db^2} = \frac{1}{2} \left\{ \frac{1}{q} + \frac{1}{q-1} + \frac{1}{q-b} \right\} \left( \frac{dq}{db} \right)^2 - \left\{ \frac{1}{b} + \frac{1}{b-1} + \frac{1}{q-b} \right\} \frac{dq}{db} + \frac{q(q-1)(q-b)}{b^2(b-1)^2} \left\{ \alpha + \frac{\beta b}{q^2} + \frac{\gamma(b-1)}{(q-1)^2} + \frac{\delta b(b-1)}{(q-b)^2} \right\}$$

with parameters  $(\alpha, \beta, \gamma, \delta) = (\frac{(v+n)^2}{2}, \frac{-(v+n+1)^2}{2}, \frac{n^2}{2}, \frac{1-n^2}{2})$ .

This was typeset using the Times font (available in any  $\text{\TeX}$  distribution). Let us now be a bit more original and have our mathematics with italic letters from the sans serif font Helvetica, while the letters in text use New Century Schoolbook.

Let  $(X, Y)$  be two functions of a variable  $a$ . If they obey the differential system  $(VI_{v,n})$ :

$$\begin{aligned} a \frac{d}{da} X &= vX - (1 - X^2) \frac{2na}{1 - a^2} \frac{aX + Y}{1 + aXY} \\ a \frac{d}{da} Y &= -(v+1)Y + (1 - Y^2) \frac{2na}{1 - a^2} \frac{X + aY}{1 + aXY} \end{aligned}$$

then the quantity  $q = a \frac{aX+Y}{X+aY}$  satisfies as function of  $b = a^2$  the  $P_{VI}$  differential equation:

$$\frac{d^2q}{db^2} = \frac{1}{2} \left\{ \frac{1}{q} + \frac{1}{q-1} + \frac{1}{q-b} \right\} \left( \frac{dq}{db} \right)^2 - \left\{ \frac{1}{b} + \frac{1}{b-1} + \frac{1}{q-b} \right\} \frac{dq}{db} + \frac{q(q-1)(q-b)}{b^2(b-1)^2} \left\{ \alpha + \frac{\beta b}{q^2} + \frac{\gamma(b-1)}{(q-1)^2} + \frac{\delta b(b-1)}{(q-b)^2} \right\}$$

with parameters  $(\alpha, \beta, \gamma, \delta) = (\frac{(\nu+n)^2}{2}, \frac{-(\nu+n+1)^2}{2}, \frac{n^2}{2}, \frac{1-n^2}{2})$ .

And after all that, we may wish to return to the default math typesetting (let's shorten the extract here in case the reader makes an indigestion ...):

Let  $(X, Y)$  be two functions of a variable  $a$ . If they obey the differential system  $(VI_{\nu, n})$ :

$$\begin{aligned} a \frac{d}{da} X &= \nu X - (1 - X^2) \frac{2na}{1 - a^2} \frac{aX + Y}{1 + aXY} \\ a \frac{d}{da} Y &= -(\nu + 1)Y + (1 - Y^2) \frac{2na}{1 - a^2} \frac{X + aY}{1 + aXY} \end{aligned}$$

then the quantity  $q = a \frac{aX+Y}{X+aY}$  satisfies as function of  $b = a^2$  the  $P_{VI}$  differential equation with parameters  $(\alpha, \beta, \gamma, \delta) = (\frac{(\nu+n)^2}{2}, \frac{-(\nu+n+1)^2}{2}, \frac{n^2}{2}, \frac{1-n^2}{2})$ .

Notice that the Greek letters also changed according to the *math version*: **mathastext** has indeed some (limited) capabilities to this effect, with its **LGRgreek** option. This document uses the LGR encoded fonts **cmmtt**, **cmss**, and **txr**, which are part of standard T<sub>E</sub>X distributions.<sup>1</sup>

## 1.2 Overview

### 1.2.1 Basic use

The initial ideology of **mathastext** was to produce mathematical texts with a very uniform look, not separating math from text as strongly as is usually done.

As soon as one tries out other fonts for text than the Computer Modern ones one realizes how extremely “thin” are the default T<sub>E</sub>X fonts for mathematics: they definitely do not fit well visually with the majority of text fonts. With **mathastext** one can get one's (simple... or not) mathematics typeset in a manner more compatible with the text, without having to look for an especially designed font.

Here is a minimal example of what may go into the preamble:

```
\usepackage[T1]{fontenc}
\usepackage{times}
\usepackage[italic]{mathastext}
```

The package records which font is set up for text, at the time it is loaded,<sup>2</sup> and then arranges things in order for this text font to be used in math mode as well. So, with the preamble as above all letters, digits, and punctuation signs inside math

<sup>1</sup>The first two are available (with no need to load explicitly any package in the document) via the combination **cbfonts** (**cbgreek-complete**) & **babel**, and the LGR encoded **txr** font (again no package loading is necessary) is part of the files of the **txfontsb** package.

<sup>2</sup>alternatively it is possible to configure the text font after loading **mathastext**, and then the command **\Mathastext** will accomplish the necessary changes to the font for letters, digits and a few extra ascii symbols in math mode.

mode will then be typeset in Times.<sup>3</sup> The exact list of characters concerned by **mathastext** is a subset of the basic ASCII set:

abcdefghijklmnopqrstuvwxyz  
 ABCDEFGHIJKLMNOPQRSTUVWXYZ  
 0123456789  
 !?\*,.:;+-=()[\/\$%&<>|{} and \

As one can see, this is a very limited list! some possibilities are offered by **mathastext** for Greek letters and will be described later.

The text characters ' and - are not used, and the asterisk is done optionally:

- the derivative sign ' is left to its default as the text font glyph ' is not, as a rule, a satisfying alternative.<sup>4</sup>
- for the minus sign **mathastext** uses the endash character –, if available, and not the hyphen character -.<sup>5</sup>
- the **asterisk** option is mandatory for **mathastext** to replace the binary math operator \* (and the equivalent control sequence `\ast`) with a version which uses the text asterisk \* suitably lowered<sup>6</sup> (and with the correct spaces around it as binary operator). The reason is that after this inputs such as  $\$R^*\$$  or  $\$R^{\ast}\$$  raise errors and *must* be written  $\$R^{\{*\}}\$$  or  $\$R^{\{\ast\}}\$$ .

Nothing is changed to the “large” math symbols, except for  $\prod$  and  $\sum$  in inline math which, like here:  $\prod \sum$ , will be taken from the Symbol Font if option **symbol-misc** was used.

The left and right delimiters are taken from the text font only for the base size: any `\big`, `\bigl`, `\bigr`, etc...reverts to the original math symbols.

### 1.2.2 always load **mathastext** last

The “large” math symbols are not modified in any way by **mathastext**. Only loading some math font packages such as **fourier**, **kpfonts**, **mathabx**, **mathdesign**, **txfonts**, **newtxmath**, etc... will change them. Think of loading these packages before **mathastext**, else they might undo what **mathastext** did.

More generally any package (such as **amsmath**) dealing with math mode should be loaded *before* **mathastext**.

<sup>3</sup>let's do as if we did not know the excellent **txfonts** package which employs Times for text and has a very complete math support, including many additional mathematical glyphs in comparison to the CM fonts.

<sup>4</sup>**v1.2** adds a customizable tiny space before ' to separate it from the previous letter, this is really needed when using upright letters in math mode with the CM derivative glyph. Compare  $f'$  with  $f'$ .

<sup>5</sup>see the **unicodeminus** option if using an OpenType font.

<sup>6</sup>the amount of lowering can be customized.

### 1.2.3 sans in math

The following set-up often gives esthetically pleasing results: it is to use the sans-serif member of the font family for math, and the serif for text.

```
\renewcommand\familydefault\sfdefault
\usepackage{mathastext}
\renewcommand\familydefault\rmdefault
\begin{document}
```

### 1.2.4 using **mathastext** with beamer

Starting with release 3.34 of beamer, **mathastext** is recognized as a “math font package”.

*Only with earlier beamer versions is it necessary to issue*  
`\usefonttheme{professionalfonts}`  
*in the preamble.* Example:

```
\documentclass{beamer}
%\usefonttheme{professionalfonts}% obsolete for mathastext since beamer 3.34
\usepackage{newcent}
\usepackage[scaled=.9]{helvet}
\renewcommand{\familydefault}{\rmdefault}
\usepackage[defaultmathsizes,symbolgreek]{mathastext}
\renewcommand{\familydefault}{\sfdefault}
\begin{document}
\begin{frame}
  This is some text and next comes some math:  $E=mc^2$ 
  \[
    E=mc^2=a^n+b^n-c^n=\alpha\beta\gamma
  \]
  \begin{align}
    E&=mc^2\\
    E&=h\nu
  \end{align}
  And again some text.
\end{frame}
\end{document}
```

### 1.2.5 option **LGRgreek**

There is the issue of Greek letters. Sometimes the text font has Greek glyphs, in LGR encoding (this will be mentioned in the documentation of the font package). Then option **LGRgreek** tells **mathastext** to pick up these Greek letters. And it is possible to specify whether the Greek letters should be upright, or “italic”.<sup>7</sup>

---

<sup>7</sup>the default CM and its replacement Latin Modern for european languages are (transparently to the user) extended with LGR encoded fonts from the cbfonts (cbgreek-complete) package.

It is naturally possible to leave the responsibility to set up Greek letters to some other packages loaded previously to `mathastext`. And even if `mathastext` has been loaded with one of its Greek related options the command `\MTstandardgreek` will locally cancel its customization of Greek letters. See also `\MTcustomgreek`.

### 1.2.6 avoid OT1 encoding

We specified in our minimal working example a T1 encoding (LY1 would have been ok, too) because the default OT1 does not have the `<>|{}` and `\` glyphs. If `mathastext` detects OT1 as the default encoding it will leave these characters to their defaults from the math fonts.<sup>8</sup>

If `mathastext` detects the obsolete OT1 encoding it does not do anything with `<`, `>`, `|`, `{`, and `}` which (except for monospace fonts) are not available in that encoding. To fully benefit from `mathastext` it is recommended to use some other encoding having these glyphs such as T1 or LY1.

## 1.3 Main options

### 1.3.1 The `italic` option

In the initial version 1.0, the Latin letters in mathematical mode assumed the exact same shape as in text mode, and this meant, generally speaking, that they would turn up upright. Doing this gives a very uniform look to the document, so that one has to make an effort and read it with attention, and this was one of the design goals of `mathastext`.

Nevertheless, soon after I posted the initial version of the package to CTAN, I was overwhelmed by numerous<sup>9</sup> questions<sup>10</sup> on how to have the letters be in italic shape.

The default is still, as in version 1.0, for everything to be in upright shape, but it suffices to pass to the package the option `italic` to have the Latin letters in math mode in italic shape.<sup>11</sup> There is also an option `frenchmath` to make the uppercase letters nevertheless upright, because this is the way of traditional French mathematical typography.<sup>12</sup> (1.1)

---

<sup>8</sup>the `subdued` option, described next, acts a bit otherwise, it forces, contrarily to its usual low-key character, the replacement of OT1 by T1 for the fonts ultimately used with letters and digits in math mode.

<sup>9</sup>this means “more then one.”

<sup>10</sup>I thank in particular TARIQ PERWEZ and KEVIN KLEMENT for their kind remarks (chronological order).

<sup>11</sup>more precisely stated, the value of `\itdefault` is used.

<sup>12</sup>more precisely stated, the value of `\shapedefault` is used.

### 1.3.2 The `defaultmathsizes` option

The default sizes give for subscripts of subscripts barely legible glyphs (author's opinion!). So `mathastext` makes more reasonable choices. It also redefines `\Huge` and defines a `\HUGE` size, copied from the `moresize` package. To cancel all of this use option `defaultmathsizes`.

### 1.3.3 The `subdued` option

This option was introduced in v1.15. It provides a manner to switch on the `mathastext`-ification only for limited portions of the document, with the help of the mechanism of math versions. Without the `subdued` option, the *mathastextification* applies by default to the whole of the document (and one may also define additional math versions in the preamble); with the `subdued` option the *mathastextification* is done only in *math versions* distinct from the standard and bold ones. (1.15)

Despite some limitations I will now partially describe, the `subdued` option has its utility, as I think is illustrated enough by the examples given at the start of this document and it works reasonably well.

`mathastext` was not written initially in order to allow its action to be completely canceled. It does not store (all) mathcodes nor does it set them (all) when changing math versions; only that would allow a perfect subdued mode (and  $\text{\LaTeX}$  is rather obstinate in making that tricky or at least uneasy if sticking to its official interface to math mode, as it is almost entirely preamble only).

Releases 1.3t and 1.3u do this kind of things to maintain usability across multiple `mathastext`-ified math versions of characters which are obviously font encoding dependent such as the minus sign as en-dash (or unicode minus), the dotless i, the `\hbar`, the text accents.

But this should be extended to all `mathastext`-ified characters which basically would amount to an extensive rewrite of large legacy portions of the code. Currently the support for the `subdued` mode and to multiple math versions amounts to some kind of a kludge, added to an initial design which handled a single unique text font.

To get the displayed math (almost) as if `mathastext` had not been loaded, one must also use the option `defaultmathsizes`. But this does not quite suffice, as, for example, the colon, the dot, and the minus sign belong in the default  $\text{\LaTeX}$  math mode set-up to three distinct fonts whereas `mathastext` will pick (even subdued) the three of them in the same font,<sup>13</sup> and although it will make a reasonable choice of

changed: <sup>13</sup>The minus sign is now perfectly subdued, because its original mathcode is stored and restored; this was only way to handle the case with Unicode engines where the math operator font is in a classic  $\text{\TeX}$  encoding, but the minus sign is configured by `mathastext` to use a Unicode en-dash or minus character in non-subdued math versions. (1.3t)



this font, this is not an exact re-installment of the previously prevailing situation. And then other packages could have done arbitrary things regarding character mathcodes, so to be on the safe side one needs the `basic` option which limits the mathastextification to letters and digits.<sup>14 15 16</sup> Even then, in some circumstances, this may not suffice: for example the *euler* package puts the digits in the same font as the Latin letters in math mode, but the subdued `mathastext` will pick them up in the same font as used for operator names, which for example in the case of the *euler* package, is the main document font.

## 1.4 Math versions

L<sup>A</sup>T<sub>E</sub>X has the concept of *math versions*, but most font packages do not define any such version beyond the default normal and bold (that they possibly customize to use such or such math font). The package `unicode-math` for unicode engines fruitfully uses this concept. `mathastext` uses math versions in order to allow the math mode fonts (for letters, digits, punctuation and a few other ascii symbols) used in the different parts of the document to be kept in sync with the text fonts. However the other math symbols (sums, products, integrals, logical signs, etc...) will be the same throughout the document as it is not in `mathastext` power to modify them. There are some possibilities to use different sets of fonts for the Greek letters, though.

The present document illustrated the use of various fonts, here is its preamble (slightly stripped-down):

```
\usepackage{lmodern}
\usepackage[T1]{fontenc}
\usepackage[subdued,italic,defaultmathsizes]{mathastext}
\MTDeclareVersion[n]{lmtt}{T1}{lmtt}{m}{n}
\usepackage{newcent}
\Mathastext[newcent]
\usepackage{times}
\Mathastext[times]
\usepackage[scaled]{helvet}
\renewcommand\familydefault\sfdefault
\Mathastext[helvet]
\begin{document}\MTversion{normal}
```

Let us examine this code: it uses once the command `\MTDeclareVersion` and three times the command `\Mathastext`, thus defining four math versions<sup>17</sup>: `lmtt`, `newcent`, `times`, and `helvet`. The names can be taken arbitrarily (they only need to be suitable arguments to the L<sup>A</sup>T<sub>E</sub>X `\DeclareMathVersion` command which is

changed: <sup>14</sup>The `subdued` mode does extinguish in the normal and bold math versions the action of options `selfgreek`, `eulergreek`, and `symbolgreek` (previously only `LGRgreek` was subdue-able). (1.3d)

changed: <sup>15</sup>The `\imath` and `\jmath` now obey the subdued regime. (1.3t)

changed: <sup>16</sup>Also `\hbar` and the math accents (see `mathaccents` option) obey the subdued regime. (1.3u)

<sup>17</sup>math versions are discussed in the document `fontguide.pdf` from your T<sub>E</sub>X distribution.

invoked internally). Two additional math versions preexist: the `normal` and `bold`, which, because there was the `subdued` option, were left untouched by `mathastext`.

Once these `math versions` are defined, `\MTversion{name_of_version}`, or equivalently `\Mathastextversion{name_of_version}`, enacts the font switches in the body of the document. As is usual with L<sup>A</sup>T<sub>E</sub>X one can limit the scope to the inside of a group, or also switch back to the main set-up through issuing `\Mathastextversion{normal}`.

When `\Mathastext` is used in the preamble, it records the current font defaults and (except for the `normal` and `bold` versions under the `subdued` regime) sets up the math font to be used in that version to be the text font as found in `\familydefault`. But it is still possible for a `mathastext`-declared math version to have distinct fonts for text and math:

1. in the body of the T<sub>E</sub>X source, an optional argument (the name of a `mathastext`-declared math version) to `\MTversion` is allowed, and for example we used in the source of this document `\MTversion[newcent]{helvet}` meaning “New Century Schoolbook for the text and Helvetica for the math.”
2. there are preamble-only commands `\MTencoding`, `\MTfamily`, `\MTseries`, `\MTshape`, `\MTlettershape` which tell `mathastext` what to do (for math *only*) in each math version declared *afterwards*, independently of the text fonts.

The native L<sup>A</sup>T<sub>E</sub>X command `\mathversion{⟨version_name⟩}` would change only the fonts used in math mode. It is important to use rather the package command `\MTversion` (or one of its synonyms `\mathastextversion`, `\Mathastextversion`, `\MTversion`), with its mandatory argument `{⟨version_name⟩}`, as it does additional actions:

- it sets the font for math mode (letters, math operator names, digits, punctuations, some other symbols) according to the version name given as mandatory argument,
- it resets the text font of the document and the `\(family,rm,sf,...)defaults` to their values as registered at the time of definition of the version. *Use the starred variant in case this is not desired.* It is possible to also specify within brackets an extra optional version name, and the text font will be set according to it.

For all math versions if not using the `subdued` option, or only for the non-*normal* and non-*bold* math versions if using the `subdued` option, `\MTversion` does further additional tasks:

NEW FEATURE!

- it resets the `\hbar`, `\imath` (see `\inodot`), `\jmath`, math accents (see option `mathaccents`) and minus sign as en dash according to the used font encoding for the `mathastext`-ified text font, (1.3u)

- (see sections 1.5 and 1.6) it re-issues the command `\MTmathactiveletters` to let a to z, A to Z, be mathematically active in order to automatically insert the skips as defined by the user with `\MTsetmathskips`, and the italic corrections (if the font is not italic or slanted),
- (see section 1.7) it resets the extra spaces after the symbols  $\exists$ ,  $\forall$  and before the derivative  $'$  to the values as decided by the user in the preamble on a *per version* basis,
- (see section 1.8) it re-issues the commands `\MTmathoperatorsobeymathxx` and `\MTeasyonlettersobeymathxx` to let the math operator names and (‘easy’) non letter characters obey the math alphabets,
- in case of option `asterisk`, it re-issues `\MTactiveasterisk`,
- it does the additional set-up for Greek letters in case of the package received one of the Greek related options.

The scope is limited to the current L<sup>A</sup>T<sub>E</sub>X environment or group.

It is sometimes not compatible with `mathastext` to load a font package after it, as the font package may contain instructions which will modify the math set-up. This may be a bit hidden to the user: for example the `epigrafica` package loads `pxfonts`. Hence it will interfere with `mathastext` if it is loaded after it.<sup>18</sup> But one can use instead `\renewcommand{\rmdefault}{epigrafica}`,<sup>19</sup> followed with `\Mathastext`, or also `\MTfamily{epigrafica}\Mathastext` which will only change the font in math.

To use `epigrafica` for Greek in math mode one can use the package option `LGRgreek` and the command `\MTgreekfont{epigrafica}\Mathastext`. Or `\usepackage{epigrafica}` followed with `\usepackage[LGRgreek]{mathastext}`.

## 1.5 Extra spaces around letters

This is a new feature added with release 1.3: the command `\MTsetmathskips` allows the user to set up some spaces (more precisely, ‘mu glue’; but stretch and shrink are discarded) to be automatically inserted around the letters in math mode. Some (very) unrealistic uses:

```
% this may be anywhere in the document (also within a math group):
\MTsetmathskips{x}{20.33mu}{15.66mu}% 20.33mu before all x's and 15.66mu after.
\MTsetmathskips{y}{\thickmuskip}{\thickmuskip}%
\MTsetmathskips{z}{10mu}{5mu}% stretch and shrink are anyhow without effect.
\MTsetmathskips{A}{\muexpr \thickmuskip*2}{\muexpr \medmuskip-\thinmuskip/2}%
```

<sup>18</sup> may typically give a ‘too many math alphabets’ error message.

<sup>19</sup> sometimes one needs to look in the `.sty` file of the font package to figure out the font name (it is rarely as `epigrafica`, the same as the package name), and, if one does not know the arcana of finding `.fd` files in one’s T<sub>E</sub>X distribution, one should look at the log file of a test document to see if for example T1 is available for that font; for `epigrafica` it is not, only OT1 and LGR are possible.

Here is what `$\wxytytz^{\wxytytz}=BAC^{\{BAC\}}$` then gives using the Times font:  $w \ x \ t \ y \ t \ z^w \ x \ t \ y \ t \ z = B \ A C^B \ A C$ . Any  $\mathrm{T}_{\mathrm{E}}\mathrm{X}$  group or  $\mathrm{L}^{\mathrm{A}}\mathrm{T}_{\mathrm{E}}\mathrm{X}$  environment limits as usual the scope of this command. Furthermore the command `\MTunsetmathskips` cancels previous use of `\MTsetmathskips` for a given letter.

The implementation relies on the ‘mathematical activation’ of letters, which is done by default by the package since release 1.2b. Should this cause compatibility problems, the command `\MTmathstandardletters` cancels it entirely. To reactivate it, there is `\MTmathactiveletters`. Note that `\MTmathactiveletters` is done automatically by `mathastext` when loaded, and also each time the package enhanced math-version-switch command `\MTversion` is used, except for the normal and bold math versions under the `subdued` option.

The extra skips are set at natural width; they do not contribute to the overall stretchability or shrinkability of the math formula and do not create break points.

**Changed with 1.3i:** they are *not* applied within the scope of math alphabet commands.

## 1.6 Italic corrections

Note: this is somewhat technical discussion which may well be skipped in its entirety on first reading.

With the `italic` option the letters in math will be generally in italic shape (and, normally, upright in operator names).

For the built-in placement routines of  $\mathrm{T}_{\mathrm{E}}\mathrm{X}$  in math mode to work as well as they usually do, the characters from the math italic font obviously should have their bounding boxes wide enough for the glyphs not to collide with other symbols. A letter from a text italic font such as  $f$  extends way out of its declared bounding box; let us compare the bounding boxes<sup>20</sup> for the letter  $f$  in the math italic font to the one from the text italic font:  $\mathit{f}$  vs.  $f$ .

This could make us think that attempting to use in math a text italic font will lead to disaster. Well, surprisingly the situation is not that bad. Sure  $\mathbf{f(x)}$  is wider with the standard math italic  $\mathit{f(x)}$  (21.31474pt) than it is with the text italic font used in math:<sup>21</sup>  $\mathit{f(x)}$  (19.74986pt) but we should be surprised that our text italic  $f$  did not end up even closer to the opening parenthesis. Why is it so?

The explanation is that  $\mathrm{T}_{\mathrm{E}}\mathrm{X}$  uses in such a situation the *italic correction* for the letter  $f$ . The italic correction also exists and is used for the math italic font, it was inserted in  $\mathbf{f}$  without us having to ask anything. Its value is 1.17865pt for the math italic  $f$  and 1.8919pt for the text italic  $f$ .<sup>22</sup> With the italic corrections

<sup>20</sup>let’s be honest, we are lying here about what exactly the first of these is bounding; this is explained later!

<sup>21</sup>we used simply `$\mathit{f(x)}$`.

<sup>22</sup>these values are for the Latin Modern fonts of course.

included our bounding boxes are indeed more alike:  $\overline{f}$  vs  $\overline{f}$ .

Without the italic corrections<sup>23</sup> it is  $\overline{f}$  vs  $\overline{f}$ . I said that `$f$` included the italic correction automatically, but if we tell TeX to use the text italic in math, and typeset the alphabet, we obtain something exactly identical to typing the letters in text, hence without any italic correction:

<code>abcdefghijklmnopqrstuvwxy</code>	<code>text italic in text</code>
<code>abcdefghijklmnopqrstuvwxy</code>	<code>text italic in math</code>
<code>abcdefghijklmnopqrstuvwxy</code>	<code>math italic in math</code>
<code>abcdefghijklmnopqrstuvwxy</code>	<code>math italic in text</code>

Where are our italic corrections gone? the last line was done with `\usefont{OML}{lmm}{m}{it}` and confirms that italic corrections have been used for the math italic in math.

Turning to the TeXbook (and its Appendix G) we learn that in such circumstances, for the italic corrections to be put in from the font, one of its parameters, the interword space (aka `\fontdimen2`), should be zero. It is indeed zero for the math italic font, not for the text italic.

It is possible to make TeX believe it is. Doing so, we obtain in math mode with the text italic:

<code>abcdefghijklmnopqrstuvwxy</code>	<code>text italic in math</code>
<code>abcdefghijklmnopqrstuvwxy</code>	<code>math italic in math</code>

We saw that the italic correction was taken into account automatically (independently of the value of the interword space font parameter) in expressions such as `$f(x)$`. Another clever thing done by TeX is to use it for the placement of superscripts; the next examples systematically use the text italic in math. We see that  $f^j$  is very different from  $\overline{f}^j$ ... where the latter was coded with `$(\hbox{\itshape f})^j$`. The inputs `$(\mathit{\hbox{\itshape f}})^j$` and `$(\mathit{f})^j$` give almost identical results:  $\overline{f}^j$  vs.  $\overline{f}^j$ . Close examination reveals that the horizontal spacing is exactly identical, however the exponent in the second case is a bit lower. Anyway, the point is that in the second case the italic correction for  $f$  was indeed used.

Subscripts are another matter: they do *not* take into account the italic correction. For example `$(\mathit{f}_i)$` gives the same horizontal positions as `$(\mathit{\hbox{\itshape f}}_i)$`:  $f_i$  vs.  $\overline{f}_i$ . Printing them one on another gives  $\overline{f}_i$  and reveals (use the zoom of your viewer!) that only the vertical placement was affected, not the horizontal placement.

We learn in Appendix G of the TeXbook that the italic correction is used for the horizontal shift of the superscript with respect to the position of the subscript:  $\overline{f}_i^j$ , or, going back now to the standard math italics  $f_i^j$ . In the next paragraphs we use  $\overline{f}_i^i$  for more accurate comparison of the positioning of the sub- and superscript.

If we try something like this: `$(f\_i^i)$` we obtain  $\overline{f}_i^i$ . Our overlapping game with `\rlap{$f\_i^i$}$f\_i^i$` gives  $\overline{f}_i^i$ . We discover that the effect of the explicit italic correction has mainly been to translate the subscript horizontally to be

<sup>23</sup>here we give correctly the bounding box for the math italic  $f$ ... without its italic correction!

positioned exactly below the superscript!<sup>24</sup> We most probably do *not* want this to happen for our indices and exponents in math mode. So perhaps we can rejoice in how astute T<sub>E</sub>X has been in judiciously using the italic correction data, and there seems to be no need into fiddling with this algorithm which seems to work well even when applied to a text italic font. Actually we may even be of the opinion that the text italic version  $f_i^i$  is a bit better-looking than the true math italic  $f_i^i$  . . .

But wait... **mathastext** was initially developed to easily use in math mode the document text font not in its italic variant, but as is, so, usually, upright. And upright T<sub>E</sub>X fonts may also have italic correction data! And what I just said about the shift of the superscript with respect to the subscript apply equally well to such a font, if T<sub>E</sub>X has been told to use it. Let's try Latin Modern Upright for letters in math:  $\text{\texttt{$f_i^i$}}$  now gives<sup>25</sup>  $f_i^i$ . We see the italic correction in action for the positioning of the superscript! Compare with  $\text{\texttt{$\mathrm{\hbox{f}_i^i$}}}$ :  $f_i^i$ . Overlapping with  $\text{\texttt{$\rlap{\mathrm{f}_i^i}\mathrm{\hbox{f}_i^i$}}}$  gives  $f_i^i$  and shows that the upright f has an italic correction which was used to shift the superscript to the right (and it is now in a slightly lower position). Let's now do  $\text{\texttt{$\mathrm{\f/}_i^i$}}$ : this gives  $f_i^i$  and the subscript is shifted to the right, and is now on the same vertical axis as the superscript. There are also some slight vertical displacements,  $\text{\texttt{$\rlap{\mathrm{f}_i^i}\mathrm{\f/}_i^i$}}$  gives  $f_i^i$ .

People will tell me crazy, but if we decide for using upright fonts in math, wouldn't it be satisfying to have the subscript and superscript positioned on the same vertical axis? the letter has no slant, why should the indices display one?

We end up in this strange situation that it is attractive to systematically incorporate the italic corrections after the upright Latin letters in math! But we don't want to do this inside the arguments to math alphabets as this would make impossible the formation of ligatures (the standard  $\text{\texttt{$\mathrm{ff}$}}$ ,  $\text{\texttt{$\mathit{ff}$}}$ ,  $\text{\texttt{$\mathbf{ff}$}}$ ,  $\text{\texttt{$\mathsf{ff}$}}$  all give ligatures ff, *ff*, **ff**, and ff and we would like to preserve this behavior).

Starting with version v1.2b, **mathastext** adds the italic correction automatically after each letter of the Latin alphabet in math mode, *except* when these letters are italic or slanted.<sup>26</sup>

These italic corrections are canceled inside the arguments to the math alphabet commands, to allow the formation of ligatures as is expected in the standard default T<sub>E</sub>X font set-up in math.<sup>27</sup>

<sup>24</sup>there are also some tiny vertical displacements of the sub- and superscripts.

<sup>25</sup>we just use  $\text{\texttt{$\mathrm{f}_i^i$}}$ .

The feature-implementing commands `\MTicinmath`, `\MTnoicinmath`, `\MTical-soinmathxx` are described in section 2.3.4.

**Note:** from brief testing on 2012/12/28,  $X_{\mathcal{L}}\mathrm{T}_{\mathcal{E}}\mathrm{X}$  seems not to obey in math mode italic corrections for OpenType fonts. Hence the  $\mathrm{T}_{\mathcal{E}}\mathrm{X}$  placement algorithms for math mode described in this section do not work well when an OpenType (text) font is used for the letters in math mode, and the document is compiled with the  $X_{\mathcal{L}}\mathrm{T}_{\mathcal{E}}\mathrm{X}$  engine. On the other hand  $\mathrm{Lua}\mathrm{L}\mathrm{A}\mathrm{T}_{\mathcal{E}}\mathrm{X}$  seems to implement the italic corrections when using OpenType fonts, but only with italic fonts (as far as I could tell). Try the following (which will use the OpenType Latin Modern font) on a recent  $\mathrm{T}_{\mathcal{E}}\mathrm{X}$  installation and compare the output of both engines:

```
\documentclass{article}
\usepackage{fontspec}
\begin{document}
\Huge
$\mathit{f_i^i}$\par $\mathrm{f_i^i}$
\end{document}
```

Comment out the `fontspec` line and use  $\mathrm{pdf}\mathrm{L}\mathrm{A}\mathrm{T}_{\mathcal{E}}\mathrm{X}$ . All three outputs are different on my  $\mathrm{T}_{\mathcal{E}}\mathrm{X}$  installation.  $X_{\mathcal{L}}\mathrm{T}_{\mathcal{E}}\mathrm{X}$  does not have the italic corrections.  $\mathrm{Lua}\mathrm{L}\mathrm{A}\mathrm{T}_{\mathcal{E}}\mathrm{X}$  does, but only for the italic font.  $\mathrm{pdf}\mathrm{L}\mathrm{A}\mathrm{T}_{\mathcal{E}}\mathrm{X}$  has them for both the italic and the upright font.<sup>28</sup>

## 1.7 Extra glue after `\exists`, `\forall`, and before the prime glyph

`\MTforallskip`, `\MTexistsskip`, and `\MTprimeskip` are three commands with each a mandatory argument like for example `3mu plus 1mu minus 1mu` or just `2.5mu`. They are especially useful when using an upright font in math mode. The `mu` is a unit length used in math mode (‘math unit’, 1/18th of the ‘quad’ value of the symbol font in the current style). Its value is relative to the current math style. Its use is **mandatory** in the commands described here.

- compare  $\forall B$  with  $\forall B$ , typeset after `\MTforallskip{2mu}`,
- compare  $\exists N$  with  $\exists N$ , typeset after `\MTexistsskip{2mu}`,
- and finally compare  $f'$  with  $f'$ , typeset after `\MTprimeskip{2mu}`.

These three commands may be used throughout the document, or also in the preamble, in which case the declared math versions will record the then current values of the skips. `mathastext` applies the following (small) default skips: `0.6667mu`

<sup>26</sup>the situation is rather ironical! by the way, the warnings in section 1.8 with  $\$x^? \$$  or similar are less of an issue here, because the letter is only *followed* by `\` and anyhow the whole is put by `mathastext` within group braces, so no surprises with  $\$x^y \$$  or  $\$ \mathbin{x} \$$ . Nevertheless it is still true that (in math mode only) the letters `a-z`, `A-Z`, expand to composite objects, something which could surprise other packages. The command `\MTmathstandardletters` cancels this mechanism.

changed: <sup>27</sup>Formerly, italic corrections were added to the `\mathnormal` arguments.

(1.3i)

<sup>28</sup>2016/11/04: the situation hasn’t changed a iota since, at least on current TL2016.



for the skip after  $\forall$ ,  $1\mu$  for the skip after  $\exists$ , and  $0.5\mu$  for the skip before the prime. The examples above become  $\forall B$ ,  $\exists N$  and  $f'$ .<sup>29</sup>

With the **italic** option the defaults are set to zero. Indeed  $\forall B$ ,  $\exists N$  and  $f'$  look fine without additional skips. If the document decides then to declare in the preamble a math version with an upright font it is thus recommended to use the commands in the preamble before the `\Mathastext[⟨version_name⟩]` (or `\MTDeclareVersion`) command defining the version. They will be remembered when this math version is entered in the document. The commands may also be used directly in the document body.

Under the **subdued** option, the *normal* math version (at the start of the document body, or after `\MTversion{normal}`) and the *bold* math version (either at the start of the document body after `\boldmath`, or after `\MTversion{bold}`) do not have any extra skip inserted (even one of zero width) after  $\forall$ ,  $\exists$ , or before the  $'$ .<sup>30</sup>

## 1.8 Extended scope of the math alphabets commands

Ever since the initial version of the package, some characters usually unaffected by the math alphabet commands `\mathbf`, `\mathtt`, `\mathsf`... are declared to be of ‘variable family type’, in order for them to obey these commands: for example the hash sign `#` gives `#` if input as `⟨mathbf⟩{⟨#⟩}` (**mathastext**, especially in its beginnings, wanted as many characters as possible to be picked up from the text font and to behave similarly to letters and digits).

So it was especially frustrating that mathematical characters such as  $+$ , or  $<$ , or  $]$  could not be declared of ‘variable family’ (in addition to being picked up in the text font) as this would, for reasons of the inner workings of  $\mathrm{T\!E\!X}$ , not be compatible with the automatically inserted spaces around them.

A revolutionary ;-) novelty is introduced with version 1.2 of the package: (1.2)

1. the pre-declared or user-declared (using the `\DeclareMathOperator` or equivalent) operator names obey the math alphabet commands,<sup>31</sup>
2. and, *optionally*, all non alphabetical characters<sup>32</sup> treated by **mathastext**, *i.e.*, if not disabled by options, `!?`, `:`, `;`, `+`, `-`, `=`, `()`, `[]`, `<`, `>`, `{}`, the asterisk `*`, and `.`, `/`, `\`, `#`, `$`, `%`, `&`<sup>33</sup> will also obey the math alphabet commands (when not used

<sup>29</sup>the derivative glyph from the `txfonts` math symbols adapts itself better to an upright letter, no skip seems to be needed then.

changed: <sup>30</sup>Formerly, skips of zero widths were inserted.

<sup>31</sup>contrarily to the next feature, this one is not likely to create incompatibilities with other packages, so it is activated by default. (1.3j)

<sup>32</sup>of course some of them are input preceded by a backslash, and the backslash itself is input as `\backslash`.

<sup>33</sup>`#`, `$`, `%`, `&` obey the math alphabets since the initial version of **mathastext**; the dot `.`, the slash `/`, the vertical bar `|` and the backslash `\` do not have specific spacings inserted by  $\mathrm{T\!E\!X}$  around them, and the procedure is then not a devilish one, this is why it is made the default for these characters which are listed apart. The math symbols `\mid` (which is `|` with type `\mathrel`) and `\setminus` (with type `\mathbin`) are counted among the ‘difficult’ cases, not the ‘easy non-letters’.



as delimiters). The important thing is that the spaces added by T<sub>E</sub>X before and after are not modified.

Let us compare, for example, the new behavior of `\mathtt` and `\mathbf`

$$(\sin(n!) < \cos(m - p)?) \quad [\sin(\mathbf{x} + \mathbf{y}) = \cos(\mathbf{z} - \mathbf{t})]$$

with the traditional default behavior:

$$(\sin(n!) < \cos(m - p)?) \quad [\sin(\mathbf{x} + \mathbf{y}) = \cos(\mathbf{z} - \mathbf{t})]$$

The first feature is activated by default, except of course for the normal and bold math versions when the package was given the *subdued* option. The second feature is *off* by default for the characters listed first. It is *on* for the ‘easy’ cases `# $ % & . / | \` (activating the feature for them puts no constraint on the user input and should not be too upsetting to other packages), and also for `*` but only if this was required explicitly by the option *asterisk*, as the user then is supposed to know that `$R^*$` is no valid input anymore and should be replaced by `$R^{\ast}`. The remaining ‘difficult’ cases create similar constraints, which will be commented more upon next. The relevant commands are

```
\MTmathoperatorsdonotobeymathxx
\MTnonlettersdonotobeymathxx
\MTeasyonlettersdonotobeymathxx
```

for deactivation and

```
\MTmathoperatorsobeymathxx
\MTnonlettersobeymathxx
\MTeasyonlettersobeymathxx
```

for activation.<sup>34</sup>

**Important:** the package does `\MTnonlettersdonotobeymathxx` by default. The reason is that activating the mechanism adds some constraints to the way things must be input, adding

```
\usepackage{mathastext}\MTnonlettersobeymathxx
```

to a pre-existing document might well create errors: all these characters treated by *mathastext*, such as `?`, `[`, `<` now represent (in math mode only!) *two* ‘tokens’ and this will utterly confuse T<sub>E</sub>X if some precautions are not taken: `$x^?$`, `$R^+$` or `$\mathopen<A\mathclose>$` must now be coded as `$x^{\?}$`, `$R^{\+}$` and `$\mathopen{\<}A\mathclose{\>}$` (the rule is to do as if `?`, `+`, `<` or `>` were each really *two* characters).

<sup>34</sup>these commands are to be used outside of math mode. Their scope is limited to the current L<sup>A</sup>T<sub>E</sub>X environment or group. They use the `\everymath` and `\everydisplay` mechanism so if the document needs to modify these token lists it has to do so in a responsible manner, extending not annihilating their previous contents.

Even if this rule is respected in the document source, it is still a possibility that incompatibilities with other packages will arise because `mathastext` does a *mathematical activation* of the characters which could be unexpected and unchecked for by other packages. This is precisely the case with the `amsmath` package, and the problem goes away by just making sure that `amsmath` is loaded before `mathastext` (generally speaking, `mathastext` should be loaded last after all packages dealing with math things).

The braces `\{` and `\}` remain unresponsive to the alphabet changing commands even after `\MTnonlettersobeymathxx`. One must issue also `\MTexplicitbracesobeymathxx`, but it has the disadvantage that `\{` and `\}` become then unusable as variable-size delimiters: `\big\{` or `\big\}` create errors and one must make use of `\big\lbrace` and `\big\rbrace`. But one can now enjoy `\{a, a > b\}`, `\{a, a > b\}`, `\{a, a > b\}`, or even `\{a, a > b\}`.<sup>3536</sup>

Even with `\MTnonlettersobeymathxx`, the parenthese-like symbols `(, ), [, ], <` and `>` and the slashes `/, \`, if used as left/right delimiters (i.e. with `\left/\right`) do not react to math alphabet commands. This is mainly explained by the fact that the text font will not contain suitable glyphs, hence no attempt was made to make the delimiters pick up their glyphs there.

But `mathastext` does try to pick up most of the ‘small variants’ of the delimiters from the text font: `\left<x\right>` gives `<x>` (but `\left<b\right>` gives `<b>`.) Notice that this differs from standard L<sup>A</sup>T<sub>E</sub>X for which `\left<x\right>` gives `<x>`. As it is perhaps a bit strange to have `<x>` next to `<X>` there is option `nosmalldelims`: with this option the small-sized variants of the delimiters are not modified by `mathastext` (option `nosmalldelims` has the side effect that, for the non-delimiter uses of `\{, \}` to be `mathastext`-ified it is necessary to issue `\MTnonlettersobeymathxx` and `\MTexplicitbracesobeymathxx`.)

At any rate, as said above, whether ‘small’ or not, delimiters are unresponsive to math alphabet commands, due to technical aspects of T<sub>E</sub>X, and the way `mathastext` handles these things. Examples: `\mathbf{<a,b>}` gives `<a,b>` (no use of `\left/\right`, hence brackets do obey the math alphabets — as we issued `\MTnonlettersobeymathxx` a bit earlier), `\mathbf{\left<a,b\right>}` gives `<a,b>` (brackets used with `\left/\right` do not obey the math alphabets), `\mathbf{\mathopen{<a,b\mathclose{>}}}` gives `<a,b>` (no `\left/\right`, brackets do obey the math alphabets).

For comparison, the L<sup>A</sup>T<sub>E</sub>X standard behavior for

`\mathbf{\mathopen{<a,b\mathclose{>}}}`

is `<a,b>` (neither brackets nor the comma do respond).

<sup>35</sup>this last example uses the `\mathnormalbold` additional alphabet defined by `mathastext`.

<sup>36</sup>Let me recall that braces will anyhow not be handled at all by `mathastext` if the document font encoding is OT1, except under option `alldelims`.

## 1.9 Greek letters

The Computer Modern fonts are very light and thin in comparison to many text fonts, and as a result rarely mix well with them (particularly if the Latin letters in math mode are upright). The following options are provided by **mathastext**:

**no option:** nothing is done by the package, Greek letters are the default Computer Modern ones or have been set-up by other packages; for example by the **fourier** package with option ‘upright’, which gives upright Greek letters.

**LGRgreek:** this is for fonts which additionally to Latin letters also provide Greek letters in LGR encoding. Here is a list from a 2012 standard T<sub>E</sub>X installation: the Computer Modern, Latin Modern, and the CM-LGC fonts; the Greek Font Society fonts (such as GFS Didot), the epigrafica and kerkis packages, the txfontsb package which extends the txfonts package with LGR-encoded Greek letters; the Droid fonts, the DejaVu fonts, the Comfortaa font, and the Open Sans font. The LGR encoded CM/LM fonts (in serif, sans-serif and typewriter family) give the nice Greek letters in upright shape from the **cbfonts** package. To get these letters in your **mathastext** math mode, you can do the following:

```
% instructions to load the document fonts:
\usepackage{nice_font}
% and then the following:
\renewcommand{\familydefault}{\cmr} % or cmss or cmtt for sans resp. mono
\usepackage[LGRgreek]{mathastext}
\renewcommand{\familydefault}{\rmdefault}
\Mathastext % this re-initializes mathastext with the nice_font,
% without changing the LGR font cmr/cmss/cmtt used for Greek letters
% in math mode.
\begin{document}
```

If you use the **italic** option note that the italic Greek letters from the **cbfonts** are not the same glyphs as the default Greek letters from the OML encoded font **cmmi**.

**eulergreek:** the Greek letters will be taken from the Euler font (the document does not have to load the eulervm package, **mathastext** directly uses some file included in this package, as it provides a mechanism to scale by an arbitrary factor the Euler font.) The letters are upright.

**symbolgreek:** the Greek letters will be taken from the (Adobe Postscript) Symbol font. A command is provided so that the user can scale the Symbol font to let it better fit with the text font. The letters are upright.

**selfGreek:** this option concerns only the eleven Greek capitals from the OT1-encoding. It does nothing for the lowercase Greek letters. The encoding used in the document does not have to be OT1.

There is also `LGRgreeks` which tells `mathastext` to pick up in each math version the letters from the LGR encoded font used in that version, and `selfGreeks` to tell `mathastext` to do as for `selfGreek` but separately in all math versions.

Under the `subdued` option the Greek letters in the normal and bold math versions are kept to their defaults as found at the time of loading the package.

The commands `\MTstandardgreek` allow at any point in the document to turn inactive any Greek related option passed to `mathastext`. And conversely `\MTcuse-tomgreek` reactivates it.

### 1.9.1 Shape of Greek letters

Classic T<sub>E</sub>X uses in math mode italic lowercase and upright uppercase Greek letters. French typography uses upright shape for both lowercase and uppercase. And the ISO standard is to use italic shape for both lowercase and uppercase.

The Euler and Symbol fonts not being available in other than their default upright shape, this question of shapes for Greek letters raises issues only in the case of the options `LGRgreek` and `selfGreek`.

The options `frenchmath`, `itgreek`, `upgreek`, `itGreek` and `upGreek` modify the Greek letter shapes according to the following rules, listed from the lowest to the highest priority:

**no option:** the lowercase Greek letters are in the same shape as Latin letters, and the uppercase in the same shape as applied to digits and operator names,

`frenchmath:` both lowercase and uppercase are in the same shape as the digits and operator names (most of the time this means “upright shape”, but it can be otherwise),

`itgreek`, `upgreek:` both lowercase and uppercase are in the `\itdefault`, respectively the `\updefault` shape (at the time of loading the package or at the time of a subsequent call to `\Mathastext` or `\MathastextWillUse`),

`itGreek`, `upGreek:` same as above, but only for the uppercase letters.

So, the default gives the classic T<sub>E</sub>X behavior when option `italic` was passed. Each call to `\Mathastext` (or `\MathastextWillUse`) macros (described in a later section) reinitializes the computation of the shapes.

As mentioned already the package allows to define various “math versions”. In the case of `eulergreek` or `symbolgreek` they apply to all these versions. In the case of the options `LGRgreeks` or `selfGreeks` (notice the additional “s”), each math version is assumed to have its text font available in LGR (or OT1 encoding) and also the shapes will be local to the math version.

Finally version 1.15c of `mathastext` introduces new preamble-only commands to change the shapes, and even the font, used for Greek letters, in case of package options `LGRgreek`/`selfGreek`. They are `\MTitgreek`, `\MTupgreek`, `\MTitGreek`, `\MTupGreek`: these are used like the options and change only the shapes

for the math versions which will be declared *next* in the preamble; and `\MTgreek-font{name_of_font}` will tell the *next* math versions to use that font family. To use this command you need to know the (little) name of a suitable font family available in LGR encoding: for example `lmr`, `txr` (needs `txfontsb` package on your system), `DejaVuSerif-TLF` (needs `dejavu` package on your system), etc...

## 1.10 Unicode engines

`mathastext` is minimally Unicode aware since 1.12 and can be used with  $\text{\XeTeX}$  or  $\text{\LuaTeX}$ . Starting with release 1.3, it needs `luatex` to be at least as recent as the one which was provided with the TL2013 distribution.

### 1.10.1 Caveat emptor

With  $\text{\XeTeX}$  the user is strongly advised to first consider using the `mathspec` package, which is designed for Unicode, with a key-value interface. With both  $\text{\XeTeX}$  and  $\text{\LuaTeX}$ , `unicode-math` is recommended for OpenType math fonts.

Particularly in the latter case (*i.e.* using `unicode-math`) you probably don't need, don't want, and should not use `mathastext`: it is extremely far from being able to define a math font, as it applies basically only to a subset of the 32–127 ascii range, and in particular it does not know how to use a given Unicode font simultaneously for Latin and Greek letters. Again the user is strongly advised to look at `mathspec` and `unicode-math`.

Let me point out explicitly that `mathastext` has not been tested in any systematic manner under the Unicode engines; and that it is expected to be most definitely incompatible with `unicode-math`, although your mileage may vary and some features may appear to work.

When using `mathastext` with either  $\text{\XeTeX}$  or  $\text{\LuaTeX}$  it is recommended to use the `fontspec` package (see remark below on `\encodingdefault`). Furthermore, it is *necessary* to load `fontspec` with its `no-math` option, and this *must* happen before loading `mathastext`.

- Use `fontspec` with its *no-math* option, and load it *prior* to `mathastext`. As some packages load `fontspec` themselves (for example `polyglossia`), a `\PassOptionsToPackage{no-math}{fontspec}` early in the preamble might be needed.
- The `amsmath` package, if used, *must* be loaded *prior* to `mathastext`.
- Under `luatex` engine, it has long been recommended to also load the package `luatex-math`. Please check its documentation as possibly it has now been incorporated upstream (I am not following up on the situation).



```

\columnbreak
\centerline{ abcdefghijklmnopqrstuvwxyz }
\centerline{ ABCDEFGHIJKLMNOPQRSTUVWXYZ }
\centerline{ 0123456789}
\centerline{ !\,?\,*\,,\,.\,:\\,;\,+\,-\\,=\\,(\\,)\, [\\,]\,/\, \#\,%
\$\,\\,\,&\\,<\\,>\\,|\\,\{\\,\\}\,\\,\char92 }
\end{multicols}}
\begin{multicols}{2}
\centerline{\textbf{math mode}}
\columnbreak
\centerline{ \textbf{text} }
\end{multicols}
\TEST{DejaVu}\TEST{Verdana}\TEST{times}\TEST{Andale}
\TEST{Arial}\TEST{bold}\TEST{normal}
\end{document}

```

And now the same thing with fonts available on Mac OS X:

```

\documentclass{article}
\usepackage[hscale=0.8]{geometry}
\usepackage{multicol}
\usepackage[no-math]{fontspec}
\usepackage{lmodern}
\usepackage[subdued,italic]{mathastext}
\setmainfont[Color=FF0000]{Hoefler Text} \Mathastext[Hoefler]
\setmainfont[Color=336633]{American Typewriter}\Mathastext[Typewriter]
\setmainfont[Color=0000FF]{Herculanum} \Mathastext[Herculanum]
\setmainfont[Color=FF00FF]{Didot} \Mathastext[Didot]
\setmainfont[Color=999999]{Comic Sans MS} \Mathastext[Comic]
\begin{document}
--- copy here the code from the previous example ---
\TEST{Didot}\TEST{Comic}\TEST{normal}\TEST{Herculanum}
\TEST{Hoefler}\TEST{Typewriter}\TEST{bold}
\end{document}

```

## 1.11 Compatibility issues

Compatibility issues (or just questions of who decides last) are naturally to be expected with packages dealing with the math setting; the fix is simply to load **mathastext** last. And one should always load **amsmath** before **mathastext** (this is especially true when using Unicode engines but applies in general as well).

Any definition made in a package loaded before **mathastext** of the font to be used for letters or for the common characters in the **ascii** basic range will be overruled by the loading of **mathastext** (this includes the case when the earlier package had made the character ‘mathematically active’). Conversely most of the set-up done by **mathastext** may well be overruled by packages loaded later which do math related things.

In case of a ‘too many math alphabets’ message try the `defaultalphabets` option or one of its `defaultnormal`, `defaultttt`, etc. . . sub-options.

Starting with version 1.2, `mathastext` makes some characters ‘mathematically active’ to achieve certain effects: automatic insertion of the italic corrections when using an upright text font in math, extended scope of the math alphabet commands which now apply to non-letter symbols (and also to math operator names, but this is much easier to achieve). And the (already mathematically active) right quote is modified to have some extra space added before the derivative glyph ‘.

This is compatible with using `\label` and `\ref` in and outside of math mode. But a difficulty arises when some other package has made the character ‘globally active’ everywhere in the document. The action of `mathastext` is made anew at each mathematical inline or displayed formula. If it is detected that a character has been activated then nothing further will be done (so the `mathastext` feature<sup>39</sup> for that character is lost) *except* if it appears that this activation was done by the Babel system. In that case `mathastext` does not make the character mathematically active but it modifies in the appropriate manner the action of Babel for that character in math mode. Furthermore `mathastext` makes the character mathematically *inactive*.<sup>40</sup>

Here is indeed some code that you should **not** try at home:

```
\documentclass{article}
\usepackage[french]{babel}
\usepackage{mathtools}\mathtoolsset{centercolon}
\begin{document}
$:$
\end{document}
```

DO NOT DO THIS AT HOME: it creates an infinite loop.<sup>41</sup> This is due to the fact that the colon is simultaneously active (this is made by `babel+frenchb` at begin document) and mathematically active (done by `mathtools` in the preamble). The interaction gives an infinite loop. Such a situation will be cured by `mathastext`, even loaded before `mathtools`, *if* use is made of `\MTnonlettersobeymathxx`. At each math formula `mathastext` will detect that Babel has activated the colon, and will cancel the mathematical activation (the precise definition done by `mathtools` was already lost at begin document due to overwriting by `babel` but the fact that the character was mathematically active remained true).

So far I have briefly described the problem of document active characters (see the test file `mathastexttestalphabets.tex` for more explanations and illustrations,

<sup>39</sup>italic correction insertion for the latin letters, receptivity to the math alphabet action for the other characters.

<sup>40</sup>only the characters  `; , : ! ? + - = < > ( ) [ ] *`  mentioned in section 1.8 as ‘difficult non letters’ (and the right quote ‘) and the latin letters are concerned here; it seems highly improbable that a latin letter  $\in \{a-z, A-Z\}$  will have been made globally active (only letters never being used in command names are possible candidates), but `mathastext` has been designed to cope with it, should it happen ...

<sup>41</sup>This seems to still be the case with Babel 3.9f and frenchb.lfd 2.6e, as tested on Sep. 2, 2013. Again tested with up-to-date TL2015 Jan. 15, 2016 with same result.



and the commented source code of the package). Pure mathematical activation revealed an incompatibility of another type with `amsmath`. To fix it, `mathastext` now replaces an inner macro of `amsmath` (`\resetMathstrut@`) with its own version.

Always load `amsmath` before `mathastext`.

Actually this last commandment was already made necessary by the use of the text endash to represent the minus sign in math mode, and, especially for Unicode engines, some aspects of the `\DeclareMathOperator` macro from `amsmath`.

**Important!** As is mentioned in the section 1.8, after command `\MTnonlettersobeymathxx`, characters such as `?`, or `[`, now represent *two* ‘tokens’ and this will utterly confuse  $\TeX$  if some precautions are not taken. Examples:  $0^+ \$$  or  $x \mathrel{?} y \$$  or  $R^* \$$  *must* be input now as  $0^{+} \$$  and, respectively,  $x \mathrel{\{?\}} y \$$  or  $R^{\{*\}} \$$ . This is why the package does `\MTnonlettersdonotobeymathxx` by default.

One thing to take note of is that this mechanism uses the `\everymath` and `\everydisplay`, so if it is needed to add to these  $\TeX$  ‘token lists’ some additional things this should be done in a way preserving the former contents.

If one issues (after `\begin{document}`) `\everymath={}` and `\everydisplay={}` this annihilates not only all the `mathastext` (evil ?) doings with math active characters but also everything else some other package might have put in these token registers, so it is better, if the need arises to cancel the math activation of characters done by `mathastext` to use the command `\MTeverymathoff`, which does all of `\MTmathoperatorsdonotobeymathxx`, `\MTnonlettersdonotobeymathxx` (already default), `\MTmathstandardletters`, `\MTnormalprime`, and `\MTnormalasterisk`. This is supposed to be used in a group or environment (as there is no `\MTactivemathon`). It must be used prior to entering math mode.

**New with 1.3i:** `mathastext` patches `\url` of packages `url` and `hyperref`, and also `\nolinkurl`, to force them to do automatically `\MTeverymathoff`. Indeed they use math mode, and it is better to turn `mathastext` off for their dealings.

## 2 Package options and commands

### 2.1 Summary of main options

**italic**, **frenchmath**: italic letters in math, upright uppercase if **frenchmath**.

**subdued**: acts in a subdued way. The  $\LaTeX$  normal and bold math versions are left (quasi) unchanged. With version 1.15e of the package this statement applies

also to the math alphabets `\mathbf`, `\mathit`, `\mathsf`, and `\mathtt` (and not only to `\mathnormal` and `\mathrm` as in previous versions.)

**LGRgreek**, **eulergreek**, **symbolgreek**: the Greek letters will be taken, respectively from the text font itself (in LGR encoding), or from the Euler font, or from the Postscript Symbol font.

**symbolmax**: all characters other than letters and digits, are taken from the Symbol font. This option also makes a number of further glyphs available, such as some basic mathematical arrows, and the sum and product signs. For documents with very simple needs in mathematical symbols, **mathastext** with option **symbolmax** may give in the end a PDF file quite smaller than the one one would get without the package.

**defaultmathsizes**: **mathastext** sets up bigger sizes for subscripts (it also copies code from the **moresize** package to redefine `\Huge` and define `\HUGE`). Use this option to prevent it from doing so.

**defaultalphabets**: by default, **mathastext** redeclares the math alphabets `\mathrm`, `\mathit`, `\mathtt` etc... (but not `\mathcal` of course) to refer to the current document text fonts (at the time of loading the package and in each **mathastext** math version). Use this option to prevent it from doing so (each alphabet also has its own disabling option).

## 2.2 Miscellaneous

**the en-dash as minus sign**: very often the `-` character from the text font does not give a good minus sign. So by default, the package uses the en-dash sign `–`. Use **noendash** to deactivate it. Starting with version 1.12 of the package this ‘en-dash as minus’ should work in all encodings, including Unicode (if **fontspec** has been loaded); see also **unicodeminus** for OpenType fonts.

**changed:** **amsmath**: the behaviour of the `\DeclareMathOperator` command of **amsmath** is modified by **mathastext** for it to use the correct font. Additionally, release 1.3n of **mathastext** at long last also handles an extra operation done by **amsmath** for `'./-*` to be used in operator names without the extra math spacing.<sup>42</sup> This customization is suppressed in **subdued** mode for the **normal** and **bold** math versions. (1.3n)

**hbar**: the default L<sup>A</sup>T<sub>E</sub>X definition of `\hbar` would in our context make use of the `h` of the current math font (so for us, it is also the text font, perhaps in italic

---

<sup>42</sup>To the experts: there is a long story here that `\newmcodes@` hardcodes the font, that it was not compatible with Unicode engines, that during some time (2013-2016) **lualatex-math** fixed that and very recently **amsopn.sty** 2016/03/08 v2.02 also, so now **lualatex-math** 1.6 does nothing as it is already fixed “upstream” in **amsopn.sty**, but anyhow in both cases, this still hardcoded the font, so finally **mathastext** does the right thing from its point of view. See the code comments for more, there is an issue here with L<sup>A</sup>T<sub>E</sub>X not applying the curly right quote contrarily to X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X.

shape), but with a bar across the `h` from the original default math font for letters (usually `cmmi`). We redefine `\hbar` to use the text font macron accent (`\=`) as a mock math accent (this takes into account the `italic` option and is compatible with subscripts and superscripts).

Since 1.12 `mathastext` when dealing with a Unicode font sets the `\hbar` to be the character from the font having hexadecimal codepoint U+0127.

**changed:** Since 1.3u the general 8bits font encoding is supported (see discussion of the `mathaccents` option at end of this list for the shared limitations). Brief testing with various usual  $\TeX$  fonts shows that the vertical positioning of the bar isn't satisfying. It is planned to either add a parameter to adjust it or to modify altogether the mode of construction of the `\hbar`. (1.3u)

Use `nohbar` to tell `mathastext` not to provide its own `\hbar`.

**dotless i and j:** by default the package redefines `\imath` and `\jmath` to give (in math mode) the dotless i and j (if it exists at all) from the text font.<sup>43</sup>

**asterisk:** versions of `mathastext` earlier than 1.2d [2013/01/02] did not do anything with the `\ast` control sequence but did pick the asterisk `*` in the document text font, and this often was a rather silly thing as the text asterisk is generally in a raised position. Furthermore, the `*` lost its status of a binary operator and was treated as an 'ordinary' symbol. An option `noasterisk` turned this feature off. Starting with 1.2d, the `noasterisk` option is deprecated and the new default is to do nothing. But when option `asterisk` is received by the package, then both `\ast` and `*` are simultaneously modified to use (as binary operators) the text asterisk, slightly lowered. The amount of lowering<sup>44</sup> is decided by the mandatory argument to the command `\MTlowerast{<dimen>}`. The package initially does `\MTlowerast{.3\height}`. Doing `\MTlowerast{.5ex}` is not a good idea as it does not scale properly in the script and scriptscript styles. With an argument given as a multiple of `\height`, the asterisk will behave as expected in subscripts and subscripts of subscripts. But `*` is now 'mathematically active'<sup>45</sup> and `$R^*$` or `$R^{\ast}` *must* be input as `$R^{\ast}` and `$R^{\ast}`. Furthermore, they will obey the math alphabet commands.

**X<sub>Y</sub>TeX and Lua $\TeX$ :** regarding the en-dash and the dotless i and j, the package is now under the Unicode engines compatible not only with the "Unicode"  $\LaTeX$  font encodings EU1 (X<sub>Y</sub>TeX, old fontspec), EU2 (Lua $\TeX$ , old fontspec),

**changed:** <sup>43</sup>Since 1.12 it also redefined `\i` and `\j` for usability both in text and math modes, but this has been dropped at 1.3t. Breaking change! (1.3t)

<sup>44</sup>with the option `symbolmisc`, the asterisk is picked from the Symbol font, and the amount of lowering is non-customizable; however if a math alphabet command is used, the asterisk is then again from a text font and the lowering will be as specified by `\MTlowerast`.

<sup>45</sup>in a hopefully safe way, for example `$\label{eq*1}` is ok.

NEW FEATURE!

TU (X<sub>Y</sub>TeX and Lua<sup>A</sup>TeX, modern fontspec), but also with traditional 8bits-encodings declared as a `fontenc` option. Formerly, with a Unicode engine, only OT1, T1 and LY1 were supported by `mathastext` as the 8bit encoding of the document text font, regarding the minus as en-dash and the dotless i and j. (1.3u)

**fontspec:** one more note to users of X<sub>Y</sub>TeX/Lua<sup>A</sup>TeX with `fontspec`:

it has to be loaded with the option `no-math`, and *before* `mathastext`.

**vec accent:** The default `\vec` accent is not appropriate for upright letters, so `mathastext` provides a `\fouriervec` which takes its glyph in a Fourier font, and an Ersatz `\pmvec` which is reasonably good looking on upright letters and works with the `\rightarrow` glyph. Contrarily to version 1.0, the default `\vec` is not overwritten with `\fouriervec`. And contrarily to version 1.1, one now needs to pass the option `fouriervec` to have the math accent `\fouriervec` defined by the package.<sup>46</sup>

**math alphabets:**

- We define a new math alphabet command `\mathnormalbold` which gives direct access to the bold version of the `\mathnormal` alphabet (rather than using either the `\bm` command from the `bm` package or the `\boldsymbol` command from the `amssy` package). As it does not exist in the default <sup>A</sup>TeX math font set-up, this alphabet is *not* subjected to the subdued option action.
- The other math alphabet changing commands defined by the package are `\MathEulerBold`, `\MathEuler` and `\MathPSymbol`.
- `\mathnormal`, `\mathrm`, `\mathbf`, `\mathit`, `\mathsf` and `\mathtt` are modified to make reference to the document text fonts (this can be disabled by suitable package options).
- version 1.2 of `mathastext` has extended the scope of the math alphabets to apply to non-alphabetical characters and to operator names. This respects the automatic white spaces added by TeX around math symbols.
- the extra skips around letters (see subsection 1.5 and subsection 1.6) are removed in the scope of the math alphabets. (1.3i)

**math accents:** if option `mathaccents` is used then `mathastext` attempts to let the math accents `\acute`, `\grave`, etc... use the suitable glyphs from the text font. Prior to 1.3u only OT1, T1, and LY1 were supported (via hardcoded slots). It should now work with any 8bits font encoding having been declared as an option to the `fontenc` package (and of course providing the ten needed text accents which will mock math accents).<sup>47</sup> (1.3u)

NEW FEATURE!

<sup>46</sup>this costs a math family, as I never came back to this to try to do otherwise.

<sup>47</sup>The code will raise low-level TeX errors if the user attempts to use an 8bits font encoding whose <sup>A</sup>TeX definition file is lacking the suitable uses of `\DeclareTextAccent` or if the low level <sup>A</sup>TeX

The `\vec` math accent is not handled here, as it is not available in the usual 8bits font encodings. See the `fouriervec` option or the `\pmvec` command.

NEW FEATURE!

The math accents obey the `subdued` option and will change in sync with the `mathastext`-ified text font used in each non subdued math version. (1.3u)

(Very) brief testing during 1.3u development with X<sub>Y</sub>T<sub>E</sub>X and LuaT<sub>E</sub>X let the author conclude that usage with the `\Umathaccent` primitive of an OpenType accent glyph slot (which in the text font is for usage as a postpended combining character) gives definitely bad horizontal placements for both engines (each in its own way). Thus, the redefinitions of accents for a `mathastext` declared math version with an OpenType font is by default canceled.<sup>48</sup> Use `unimathaccents` to force usage of the OpenType font text accents glyph slots with the `\Umathaccent` primitive. Expert users are invited to check out the code and to contribute suggestions if some extras can improve it.

**varying font encodings:** the very first release of `mathastext` dealt with only one font; very soon thereafter it acquired the capacity to define multiple math versions, each one using its own text font. But, as was documented at this location formerly, various encoding dependent decisions were done once and for all during package loading.

This meant in particular that the minus sign (using the text endash), the dotless i and j, the `\hbar`, the math accents were all set up for only one unique font encoding. It was thus recommended that all math versions share the same font encoding.

NEW FEATURE!

The 1.3u release has lifted this restriction. (1.3u)

## 2.3 Commands

A few preliminary comments, mainly destined to advanced users aware of some T<sub>E</sub>X innards (more extensive explanations are to be found in the code comments).

The timing for actions of `mathastext` falls into three cases:

1. things done during the loading of the package, or delayed to `\AtBeginDocument`,
2. things done as the result of user commands, either in the preamble or in the body of the document,
3. things done everytime math mode is entered.

---

macro implementation of text accents changes significantly; in such cases please report the problem to the author, so that it can be documented in future releases!

<sup>48</sup>i.e., the `\grave` etc... control sequences will, in math versions with an OpenType `mathastext`-ified font, expand to macros holding their initial meanings, unmodified by `mathastext`, which was in force at the `\begin{document}`.

The second category overlaps with the others, as the (preamble) use of some commands can have either immediate effect or only trigger some actions in `\AtBeginDocument` or perhaps only influence the things done later by `mathastext` each time math mode is entered.

The third category deserves some brief additional comments: it mainly (but not exclusively) regards the “math activation” of characters, and conversely all “math activations” fall into this category. The package re-checks each time math mode is entered if some characters have been made in-between catcode active, or math active, and takes appropriate decisions: one important aspect of this issue is that `babel`’s mechanism for activating character was not, last time I checked, very robust against math active characters. I now checked again (on January 15, 2016) that

```
\documentclass{article}
\usepackage[french]{babel}
\usepackage{mathtools}\mathtoolsset{centercolon}
\begin{document}
$:$
\end{document}
```

creates an infinite loop (see section 1.11 where this was mentioned already, some years ago). Thus `mathastext` has (since 1.2e 2013/01/10) a somewhat elaborate mechanism related to these issues (see the code comments), installed into the list of things done by `TeX` systematically each time it enters math mode. For some legacy reason the package also puts into this list a few other things which could arguably be done elsewhere once and for all. The command `\MTEverymathoff` cancels all actions done by `mathastext`.

### 2.3.1 Preamble-only commands

These commands mainly facilitate the definition of math versions, in a `mathas-text` extended sense. It is not necessary to use them to activate the package basic functionalities, as loading `mathastext` is enough (except with the `subdued` option).

- `\Mathastext` (or `\mathastext`) reinitializes `mathastext`: it sets the fonts used in math mode (in versions `normal` and `bold`) for letters, digits and a few ascii symbols to the *current* defaults of encoding, family, series and shape.<sup>49</sup> Both the normal and bold math version are modified by this action of `\Mathastext`.
  - **math versions:** `\Mathastext` accepts an optional argument [*<name>*]. With this (within square brackets) argument, rather than redefining the fonts for math mode, `\Mathastext` declares a new *math version*, and it is this math version which will use the then current text font in math mode.<sup>50</sup>

<sup>49</sup>`\Mathastext` updates also the font and shapes for the Greek letters (LGRgreek option), and the skips to be inserted after the symbols  $\forall$  and  $\exists$ , see *infra*.

<sup>50</sup>The allowed version names are as for the `\LaTeX \DeclareMathVersion` macro. *Do not use* `\Mathastext[foo]` with *foo* equal to “normal” or “bold”; this is already taken care of by the initial loading of the package or a later command `\Mathastext` without any optional argument.

- **inheritance:** starting with version 1.3c a second optional argument (*other\_version*) will transfer its set-up for things not affected by **mathas-text** action, like large symbols, to the declared math version whose name was given as first optional argument. The main use will be with **[bold]** in order for the symbols and large symbols to be typeset as in the bold math version. For example, this document has in its preamble:

```
\usepackage{newcent}% this package makes New Century the roman font
\Mathastext[newcent]% this math version will use New Century
\MTseries{b}          % next \Mathastext will use a bold font
\Mathastext[boldnewcent][bold]% large symbols, etc., will be bold too
We can check that it does work:
```

$\backslash\text{MTversion}\{\text{newcent}\}: abcde \oint \bigvee \bigcup \bigotimes \bigoplus$   
 $\backslash\text{MTversion}\{\text{boldnewcent}\}: \textit{abcde} \oint \bigvee \bigcup \bigotimes \bigoplus$

Naturally, for this one needs an initial math font setup with some nice bold fonts also for large symbols. This is the case with the excellent **txfonts** package of YOUNG RYU. As the present document must use many fonts and declares many math alphabets, we did not load the full package and fonts but only the **largesymbols**:

```
\DeclareSymbolFont{largesymbols}{OMX}{txex}{m}{n}
\SetSymbolFont{largesymbols}{bold}{OMX}{txex}{bx}{n}
\DeclareFontSubstitution{OMX}{txex}{m}{n}
```

- **\Mathastext** may be preceded optionally by one or more of<sup>51</sup> **\MTencoding{<enc>}**, **\MTfamily{<fam>}**, **\MTseries{<ser>}**, **\MTshape{<sh>}**, and **\MTlettershape{<sh>}**. For example valid values are, respectively, *<T1>*, *<phv>*, *<m>*, *<n>*, and *<it>*: this is the Helvetica font in T1-encoding, regular (medium) series, upright shape, and the letters will be in italic shape. Once used their effect applies to all succeeding calls to **\Mathastext**, and can only be undone by using them again.
- **\MTWillUse[<ltsh>]{<enc>}{<fam>}{<ser>}{<sh>}** tells **mathastext** to use the font with the specified encoding, family, series, and shape for the letters and digits (and all other afflicted characters) in math mode. The optional argument *<ltsh>* specifies a shape for the letters, for example **\itdefault**, or directly *<it>* or *<sc>*.
- **\MTDeclareVersion[<ltsh>]{<name>}{<enc>}{<fam>}{<ser>}{<sh>}[<other\_version>]:** declares that the document will have access to the font with the specified characteristics, under the math version name *<name>*. For example:  

$$\backslash\text{MTDeclareVersion}[\text{sc}]{\text{palatino}}{\text{T1}}{\text{ppl}}{\text{b}}{\text{sl}}$$
declares under the name **palatino** a version where mathematics will be typeset using the Palatino font in T1-encoding, bold, slanted, and the letters will in fact

<sup>51</sup>these commands exist also with long names: **\Mathastextencoding**, etc. . . The same applies to the other commands mentioned in this section.



be in caps and small caps (and bold).<sup>52</sup> When the initial optional argument is absent, and `mathastext` was loaded with the `italic` option, then the default letter shape will be `it`,<sup>53</sup> else letters will have the same shape as used for digits and operator-names.

Another optional argument may be used as last argument. Similarly as its use with `\Mathastext` this makes the declared math version inherit, for things not modified by `mathastext` like large symbols, the font set up of the math version whose name was passed as optional argument (typical use will be with `[bold]`). (1.3c)

- `\MTboldvariant{⟨var⟩}`: when used before `\Mathastext`, specifies which bold (`b`, `sb`, `bx`, ...) to be used by `\mathbf` (and `\boldmath`). Default is the `\bfdefault` at the time of loading `mathastext`. When used before the declaration of a version, decides the way `\mathbf` will act in this version.
- `\MTEulerScale{⟨factor⟩}`: scales the Euler font by `⟨factor⟩`.
- `\MTSymbolScale{⟨factor⟩}`: scales the Symbol font by `⟨factor⟩`.
- `\MTitgreek`, `\MTupgreek`, `\MTitGreek`, `\MTupGreek`: optional commands, active only in the case of the `LGRgreek` option, to decide the shape of the Greek letters in the versions which will be declared next.
- `\MTgreekfont{⟨fontfamily⟩}`: optional command with a mandatory argument which specifies the font for Greek letters in all `mathastext` math versions declared afterwards via `\Mathastext` or `\MTDeclareVersion`. Only effective with `LGRgreek` option.

### 2.3.2 Commands usable only outside of math mode

They are usable only from outside math mode because they act via turning on or off the execution, each time math mode is entered, of certain macros added by `mathastext` to the `\everymath` and `\everydisplay` token list variables.

- `\MTmathactiveletters`: activates the ‘math activation’ of Latin letters. This is done by the package during loading, except under the `subdued` option.<sup>54</sup> It is again executed in the body at each `\MTversion`, except under the `subdued` option when switching to the *normal* or *bold* math versions.

The letters are made mathematically active<sup>55</sup> to insert the extra skips as specified by `\MTsetmathskips` (see section 1.5), and also possibly the italic corrections when using upright fonts (see section 1.6).

<sup>52</sup>I do not especially recommend to use this in real life!

<sup>53</sup>more precisely, the shape is the latest value passed in one of the previously used package commands to specify the shape of letters, or the `\itdefault` of the time of loading the package.

changed: <sup>54</sup>Formerly, it was also executed from each `\Mathastext` in the preamble.

<sup>55</sup>the `mathcode`'s are only modified at the time of execution of `\everymath`, `\everydisplay`. (1.3j)



- `\MTmathstandardletters`: cancels the ‘math activation’ of the letters. Must be re-issued after each `\MTversion`, but see `\MTeverymathdefault`.
- `\MTicinmath`: this command is executed by default by `mathastext` except in case of option `subdued` or if the user chosen letter shape is oblique (`it` or `sl`). It tells `mathastext` to add italic corrections after all letters in math mode, except within the scope of math alphabets.<sup>56</sup>

This command and the next ones in this item can be used in the preamble as well as in the body of the document (in case of `subdued` option, using the commands from within the preamble will remain without effect, as the document body will start in the subdued normal math version anyhow.) But each `\MTversion` in the body will re-emit `\MTicinmath` (in case of non-oblique letter shape), except if the `subdued` option was used and the chosen math version is *normal* or *bold*.

The effect of this and the other commands of this item is local to the group or environment in which it has been issued.

It may theoretically be used from inside math mode, but the included `\MTmathactiveletters` will have an effect only if issued prior to entering math mode.

`\MTnoicinmath`: this command deactivates the package added italic corrections. It can be used inside as well as outside of math mode (or in the preamble of the document).

`\MTICinmath`, `\MTnoICinmath`: these commands activate the italic corrections only for the uppercase letters (but recall that `\MTicinmath` is done by default, thus this will typically have to follow `\MTnoicinmath`.)

`\MTicalsoinmathxx`: this command de-activates the de-activation of the italic corrections inside the arguments to the math alphabet commands. It can be issued inside as well as outside of math mode. Will be effective only if `\MTicinmath` or `\MTICinmath` is in force. To cancel its effect either enclose it in a group or environment or re-issue `\MTicinmath` after it.

- `\MTnormalasterisk`, `\MTactiveasterisk`: the latter will use for `*` and `\ast` the text font asterisk, suitably lowered; the former tells `mathastext` to not modify the L<sup>A</sup>T<sub>E</sub>X default. Both are no-op without option `asterisk`.
- `\MTeasynonlettersobeymathxx`, `\MTeasynonlettersdonotobeymathxx`: the former is done by default, it makes characters `.`, `/`, `|`, `\`, `#`, `$`, `%`, and `&` (if not excluded by package options) obey math alphabet commands. See also section 1.8. This functionality does *not* make the characters “math active” (but it does modify `\mathcode`’s, naturally).
- `\MTnonlettersobeymathxx`, `\MTnonlettersdonotobeymathxx`: the former will make (except if excluded by relevant package options) `!`, `?`, `..`, `:`, `;`, `+`, `-`, `=`, `(`, `)`, `[`, `]`, `<`, and `>` obey the math alphabet commands (when not used as delimiters). These characters are made “math active”, and each one now expands to two tokens. This makes for example `$a^{!}$` illegal input and it will have to be coded `$a^{\!}$`. Hence, by default, the package does `\MTnonlettersdonotobeymathxx`.

changed: <sup>56</sup>Formerly, italic corrections were added to the (non-oblique) letters of `\mathnormal` arguments.

(1.3i)

Under `subdued` option, `\MTnonlettersobeymathxx` effect is of course canceled in the *normal* and *bold* math versions; but please note that when switching back to a non-subdued math version it will be mandatory to issue again `\MTnonlettersobeymathxx` explicitly if its effect is to be re-activated.

In particular, executing `\MTnonlettersobeymathxx` in the preamble or at the start of the document body serves nothing, because the document is in the subdued *normal* math version regime then. It must thus be executed after the first usage of `\MTversion` switching to a non-subdued math version, and again on each successive exit from the *normal* or *bold* math versions.

`\MTexplicitbracesobeymathxx` extends an earlier `\MTnonlettersobeymathxx` to also treat `\{` and `\}`. But then `\left\{`, `\right\}` must be coded `\left\lbrace`, `\right\rbrace` rather. There is also `\MTexplicitbracesdonotobeymathxx`.

- `\MTnormalprime`, `\MTprimedoesskip`: the latter (done by default if not `subdued`, and also on each use of `\MTversion` in the body of the document except for the subdued *normal* and *bold* math version) makes it so that `'` takes into account the math glue as specified by `\MTprimeskip`. The former is its opposite. In all cases the right quote `'` is a mathematically active character producing `'` as is the default in `TEX`, it is only its meaning which changes to include or not an extra skip. For some (legacy) reason, this change of meaning is done anew by `mathastext` each time math mode is entered. The commands of this item are thus no-op from inside math mode. (1.3j)
- `\MTeverymathdefault`: this hook is executed by `\MTversion{<version_name>}`, except under option `subdued` when switching to the *normal* or *bold* math versions. Its default meaning is: (1.3j)

```
\MTactiveasterisk % this has no effect without option asterisk
\MTprimedoesskip  % this makes prime glyph obey extra space
\MTeasynonlettersobeymathxx
\MTicinmath       % this does \MTmathactiveletters, hence also skips from
                  % \MTsetmathskips are obeyed.
\MTfixfonts       % only operant under LuaLaTeX.
```

Notice that under `subdued` option, switching to the *normal* or *bold* version does `\MTeverymath-off` which includes `\MTnonlettersdonotobeymathxx`.

The default `\MTeverymathdefault` which is issued when going back to a non-*normal* or *bold* math version doesn't do `\MTnonlettersobeymathxx`: thus it is up to the user to correct this if needed (no issue without `subdued` option).

Notice also that `\MTversion{<version_name>}`, except for *normal* or *bold* if `subdued` does `\MTforalldoesskip` and `\MTexistsdoesskip`, which are not included in `\MTeverymathdefault` actions as they are not related to `\everymath` and `\everydisplay`.

- `\MTeverymathoff`: does `\MTnormalasterisk`, `\MTnormalprime`, `\MTnonlettersdonotobeymathxx`, `\MTeasynonlettersdonotobeymathxx`, `\MTmathstandardletters` and `\MTdonotfixfonts`. (1.3j)

The commands `\url/\nolinkurl` of package `hyperref` and `url` from `url.sty` (which use math mode under the hood) are patched by `mathastext` to do `\MTeverymathoff` automatically: this is needed because `mathastext` modifies anew some mathcodes *each time math mode is entered*, hence may overwrite to some extent the specific preparation done by `{url,hyperref}.sty`. (1.3i)

Automatically done by `\MTversion` under option `subdued` if switching to the *normal* or *bold* math versions; and `\MTversion` then does also `\MTnormalexists` and `\MTnormalforall`.

- `\MTfixfonts`: this is operant only under Lua $\text{\LaTeX}$ . It has the effect that each time math mode is entered macro `\MTfixmathfonts` will be executed. The latter forces so-called **base** mode for the used text font in math mode, in an effort to (only partially, see code comments) fix the fact that OpenType features such as Lining Figures were in some cases not being applied in math mode when one uses text fonts there (text fonts are declared by `Lua $\text{\LaTeX}$ +luaotfload` to use **node** mode, which is non-functional in math.) It is invoked automatically by the package (except for **normal** and **bold** math versions under `subdued` option), and in normal situations, there is no reason to use it directly. (1.3o)
- `\MTdonotfixfonts`: cancels the job of `\MTfixfonts`. Done automatically in `subdued` mode when in the **normal** or **bold** math version; in normal contexts, there is no reason to use this command. Only operant under Lua $\text{\LaTeX}$ . (1.3o)

### 2.3.3 Commands usable only in math mode

`\MTfixmathfonts`: this used to be an inner macro but it is given a public name by 1.3p because I discovered that `$..\hbox{\mathversion{foo}}$..$` causes an issue and one needs to invoke again `\MTfixmathfonts` *after* the `\hbox`, for some reason. To be used *only* under Lua $\text{\LaTeX}$  and only for such rare cases where it may be needed. (1.3p)

### 2.3.4 Commands usable everywhere

- `\MTsetmathskips{\langle a-z/A-Z \rangle}{\langle mu glue _before \rangle}{\langle mu glue _after \rangle}`: is used to specify extra skips (or rather mu glue) to be inserted in math mode, before and after a letter. The rationale is that standard text fonts used in math mode may sometimes cause glyph (near-) collisions with math symbols, as  $\text{\TeX}$  has some implicit expectations on the design of fonts for math letters. (1.3a)

These extra skips around letters are set at their natural width and do not add any stretchability or shrinkability to the math formula as a whole, nor do they result in extra potential break points.

Random (silly) examples:

```
\MTsetmathskips{x}{\medmuskip}{\thickmuskip}
\MTsetmathskips{A}{.5mu}{2.3mu}
```

and the effect:  $vw\ x\ yzA\ BC^{vw\ x\ yzA\ BC}$ . The effect obeys the usual  $\text{\LaTeX}$  scoping rules.

The first argument of `\MTsetmathskips` may be any expandable code giving a letter; this facilitates use of `\MTsetmathskip` in `\@for` loops such as this one:

```

\makeatletter
\@for\@tempa:=a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z\do{%
  \MTsetmathskips{\@tempa}{2mu}{2mu}}%
\makeatother

```

*Starting with v1.3i:* the extra skips are *not* applied to the letters within the scope of math alphabet commands, or the letters from operator names (pre-defined or user declared).

Note that contrarily to the `\MTexistsskip`, `\MTforallskip`, and `\MTprimeskip` commands described next, these extra skips (which may be specified in the preamble) are not recorded in the definition of the math version (as defined via `\Mathastext` with its optional argument or via `\MTDeclareVersion`). The declared skips hold throughout the document until modified or canceled, independently of math versions (of course, `mathastext` cancels the skips in the normal and bold math versions if package option `subdued` was used).

- `\MTunsetmathskips{⟨a-z/A-Z⟩}`: cancels the skips for that letter (they are not set to 0mu but completely removed).

The argument may be a macro (or any expandable code) expanding to a letter.

- `\MTexistsskip{⟨math glue⟩}`: specifies the amount of skip or more generally glue to put after each  $\exists$  math symbol. Indeed, upright letters (or digits for that matter) often appear to be positioned a bit too close to the quantifier:  $\exists B$ . The package default is to add a 1mu skip (this default is set to zero in the case of *italic*):  $\exists B$ . One can change the default with the following syntax: `\MTexistsskip{2mu plus 1mu minus 1mu}`, which if used in the preamble and followed with a `\Mathastext` command (or `\MTDeclareVersion`), will be recorded in the definition of this math version (and subsequent ones). One may also use the command at any time in the document. In the case of the option `subdued`, the skip is canceled in the *normal* and *bold* math versions.<sup>57</sup> In the case of the option *italic*, the default skip is set to zero.
- `\MTnormalexists`, `\MTexistssdoesskip`: the latter (done by default if not `subdued`, and also on each use of `\MTversion` in the body of the document) makes it so that  $\exists$  takes into account the math glue as specified by `\MTexistsskip`. The former is its opposite. (1.3j)
- `\MTforallskip{⟨math glue⟩}`: the default is to add a .6667mu math skip after each  $\forall$  (except with the option *italic* for which the default skip is set to zero). Compare  $\forall F$  (has the skip) with  $\forall F$  (has no skip). Use this command in the preamble to set up the skip or glue to be used in the *next to be declared* math versions. In the case of the option `subdued`, the skip is canceled in the *normal* and *bold* math versions.<sup>58</sup> In the case of the option *italic*, the default skip is

changed: <sup>57</sup>Formerly, it was set to 0mu. (1.3j)

changed: <sup>58</sup>Formerly, it was set to 0mu. (1.3j)

zero for all math versions. One may use the command at any location in the document.

- `\MTnormalforall`, `\MTforalldoesskip`: the latter (done by default if not subdued, and also on each use of `\MTversion` in the body of the document) makes it so that  $\forall$  takes into account the math glue as specified by `\MTforall-skip`. The former is its opposite. (1.3j)
- `\MTprimeskip`{ $\langle math glue \rangle$ }: the default is to add a 0.5mu skip before the derivative glyph, except for the *italic* option. In the case of the option *subdued*, the skip is canceled in the *normal* and *bold* math versions.<sup>59</sup>
- `\MTlowerast`{ $\langle dimen \rangle$ }: a `\raisebox` command is used to lower the text asterisk to produce a reasonable math asterisk. The package uses this command initially with argument `0.3\height`, this will have to be fine-tuned for each given text font but worked out ok with the fonts we tried. Note that the dimension argument will be used also in sub-scripts and sub-sub-scripts, so it is best not to use an absolute dimension.
- `\MTmathoperatorsobeymathxx`, `\MTmathoperatorsdonotobeymathxx`: the former is done by default, it makes operator names obey math alphabets. See also section 1.8. This functionality *does not rely* on “math active characters”. Automatically issued by each `\MTversion`, except under option *subdued* when switching to *normal* or *bold*.
- `\MTcustomgreek`: in case `mathastext` has been loaded with one of its Greek related options, this activates the corresponding customization of Greek letters in math mode. It is issued automatically by the package in the preamble (except if loaded with *subdued* option) and at each switch of math version via `\MTversion` or `\MTversion*` (except for the normal and bold math versions in subdued mode). Also available as `\Mathastextcustomgreek`. May be used even inside of math mode. (1.3d)
- `\MTstandardgreek`: in case `mathastext` was loaded with one of the Greek related options this command reverts the customization, it resets the Greek letters to their definitions in force at package loading time. Can be used in the preamble, but is mainly for the document body (may even be used inside math mode ...). Done automatically under the *subdued* option when switching to the normal or bold math version. Also available as `\Mathastextstandardgreek`. (1.3d)

### 2.3.5 Body-only commands

- `\MTversion`[ $\langle nametext \rangle$ ]{ $\langle namemath \rangle$ }, `\MTversion*`{ $\langle namemath \rangle$ }, also known as `\Mathastextversion` (and as `\MTVersion`, and `\mathastextversion`):

---

changed: <sup>59</sup>Formerly, it was set to 0mu.

(1.3j)

- the non-starred version changes *both* the document text fonts and the math fonts (for those characters treated by `mathastext`): the mandatory argument is the math version to be used for math; the optional argument is the name of (another) `mathastext`-declared math version, the font which was chosen during its declaration will be set as document text font (and `\familydefault` etc...also are redefined). In the absence of the optional argument, the mandatory one is used. The versions *must* be either `normal`, or `bold`, or previously declared ones via `\Mathastext` or `\MTDeclareVersion`.
- the starred variant does the math set-up, but changes *nothing* to the text fonts (see [subsection 1.4](#) for a description of the math set-up, which summarizes what is done additionally to only using L<sup>A</sup>T<sub>E</sub>X's `\mathversion`). (1.3c)

`\MTversion[⟨nametext⟩]{⟨namemath⟩}` does `\MTeverymathdefault` (except for `\MTversion{normal}` and `\MTversion{bold}` under package option `subdued`), which in particular activates the insertion of skips around letters specified by `\MTsetmathskips` and also, if the font used is not oblique the insertion of italic corrections (for better positioning of subscripts; see the discussion in [subsection 1.6](#)). Under the `frenchmath` option the package checks separately the letter shape for lowercase and uppercase.

`\MTversion` also does `\MTexistsdoesskip`, `\MTforallldoesskip`, and also `\MTprimedoesskip`, `\MTmathoperatorsobeymathxx`, except under the `subdued` option for *normal* and *bold*, in which case it does the opposite actions. (1.3j)

All further commands are usable only inside math mode.

- `\hbar`: this macro is by default redefined (in a way compatible with the `italic` option) combining the `h` letter and the `ˉ` accent from the `mathastext` font. Note that `\mathrm{\hbar}` and `\mathbf{\hbar}` will work and that `\hbar` does scale in subscripts and exponents. Since 1.3u, this is a priori compatible with all 8bits text font encodings supporting the `\=` text accent in the L<sup>A</sup>T<sub>E</sub>X way.<sup>60 61</sup> (1.3u)
- `\fouriervec`: this is a `\vec` accent taken from the Fourier font; the `fourier` package need not be loaded. Active only if option `fouriervec`.
- `\pmvec`: this provides a poor man `\vec` accent command, for upright letters. It uses the right arrow. Does not change size in subscripts and exponents.
- `\mathnormal`, `\mathrm`, `\mathbf`, `\mathit`, `\mathsf`, `\mathtt`: modifications of the original `\mathnormal`, `\mathrm`, `\mathbf`, `\mathit`, `\mathsf`, `\mathtt`

<sup>60</sup>The horizontal skips for letter `h` from `\MTsetmathskips` are ignored for `\hbar`. Formerly, a positive “before” skip was not properly taken into account for the horizontal positioning of the accent and thus gave a bad result. The user can extend the package `\hbar` definition to add skips. (1.3u)

<sup>61</sup>The `\hbar` redefinition is canceled in normal and bold math versions under the `subdued` option. (1.3u)





`\notin`  $\notin$  `\langle`  $\langle$  `\rangle`  $\rangle$ . And a `\DotTriangle`  $\therefore$  is made available by option `symbolre` (which overwrites `\Re` and `\Im`:  $\Re, \Im$ ). The `\infty` and `\propto` have these names to leave up to the user the choice to replace (or no) the original (larger) `\infty` and `\propto`.

Regarding the `\prod` and `\sum` commands: they will use the Symbol glyphs  $\prod$   $\Sigma$  in inline math, and in display math the Computer Modern ones (or whatever is set up by other packages; here we have the symbols from `txfonts`):

$$\prod \Sigma$$

The package provides `\prod` and `\sum`: if one really wants in all situations the Symbol glyphs, one can do `\let\prod\prod` and `\let\sum\sum`. Also `\MToriginalprod` and `\MToriginalsum` will refer to the `\prod` and `\sum` before redefinition by the package: this is to allow constructs such as  $\displaystyle\MToriginalprod$  or  $[\textstyle\MToriginalprod]$ , because they would not work with the `\prod` and `\sum` as re-defined by the package.

## 2.4 Complete list of options

- **basic**: only `mathastextify` letters and digits.
- **subdued**: do not change the default fonts or the math alphabets in math mode for the normal and bold math versions, turn on the `mathastext`-ification only after an explicit `\MTversion` (or `\mathastextversion`) command activating an additional math version as declared in the preamble. With option `subdued` `\MTversion{normal}` and `\MTversion{bold}` do `\MTmathoperatorsdonotobeymathxx`, `\MTeasynonlettersdonotobeymathxx`, `\MTnonlettersdonotobeymathxx`, `\MTmathstandardletters`.
- **italic**: the letters default to italic shape in math mode.
- **frenchmath**: italic lowercase Latin letters, but uppercase Latin letters in the same font as for digits and operator names. In general this means that they will be upright. In case of the `LGRgreek` option, `frenchmath` influences also the shape of the Greek letters.
- **endash**, **emdash**: use the text font en-dash (–) or even the em-dash (—, but this seems crazy) for the minus sign rather than -. `endash` option is default for the package.
- **unicodeminus**: use the MINUS SIGN U+2212 (requires `fontspec`.) Or, in the form `unicodeminus=HHHH` with four *uppercased* hexadecimal digits: use the U+HHHH code point. As `noendash` really means “use the hyphen from the text font”, `unicodeminus` remains without effect under it, or, naturally, under `nominus`. Without this option, `mathastext` uses the EN DASH U+2013 by default for OpenType fonts. (1.3q)



- **asterisk**: use the text font (or the Symbol font) asterisk in math mode.
- **nohbar**: prevents **mathastext** from defining its own `\hbar`.
- **noendash**: the minus sign will be the - from the text font, not the en-dash –.
- **nolessnomore**: besides `!?`, `,.;`, `+–=()`, `[]/`, `#$%&` **mathastext** treats also `<>`, `|{ }` and `\`. Use this option to let it not do it. This is the default in case of OT1-encoding.
- further excluding options: **noexclam** `!?`, **nopunctuation** `,.;`, **noplus**, **nominus**, **noplusnominus** `+–`, **noequal** `=`, **noparenthesis** `()[]/`, **nospecials** `#$%&` and **nodigits**.
- **alldelims**: true by default, means that the characters excluded by **nolessnomore** are treated. Use this option in case of a mono-width OT1-encoded font.
- **nosmalldelims**: this prevents **mathastext** from trying to pick up in the text font the ‘small variants’ of some math delimiters; it only affects what happens when a character such as a left parenthesis ( or [ is used as a delimiter, and in the event that T<sub>E</sub>X has chosen the smallest sized variant. This has no impact on what happens when they are not used as delimiters: then, and if not disabled by the corresponding options, these characters are always picked up from the text font.<sup>64</sup>
- **symbolgreek**, **symboldigits**: to let Greek letters (digits) use the Symbol font.
- **symbolre**: replaces `\Re` and `\Im` by the Symbol glyphs  $\Re$ ,  $\Im$  and defines a `\Dot-Triangle` command (`\dottriangle`).
- **symbolmisc**: takes quite a few glyphs, including logical arrows, product and sum signs from Symbol. They are listed *supra*. Doing `\renewcommand{\int}{\smallint}` will maximize even more the use of the Symbol font.
- **symboldelimiters**: the characters apart from letters and digits will be taken from the Symbol font.
- **symbol**: combines **symbolgreek**, **symbolre**, and **symbolmisc**.
- **symbolmax**: combines **symbol** and **symboldelimiters**.
- **eulergreek**, **eulerdigits**: to let Greek letters (digits) use the Euler font.
- **LGRgreek**: this is for a font which is also available in LGR-encoding. It is possible to change the font per math version, via the use of the `\MTgreekfont` command in the preamble.

---

<sup>64</sup>in this very special situation of option **nosmalldelims**, the braces are an exception to this rule and they require both of `\MTnonlettersobeymathxx` and `\MTexplicitbracesobeymathxx` for being picked up from the text font when not used as delimiters.

- **LGRgreek**s: each declared math version will be supposed to be with a font which is also available in LGR-encoding.
- **selfGreek**: this is for a font which is also available in OT1-encoding and contains the glyphs for the default eleven capital Greek letters.
- **selfGreeks**: each declared math version will be supposed to be with a font with the eleven capital Greek letters in its OT1-encoded version.
- **upgreek**, **itgreek**, **upGreek**, **itGreek**: options to tell to use `\itdefault` or `\updefault` for the lowercase and uppercase (or only the uppercase) Greek letters. Only operant in the case of the **LGRgreek(s)** and **selfGreek(s)** options.
- **mathaccents**: use the text font also for the math accents. As in vanilla  $\text{\LaTeX}$ , they are taken from the font for the digits and `\log`-like names. Obey the alphabet changing commands.
- new:** • **unimathaccents**: extends **mathaccents** to OpenType fonts. Gave bad results in my brief testing. (1.3u)
- **defaultbf**, **defaultit**, **defaultsf**, **defaultttt**: do not set up, respectively, the `\mathbf`, `\mathit`, `\mathsf`, and `\mathtt` commands to use the **mathastext**-ified font. This also prevents **mathastext** to create internally `\Mathxx` alphabets (it never overwrites the original `\mathxx` things but let `\mathxx` point to `\Mathxx` instead), so one can use these options if one encounters a ‘too many math alphabets’  $\text{\LaTeX}$  error.
- **defaulnormal**, **defaultrm**: do not identify the default `\mathnormal` (resp. `\mathrm`) with the newly created `\Mathnormal` (resp. `\Mathrm`) commands which use the **mathastext**ified fonts in each math version.
- **defaultalphabets**: all the **defaultxx** options together, and additionally tells **mathastext** not to create the `\mathnormalbold` alphabet either.
- **defaultimath**: do not overwrite `\imath` and `\jmath` to use `\inodot` and `\jnodot`.
- **defaultmathsizes**: do not change the  $\text{\LaTeX}$  defaults for the sizes of exponents and subscripts.
- **fouriervec**: provides a `\fouriervec` command. The user can then add in the preamble `\let\vec=\fouriervec`. There is also always available a “poor man” vec accent `\pmvec` for upright letters.

Thanks to Kevin KLEMENT, Tariq PERWEZ and Ricard TORRES for sending bug reports and feature requests when the first version of the package was issued.

Numerous examples will be found there:

<http://jf.burnol.free.fr/mathastext.html>

<http://jf.burnol.free.fr/showcase.html>

## 3 Change log

### 1.3u [2019/08/20]

- \* new feature: the initial release dealt with only one font, and although shortly thereafter the 1.11 version added support for extended math versions, it was documented that some font-dependent set-up (minus as endash, dotless i and j, hbar, math accents) was done only once. This release makes the relevant characters font encoding savvy in each mathastext-extended math version. Thus, they should render correctly even with multiple math versions using fonts with varying encodings. This reinforces importance of using `\MTversion` and not the LaTeX `\mathversion` when switching to a new math version (which got declared via the package interface). The implementation is compatible with Unicode engines and mixed usage of TU encoding (OpenType fonts) with traditional 8bits TeX font encodings. For all engines, all used (8bits) encodings must have been passed as options to the fontenc package.

Thanks to Falk Hanisch for feature request and code suggestions.

- \* new option `unimathaccents`: this adds to option `mathaccents` the demand to use the text font accents for OpenType fonts in math mode via the `\Umathaccent` primitive. Indeed, as my testing showed that this gave non-satisfactory results both with XeTeX and LuaTeX regarding the horizontal placement of the accents, the main option `mathaccents` acts only on 8bits encoded fonts.

- \* bugfix: the `\Mathastext` without optional argument forgot to repeat some font-encoding dependent initialization set-up done originally during package loading.

- \* bugfix: under the subdued option macros `\MTmathactiveletters` or `\MTnonlettersobey-mathxx` now act like no-ops if issued explicitly while in the normal or bold math version. Formerly, this was not the case and could cause bugs such as a disappearing minus sign in math mode.

- \* bugfix: the letter h used in the `\hbar` obeyed the extra skips as set-up by `\MTsetmathskips`, badly interfering with the horizontal positioning of the bar accent. They are now ignored (as well as the added italic correction).

### 1.3t [2018/08/22]

- \* bugfix: the 1.3s bugfix about subdued com-

patibility with fontspec was deficient.

- \* bugfix: very old (v1.2, 2012/12/20) bug causing low-level TeX error during package loading (with pdf<sub>l</sub>atex) when setting up the math minus sign to be the text font endash character, in cases with `\encodingdefault` other than OT1, T1 or LY1, e.g. something like T2A.

- \* `\imath` and `\jmath` obey the subdued regime. And the minus sign is now handled especially to ensure perfect compatibility with the subdued option.

- \* breaking change: mathastext does not redefine anymore `\i` and `\j` to let them be usable both in text and math mode.

### 1.3s [2018/08/21]

- \* fix to an issue with subdued option in a fontspec context.

### 1.3r [2016/11/06]

- \* documentation tweaks.

### 1.3q [2016/10/31]

- \* new option `unicodeminus`.

- \* the Recent Changes section of the documentation has been removed as it was a duplicate of information available in the Change Log.

- \* some other changes in the documentation, in particular the use of straight quotes in verbatim.

### 1.3p [2016/05/13]

- \* bugfix: release 1.3n had forgotten to activate by default its new customization of the `ams-math` macro `\newmcodes@` (it was done from using `\MTversion` in the document body but not by default at start of body.)

- \* public name `\MTfixmathfonts` for a 1.3o macro.

### 1.3o [2016/05/03]

- \* mathastext fixes an issue related to a feature of LuaLaTeX and luaotfload that OpenType fonts are declared in one of two modes: node and base, and only the latter is functional in math mode. But by default text fonts are declared in mode node. Thus mathastext now intervenes to make it so that the font it declares in math mode will use mode

base. This fixes issues with for example old style figures being used while the text font used lining figures (or vice versa, depending on the font). But see the code comments for more.

### 1.3n [2016/04/22]

- \* at long last, mathastext takes care properly of annoying and perplexing amsmath's `\newmcodes@`. The very recent change in amsopn.sty finally made it compatible with Unicode engines, but anyhow, mathastext must do its own patch to use the correct font. All of this taking into account the various options passed to the package. Lots of trouble for a tiny thing.

### 1.3m [2016/04/02]

- \* minor code maintenance before annual TL freeze.

### 1.3l [2016/01/29]

- \* compatibility with fontspec's upcoming switch from EU1/EU2 to TU common to both Unicode engines.

### 1.3k [2016/01/24]

- \* typos fixed in the documentation. In particular, the README link to the package homepage had remained broken from day one of the package releases: mathastext.html therein was misspelled as mathasastext.html ! (but the pdf documentation had the correct link; as well as the CTAN catalogue).

### 1.3j [2016/01/15]

- \* renamed and modified recent 1.3i's `\MTactivemathoff` into `\MTeverymathoff`. Added `\MTeverymathdefault`.

- \* subdued mode is a bit stronger: also the asterisk reverts to the default (if it was modified due to option asterisk), the added extra `\mskip's` (useful with upright fonts) for `'`, `\exists`, and `\forall` are suppressed rather than re-configured to use `0mu`. Related new commands `\MTexistdoeskip`, `\MTforalldoeskip`, `\MTprimedoeskip`, `\MTnormalexists`, `\MTnormalforall`, `\MTnormalprime`.

- \* the toggle for using mathematically active letters is only emitted once during package loading; the `\Mathastext` command does not do it anymore; the use in the preamble of `\MTmathstandardletters`, or `\MTnoicinmath` and related commands is not overruled by later use of `\Mathas-text`.

- \* quite a few documentation improvements and rewrites, particularly in the description of commands which are related to the modifications of mathcodes (mainly for math activation of characters or letters) as done by mathastext at `\every-math` or `\everydisplay`.

### 1.3i [2016/01/06]

- \* `\url` from url.sty as well as `\url` and `\nolinkurl` from hyperref.sty use math mode and (by default) the monospace text font. To avoid mathastext overwriting the special preparation done by `{url,hyperref}.sty` the commands `\url/\nolinkurl` are patched to do automatically `\MTactivemathoff` (now `\MTeverymathoff`) before entering math mode.

- \* the extra skips specified by `\MTsetmathskips` are not inserted around letters if inside the arguments of math alphabet commands, or within operator names.

- \* the added explicit italic corrections (for non-oblique fonts) were disabled within math alphabet scopes, except `mathnormal`; they are now disabled within all math alphabets, inclusive of `mathnormal`.

### 1.3h [2015/10/31]

- \* bugfixes: since 1.3d 2014/05/23 the option `symbolgreek` caused `\ell` to become undefined, and, similarly but far worse, options `selfGreek`, `self-Greeks` caused all lowercase Greek letters `\alpha`, `\beta`, etc.. to become undefined.

### 1.3g [2015/10/15]

- \* following 2015/10/01 LaTeX release, removal of the "luatex" prefix from the names of the LuaLaTeX math primitives. Compatibility maintained with older LaTeX formats.

### 1.3f [2015/09/12]

- \* the replacement of amsmath's `\resetMathstrut@`, when it is done, emits an Info rather than a Warning as this could be potentially stressful to some users.

- \* the README self-extracts from the dtx source, as a text file README.md with Markdown syntax.

### 1.3e [2015/09/10]

- \* bugfix: under option `nosmallldelims`, `\lbrace` and `\rbrace` were redefined as math symbols and could not be used as delimiters.

### 1.3d [2015/02/26]

- \* the documentation mentions the improved compatibility of mathastext with the latest (3.34) beamer release: no more need for `\usefont-theme{professionalfonts}`.

### 1.3d [2014/05/23]

- \* new commands `\MTstandardgreek` and `\MTcustomgreek`.

- \* The Greek letters, in case of use of one of the package related options, are left to their defaults in the normal and bold math versions if the subdued option was also used (this was so far the case only with options `LGRgreek/LGRgrees`).

- \* `\newmcodes@` of `amsmath` is left untouched if package `lualatex-math` is detected.

### 1.3c [2013/12/14]

- \* added a starred variant to `\MTversion` which tells mathastext to only do the math set-up and not modify the text fonts.

- \* added second optional version name argument to `\Mathastext` and to `\MTDeclareVersion`, to transfer settings for things not otherwise changed by mathastext from a math version to the one declared. This is mainly for symbols and large symbols to be the bold ones when the user sets up the series of a mathastextified font to be bold in a mathastext-declared version.

- \* renamed `\defaultprod` to `\MToriginalprod`, `\defaultsum` to `\MToriginalsum`, (this is in case of option `symbolmisc`).

- \* changes to the dtx organization; options for generating the documentation can be customized in generated `mathastext.tex` file.

- \* 1.2d code for `\#`, `\$`, `\%`, and `\&` modified erroneously the earlier correct 1.2c code and created a bug showing up with more than 16 math families (a possibility only with `lualatex` or `xelatex`).

### 1.3a [2013/09/04]

- \* the somewhat silly `\string's` are removed from the `\MTsetmathskips` command of release 1.3, thus allowing its first argument to be a macro, or any expandable code, giving a letter.

- \* the `amsmath` `\resetMathstrut@`, which is incompatible with a mathematically active parenthesis ( is now modified only if necessary (i.e. only when `\MTnonlettersobeymathxx` is issued) and is restored to its original value if not needed anymore

(i.e. after `\MTnonlettersdonotobeymathxx`, as for example when switching to the normal version under option `subdued`).

- \* improved documentation.

### 1.3 [2013/09/02]

- \* commands `\MTsetmathskips` and `\MTunsetmathskips` added.

- \* commands `\MTmathactiveletters` and `\MTmathstandardletters` to govern the math activation of letters independently of its use for insertion of the italic corrections (`\MTicinmath` and `\MTnoicinmath` correspondingly modified).

- \* the new `\luatexUmathcodenum` as available since TL2013 allows identical treatment by mathastext of `=` and `-` under both `LuaTeX` and `XeTeX`.

- \* `\newmcodes@` of `amsmath` is left untouched in case of option `basic`.

- \* a sentence containing `|` which was written to the log during the loading caused a problem if `|` was active (typically if `\MakeShortVerb{\|}` was added to the preamble prior to the loading of mathastext).

- \* some preemptive measures taken regarding things such as `\mid`, `\lbrace`, and `\rbrace`, as some packages define these things in manners which made the re-definitions done by mathastext issue errors.

### 1.2f [2013/01/21]

- \* minor code improvements. Change log added to the user manual.

### 1.2e [2013/01/10]

This version should be the last one in the 1.2 series as it seems to correct most of the main problems which were introduced with the massive use of mathematically active characters in versions 1.2 and 1.2b.

- \* It is indeed a thorny point when one wants to modify an active character in math mode only (without breaking usage in label's and ref's for example). The package now does that `_only_` if the activation originated in the Babel system as it is then possible to modify appropriately the Babel macros `\user@active<char>` and `\normal@char<char>`, at the time of entering math mode (mathastext does all its activation job at `\everymath` and `\everydisplay`).

The relevant issues are discussed in section 2.10 of the user manual, in the test file `mathastexttestalphabets.tex`, and in the source code comments for macro `\mst@mathactivate`. The inherent incompatibility of Babel with packages having made mathematically active the characters itself makes document active is circumvented by this interference of `mathastext`. A generally applicable Babel patch could be derived from the method used by `mathastext`.

For the non catcode active characters, mathematical activation is used. This is done at the entrance in math mode.

- \* Sadly, the feature of added italic corrections introduced in version 1.2b did not behave as described in the user manual, due to forgotten group braces. Fixed.

- \* The command `\MTlowerast` from the user manual of v1.2d was not the one implemented in the source code. Fixed.

- \* The test files automatically extracted from a latex run on the dtx file have been revised and extended.

- \* The code is better documented.

#### 1.2d [2013/01/02]

- \* an incompatibility with `amsmath` (its macro `\resetMathstrut@`), exists since version 1.2 of the package. This is fixed here.

- \* various improvements in dealing with the asterisk and in the mechanism of letting non-letter symbols obey the math alphabet commands.

- \* documentation extended and improved.

#### 1.2c [2012/12/31]

- \* `mathastext` now inserts automatically after all (latin) letters in math mode their italic corrections, if the font used is upright (sic). This improves the spacings for the positioning of subscripts. The feature is de-activated inside the math alphabets commands (apart from `\mathnormal`), so as to not prohibit the formation of ligatures.

- \* the documentation has been extended to explain in detail the issues which are relevant to the new feature of added italic corrections.

- \* version 1.2 had some bad bugs when confronted to active characters. This is corrected and additionally `\MTnonlettersdonotobeymathxx` is made the default, as the user input is too much constrained in its absence.

- \* a less fatal, but still annoying, typo had made the dot in 1.2 of type `\mathpunct` rather than `\mathord`.

- \* the inner namespace has been rationalized a bit.

#### 1.2 [2012/12/20]

- \* a new command sets up the amount of space to be automatically inserted before the derivative glyph (useful when using an upright font).

- \* the scope of the math alphabets has been extended to apply to the non-alphabetical characters, and also to operator names.

- \* the format of the dtx file has changed. The package file is self-extracting from the dtx, and four additional test files are also produced during latex `mathastext.dtx`.

#### 1.15f and 1.15g [2012/10/25]

- \* `\$, \#, \&`, and `\%` had been re-defined by `mathastext` since its inception in a rather strange (but working) way, which could cause surprises to other packages. Fixed.

- \* the subdued mechanism for the math alphabets is implemented in a simpler and more efficient manner than in 1.15e.

- \* the defaultxx options act a bit differently, and are more useful in case of a too many math alphabets situation.

- \* various improvements in the documentation.

- \* general clean up and better commenting of the source code.

#### 1.15e [2012/10/22]

- \* new user commands to specify skip or glue to be inserted after the math symbols `\exists` and `\forall`

- \* complete (user transparent) rewrite of the code implementing the subdued option; and its action has been extended to apply also to the `\mathbf`, `\mathit`, `\mathsf`, `\mathtt` alphabets and not only to `\mathrm` and `\mathnormal` as in the previous versions.

- \* improvements in the documentation.

#### 1.15d [2012/10/13]

- \* the Unicode situation is now correctly treated, throughout the code (this had been left in a half-done way from version 1.14 of April 2011).

- \* this includes an issue related to amsmath and its `\DeclareMathOperator` macro which has been fixed,

- \* and the code related to `\relbar` and `\Relbar` (and `\models`) has been revised.

#### 1.15c [2012/10/05]

- \* it is now possible to use distinct fonts in LGR encoding for the Greek letters according to the current math version.

- \* improvements to the documentation.

#### 1.15b

- \* corrected a 'feature' of 1.15 which was backward-incompatible

- \* improvements to the pdf documentation

#### 1.15 [2012/09/26]

- \* the `\subdued` option allows the `\mathastextif` command to act only locally.

- \* some measures taken to deal with amsmath related issues when using xetex or luatex.

#### 1.14c

- \* a bug is fixed: the `\Mathastext` macro reinitializes the fonts in the normal and bold math versions, but it also erroneously redeclared the math alphabet changing commands which could have been set up in previously defined math versions (via earlier calls to `\Mathastext\{version_name\}`).

#### 1.14b [2011/04/03]

- \* there was a bug with `\$, \#, \&, \%` in math mode which showed up when ten or more math families had been declared. This bug affected also the minus sign under the same circumstances, when Unicode engines were used. Fixed.

- \* the options `LGRgreek` and `selfGreek` act now a bit differently, and new options `LGRgreeks` and `selfGreeks` have been defined.

- \* I also cleaned up a bit the code, for a more structured namespace.

#### 1.14

- \* `\mathastext` now modifies also the math alphabets `\mathit`, `\mathsf` and `\mathtt`, thus making it a quite generic complete manner to adapt the math configuration to fonts provided with no math support.

#### 1.13b

- \* when the Symbol font is used for `\prod` and `\sum` this will be only for inline math; display math will use the default glyphs

#### 1.13 [2011/03/11]

- \* the `LGRgreek` option is added.

- \* internal changes for better readability of the code.

#### 1.12

- \* various bugs have been corrected.

- \* the `endash` and `alldelims` options are active by default.

- \* the package is more Unicode aware.

- \* the `\Mathastext` command has been improved to facilitate the mechanism of math versions also when using XeTeX or LuaTeX (with package `fontspec`.)

- \* the `en-dash` and `dotless i` and `j` now work with all encodings, Unicode inclusive.

#### 1.11 [2011/02/06]

- \* optional argument to `\Mathastext` macro.

#### 1.1 [2011/02/01]

- \* options `italic` and `frenchmath`.

#### 1.0 [2011/01/25]

- \* Initial version.

## 4 Implementation

The usual catcode regime for letters and digits is assumed and some characters such as `*`, ```, `"`, `=` are supposed to be of catcode other at the time of loading of `mathastext`. The source of `mathastext` takes precautions for some other characters such as the right quote `'`, which may thus be active with no harm at the time of loading. By the way, I think  $\text{\LaTeX}2\text{e}$  should have provided to authors a standard macro to be used at the beginning of a style file to make sure the catcodes are standard. Shorthands created by Babel should be mostly no problem as Babel does the activation only at the `\begin{document}`.

The comments have been accumulating through successive versions with only partial efforts to achieve some sort of coherence; as a result some are a bit strange or obsolete to various degrees. And the similar remark applies to some ancient parts of the code itself!

```
1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage {mathastext}
3 [2019/08/20 v1.3u Use the text font in math mode (JFB)]
```

Testing for  $\text{\XeTeX}$  and  $\text{\LuaTeX}$ .

1.3g 2015/10/15: update for the naming of primitives, the situation has evolved both on  $\text{\XeTeX}$  side and on the  $\text{\LuaTeX}$  side ( $\text{\LaTeX}$  base 2015/10/01): I was told "U" named math primitives were always available for  $\text{\LuaTeX}$ . For  $\text{\XeTeX}$ , the  $\text{\XeTeX}$  prefix got replaced by U prefix with 0.99.. a certain number of 9. I opted for rather simple approach of just trying the "modern" names and if they don't exist fall back on earlier (and in danger of being deprecated) names.

```
4 \let\mst@Umathcharnumdef\Umathcharnumdef
5 \let\mst@Umathcodenum \Umathcodenum
6 \let\mst@Umathcode \Umathcode
7 \let\mst@Umathchardef \Umathchardef
8 \let\mst@Umathaccent \Umathaccent
9 \newif\ifmst@XeTeX
10 \ifx\XeTeXinterchartoks\@undefined
11 \mst@XeTeXfalse
12 \else
13 \mst@XeTeXtrue
14 \ifx\mst@Umathcharnumdef\@undefined
15 \let\mst@Umathcharnumdef\XeTeXmathcharnumdef
16 \let\mst@Umathcodenum \XeTeXmathcodenum
17 \let\mst@Umathcode \XeTeXmathcode
18 \let\mst@Umathchardef \XeTeXmathchardef
19 \let\mst@Umathaccent \XeTeXmathaccent
20 \fi
21 \fi
22 \newif\ifmst@LuaTeX
23 \ifx\directlua\@undefined
24 \mst@LuaTeXfalse
25 \else
26 \mst@LuaTeXtrue
27 \ifx\mst@Umathcharnumdef\@undefined
28 \let\mst@Umathcharnumdef\luaTeXmathcharnumdef
29 \let\mst@Umathcodenum \luaTeXmathcodenum
30 \let\mst@Umathcode \luaTeXmathcode
```



```

31 \let\mst@Umathchardef \luatexUmathchardef
32 \let\mst@Umathaccent \luatexUmathaccent
33 \fi
34 \fi
35 \newif\ifmst@XeOrLua
36 \ifmst@LuaTeX\mst@XeOrLuatrue\fi
37 \ifmst@XeTeX \mst@XeOrLuatrue\fi

```

1.2: all inner macros of **mathastext** now starts with **\mst@** for a cleaner name-space.

1.31 2016/01/29: hmmm... at this late stage where nobody would expect me to still look at the code, I have found at least two macros which still didn't: **\do@the@endashstuff** and **\do@the@emdashstuff**.

Ok, doing something more serious: compatibility with upcoming TL2016 fontspec and its switch to **`TU'** NFSS font encoding in replacement of **`EU1/EU2'** Anyhow, the code in **mathastext** has been common to the two Unicode engines for a while, hence it is not hard to adapt to the replacement of EU1/EU2 by TU, maintaining compatibility with legacy installations.

**\mst@OneifUniEnc** The **\mst@OneifUniEnc** is expandable but must be used after having set **\mst@tmp@enc...**

```

38 \def\mst@oti{OT1}
39 \def\mst@eui{EU1}\def\mst@euii{EU2}\def\mst@tu{TU}
40 \def\mst@OneifUniEnc {%
41   \ifx \mst@tmp@enc\mst@tu 1\else
42   \ifx \mst@tmp@enc\mst@eui 1\else
43   \ifx \mst@tmp@enc\mst@euii 1\else 0\fi\fi\fi }
44 \newif\ifmst@goahead
45 \newif\ifmst@abort

```

**\mst@enc** Macros to store the font settings, each math version will store its own records.

```

\mst@fam 46 \def\mst@enc{\encodingdefault}
\mst@ser 47 \def\mst@fam{\familydefault}
\mst@opsh 48 \def\mst@ser{\seriesdefault}
\mst@bold 49 \def\mst@opsh{\shapedefault} %% will be default shape for operator names
\mst@ltsh 50 \def\mst@bold{\bfdefault}
51 \def\mst@ltsh{\shapedefault} %% will be default shape for letters

```

**\mst@greekfont** 1.15c: for use by the LGRgreek and selfGreek options. Defined as an **\edef** in order to be able to set-up once and for all the Greek at the time of **\usepackage**. Modifiable in the preamble via **\MTgreekfont{<font\_name>}\Mathastext**.

```
52 \edef\mst@greekfont{\familydefault} %% v 1.15c
```

**Package options** 2011/03/09: 1.13 introduces the option LGRgreek and systematic use of **\if...** conditionals, for better readability (by myself) of the code.

```

53 \newif\ifmst@italic
54 \newif\ifmst@frenchmath
55 \DeclareOption{italic}{\mst@italictrue}
56 \def\mst@ltsh{\itdefault}}
57 \DeclareOption{frenchmath}{\mst@frenchmathtrue\mst@italictrue}
58 \def\mst@ltsh{\itdefault}}
59 \newif\ifmst@endash\mst@endashtrue
60 \DeclareOption{endash}{\mst@endashtrue}

```

```

61 \DeclareOption{noendash}{\mst@endashfalse}
62 \newif\ifmst@emdash
63 \DeclareOption{emdash}{\mst@emdashtrue\mst@endashfalse}
64 \newif\ifmst@alldelims
65 \edef\mst@tmp{\encodingdefault}\ifx\mst@oti\mst@tmp\else\mst@alldelimstrue\fi
66 \DeclareOption{alldelims}{\mst@alldelimstrue}
67 \DeclareOption{nolessnomore}{\mst@alldelimsfalse}
68 \newif\ifmst@nosmalldelims
69 \DeclareOption{nosmalldelims}{\mst@nosmalldelimstrue}
70 \newif\ifmst@noplus
71 \DeclareOption{noplus}{\mst@noplustrue}
72 \newif\ifmst@nominus
73 \DeclareOption{nominus}{\mst@nominustrue}
74 \DeclareOption{noplusnominus}{\ExecuteOptions{noplus,nominus}}
75 \newif\ifmst@noparen
76 \DeclareOption{noparenthesis}{\mst@noparenttrue}
77 \newif\ifmst@nopunct
78 \DeclareOption{nopunctuation}{\mst@nopuncttrue}
79 \newif\ifmst@noequal
80 \DeclareOption{noequal}{\mst@noequaltrue}
81 \newif\ifmst@noexclam
82 \DeclareOption{noexclam}{\mst@noexclamtrue}
83 \newif\ifmst@asterisk
84 \DeclareOption{noasterisk}{\PackageWarningNoLine{mathastext}
85 {option 'noasterisk\string' is deprecated.^^J\space\space\space
86 Check the documentation}}
87 \DeclareOption{asterisk}{\mst@asterisktrue}
88 \newif\ifmst@nospecials
89 \DeclareOption{nospecials}{\mst@nospecialstrue}
90 \newif\ifmst@basic % 1.3 to avoid unnecessary patch of amsmath \newmcodes@
91 \DeclareOption{basic}{\mst@basicttrue}
92 \ExecuteOptions{noparenthesis,nopunctuation,%
93 noplusnominus,noequal,noexclam,nospecials,nolessnomore}}
94 \newif\ifmst@nohbar
95 \DeclareOption{nohbar}{\mst@nohbartrue}
96 \newif\ifmst@nodigits
97 \DeclareOption{nodigits}{\mst@nodigitstrue}
98 \newif\ifmst@defaultimath
99 \DeclareOption{defaultimath}{\mst@defaultimathtrue}
100 \newif\ifmst@mathaccents
101 \DeclareOption{mathaccents}{\mst@mathaccentstrue}
102 \newif\ifmst@unimathaccents % 1.3u
103 \DeclareOption{unimathaccents}{\mst@mathaccentstrue\mst@unimathaccentstrue}
104 \newif\ifmst@needsymbol
105 \newif\ifmst@symboldelimiters
106 \DeclareOption{symboldelimiters}{\mst@needsymboltrue\mst@symboldelimiterstrue}
107 \newif\ifmst@symboldigits
108 \DeclareOption{symboldigits}{\mst@needsymboltrue\mst@symboldigitstrue}
109 \newif\ifmst@symbolgreek

```

```

110 \newif\ifmst@customgreek %% new with 1.3d
111     \DeclareOption{symbolgreek}{\mst@needsymboltrue\mst@symbolgreektrue
112                                     \mst@customgreektrue }
113 \newif\ifmst@symbolre
114     \DeclareOption{symbolre}{\mst@needsymboltrue\mst@symbolretrue}
115 \newif\ifmst@symbolmisc
116     \DeclareOption{symbolmisc}{\mst@needsymboltrue\mst@symbolmisctrue}
117     \DeclareOption{symbol}{\ExecuteOptions{symbolgreek,symbolmisc,symbolre}}
118     \DeclareOption{symbolmax}{\ExecuteOptions{symbol,symboldelimiters}}
119 \newif\ifmst@needeuler
120 \newif\ifmst@eulerdigits
121     \DeclareOption{eulerdigits}{\mst@needeulertrue\mst@eulerdigittrue}
122 \newif\ifmst@eulergreek
123     \DeclareOption{eulergreek}{\mst@needeulertrue\mst@eulergreektrue
124                                     \mst@customgreektrue }
125 \newif\ifmst@selfGreek
126     \DeclareOption{selfGreek}{\mst@selfGreektrue\mst@customgreektrue}
127 \newif\ifmst@selfGreeks
128     \DeclareOption{selfGreeks}{\mst@selfGreekstrue\mst@selfGreektrue
129                                     \mst@customgreektrue }
130 \newif\ifmst@LGRgreek
131     \DeclareOption{LGRgreek}{\mst@LGRgreektrue\mst@customgreektrue}
132 \newif\ifmst@LGRgreeks
133     \DeclareOption{LGRgreeks}{\mst@LGRgreekstrue\mst@LGRgreektrue
134                                     \mst@customgreektrue}
135 \def\mst@greek@select{0}
136 \newif\ifmst@itgreek
137 \newif\ifmst@upgreek
138     \DeclareOption{itgreek}{\mst@itgreektrue}
139     \DeclareOption{upgreek}{\mst@upgreektrue}
140     \DeclareOption{itGreeks}{\def\mst@greek@select{1}}
141     \DeclareOption{upGreeks}{\def\mst@greek@select{2}}

```

Starting with 1.15f the meaning of the ‘defaultxx’ options has changed. They now prevent `mathastext` from defining additional alphabets rather than prevent it from identifying the ‘mathxx’ with the new ‘Mathxx’. The ‘Mathnormal’ and ‘Mathrm’ alphabet commands are always created as they are SymbolFontAlphabets.

```

142 \newif\ifmst@defaultnormal
143     \DeclareOption{defaultnormal}{\mst@defaultnormaltrue}
144 \newif\ifmst@defaulttrm
145     \DeclareOption{defaulttrm}{\mst@defaulttrmtrue}
146 \newif\ifmst@defaultbf
147     \DeclareOption{defaultbf}{\mst@defaultbftrue}
148 \newif\ifmst@defaulttit
149     \DeclareOption{defaulttit}{\mst@defaulttittrue}
150 \newif\ifmst@defaultsf
151     \DeclareOption{defaultsf}{\mst@defaultsftrue}
152 \newif\ifmst@defaultttt
153     \DeclareOption{defaultttt}{\mst@defaultttttrue}
154 \newif\ifmst@nonnormalbold

```

```

155 \DeclareOption{defaultalphabets}{\ExecuteOptions{defaultnormal,defaultrm,%
156 defaultbf,defaultit,defaulttsf,defaultttt}\mst@nonormalboldtrue}

```

`mathastext` considers the default script and especially scriptscript sizes to be far too small, and it will modify them. An option maintains the default.

```

157 \newif\ifmst@defaultsizes
158   \DeclareOption{defaultmathsizes}{\mst@defaultsizetrue}
159 \newif\ifmst@twelve
160   \DeclareOption{12pt}{\mst@twelvetrue}
161 \newif\ifmst@fouriervec
162   \DeclareOption{fouriervec}{\mst@fouriervectrue}

```

1.15: the subdued option.

```

163 \newif\ifmst@subdued
164   \DeclareOption{subdued}{\mst@subduedtrue}

```

1.3q: the unicode option. Thanks to TOBIAS BRINK for suggesting its incorporation. The parsing of `\CurrentOption` does not seek any robustness, it just does its job if the option is used correctly.

```

165 \def\mst@unicodeminus {2013}
166 \def\mst@checkoption #1unicodeminus#2\mst@#3\mst@@
167   {\ifx\#3\\PackageWarningNoLine{mathastext}
168     {Unknown option `\'CurrentOption\'string'}\else
169     \ifx\#2\\def\mst@unicodeminus {2212}\else
170     \expandafter\def\expandafter\mst@unicodeminus\expandafter{\@secondoftwo#2}%
171     \fi\fi}
172 \DeclareOption*%
173   {\expandafter\mst@checkoption\CurrentOption\mst@ unicodeminus\mst@\mst@@}

```

```

174 \ProcessOptions\relax

```

<pre> \exists \mst@exists@skip \forall \mst@forall@skip \MTnormalexists \MTexistsdoesskip \MTnormalforall \MTforalldoesskip </pre>	<p>1.15e 2012/10/21: <code>math skip/glue</code> <i>after</i> <code>\exists</code> and <code>\forall</code>, this is useful with upright letters in math mode. Each math version has its own user defined values for the skips, stored as macros. The redefinitions of <math>\exists</math> and <math>\forall</math> are done only at the end of the package as the <code>symbol</code> option will also want to redefine these math symbols.</p> <p>The subdued option (later and only for the normal and bold math version) and the italic option (here) set to zero the package default skips. With 1.2 the skips can be modified on the fly in the document, they are not necessarily set in the preamble once and for all for each math version.</p>
--	---

1.3j adds `\MTnormalexists`, `\MTexistsdoesskip`, `\MTnormalforall`, `\MTforalldoesskip`.

Earlier to 1.3j, `\let\mst@stdexists\exists` was done at End of Package, now it is done at Begin Document, and same for `\forall`. We pay attention that use of `\MTnormalexists` etc... inside the preamble does not create self-let's.

Also subdued mode will do `\MTnormalexists`, `\MTnormalforall` (earlier than 1.3j, it only set the muskips to 0mu.) Same when using `\MTversion{normal}`, if subdued.

For some (random, legacy) reason, the handling of  $\exists$  and  $\forall$  is part of the things not included inside `\everymath/\everydisplay`.

```

175 \newmuskip\mst@exists@muskup %% v 1.15e
176 \newmuskip\mst@forall@muskup
177 \def\mst@exists@skip{1mu}
178 \def\mst@forall@skip{.6667mu}
179 \ifmst@italic\ifmst@frenchmath\else

```

```

180 \def\mst@exists@skip{0mu}
181 \def\mst@forall@skip{0mu}
182 \def\mst@prime@skip{0mu}
183 \fi\fi
184 \def\mst@exists{\mst@stdexists\mskip\mst@exists@mskip}
185 \def\mst@forall{\mst@stdforall\mskip\mst@forall@mskip}
186 \AtBeginDocument{%
187 \let\mst@stdexists\exists
188 \let\mst@stdforall\forall
189 \def\MTnormalexists {\let\exists\mst@stdexists }%
190 \def\MTexistsdoesskip {\let\exists\mst@exists }%
191 \def\MTnormalforall {\let\forall\mst@stdforall }%
192 \def\MTforalldoesskip {\let\forall\mst@forall }%

```

The document body starts in the normal math version, whether or not `\Mathastext` command as been used in the preamble (which either re-defines the normal/bold math version or defines another one in case of optional argument), and in case of `subdued` option should use the standard  $\forall$  and  $\exists$ .

```

193 \ifmst@subdued
194 \else
195 \MTexistsdoesskip
196 \MTforalldoesskip
197 \fi
198 }%
199 \newcommand*\MTnormalexists {\AtBeginDocument {\MTnormalexists }}
200 \newcommand*\MTexistsdoesskip {\AtBeginDocument {\MTexistsdoesskip }}
201 \newcommand*\MTnormalforall {\AtBeginDocument {\MTnormalforall }}
202 \newcommand*\MTforalldoesskip {\AtBeginDocument {\MTforalldoesskip }}

```

`\prime` 1.2 2012/12/17: math skip/glue *before* the `\prime` glyph. This is useful with the default CM `\mst@prime@skip` glyph and upright letters (in contrast the prime from `txfonts` works fine with upright letters). `\active@math@prime` For this we replace the L<sup>A</sup>T<sub>E</sub>X kernel `\active@math@prime` with our own skip-enhanced version `\mst@active@math@prime`.

`\MTnormalprime` 1.2b 2012/12/31: doing

```
\catcode'\='=\active \global\let'\mst@active@math@prime}
```

is awfully wrong when the right quote is made active at begin document by some other package (as happens with `babel` for some languages). So `mathastext` treats now the right quote with the same method as applied to the other characters it makes mathematically active. This uses the macro `\mst@mathactivate` which is defined later in the package.

Babel does `\let\prim@s\bbl@prim@s` when `'` is made active via its services (the czech and slovak languages also store the initial version of `\prim@s`, else the quote would not work correctly when being again of `catcode 12`), and it doesn't matter if `mathastext` is loaded before or after this happens, as the `\mst@mathactivate` does its job only as part of the `\everymath` and `\everydisplay` token lists.

1.2e being paranoid, we take precautions against a possibly catcode active right quote at the time of loading `mathastext`.

1.3i adds `\MTactiveprime`.

1.3j renames it to `\MTprimedoesskip`. Besides, it makes use in the preamble of `\MTnormalprime` or `\MTprimedoesskip`.

```
203 \newmuskip\mst@prime@mskip %% v 1.2
```

```

204 \def\mst@prime@skip{.5mu}
205 \ifmst@italic\ifmst@frenchmath\else\def\mst@prime@skip{0mu}\fi\fi
206 \def\mst@active@math@prime{\sp\bgroup\mskip\mst@prime@muskip\prim@s}
207 {\catcode`\'=12
208 \gdef\mst@@modifyprime{\mst@mathactivate'}{\mst@active@math@prime}}
209 \newcommand*{\MTnormalprime}{\let\mst@modifyprime\@empty}
210 \newcommand*{\MTprimedoesskip}{\let\mst@modifyprime\mst@@modifyprime}
211 \ifmst@subdued
212     \MTnormalprime
213 \else
214     \MTprimedoesskip
215 \fi
216 \AtBeginDocument{%
217     \everymath\expandafter
218         {\the\everymath \mst@modifyprime \MTnormalprime}%
219     \everydisplay\expandafter
220         {\the\everydisplay \mst@modifyprime \MTnormalprime}%
221 }

```

`\MTexistsskip` 1.15e: These user macros set up the amount of muglue after `\exists` or `\forall`. The normal and bold math versions inherit the same skips; these skips are set to zero in case of the subdued, `\MTforallskip` or the italic option. Each command `\Mathastext[⟨version_name⟩]` stores the current values in the definition of the math version.

1.2: `\MTprimeskip` added, the silly `\@onlypreamble` are removed and the macros are modified to have immediate effect in the document, independently of their possible use in the preamble for the math versions to store values.

Note (september 2013): the names were badly chosen; `\MTsetprimeskip` for example would have been a better choice.

```

222 \newcommand*{\MTexistsskip[1]{\edef\mst@exists@skip{#1}%
223     \mst@exists@muskip\mst@exists@skip\relax}
224 \newcommand*{\MTforallskip[1]{\edef\mst@forall@skip{#1}%
225     \mst@forall@muskip\mst@forall@skip\relax}
226 \newcommand*{\MTprimeskip[1]{\edef\mst@prime@skip{#1}%
227     \mst@prime@muskip\mst@prime@skip\relax}
228 \let\Mathastextexistsskip\MTexistsskip
229 \let\Mathastextforallskip\MTforallskip
230 \let\Mathastextprimeskip\MTprimeskip
231 \let\mathastextexistsskip\MTexistsskip
232 \let\mathastextforallskip\MTforallskip
233 \let\mathastextprimeskip\MTprimeskip

```

`\resetMathstrut@` 2012/12/31: The `amsmath` macro `\resetMathstrut@` is not compatible with a mathematically active opening parenthesis: it does

```
\mathchardef\@tempa\mathcode`\(\relax
```

and is made a part of the hook `\everymath@size` inside `\glb@settings`. This is called from `\check@mathfonts` which is done in particular in `\frozen@everymath`, hence *before* (but wait) what `mathastext` puts in `\everymath`. Also, `\glb@settings` is triggered by `\mathversion` which must be done outside of math mode.

Alas, with things such as `$. . . \hbox{. . . $. . .} . . . $` `mathastext` will have already made the parenthesis (mathematically) active. And `\boldsymbol` from `amsbsy` disables the `\@nomath`

switch and executes `\mathversion{bold}` directly in math mode. So we have a problem with `\resetMathstrut@`.

`lualatex-math` replaces `\resetMathstrut@` with its own version (which also looks at `)`) and no error is signaled when `mathastext` has done `\mathcode`("8000`, but the `\Mathstrutbox@` created by `mathastext` is then wrong.

The replacement macro avoids a potentially math active `(`. It assumes that there is still some appropriate glyph in slot 40 of `operators` and it sets the height and depth of `\Mathstrutbox@` to be large enough to accomodate both this glyph and the one from the `mathastext` font (both in the current math version). If option `noparenthesis` was used, we leave everything untouched.

In 1.3a, 2013/09/04, the modification is done only at the time of `\MTnonlettersobeymathxx`. It is canceled by `\MTnonlettersdonotobeymathxx`. So the code has been moved to these macros and here we just store at the begin document the then meaning of `\resetMathstrut@`, and check also if `\MTnonlettersobeymathxx` has been invoked in the preamble.

1.3f 2015/09/12 issues only an Info message not a Warning, as I am becoming aware from another context (etoc) that Warnings are stressful to users, in some integrated environments for editing and compiling L<sup>A</sup>T<sub>E</sub>X source files.

```

234 \ifmst@noparen\else
235 \AtBeginDocument{%
236   \@ifundefined{resetMathstrut@}{% nothing to do, no amsmath
237   }{% amsmath loaded, and possibly patched by things such as lualatex-math
238   \let\mst@savdresetMathstrut@\resetMathstrut@
239   \PackageInfo{mathastext}{current meaning of amsmath
240   \string\resetMathstrut@\space saved}%
241   \ifx\mst@the\the % means that \MTnonlettersobeymathxx was used in preamble
242   \let\mst@the\@gobble\MTnonlettersobeymathxx
243   \fi}}
244 \fi

```

1.2 2012/12/20 does some rather daring *math* activation of `;`, `,`, `:`, `!`, `?`, `+`, `-`, `=`, `<`, `>`, `(`, `)`, `[`, `]` in math mode to achieve something I wanted to do since a long time: overcome the mutually excluding relation between the variable-family concept and the automatic spacing concept. After loading `mathastext`, these characters now obey the math alphabets commands but still have the automatic spacing. The use as delimiters for those concerned is also ok.

The activation is done via setting the `\mathcode` to "8000 through the macro `\mst@mathactivate` which in turn is put into the `\everymath` and `\everydisplay` token lists. No character is made active in the sense of the `\catcode` (the issues with catcode active characters at the entrance of the math mode are discussed later),

but the concerned characters will now expand in math mode to *two* tokens.

1.2c 2012/12/31: hence, this current implementation puts constraints on the input: `$x^?$` or `$x\mathrel?y$` now create errors. They must be input `$x^{?}$`, respectively `$x\mathrel{?}y$`.

The disactivating macro `\MTnonlettersdonotobeymathxx` is made the default.

The mechanism is (even more) off by default for `\{` and `\}` as this is not compatible with their use as delimiters (`\lbrace` and `\rbrace` should be used instead) but it can be activated for them too.

`\mst@mathactivate` 1.2b 2012/12/30: there were bad oversights in the 1.2 code for `\mst@mathactivate` related to the possibility for some characters to have been made active (in the sense of the catcode) elsewhere (something which often is done by language definition files of the `babel` system). The code from v1.2b tried to provide correct behavior using a prefix called `\mst@fork` (its definition

and its use has since been modified) which let the active character expand to the `mathastext` re-definition *only* in math mode and *only* if `\protect` was `\@typeset@protect`. This indeed took care of situations such as `$(\hbox{?})$` with an active `?` or `$(\label{eq:1})$` with an active `:` (assuming for the latter that things would have worked ok before the twiddling by `mathastext`).

1.2e 2013/01/09: alas `$(\ref{eq:1})$` still was a problem. Indeed in that case the `mathastext` prefix had no means to know it was inside a `\ref` so it made the character expand to its `mathastext` redefinition, which is not acceptable inside a `\csname...\endcsname`. What happens with Babel is that it patches things such as `\ref`, `\newlabel`,... we can test the `\if@safe@actives` flag to detect it in that case, but this is Babel specific. After having thought hard about this I see no general solution except patching all macros such as `\ref`... (in an imitation of what Babel does). So the final decision is to not do anything when the character is catcode active *except* it it seems that Babel is behind the scenes.

Incidentally, Babel and TikZ are buggy with characters which are mathcode actives. For example the combination of `[french]{babel}` and `mathtools` with its `centercolon` turns `$$` into an *infinite loop* !!

In the case of Babel the reason is that, generally (but not always, the right quote ' is an exception), the `\normal@char<char>` fall-back is `\string<char>`. But this is wrong if the mathcode is 32768! The fall-back becomes the default if the user switches to a language where `<char>` is 'normal' and then an infinite loop arises.

As a further example (I am not familiar with other languages from the Babel system) with `frenchb` the active `!?:` expand in math mode to `\string!` or `?` or `;` or `..`. This creates an infinite loop if the mathcode is 32768.

For the special case of the right quote ' when it is made active by Babel, its fall-back does not invoke `\string'` so being still of mathcode 32768 is not a problem.

I have posted online how Babel should possibly modify its definitions and I use this here. I simplify a bit my proposed replacement of `\normal@char<char>` as the check for `\protect` is superfluous, I think, having been done already at the level of the Babel prefix.

Replacing `\user@active<char>` is indeed not enough, and `\normal@char<char>` also must be changed, because when the user switches back to a language where the character is 'normal' it remains catcode active. The crucial thing is the test of `\if@safe@actives` in the replacement of the `\normal@char<char>`, besides of course the test for math mode in both replacements.

When the character is not catcode active, then `mathastext` uses the math activation method. As the mathcode is not looked at in `\edef`, `\write` or inside `\csname...\endcsname` nothing special needs to be done, I think, in terms of protection against premature expansion. (I did not know that initially).

So, to recapitulate, `mathastext` will use the mechanism of the active mathcode if the character is not catcode active, and in the opposite case will do something only in the context of Babel, modifying directly its `\user@active<char>` and its `\normal@char<char>` macros and it does NOT then set the mathcode to 32768!!, rather it makes *sure* the character is not mathematically active.

As 1.2e is a bit paranoid it takes precautions against the possibility of characters it treats being active at the time of its loading. Excepted from the scope of the paranoia are the latin letters (that would be crazy!) and also `*`, `"` and the left quote ```.

1.2f 2013/01/21 with earlier versions (\*) it was important not to do twice the business of `\mst@mathactivate` (think `$(\hbox{${?}$})$`), so I used (this was a bit wasteful) some sort of boolean macro for each character. But now that there are the `\mst@the..` prefixes, let's just use them! (don't know why I did not think of that earlier; perhaps I had in mind some more general character per character customization initially, which I just dropped.)



(\*) it is still important to not do twice the thing when the character is active, in which case the `babel` macros are patched.

As an aside, `\hbox{\catcode`\?= \active $?$}$` for an `?` which was unactive at the first `$` will just make `mathastext` overwrite the definition (assumed here to have been done earlier) of an active `?`, but the result is that the inner `?` can not be used in `\label` or `\ref`. So testing for active characters should be done always... many things should be done always... I leave as is.

1.3i 2016/01/06 removes a spurious end of line space in `\mst@mathactivate` (did not show as anyhow done in math mode).

`\mst@do@az` 1.2b 2012/12/28 now that we understand the great advantages of "8000 we do it also for all letters a-z and A-Z to insert automatically the italic corrections. See the [discussion](#) in the user manual. Ironically I wrote the code initially for the `italic` option only to realize later it was more suitable to using an *upright* text font in math mode! So this mathematical activation of the letters is not done if the font shape is detected to be `it` or `sl`; to bypass this the command `\MTicinmath` is provided.

1.2e 2013/01/10 corrects a bad oversight of 1.2b in `\mst@mathactivate` which made the reproduction of the user manual illustrations with `$f_i^i$` impossible. As `\mst@mathactivate` was originally used also to get the non-letters obey math alphabet while maintaining the `TeX` spacings, it added no extra braces. The braces should however be added for expansion of math active letters, in order of things like `x^y` to work as expected. (the group braces do not prevent ligatures when the letters are arguments to the math alphabet commands, the added macros `\mst@itcorr` and `\mst@before<letter>` expanding to nothing).

Added note 2016/01/06: it should be explicitly said that the extra `{. .}` in `\mst@mathactivate` for letters end up creating `\hbox`'es around each letter with its extra skips and explicit italic correction, when present. These skips are thus set at natural width and do not add any break point.

`\MTmath-activeletters` 1.3 2013/09/02 extends the use of mathematically active letters to allow the user to specify `muglue` before and after the letter itself (see `\MTsetmathskips`, below). Mathematically active letters were previously used only to add the italic correction; the math activation has now been separated and put in `\MTmathactiveletters`. There is also `\MTmathactiveLetters` to allow math activation only for the uppercase letters. To cancel the (now default, even with option `italic`) math activation of letters, there is `\MTmathstandardletters`. Version 1.3a removes some silly `\string`'s from the code, which prevented to pass macros as first argument to the command.

`\MTnonletters-obeymathxx` These macros are modified in version 1.3a 2013/09/04 in order to cleverly adjust, or not, the `amsmath \resetMathstrut@`. When used in the preamble, they just modify `\mst@the`. And there is code at begin document to check the status there of `\mst@the` and if its meaning is `\the`, then `\MTnonlettersobeymathxx` is activated again to do the patch. When used in the body they adjust `\resetMathstrut@`.

Notice that the saved meaning is the one at begin document (thus, possibly patched by `lualatex-math` — not anymore since 1.5 of March 2016, as `amsmath.sty` now maintained by LaTeX team has modified `\resetMathStrut@` to make it compatible to Unicode engines) but modifications done after that would not be seen in `\mst@saveresetMathstrut@`.

The new version of `\resetMathStrut@` from LaTeX team release 2016/03/03 v2.15a of `amsmath.sty` is still not compatible with a math active opening parenthesis. Hence my patch here is still needed.

At 1.3u `\MTnonlettersobeymathxx` and `\MTeasynonlettersobeymathxx` are made no-ops under subdued mode. This fixes some bug if for example the former was used in preamble or im-

mediately after `\begin{document}` making the minus sign math active although the `mathastext` action was supposedly subdued. Similarly `\MTmathactiveletters` is now a no-op if issued under subdued mode in the *normal* or *bold* math versions.

```

245 \newtoks\mst@do@nonletters
246 \newtoks\mst@do@easynonletters
247 \newtoks\mst@do@az
248 \newtoks\mst@do@AZ
249 \let\mst@the\@gobble
250 \newcommand*\MTnonlettersdonotobeymathxx{%
251     \ifx\mst@the\@gobble
252     \else
253         \@ifundefined{mst@saveresetMathstrut@}{\}%
254         \PackageInfo{mathastext}{restoring (for this group or environment) ams-
math \string\resetMathstrut@}%
255         \let\resetMathstrut@\mst@saveresetMathstrut@}%
256     \fi
257     \let\mst@the\@gobble
258 }%
```

1.3u adds this check that we are not in a subdued normal or bold math version. No need for expandable coding.

```

259 \def\mst@OnlyIfNotSubdued#1{%
260     \ifmst@subdued
261         \def\mst@tmpa{normal}%
262         \ifx\math@version\mst@tmpa
263         \else
264             \def\mst@tmpa{bold}%
265             \ifx\math@version\mst@tmpa
266             \else
267                 #1%
268             \fi
269         \fi
270     \else
271         #1%
272     \fi
273 }%
274 \def\mst@nonlettersobeymathxx{%
275     \ifx\mst@the\the
276     \else
277         \@ifundefined{mst@saveresetMathstrut@}{\}%
278         \ifmst@symboldelimiters
279         \def\resetMathstrut@{%
280             \setbox\z@\hbox{\the\textfont\symmtpsymbol\char40
281                 \the\textfont\symmtooperatorfont\char40
282                 \the\textfont\symoperators\char40}%
283             \ht\Mathstrutbox@ \ht\z@ \dp\Mathstrutbox@ \dp\z@}%
284         \else
285         \def\resetMathstrut@{%
286             \setbox\z@\hbox{\the\textfont\symmtooperatorfont\char40
```

```

287             \the\textfont\symoperators\char40}%
288             \ht\Mathstrutbox@ht\z@ \dp\Mathstrutbox@dp\z@}%
289         \fi
290         \PackageInfo{mathastext}{\string\resetMathstrut@space
291         from amsmath replaced (for this group or environment)}}%
292     \fi
293     \let\mst@the\the
294 }%
295 \newcommand*{\MTnonlettersobeymathxx
296     {\mst@OnlyIfNotSubdued\mst@nonlettersobeymathxx}%
297 \newcommand*{\MTeasynonlettersdonotobeymathxx{\let\mst@theeasy\@gobble}%
298 \def\mst@easynonlettersobeymathxx{\let\mst@theeasy\the}%
299 \newcommand*{\MTeasynonlettersobeymathxx
300     {\mst@OnlyIfNotSubdued\mst@easynonlettersobeymathxx}%
301 \MTeasynonlettersobeymathxx % no-op here if subdued mode
302 \def\mst@mathactiveletters{\let\mst@thef\the \let\mst@theF\the}%
303 \newcommand*{\MTmathactiveletters
304     {\mst@OnlyIfNotSubdued\mst@mathactiveletters}%
305 \MTmathactiveletters % no-op here if subdued mode
306 \def\mst@mathactiveLetters{\let\mst@theF\the}%
307 \newcommand*{\MTmathactiveLetters
308     {\mst@OnlyIfNotSubdued\mst@mathactiveLetters}%
309 \newcommand*{\MTmathstandardletters{\let\mst@thef\@gobble \let\mst@theF\@gobble}%

```

`\MTicinmath` `\MTnoicinmath` can also be used from inside math mode.

`\MTICinmath` `\MTicalsoinmathxx` is destined to be used inside `\mathnormalbold` as I didn't want to add the complication of extracting the family number used inside `\mathnormalbold` (will perhaps come back if I have time to spend on source2e). Added note 2016/01/06: this number is a priori simply `\symmtletterfont+1`.

`\MTicinmath` can also be used inside math mode, to revert an earlier `\MTnoicinmath` from inside the same math group: the math mode had to be entered with the math activation of letters allowed.

1.3i 2016/01/06: For some reason which I have now forgotten I did until now:

```

% \def\mst@itcorr{\ifnum\fam=\m@ne\else\ifnum\fam=\symmtletterfont\fi}%
%

```

hence italic corrections were also applied inside `\mathnormal` (for upright fonts; `\mathnormalbold` math alphabet was not treated like `\mathnormal`). I now drop this to be more in sync with the handling of the extra skips around letters. Everything gets suppressed inside all math alphabets, allowing ligatures, even for `\mathnormal`.

```

310 \newcommand*{\MTicinmath{%
311     \MTmathactiveletters
312     \def\mst@itcorr{\ifnum\fam=\m@ne\fi}%
313     \let\mst@ITcorr\mst@itcorr}
314 \newcommand*{\MTICinmath{%
315     \MTmathactiveLetters
316     \def\mst@ITcorr{\ifnum\fam=\m@ne\fi}}
317 \newcommand*{\MTnoicinmath{\let\mst@itcorr\empty\let\mst@ITcorr\empty}
318 \newcommand*{\MTnoICinmath{\let\mst@ITcorr\empty}

```

```

319 \newcommand*\MTicalsoinmathxx{%
320     \ifx\mst@itcorr\@empty\else\def\mst@itcorr{\}\fi
321     \ifx\mst@ITcorr\@empty\else\def\mst@ITcorr{\}\fi}

```

`\MTsetmathskips` 1.3 2013/09/02: user level command to specify extra spaces in math mode around the letters (only the 7bit a,b,...,z and A,B,...,Z). First parameter is the letter, second is the math skip to be inserted before, and third the skip to be inserted after; for example `\thickmuskip` or explicitly `0.1mu`.

For this, letters are made mathematically active. This is now the package default (version 1.2 did this only in the absence of option `italic`, or more precisely when the font used was not of shape `it` or `sl`). But if `\MTsetmathskips` has not been used for that letter, the only effect of the math activation is, as in 1.2, to add the italic correction automatically, except when the font shape is detected to be `it` or `sl`; in these latter cases, although mathematically active, the letter acts in the standard way.

The command `\MTmathstandardletters` turns off math activation and its effects for all letters.

Ligatures within the argument of a math alphabet command are impeached by skips; so `\MTunsetmathskips` is provided to cancel the skips for one specific letter (`f` for example).

1.3a 2013/09/04: I strangely had `\string#1` inside `\MTsetmathskips`. Phobic of catcode active letters... but with `\string` one needs some `\expandafter` to use `\MTsetmathskips` in an `\@for` loop for example. It is better to allow the first argument to be a macro or anything expanding to a letter, and to not be paranoid about improbable catcode active letters (the user just has to tame them at the time of the `\MTsetmathskip`) so I take out these `\string`'s.

1.3i 2016/01/06: the extra skips are suppressed for the arguments of math alphabet commands. This applies in particular for `amsmath`'s `\DeclareMathOperator`.

```

322 \newcommand*\MTsetmathskips[3]{%
323     \@namedef{mst@before#1}{\ifnum\fam=\m@ne\mskip#2\relax\fi}%
324     \@namedef{mst@after#1}{\ifnum\fam=\m@ne\mskip#3\relax\fi}%
325 }
326 \newcommand*\MTunsetmathskips[1]{%
327     \@namedef{mst@before#1}{}%
328     \@namedef{mst@after#1}{}%
329 }

```

`\mst@mathactivate` Added note 2016/01/06: Notice that the initially `\relax` tokens `\mst@[before|after]@<letter>` formed with `\csname...\endcsname` do not modify TeX's math layout: `{\relax f\relax}` is like `f` (also for ligatures inside `\mathrm` for example).

```

\mst@addtodo@az 330 \def\mst@magic@v #1#2#3#4#5{#1#3#4}
\mst@addtodo@AZ 331 \def\mst@magic@vi #1#2#3#4#5#6{#1#2#4#5}
332 \def\mst@fork{\ifmmode\mst@magic@v\fi\@thirdofthree}
333 \def\mst@safefork{\ifmmode\if@safe@actives\else\mst@magic@vi\fi\fi\@thirdofthree}
334 \def\mst@do@activecase#1#2#3{% #1 is a category 11 or 12 character token
335     \@ifundefined{active@char#1}{}{%
336         \ifcat #1a\mathcode`#1=#2\else
337             \ifx\relax #2\relax\mathcode`#1=#1 \else\mathcode`#1=#3\fi\fi
338         \expandafter\expandafter\expandafter\let\expandafter\expandafter
339             \csname mst@orig@user@active#1\endcsname
340             \csname user@active#1\endcsname
341         \expandafter\expandafter\expandafter\let\expandafter\expandafter
342             \csname mst@orig@normal@char#1\endcsname

```

```

343             \csname normal@char#1\endcsname
344 \ifcat #1a%
345     \expandafter\edef\csname user@active#1\endcsname
346         {\noexpand\mst@fork {{#2\noexpand#3}}}\expandafter
347         \noexpand\csname mst@orig@user@active#1\endcsname
348     }%
349     \expandafter\edef\csname normal@char#1\endcsname
350         {\noexpand\mst@safefork {{#2\noexpand#3}}}\expandafter
351         \noexpand\csname mst@orig@normal@char#1\endcsname
352     }%
353 \else
354     \expandafter\edef\csname user@active#1\endcsname
355         {\noexpand\mst@fork {#2}\noexpand#3\expandafter
356         \noexpand\csname mst@orig@user@active#1\endcsname
357     }%
358     \expandafter\edef\csname normal@char#1\endcsname
359         {\noexpand\mst@safefork {#2}\noexpand#3\expandafter
360         \noexpand\csname mst@orig@normal@char#1\endcsname
361     }%
362 \fi}}
363 \begingroup
364 \catcode`\~=\active
365 \def\x{\endgroup
366     \def\mst@mathactivate##1##2##3{% ##1 guaranteed of cat 11 or 12
367         \begingroup
368         \lccode`\~=`##1
369         \lccode`##1=`##1
370         \lowercase{\endgroup
371             \ifnum\catcode`##1=\active
372                 \mst@do@activecase ##1{##2}##3%
373                 % careful as ##2 is empty in the asterisk and
374                 % prime case!
375             \else
376                 \mathcode`##1="8000
377                 % version 1.3 adds the possibility of extra skips around letters,
378                 % (only if non catcode active at the time of use).
379                 \ifcat##1a\edef~{% extra braces for a~b for example
380                     {\expandafter\noexpand\csname mst@before##1\endcsname
381                     ##2\noexpand##3%
382                     \expandafter\noexpand\csname mst@after##1\endcsname}}}%
383                 \else\def~{##2##3}\fi
384             \fi}}
385 \x
386 \def\mst@addtodo@nonletters#1#2#3{%
387     % #1 will be of cat 11 or 12.
388     % #2 is empty for asterisk and right quote
389     \mst@do@nonletters\expandafter
390         {\the\mst@do@nonletters \mst@mathactivate#1{#2}#3}%
391 }

```

```

392 \def\mst@addtodo@easynonletters#1#2{% #1 is a one char control sequence
393   \mst@do@easynonletters\expandafter{\the\mst@do@easynonletters\mathcode`#1=#2}%
394 }
395 \def\mst@addtodo@az#1#2{%
396   \mst@do@az\expandafter{\the\mst@do@az\mst@mathactivate#1#2\mst@itcorr}
397 }
398 \def\mst@addtodo@AZ#1#2{%
399   \mst@do@AZ\expandafter{\the\mst@do@AZ\mst@mathactivate#1#2\mst@ITcorr}%
400 }

```

\newmcodes@ 1.15d: the \newmcodes@ amsmath macro causes an error in Unicode engines as soon someone assigns a Unicode mathcode to the minus sign, and then makes a \DeclareMathOperator declaration. Furthermore it hard-codes the font family 0 as being the one to be used. Moreover just putting the concerned signs -, :, ., \, ', \* inside braces emulates enough the behavior (although the tick will give a prime).

1.3: now tests if ‘basic’ option was used.

1.3d: I should re-examine the situation with \newmcodes@. In the meantime its relaxification will not be done if lualatex-math is loaded. And the whole thing is put at begin document.

1.3m: lualatex-math 1.5 n’a pas modifié son traitement de \newmcodes@ mais par contre a supprimé le patch de \resetMathstrut@. Mais la date de release est restée à 2015/09/22 (date de 1.4a) au lieu de quelque chose comme 2016/03/13 (date pour l’annonce sur CTAN). Il faudra suivre l’évolution future de amsmath.sty maintenant assurée par D.C.

1.3n 2016/04/22: there is no more a patch of \newmcodes@ by lualatex-math 1.6 (2016/04/16), as amsmath 2016/03/10 v2.15b has now a version compatible with LuaL<sup>A</sup>T<sub>E</sub>X.

My very radical \let\newmcodes@\relax was only a temporary measure I adopted for lack of time on October 13, 2012, and apart from avoiding to do that in case lualatex-math was detected, I never came back... finally I handle it myself for 1.3n. The remaining problem of this macro (now that it does not anymore crash lualatex or vice versa) is that (also with amsmath version 2016/03/10 v2.15b) it hardcodes the font used. The aim of the macro is to modify the type of spacing affected to symbols ', \*, ., -, /, :, in case they are used in operator names.

- As I don’t want to monopolize a count register only for computations, let’s just be mean if  $\varepsilon$ -T<sub>E</sub>X not there.
- **mathastext** makes (or not, depending on commands issued by the user) these characters math active (the right tick already is), which complicates recovery of former mathcode. We have mathchar type *macros*, but then the complication is in diverging behaviours of the engines: \numexpr\mst@varfam@minus\relax works with LuaT<sub>E</sub>X, not with X<sub>Y</sub>L<sub>A</sub>T<sub>E</sub>X.
- the \* must presumably really be the non-lowered text glyph.
- for the - I hesitated but do use the hyphen in the end.
- seems I simply don’t understand what the amsmath code does with \std@minus. It is used in \relbar and it escapes me why \newmcodes@ would ever want to redefine it, and more importantly why on earth it tests the mathcode of - for that ? yes, \std@minus is defined (at begin document) using the mathcode of -, but what’s the connexion to \newmcodes@ ?? Any way **mathastext** defines \relbar with \mst@minus@sign. Thus I just drop this conditional.
- things are complicated by the options such as **nominus**, **noparenthesis**.

- the `\newmcodes@` macro is anyhow assuming that if a new math font is used it occupies math groups 0 and 1 !! very bad; fixing it in passing if the character has not been handled by `mathastext` could be envisioned, but that's not `mathastext`'s job.
- years go by, and I remain as baffled as ever about the story of “more than 16 math families”. I will not test again, but I am pretty sure that `\DeclareMathSymbol` does not work with more than 16 families, thus when I try to be a good boy and use `\Umathcode` syntax with `symmtooperatorfont` I am perhaps doing unnecessary efforts.
- I noticed that Lua<sup>A</sup>T<sub>E</sub>X does not apply the “TeX Ligature” (bad name) regarding the right tick APOSTROPHE being transformed into RIGHT SINGLE QUOTATION MARK in math mode, but X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X does. From the point of view of `mathastext`, the behaviour of X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X is the coherent one. It appears that Lua<sup>A</sup>T<sub>E</sub>X use in math mode of a text font does not obey the set features. I opened a ticket at <https://github.com/wspr/fontspect/issues/238>, but as usual it is hard to figure out the best place where to report font matters. *This item might be obsolete – not checked (1.3q).*
- Some hesitation about what to do under option `symboldelimiters`. I temporarily used `\symmtpsymbol`, except for the right quote and for the hyphen, but finally I drop that and use `\symmtooperatorfont` always. (after testing how it looked like).

All in all this is a great deal of trouble and I understand I postponed back in 2012! I spent some hours on this small thing, with consequent testing and for example this TeX Ligature issue with Unicode engines.

```

401 \ifmst@basic\else
402 \ifx\numexpr\undefined
403 \else
404   \ifmst@XeOrLua
405     \AtBeginDocument {%
406       \ifx\newmcodes@\@undefined\else
407         \edef\mst@newmcodes@{%
408           \mst@Umathcode ``\noexpand\' 0 \symmtooperatorfont 39\relax
409           \ifmst@asterisk
410             \mst@Umathcode ``\noexpand\* 0 \symmtooperatorfont 42\relax
411           \else\mathcode``\noexpand\* 42
412           \fi
413           \ifmst@nopunct\mathcode ``\noexpand\."613A \mathcode ``\noexpand\: "603A
414           \else
415             \mst@Umathcode ``\noexpand\. 6 \symmtooperatorfont 46\relax
416             \mst@Umathcode ``\noexpand\: 6 \symmtooperatorfont 58\relax
417           \fi
418           \ifmst@nominus\mathcode ``\noexpand\- 45
419           \else
420             \mst@Umathcode ``\noexpand\- 0 \symmtooperatorfont 45\relax
421           \fi
422           \ifmst@noparen\mathcode ``\noexpand\/ 47
423           \else
424             \mst@Umathcode ``\noexpand\/ 0 \symmtooperatorfont 47\relax
425           \fi
426         }%
427       \let\mst@originalnewmcodes@\newmcodes@

```

```

428 \fi
429 }
430 \else
431 \AtBeginDocument {%
432 \ifx\newmcodes@\@undefined\else
433 \edef\mst@newmcodes@{%
434 \mathcode`\noexpand\ ' \the\numexpr\symmoperatorfont*\@cclvi+39\relax
435 \mathcode`\noexpand\*
436 \the\numexpr\ifmst@asterisk\symmoperatorfont*\@cclvi\fi+42\relax
437 \ifmst@nopunct\mathcode ` \noexpand\."613A \mathcode ` \noexpand\: "603A
438 \else
439 \mathcode`\noexpand\ . \the\numexpr\mst@varfam@dot-"1000\relax
440 \mathcode`\noexpand\: \the\numexpr\mst@varfam@colon-"1000\relax
441 \fi
442 \mathcode`\noexpand\-
443 \the\numexpr\unless\ifmst@nominus\symmoperatorfont*\@cclvi\fi+45\relax
444 \mathcode`\noexpand\/
445 \the\numexpr\unless\ifmst@noparen\symmoperatorfont*\@cclvi\fi+47\relax\relax
446 }%
447 \let\mst@originalnewmcodes@\newmcodes@
448 \fi
449 }
450 \fi
451 \fi\fi
452 \newcommand*{\MTresetnewmcodes}{\ifx\mst@originalnewmcodes@\undefined\else
453 \let\newmcodes@\mst@originalnewmcodes@\fi}
454 \newcommand*{\MTcustomizenewmcodes}{\ifx\mst@originalnewmcodes@\undefined\else
455 \let\newmcodes@\mst@newmcodes@\fi}

```

**mtoperatorfont** Declaration of the current default font as our math font. The characteristics of the used font can be changed by a user call to the macros `\Mathastext` or `\Mathastextwilluse`, which will be defined next. We will also make one internal call to `\Mathastext` to set up the normal and bold math versions, so we will also employ `\SetSymbolFont` later.

```
456 \DeclareSymbolFont{mtoperatorfont}{\mst@enc}{\mst@fam}{\mst@ser}{\mst@opsh}
```

**\operator@font** We modify this L<sup>A</sup>T<sub>E</sub>X internal variable in order for the predefined `\cos`, `\sin`, etc. . . to be typeset with the `mathastext` font. This will also work for things declared through the `amsmath` package command `\DeclareMathOperator`. The alternative would have been to redefine the ‘operators’ Math Symbol Font. Obviously people who expect that `\operator@font` will always refer to the ‘operators’ math font might be in for a surprise. . . well, we’ll see.

**\MTmathoperators-** 1.2: rather than just replacing `\symoperators` by `\symmoperatorfont` I add a modification  
**obeymathxx** which makes the declared operator names sensitive to the math alphabets... ouh le vilain!

```

\MTmathoperators- 457 \newcommand*{\MTmathoperatorsobeymathxx}
donot- 458 {\def\operator@font{\mathgroup\ifnum\fam=\m@ne\symmoperatorfont\else\fam\fi}}
obeymathxx 459 \newcommand*{\MTmathoperatorsdonotobeymathxx}
460 {\def\operator@font{\mathgroup\symmoperatorfont}}
461 \MTmathoperatorsobeymathxx

```



`mtletterfont` At version 1.1, we add the possibility to mimick the standard behavior, that is to have italic letters and upright digits. Thanks to Tariq PERWEZ and Kevin KLEMENT who asked for such a feature.

```
462 \DeclareSymbolFont{mtletterfont}{\mst@enc}{\mst@fam}{\mst@ser}{\mst@ltsh}
```

`\MTfixmathfonts` There is a long-standing issue <https://github.com/lualatex/luatexload/issues/204> on Lua $\text{\LaTeX}$  not applying OpenType features in math mode (this impacts `\url` macro too, as it uses math mode.) Lua $\text{\LaTeX}$  has two modes for handling of OpenType fonts, the default in text being to use the `node` mode, and this mode is non-working in math, thus `mathastext` needs to force use of `base` mode. Else one sees old style figures where one does not expect them, or the opposite, depending on the default font feature.

Once we know the cause, the fix is relatively easy. I will go for the `\everymath` way, because I don't want to dwell at all with the details of  $\text{\LaTeX}$ 's handling of math fonts, of size changes, of math versions etc... perhaps in the future  $\text{\LaTeX}$  will fix the issue upstream by modifying `\DeclareSymbolFont` under Lua $\text{\LaTeX}$  + `luatexload` regime, then the present patch by `mathastext` will be unneeded. Naturally, here we care only about the two maths fonts used by `mathastext`: `mtoperatorfont` and `mtletterfont`.

For the `\url` situation, I have posted online a patch.

Not all is resolved, as I comment online at <https://github.com/lualatex/luatexload/issues/204#issuecomment-216465680> that with TeX Gyre Termes for example I can not get simultaneously Old Style and Tabular Figures to work in math mode, although the font name as constructed by my patch (which is like the code below, only simpler as we only have to consider `\textfont0`) is the correct one. Similarly with Vollkorn: I can then not get the two features `lnum` and `tnum` to work simultaneously when specified with `mode=base`. It does work with `mode=node` but this mode "does not work in math mode."

Done for 1.3o of 2016/05/03.

1.3p renames the macro to `\MTfixmathfonts` for public access.

```
463 \begingroup
464 \catcode`N 12
465 \catcode`O 12
466 \catcode`D 12
467 \catcode`E 12
468 \lowercase{\gdef\mst@fixmathfonts@ #1=NODE;#2#3\relax #4\@empty #5}%
469 {\ifx#2\empty\else\font\mst@mathfont=#1=base;#2#3\relax#5=\mst@mathfont\fi}
470 \lowercase{\gdef\MTfixmathfonts
471 {\expandafter\mst@fixmathfonts@
472 \fontname\textfont\symmtoperatorfont\relax\relax=NODE;\empty\relax\@empty
473 {\textfont\symmtoperatorfont}%
474 \expandafter\mst@fixmathfonts@
475 \fontname\scriptfont\symmtoperatorfont\relax\relax=NODE;\empty\relax\@empty
476 {\scriptfont\symmtoperatorfont}%
477 \expandafter\mst@fixmathfonts@
478 \fontname\scriptscriptfont\symmtoperatorfont\relax\relax=NODE;\empty\relax\@empty
479 {\scriptscriptfont\symmtoperatorfont}%
480 \expandafter\mst@fixmathfonts@
481 \fontname\textfont\symmtletterfont\relax\relax=NODE;\empty\relax\@empty
482 {\textfont\symmtletterfont}%
483 \expandafter\mst@fixmathfonts@
484 \fontname\scriptfont\symmtletterfont\relax\relax=NODE;\empty\relax\@empty
```

```

485   {\scriptfont\symmtletterfont}%
486   \expandafter\mst@fixmathfonts@
487   \fontname\scriptscriptfont\symmtletterfont\relax\relax=NODE;\empty\relax\@empty
488   {\scriptscriptfont\symmtletterfont}%
489   }%
490 }%
491 \endgroup
492 \ifmst@LuaTeX
493   \everymath\expandafter{\the\everymath\mst@fixmathfonts}%
494   \everydisplay\expandafter{\the\everydisplay\mst@fixmathfonts}%
495 \fi
496 \newcommand*{\MTfixfonts}{\let\mst@fixmathfonts\MTfixmathfonts}%
497 \newcommand*{\MTdonotfixfonts}{\let\mst@fixmathfonts\empty}%
498 \MTfixfonts

\Mathnormal We redefine the default normal, rm, bf, it, sf, and tt alphabets, but this will be done via
\Mathrm \renewcommand{\mathrm}{\Mathrm} etc... and (1.15f) the previous status of the math alpha-
\Mathbf blets is recorded for the sake of the subdued option.
\Mathit We follow the standard LATEX behavior for \mathbf, which is to pick up the bold series of the
\Mathsf roman font (digits and operator names).
\Mathtt We will access (if no option is passed for Greek) the \omicron via \mathnormal. But un-
\mathnormalbold fortunately the fourier package with the upright option does not have an upright omicron
obtainable by simply typing \mathnormal{o}. So if fourier is loaded we use \mathrm and not
\mathnormal.

499 \let\mst@alph@omicron\mathnormal
500 \@ifpackageloaded{fourier}{\ifslowed\else\let\mst@alph@omicron\mathrm\fi}{\fi}
501 \DeclareSymbolFontAlphabet{\Mathnormal}{mtletterfont}
502 \DeclareSymbolFontAlphabet{\Mathrm}{mtoperatorfont}
503 \ifmst@nonormalbold\else
504   \DeclareMathAlphabet{\mathnormalbold}{\mst@enc}{\mst@fam}{\mst@bold}{\mst@ltsh}
505 \fi
506 \ifmst@defaultbf\else
507   \DeclareMathAlphabet{\Mathbf}{\mst@enc}{\mst@fam}{\mst@bold}{\mst@opsh}
508 \fi
509 \ifmst@defaultit\else
510   \DeclareMathAlphabet{\Mathit}{\mst@enc}{\mst@fam}{\mst@ser}{\itdefault}
511 \fi
512 \ifmst@defaultsf\else
513   \DeclareMathAlphabet{\Mathsf}{\mst@enc}{\sfdefault}{\mst@ser}{\mst@opsh}
514 \fi
515 \ifmst@defaulttt\else
516   \DeclareMathAlphabet{\Mathtt}{\mst@enc}{\ttdefault}{\mst@ser}{\mst@opsh}
517 \fi
518 \let\mst@original@normal\mathnormal
519 \let\mst@original@rm\mathrm
520 \let\mst@original@bf\mathbf
521 \let\mst@original@it\mathit
522 \let\mst@original@sf\mathsf
523 \let\mst@original@tt\mathtt

```

```

524 \def\mst@restorealalphabets{% for subdued
525     \let\mathnormal\mst@original@normal
526     \let\mathrm\mst@original@rm
527     \let\mathbf\mst@original@bf
528     \let\mathit\mst@original@it
529     \let\mathsf\mst@original@sf
530     \let\mathtt\mst@original@tt}
531 \def\mst@setalphabets{%
532     \ifmst@defaultnormal\else\renewcommand{\mathnormal}{\Mathnormal}\fi
533     \ifmst@defaultrm\else\renewcommand{\mathrm}{\Mathrm}\fi
534     \ifmst@defaultbf\else\renewcommand{\mathbf}{\Mathbf}\fi
535     \ifmst@defaultit\else\renewcommand{\mathit}{\Mathit}\fi
536     \ifmst@defaultsf\else\renewcommand{\mathsf}{\Mathsf}\fi
537     \ifmst@defaulttt\else\renewcommand{\mathtt}{\Mathtt}\fi}
538 \ifmst@subdued\else\mst@setalphabets\fi

```

LGRgreek 1.14b: We can not move the `\DeclareSymbolFont` to the `\Mathastext` macro because it resets the font family in *\*all\** math versions, and some could have been defined by the user with previous calls to `\Mathastext`. So we have to have them here. The problem is that at this stage it is impossible to know if we really need (in the case of LGRgreek) two separate shapes for upper and lowercase, and (in the case of selfGreek) a shape distinct from the one used in `mtoperatorfont`. So I opted in the end for declaring possibly one too many font. To achieve more economy the only way would be to keep cumulative track of all previously declared math versions and to redeclare appropriately the LGR or self greek fonts at each call to `\Mathastext` (with no optional argument): a bit painful, and as I am possibly the sole user in the world of this possibility of multiple math versions with this package. Also the advantage to systematically allocate a font for the selfGreek option is that we can force the use of the OT1 encoding.

First we establish the cumulative effect of the greek related options.

1.15c introduces some possibilities to change the shapes of Greek letters in each math versions, and even the Greek font (in LGR encoding). The commands `\MTitgreek` etc... will be used in-between calls to `\Mathastext` and re-adjust the shapes. And the command `\MTgreekfont` changes the Greek font family.

```

539 \def\mst@update@greeksh{
540     \def\mst@greek@lsh{\mst@ltsh} %% default behavior
541     \def\mst@greek@ush{\mst@opsh}
542     \ifmst@itgreek\def\mst@greek@lsh{\itdefault}
543         \def\mst@greek@ush{\itdefault}\fi
544     \ifmst@upgreek\def\mst@greek@lsh{\updefault}
545         \def\mst@greek@ush{\updefault}\fi
546     \ifmst@frenchmath
547         \ifmst@itgreek\else
548             \ifmst@upgreek\else
549                 \def\mst@greek@lsh{\mst@opsh}
550                 \def\mst@greek@ush{\mst@opsh}
551             \fi\fi
552     \fi
553     \ifcase\mst@greek@select
554         \or\def\mst@greek@ush{\itdefault}
555         \or\def\mst@greek@ush{\updefault}

```

```

556 \fi}
557 \mst@update@greeksh
558 \ifmst@LGRgreek
559 \DeclareFontEncoding{LGR}{\mst@fam}{\mst@ser}{\mst@greek@lsh}
560 \DeclareSymbolFont{mtlgrfontlower}{LGR}{\mst@fam}{\mst@ser}{\mst@greek@lsh}
561 \DeclareSymbolFont{mtlgrfontupper}{LGR}{\mst@fam}{\mst@ser}{\mst@greek@ush}
562 \else
563 \ifmst@selfGreek
564 \DeclareSymbolFont{mtselfGreekfont}{OT1}{\mst@fam}{\mst@ser}{\mst@greek@ush}
565 \fi\fi

```

`mteulervm` In case we need the Euler font, we declare it here. It will use `uzeur.fd` from the `eulervm` package  
`\MathEuler` of Walter SCHMIDT

```

\MathEulerBold 566 \ifmst@needeuler\typeout{** will use Euler font; command \string\MT EulerScale}
567 \DeclareSymbolFont{mteulervm}{U}{zeur}{m}{n}
568 \DeclareSymbolFontAlphabet{\MathEuler}{mteulervm}
569 \DeclareMathAlphabet{\MathEulerBold}{U}{zeur}{\mst@bold}{n}
570 \fi
571 \newcommand*\MTEulerScale[1]{\edef\zeu@Scale{#1}}
572 \let\MathastextEulerScale\MTEulerScale

```

L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub> has a strange initial configuration where the capital Greek letters are of type `mathalpha`, but the lower Greek letters of type `mathord`, so that `\mathbf` does not act on them, although lowercase Greek letters and Latin letters are from the same font. This is because `\mathbf` is set up to be like a bold version of `\mathrm`, and `\mathrm` uses the ‘operators’ font, by default `cmr`, where there are NO lowercase greek letters. This set-up is ok for the Capital Greek letters which are together with the Latin letters in both `cmmi` and `cmr`.

The package `eulervm` sets the lowercase Greek letters to be of type `mathalpha`, the default `\mathbf` and `\mathrm` will act wierdly on them, but a `\mathbfbold` is defined which will use the bold series of the Euler roman font, it gives something coherent for Latin and Greek *lowercase* letters, and this is possible because the same font contains upright forms for them all.

Here in `mathastext`, Latin letters and Greek letters (lower and upper case) must be (generally) assumed to come from two different fonts, as a result the standard `\mathbf` (and `\mathrm`) will give weird results when used for Greek letters. We could coerce `\mathbf` to do something reasonable (cf <http://tug.org/pipermail/texhax/2011-January/016605.html>) but at this time 30-01-2011 09:42:27 CET I decided I would not try to implement it here. I prefer to respect the default things.

I followed the simpler idea of the `eulervm` package and defined `\MathEuler` and `\MathEulerBold` alphabet commands (the `eulervm` package does this only for the bold font).

`mtpsymbol` In case we need the Symbol font, we declare it here. The macro `\psy@scale` will be used to scale  
`\MathPSymbol` the font (see at the very end of this file).

```

573 \ifmst@needsymbol\typeout{** will use Symbol font; command \string\MTSymbolScale}
574 \def\psy@scale{1}
575 \DeclareSymbolFont{mtpsymbol}{U}{psy}{m}{n}
576 \DeclareSymbolFontAlphabet{\MathPSymbol}{mtpsymbol}
577 \AtBeginDocument{%
578 \DeclareFontFamily{U}{psy}{%
579 \DeclareFontShape{U}{psy}{m}{n}{<->s*[\psy@scale] psy}{%
580 }

```



```

609 \mst@upgreektrue\mst@itgreekfalse\def\mst@greek@select{0}}
610 \newcommand*{\MTitGreek}{\def\mst@greek@select{1}}
611 \newcommand*{\MTupGreek}{\def\mst@greek@select{2}}
612 \let\Mathastextitgreek\MTitgreek
613 \let\Mathastextupgreek\MTupgreek
614 \let\MathastextitGreek\MTitGreek
615 \let\MathastextupGreek\MTupGreek
616 \newcommand*{\MTgreekfont}[1]{\def\mst@greekfont{#1}}
617 \let\Mathastextgreekfont\MTgreekfont

```

At (long...) last we now change the font for the letters of the latin alphabet. In version 1.1, Latin letters have their own font (shape).

1.2b initiated the use of mathematically active letters to insert the italic corrections. With version 1.3 the use of math active letters is also for extra muglue added before and after the letters. Use of \@for to shorten the code initiated with release 1.3.

```

618 \def\mst@DeclareMathLetter #1{%
619 \DeclareMathSymbol {#1}{\mathalpha}{\mtletterfont}{`#1}%
620 \expandafter
621 \DeclareMathSymbol \csname mst@#1\endcsname{\mathalpha}{\mtletterfont}{`#1}%
622 \expandafter\mst@addtodo@az\expandafter #1\csname mst@#1\endcsname
623 }%
624 \@for\mst@tmp:=abcdefghijklmnopqrstuvwxyz\do
625 {\expandafter\mst@DeclareMathLetter\mst@tmp}%
626 \ifmst@frenchmath \def\mst@font@tbu{\mtoperatorfont}%
627 \else \def\mst@font@tbu{\mtletterfont}%
628 \fi
629 \def\mst@DeclareMathLetter #1{%
630 \DeclareMathSymbol {#1}{\mathalpha}{\mst@font@tbu}{`#1}%
631 \expandafter
632 \DeclareMathSymbol \csname mst@#1\endcsname{\mathalpha}{\mst@font@tbu}{`#1}%
633 \expandafter\mst@addtodo@AZ\expandafter #1\csname mst@#1\endcsname
634 }%
635 \@for\mst@tmp:=ABCDEFGHIJKLMNOPQRSTUVWXYZ\do
636 {\expandafter\mst@DeclareMathLetter\mst@tmp}%
637 \let\mst@DeclareMathLetter\relax
638 \ifmst@nodigits\else
639 \def\mst@font@tbu{\mtoperatorfont}%

```

In version 1.1, we have now separated digits from letters, so paradoxically it is less problematic to give them the mathalpha type.

```

640 \ifmst@symboldigits \def\mst@font@tbu{\mtsymbol} \fi
641 \ifmst@eulerdigits \def\mst@font@tbu{\mteulervm} \fi
642 \DeclareMathSymbol{0}{\mathalpha}{\mst@font@tbu}{`0}%
643 \DeclareMathSymbol{1}{\mathalpha}{\mst@font@tbu}{`1}%
644 \DeclareMathSymbol{2}{\mathalpha}{\mst@font@tbu}{`2}%
645 \DeclareMathSymbol{3}{\mathalpha}{\mst@font@tbu}{`3}%
646 \DeclareMathSymbol{4}{\mathalpha}{\mst@font@tbu}{`4}%
647 \DeclareMathSymbol{5}{\mathalpha}{\mst@font@tbu}{`5}%
648 \DeclareMathSymbol{6}{\mathalpha}{\mst@font@tbu}{`6}%
649 \DeclareMathSymbol{7}{\mathalpha}{\mst@font@tbu}{`7}%

```

```

650 \DeclareMathSymbol{8}{\mathalpha}{\mst@font@tbu}{`8}%
651 \DeclareMathSymbol{9}{\mathalpha}{\mst@font@tbu}{`9}%
652 \fi

```

When `symboldelimiters` is passed as an option, we use the Symbol font for the printable characters other than letters and digits.

```

653 \ifmst@symboldelimiters
654 \def\mst@font@tbu{mtpsymbol}%
655 \mst@endashfalse
656 \mst@emdashfalse
657 \else
658 \def\mst@font@tbu{mtooperatorfont}%
659 \fi

```

1.2 adds the tricks to let non letters/digits obey math alphabets. We have to double the definitions for easy switch on-off of the mechanism, via a token list which is put into `\everymath` and `\everydisplay`.

```

660 \ifmst@noexclam\else\typeout{** \string! and \string?}%
661 \DeclareMathSymbol{!}{\mathclose}{\mst@font@tbu}{"21}%
662 \DeclareMathSymbol{\mst@varfam@exclam}{\mathalpha}{\mst@font@tbu}{"21}%
663 \expandafter\mst@addtodo@nonletters\string!\mathclose\mst@varfam@exclam
664 \DeclareMathSymbol{?}{\mathclose}{\mst@font@tbu}{"3F}%
665 \DeclareMathSymbol{\mst@varfam@question}{\mathalpha}{\mst@font@tbu}{"3F}%
666 \expandafter\mst@addtodo@nonletters\string?\mathclose\mst@varfam@question
667 \fi

```

`\MTlowerast` 1.12d The `\ast` or `*` is defined in `fontmath.ltx` as a binary operator from the symbols font. Usually the asterisk from the text font is in a raised position. Previous versions of `mathastext` did nothing with `\ast` but strangely defined `*` to be the one from the text font, with type `\mathalpha`. `\mst@@doasterisk` The package now leaves by default both `*` and `\ast` untouched, and if passed option `asterisk` `\MTnormalasterisk` replaces both of them with a lowered text asterisk (or the one from the Symbol font), and of `\MTactiveasterisk` type `\mathbin`. A trick is used to optionally get both `*` and `\ast` obey the math alphabets.

The user macro `\MTlowerast` sets the amount of lowering to be applied to the text asterisk.

1.12e Somehow there was a big omission in 1.12d, the command `\MTlowerast` as described in the manual was missing!

nota bene: it is assumed that `*` is of type `other` when `mathastext` is loaded... it should neither be active, nor of type `letter`!

1.3i adds `\MTnormalasterisk` and `\MTactiveasterisk`. They do nothing without option `asterisk`.

```

668 \def\mst@@doasterisk{\let\ast\mst@ast\mst@mathactivate*{}\mst@ast}%
669 \newcommand*{\MTnormalasterisk}{\let\mst@doasterisk\relax}
670 \newcommand*{\MTactiveasterisk}{\let\mst@doasterisk\mst@@doasterisk}
671 \ifmst@asterisk\typeout{** asterisk: \string\ast\space and *}
672 \AtBeginDocument{%
673 \everymath\expandafter
674 {\the\everymath \mst@doasterisk \MTnormalasterisk }%
675 \everydisplay\expandafter
676 {\the\everydisplay\mst@doasterisk \MTnormalasterisk }}
677 \ifmst@symbolmisc
678 \def\mst@bin@ast{%

```

```

679 \mathbin{\mathchoice{\raisebox{-.1\height}%
680 {\the\textfont\symmtpsymbol\char42}}%
681 {\raisebox{-.1\height}%
682 {\the\textfont\symmtpsymbol\char42}}%
683 {\raisebox{-.1\height}%
684 {\the\scriptfont\symmtpsymbol\char42}}%
685 {\raisebox{-.1\height}%
686 {\the\scriptscriptfont\symmtpsymbol\char42}}}%
687 \else
688 \def\mst@bin@ast{%
689 \mathbin{\mathchoice{\raisebox{-\mst@lowerast}%
690 {\the\textfont\symmoperatorfont\char42}}%
691 {\raisebox{-\mst@lowerast}%
692 {\the\textfont\symmoperatorfont\char42}}%
693 {\raisebox{-\mst@lowerast}%
694 {\the\scriptfont\symmoperatorfont\char42}}%
695 {\raisebox{-\mst@lowerast}%
696 {\the\scriptscriptfont\symmoperatorfont\char42}}}%
697 \fi
698 \def\mst@varfam@ast{\ifnum\fam=\m@ne\mst@bin@ast\else
699 \mathbin{\mathchoice{\raisebox{-\mst@lowerast}%
700 {\the\textfont\fam\char42}}%
701 {\raisebox{-\mst@lowerast}%
702 {\the\textfont\fam\char42}}%
703 {\raisebox{-\mst@lowerast}%
704 {\the\scriptfont\fam\char42}}%
705 {\raisebox{-\mst@lowerast}%
706 {\the\scriptscriptfont\fam\char42}}}\fi}%
707 \MTactiveasterisk
708 \DeclareRobustCommand*\mst@ast{\mst@bin@ast}
709 \newcommand*\MTlowerast[1]{\def\mst@lowerast{#1}}
710 \MTlowerast{.3\height}
711 \mst@do@easynonletters\expandafter\expandafter\expandafter
712 {\expandafter\the\expandafter\mst@do@easynonletters
713 \expandafter\def\csname mst@ast \endcsname{\mst@varfam@ast}}
714 \fi

```

(2011) I renounced to try to do things with all the various dots, they are defined in many different ways, and there is the amsmath also. Dealing with this issue would mean a lot a time for a minuscule result. Better to leave the user use the `mathdots` package and accept that we can not avoid the default fonts in that case. So here I just treat `.` (in the hope to really lessen by 1 the number of fonts embedded at the end in the PDF).

[(Dec. 2012) should I reexamine these definitive sounding remarks?]

```

715 \ifmst@nopunct\else\typeout{** punctuation\string: \string. \string: \string; and
716 \DeclareMathSymbol{\,}{\mathpunct}{\mst@font@tbu}{"2C}
717 \DeclareMathSymbol{\mst@varfam@comma}{\mathalpha}{\mst@font@tbu}{"2C}
718 \expandafter\mst@addtodo@nonletters\string,\mathpunct\mst@varfam@comma
719 \DeclareMathSymbol{\,}{\mathord}{\mst@font@tbu}{"2E}
720 \DeclareMathSymbol{\mst@varfam@dot}{\mathalpha}{\mst@font@tbu}{"2E}

```



```

721 \mst@addtodo@easynonletters\.\mst@varfam@dot
722 \DeclareMathSymbol{:}{\mathrel}{\mst@font@tbu}{"3A} % relation spacing
723 \DeclareMathSymbol{\mst@varfam@colon}{\mathalpha}{\mst@font@tbu}{"3A}
724 \expandafter\mst@addtodo@nonletters\string:\mathrel\mst@varfam@colon
725 \@ifpackageloaded{amsmath}
726 {} % \colon defined in amsmath.sty in terms of : with some enlarged explicit
727 % spacing. No need to intervene.
728 {% no amsmath, use standard punctuation spacing
729 \let\colon\undefined
730 % the reason is if some package has redefined \colon which then
731 % can not be used in \cs{DeclareMathSymbol} anymore (we
732 % shamelessly overwrite...)
733 \DeclareMathSymbol{\colon}{\mathpunct}{\mst@font@tbu}{"3A}
734 \mst@do@nonletters\expandafter{\the\mst@do@nonletters
735 \def\colon{\mathpunct{\mst@varfam@colon}}}}
736 \DeclareMathSymbol{;}{\mathpunct}{\mst@font@tbu}{"3B}
737 \DeclareMathSymbol{\mst@varfam@pointvirgule}{\mathalpha}{\mst@font@tbu}{"3B}
738 \expandafter\mst@addtodo@nonletters\string;\mathpunct\mst@varfam@pointvirgule
739 \fi

```

`\relbar` Due to the way = and - are used by L<sup>A</sup>T<sub>E</sub>X in arrows, we will have to redefine `\Relbar` and `\relbar` in order for them to preserve their original meanings.

1.15d: Oct 13, 2012. Belated amendment of the code to be compatible with Unicode engines in case someone changed the mathcode of -. However, for the time being I can do it in an easy way only for X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, not for LuaL<sup>A</sup>T<sub>E</sub>X. Also I do my modifications to `\relbar` in a manner testing for the presence of amsmath.

```

740 \ifmst@nominus
741 \else
742 \ifmst@XeOrLua
743 \mst@Umathcharnumdef\mst@minus@sign=\mst@Umathcodenum`\-\relax
744 %% I used this prior to the new \luatexUmathcodenum, as available since TL2013:
745 %% \mathchardef\mst@minus@sign=8704\relax % "2200
746 \else
747 \mathchardef\mst@minus@sign=\mathcode`\-\relax
748 \fi
749 \@ifpackageloaded{amsmath}
750 {\def\relbar{\mathrel{\mathpalette\mathsm@sh\mst@minus@sign}}}
751 {\DeclareRobustCommand\relbar{\mathrel{\smash\mst@minus@sign}}}
752 \def\rightarrowfill{${\m@th\mathord{\relbar}}\mkern-7mu%
753 \cleaders\hbox{${\mkern-2mu\relbar\mkern-2mu}$}\hfill
754 \mkern-7mu\mathord{\rightarrow$}}
755 \def\leftarrowfill{${\m@th\mathord{\leftarrow}}\mkern-7mu%
756 \cleaders\hbox{${\mkern-2mu\relbar\mkern-2mu}$}\hfill
757 \mkern-7mu\mathord{\leftarrow$}}
758 \fi

```

endash 1.1 2011/01/29: Producing this next piece of code was not a piece of cake for a novice like myself!

1.11 2011/02/05: Compatibility with Unicode (via use of fontspec encodings EU1 and EU2)

- 1.12 2011/02/07: Improved dealing of Unicode possibility.
- 1.14b 2011/04/02: Corrected some very irresponsible bug in the Unicode part which caused a problem when 10 or more math families have been allocated.
- 1.15 2012/09/24: Added AtBeginDocument to circumvent some amsmath problem with unicode engines.
- 1.3l 2016/01/29: anticipating TL2016 fontspec's switch to TU.
- 1.3t 2018/08/22: fix to very ancient (2012/12/20) bug with `\DeclareMathSymbol` lacking last argument if encoding not T1, OT1 or LY1 when setting up math mode to use the en-dash character as minus sign (PDF<sub>T</sub>E<sub>X</sub> engine).

`\mst@subduedminus` 1.3t Further, new macros `\mst@subduedminus` and `\mst@nonsubduedminus`, for the good functioning of the subdued option also in case of presence of fontspec. This is the only character for which subdued option works (now) by setting the mathcode on each math version change. Indeed, a typical issue is when the Unicode EN DASH or MINUS is used, but the actual font in subdued normal math version is originally in OT1 or T1 encoding. The only reasonable way to address this is by actually modifying the assigned mathcode at each version change. This means also that `\MTversion` and not `\mathversion` must be used for good functioning.

```

759 \let\mst@subduedminus\empty
760 \let\mst@nonsubduedminus\empty
761 \def\mst@dothe@endashstuff#1#2#3{%
762   \edef\mst@tmp@enc{#3}%
763   \if1\mst@OneifUniEnc
764     \mst@Umathchardef#1=2 \symmoperatorfont "\mst@unicodeminus\relax
765     \mst@Umathchardef#2=7 \symmoperatorfont "\mst@unicodeminus\relax
766   \else
767     \DeclareMathSymbol{#1}{\mathbin}{moperatorfont}
768       {\csname\mst@tmp@enc\string\textendash\endcsname}
769     \DeclareMathSymbol{#2}{\mathalpha}{moperatorfont}
770       {\csname\mst@tmp@enc\string\textendash\endcsname}
771   \fi}% mst@dothe@endashstuff
772 \def\mst@dothe@emdashstuff#1#2#3{%
773   \edef\mst@tmp@enc{#3}%
774   \if1\mst@OneifUniEnc
775     \mst@Umathchardef#1=2 \symmoperatorfont "2014\relax
776     \mst@Umathchardef#2=7 \symmoperatorfont "2014\relax
777   \else
778     \DeclareMathSymbol{#1}{\mathbin}{moperatorfont}
779       {\csname\mst@tmp@enc\string\textemdash\endcsname}
780     \DeclareMathSymbol{#2}{\mathalpha}{moperatorfont}
781       {\csname\mst@tmp@enc\string\textemdash\endcsname}
782   \fi}% mst@dothe@emdashstuff
783 \def\mst@dothe@hyphenstuff#1#2{%
784   \DeclareMathSymbol{#1}{\mathbin}{\mst@font@tbu}{ "2D}%
785   \DeclareMathSymbol{#2}{\mathalpha}{\mst@font@tbu}{ "2D}%
786 }%
787 \def\mst@varfam@minus{\@nameuse{mst@varfam@minus@mv\math@version}}%
788 \ifmst@nominus\else
789   \expandafter\mst@addtodo@nonletters\string-\mathbin\mst@varfam@minus
790 \def\mst@nonsubduedminus{%

```

```

791 \edef\mst@tmp@enc{\csname mst@encoding@\math@version\endcsname}%
792 \if1\mst@OneifUniEnc
793 \mst@Umathcode`\-=\expandafter
794 % Working around a bug (or feature...) of XeTeX/LuaTeX: afaict it is
795 % impossible to use straightforwardly in extended mathcode assignments
796 % a control sequence as created by \Umathchardef.
797 % This is counter-intuitive and breaks expectations.
798 \mst@UmathchardefWorkAround@i
799 \csname mst@minus@mv\math@version\endcsname
800 \relax
801 \else
802 \mathcode`\-=\@nameuse{mst@minus@mv\math@version}% self-delimiting
803 \fi
804 }% \mst@nonsubduedminus
805 \fi
806 \def\mst@UmathchardefWorkAround@i
807 {\expandafter\mst@UmathchardefWorkAround@ii\meaning}%
808 \def\mst@UmathchardefWorkAround@ii#1{"{"}%

```

\mst@hbar@mvnormal 2011/01/31, 1.1 I decide to settle the question of the  $\hbar$ . The  $\text{\LaTeX}$  definition is  
\mst@ltbar@mvnormal \def\hbar{{\mathchar'26\mkern-9mu h}} and its advantage is that  $h$  is in the correct font.  
But of course not the macron character ( $\bar{=}$ ,  $\bar{a}$ ). And anyway `amsfonts` uses a `\DeclareMathSymbol`. Also there is the kern whose length depends on `cmsy` ( $18\mu=1\text{em}$  and  $\text{em}$  taken from info in `cmsy`).

I will need an `rlap` adapted to math mode, and this is provided by code from Alexander R. PERLIS in his `TugBoat` article 22 (2001), 350–352, which I found by googling `rlap`. (as an aside, I am only now (April 2, 2011) aware that the package `mathtools` provides the `mathrlap` etc... )

1.31 2016/01/29: anticipating TL2016 fontspec’s switch to TU.

1.3u 2019/08/20: encoding (8bits) agnostic construct for  $\hbar$ , using same method as for `mathaccents` option. I should add some way to adjust the vertical positioning.

On this occasion I replace  $h$  by `\mst@h` because the mechanism for before and after skips does not interact well with the `rlap` construct.

```

809 \let\mst@subduedhbar\@empty
810 \let\mst@nonsubduedhbar\@empty
811 \ifmst@nohbar\else
812 \def\mst@subduedhbar{\let\hbar\mst@original@hbar}%
813 \def\mst@nonsubduedhbar{%
814 \expandafter\let\expandafter\hbar
815 \csname mst@hbar@mv\math@version\endcsname
816 }%
817 \fi
818 \def\mst@mathrlap{\mathpalette\mst@mathrlapinternal}
819 \def\mst@mathrlapinternal#1#2{\rlap{\$ \mathsurround=Opt#1{#2}$}}
820 \def\mst@dothe@hbarstuff#1#2#3{%
821 \edef\mst@tmp@enc{#3}%
822 \if1\mst@OneifUniEnc % Unicode engine and font
823 \mst@Umathchardef#1="7 \symmttletterfont "0127 \relax %% or 210F?
824 \else

```

1.15d: Oct 13, 2012. The `\mathcode` thing with `=` is (belatedly, sorry!) made Unicode compatible.

```
834 \ifmst@noplus\else\typeout{** \string+ and \string=}
835 \DeclareMathSymbol{+}{\mathbin}{\mst@font@tbu}{"2B}
836 \DeclareMathSymbol{\mst@varfam@plus}{\mathalpha}{\mst@font@tbu}{"2B}
837 \expandafter\mst@addtodo@nonletters\string+\mathbin\mst@varfam@plus
838 \fi
839 \ifmst@noequal\else
840 \ifmst@XeOrLua
841     \mst@Umathcharnumdef\mst@equal@sign=\mst@Umathcodenum`\=\relax
842 \else
843     \mathchardef\mst@equal@sign=\mathcode`\=\relax
844 \fi
845 \@ifpackageloaded{amsmath}
846 {\def\Relbar{\mathrel\mst@equal@sign}}
847 {\DeclareRobustCommand\Relbar{\mathrel{\mst@equal@sign}}}
848 \DeclareMathSymbol{=}{\mathrel}{\mst@font@tbu}{"3D}
849 \DeclareMathSymbol{\mst@varfam@equal}{\mathalpha}{\mst@font@tbu}{"3D}
```

```
% \mathcode`x="8000
% \begingroup
% \catcode`x=\active
% \global\everymath{\defx{Hello}}
% \endgroup
% \def\foox{World!}
% $x \csname foox\endcsname$
%
```

76

2012/12/28: to be on the safe side, I add also ; and + and do it without discriminating between engines

```
850 \typeout{** adding \string= \string; and \string+ to \string\nfss@catcodes}
851 \g@addto@macro\nfss@catcodes{%
852   \@makeother\=%
853   \@makeother\;%
854   \@makeother\+%
855 }
856 \expandafter\mst@addtodo@nonletters\string=\mathrel\mst@varfam@equal
857 \fi
```

noparenthesis \lbrack and \rbrack are defined in latex.ltx by \def\lbrack{[}\def\rbrack{]} so this fits well with what we do here. \lparen and \rparen are similarly defined in mathtools. On the other hand in latex.ltx with \{ and \} are defined (in math mode) in terms of the control sequences \lbrace and \rbrace. Such control sequences can not be simultaneously math symbols and math delimiters, thus, this complicates things for the mathastextification.

```
858 \ifmst@noparen\else\typeout{** parentheses \string( \string) \string[ \string] and slash \s
859 \ifmst@nosmallldelims
860   \DeclareMathSymbol{(\mathopen}{\mst@font@tbu}{28}
861   \DeclareMathSymbol{)}\mathclose}{\mst@font@tbu}{29}
862   \DeclareMathSymbol{[\mathopen}{\mst@font@tbu}{5B}
863   \DeclareMathSymbol{]}\mathclose}{\mst@font@tbu}{5D}
864   \DeclareMathSymbol{/}\mathord}{\mst@font@tbu}{2F}
865 \else
866   \DeclareMathDelimiter{(\mathopen}{\mst@font@tbu}{28}{largesymbols}{00}
867   \DeclareMathDelimiter{)}\mathclose}{\mst@font@tbu}{29}{largesymbols}{01}
868   \DeclareMathDelimiter{[\mathopen}{\mst@font@tbu}{5B}{largesymbols}{02}
869   \DeclareMathDelimiter{]}\mathclose}{\mst@font@tbu}{5D}{largesymbols}{03}
870   \DeclareMathDelimiter{/}\mathord}{\mst@font@tbu}{2F}{largesymbols}{0E}
871 \fi
872 \DeclareMathSymbol{\mst@varfam@lparen}{\mathalpha}{\mst@font@tbu}{40}
873 \DeclareMathSymbol{\mst@varfam@rparen}{\mathalpha}{\mst@font@tbu}{41}
874 \DeclareMathSymbol{\mst@varfam@lbrack}{\mathalpha}{\mst@font@tbu}{5B}
875 \DeclareMathSymbol{\mst@varfam@rbrack}{\mathalpha}{\mst@font@tbu}{5D}
876 \DeclareMathSymbol{\mst@varfam@slash}{\mathalpha}{\mst@font@tbu}{2F}
877 \expandafter\mst@addtodo@nonletters\string(\mathopen\mst@varfam@lparen
878 \expandafter\mst@addtodo@nonletters\string)\mathclose\mst@varfam@rparen
879 \expandafter\mst@addtodo@nonletters\string[\mathopen\mst@varfam@lbrack
880 \expandafter\mst@addtodo@nonletters\string]\mathclose\mst@varfam@rbrack
881 \mst@addtodo@easynonletters\/\mst@varfam@slash
882 \fi
```

alldelims

```
<,>,\ 883 \ifmst@alldelims\typeout{** alldelims: \string< \string>
\setminus 884 \string\backslash\space\string\setminus\space\string|
\backslash 885 \string\vert\space\string\mid\space\string\{\space and \string\}}
886 \ifmst@nosmallldelims
```

Dec 18, 2012. We then want \let\backslash\mst@varfam@backslash to do nothing when the \backslash is used as a delimiter. So here the original definition from latex.ltx is copied,

generally speaking when people use other math symbol fonts they do respect the encoding of the CM symbols and largesymbols, so this is 90% safe. But in truth I should extract from the meaning of `\backslash` the `delcode`.

```

887 \DeclareMathDelimiter{\mst@varfam@backslash}
888     {\mathalpha}{symbols}{"6E}{largesymbols}{"0F}
889 \else
890 \DeclareMathDelimiter{<}{\mathopen}{\mst@font@tbu}{"3C}{largesymbols}{"0A}
891 \DeclareMathDelimiter{>}{\mathclose}{\mst@font@tbu}{"3E}{largesymbols}{"0B}
    There is no backslash in the Symbol font hence mtoperatorfont here.
892 \DeclareMathDelimiter{\backslash}
893     {\mathord}{mtoperatorfont}{"5C}{largesymbols}{"0F}
894 \DeclareMathDelimiter{\mst@varfam@backslash}
895     {\mathalpha}{mtoperatorfont}{"5C}{largesymbols}{"0F}
896 \fi
897 \DeclareMathSymbol{<}{\mathrel}{\mst@font@tbu}{"3C}
898 \DeclareMathSymbol{>}{\mathrel}{\mst@font@tbu}{"3E}
899 \DeclareMathSymbol{\mst@varfam@less}{\mathalpha}{\mst@font@tbu}{"3C}
900 \DeclareMathSymbol{\mst@varfam@more}{\mathalpha}{\mst@font@tbu}{"3E}
901 \expandafter\mst@addtodo@nonletters\string<\mathrel\mst@varfam@less
902 \expandafter\mst@addtodo@nonletters\string>\mathrel\mst@varfam@more
903 \mst@do@easynonletters\expandafter{\the\mst@do@easynonletters
904     \let\backslash\mst@varfam@backslash}
905 \DeclareMathSymbol{\setminus}{\mathbin}{mtoperatorfont}{"5C}
906 \DeclareMathSymbol{\mst@varfam@setminus}{\mathalpha}{mtoperatorfont}{"5C}
907 \mst@do@nonletters\expandafter{\the\mst@do@nonletters
908     \def\setminus{\mathbin{\mst@varfam@setminus}}}
```

`\models` 1.15d: 13 oct 2012. Before modifying | we must preserve `\models`.

```

909 \ifmst@XeOrLua
910 \mst@Umathcharnumdef\mst@vert@bar=\mst@Umathcodenum`\\relax
911 \else
912 \mathchardef\mst@vert@bar=\mathcode`\\relax
913 \fi
914 \DeclareRobustCommand\models{\mathrel{\mst@vert@bar}\joinrel\Relbar}
```

|, `\mid`, `\vert` (2011) I did not do anything then to try to emulate `\Vert` with the vertical bar from the text font... and now (2012) `mathastext` is not as radical as it used to be anyhow, so it is too late.

```

915 \ifmst@nosmallldelims
916 \DeclareMathSymbol{|}{\mathord}{\mst@font@tbu}{124}
917 \else
918 \DeclareMathDelimiter{|}{\mathord}{\mst@font@tbu}{124}{largesymbols}{"0C}
919 \fi
920 \def\vert{|}
921 \DeclareMathSymbol{\mst@varfam@vbar}{\mathalpha}{\mst@font@tbu}{124}
922 \mst@addtodo@easynonletters\\mst@varfam@vbar
923 \let\mid\undefined % 1.3: to avoid problems with some packages
924 \DeclareMathSymbol{\mid}{\mathrel}{\mst@font@tbu}{124}
925 \mst@do@nonletters\expandafter{\the\mst@do@nonletters
926     \def\mid{\mathrel\mst@varfam@vbar}}
```

`\MTeXplicitbraces-` Braces. With version 1.2, `\{` and `\}` will not be acceptable as delimiters anymore if the redefi-  
`obeymathxx` inions below in `\mst@dobraces` are enacted. But they will obey math alphabets. Improvements  
`\MTeXplicitbraces-` in 1.2a, to preserve robustness.

`donotobeymathxx` For 1.3 I make `\lbrace` and `\rbrace` undefined first, else problems may arise with some  
packages. 1.3e suppresses under option `nosmallldelims` the definitions of `\lbrace` and `\rbrace`  
as math symbols as this bug made `\left\lbrace` cause an error, naturally.

```

927 \ifmst@nosmallldelims
928 \else
929   \let\lbrace\undefined \let\rbrace\undefined
930   \DeclareMathDelimiter{\lbrace}
931     {\mathopen}{\mst@font@tbu}{123}{largesymbols}{"08}
932   \DeclareMathDelimiter{\rbrace}
933     {\mathclose}{\mst@font@tbu}{125}{largesymbols}{"09}
934 \fi
935 \DeclareMathSymbol{\mst@varfam@lbrace}{\mathalpha}{\mst@font@tbu}{123}
936 \DeclareMathSymbol{\mst@varfam@rbrace}{\mathalpha}{\mst@font@tbu}{125}
937 \DeclareRobustCommand*\mst@lbrace
938   {\ifmmode\mathopen\mst@varfam@lbrace\else\textbraceleft\fi}
939 \DeclareRobustCommand*\mst@rbrace
940   {\ifmmode\mathclose\mst@varfam@rbrace\else\textbraceright\fi}
941 \mst@do@nonletters\expandafter{\the\mst@do@nonletters
942   \mst@dobraces{\let\{\mst@lbrace\let\}\mst@rbrace}}
943 \fi % end of \ifmst@alldelims
944 \newcommand*\MTeXplicitbracesobeymathxx{\let\mst@dobraces\@firstofone}
945 \newcommand*\MTeXplicitbracesdonotobeymathxx{\let\mst@dobraces\@gobble}
946 \MTeXplicitbracesdonotobeymathxx

```

**specials** 1.14b 2011/04/02: the redefinitions of `#`, `$`, `%` and `&` were buggy (this showed up when 10  
or more math families had been created).

1.15f 2012/10/23: the code, although working, was perhaps a bit insane and had definitions  
which could surprise other packages. For example, it did:

```
\renewcommand{\%}{\ifmmode\mt@mmode@percent\else\char37\relax\fi}
```

But it seems this provokes a problem with `microtype`. Perhaps the problem was that the com-  
mand was not declared robust? For the dollar  $\LaTeX$  itself does

```
\DeclareRobustCommand{\$}{\ifmmode\mathdollar\else\textdollar\fi}
```

So here I just modify `\mathdollar`. Then we have in `latex.ltx` the same definitions as in  
`plain.tex`: `\chardef\%=`%`, `\chardef\&=`&`, and `\chardef\#=`#`. It turns out that we can  
just adjust the mathcodes of these characters and achieve exactly what is wanted for the corre-  
sponding one char control sequences. In math mode the control sequence will use the specified  
mathcode. So here it is *not* a redefinition of the control sequences, purely an adjustment of  
mathcodes.

1.2d 2013/01/01: previous versions imposed the variable family type. I hereby make it possible  
to de-activate this feature with the macro `\MTeasynonlettersdonotobeymathxx`. Besides, I have  
absolutely no idea why I had different looking code depending on the engine  $\XeTeX$ ,  $\text{\LaTeX}$  or  
default. Removed.

1.3c 2013/12/14: I have absolutely no idea why I removed the  $\text{\LaTeX}$  and  $\text{\LaTeX}$  code  
at the time of 1.2d! the code for  $\text{\LaTeX}$  engine could not accomodate more than 16 math  
families. Code for  $\text{\LaTeX}$  and  $\text{\LaTeX}$  again added. (and since TL2013 no more problems with  
`\luatexUmathcode`.)

```

947 \ifmst@nospecials
948 \else
949   \typeout{** \string\#\space\string\mathdollar\space
950           \string\%\space\string\&\space}
951   \ifmst@XeOrLua
952     \mst@Umathcode`\#=0 \symmoperatorfont "23 \relax
953     \mst@Umathchardef\mathdollar=0 \symmoperatorfont "24 \relax
954     \mst@Umathcode`\%=0 \symmoperatorfont "25 \relax
955     \mst@Umathcode`\&=0 \symmoperatorfont "26 \relax
956     \mst@do@easynonletters\expandafter{%
957       \the\mst@do@easynonletters
958       \mst@Umathcode`\#=7 \symmoperatorfont "23 \relax
959       \mst@Umathchardef\mathdollar=7 \symmoperatorfont "24 \relax
960       \mst@Umathcode`\%=7 \symmoperatorfont "25 \relax
961       \mst@Umathcode`\&=7 \symmoperatorfont "26 \relax
962     }
963   \else
964     \count@=\symmoperatorfont
965     \multiply\count@ by \@cclvi
966     \advance\count@ by 35
967     \mathcode`\#\count@
968     \advance\count@ by \@ne
969     \mathchardef\mathdollar\count@
970     \advance\count@ by \@ne
971     \mathcode`\%\count@
972     \advance\count@ by \@ne
973     \mathcode`\&\count@
974     \count@=\symmoperatorfont
975     \multiply\count@ by \@cclvi
976     \advance\count@ by 28707 % = "7023
977     \mathchardef\mst@varfam@mathhash\count@
978     \advance\count@ by \@ne
979     \mathchardef\mst@varfam@mathdollar\count@
980     \advance\count@ by \@ne
981     \mathchardef\mst@varfam@mathpercent\count@
982     \advance\count@ by \@ne
983     \mathchardef\mst@varfam@mathampersand\count@
984     \mst@do@easynonletters\expandafter{\the\mst@do@easynonletters
985       \mathcode`\#=\mst@varfam@mathhash
986       \let\mathdollar\mst@varfam@mathdollar
987       \mathcode`\%=\mst@varfam@mathpercent
988       \mathcode`\&=\mst@varfam@mathampersand}
989   \fi
990 \fi

```

**symbolmisc** We construct (with some effort) some long arrows from the Symbol glyphs, of almost the same lengths as the standard ones. By the way, I always found the `\iff` to be too wide, but I follow here the default. Also, although there is a `\longmapsto` in standard L<sup>A</sup>T<sub>E</sub>X, if I am not mistaken, there is no `\longto`. So I define one here. I could not construct in the same manner `\Longrightarrow`



etc... as the = sign from Symbol does not combine easily with the logical arrows, well, I could have done some box manipulations, but well, life is finite.

`\prod` 1.13b: I correct the brutal re-definitions of `\prod` and `\sum` from the earlier versions of the package; most of the time the Symbol glyphs do appear to be too small in display mode. The new redefinitions do have some defects: `\displaystyle\prod_1^2` changes the position of limits but not the glyph itself, and `\textstyle\prod_1^2` change the limits but switches to the CM inline math glyph. So I tried  
`\renewcommand{\prod}{\mathchoice{\mst@prod}{\prodpsy}{\prodpsy}{\prodpsy}}`  
but this did not go well with subscripts and exponents.

Note oct 2012: maybe I should re-examine what I did? 1.3c (2013/12/14) renames `\defaultprod` to `\MToriginalprod` and `\defaultsum` to `\MToriginalsum`.

```

991 \ifmst@symbolmisc\typeout{** symbolmisc: miscellaneous math symbols from Symbol font}
992 \let\mst@prod\prod
993 \let\MToriginalprod\prod
994 \DeclareMathSymbol{\prodpsy}{\mathop}{mtpsymbol}{213}
995 \renewcommand*{\prod}{\ifinner\prodpsy\else\mst@prod\fi}
996 \let\mst@sum\sum
997 \let\MToriginalsum\sum
998 \DeclareMathSymbol{\sumpsy}{\mathop}{mtpsymbol}{229}
999 \renewcommand*{\sum}{\ifinner\sumpsy\else\mst@sum\fi}

1000 \DeclareMathSymbol{\mst@implies}{\mathrel}{mtpsymbol}{222}
1001 \DeclareRobustCommand*\implies{\;\mst@implies\;}
1002 \DeclareMathSymbol{\mst@impliedby}{\mathrel}{mtpsymbol}{220}
1003 \DeclareRobustCommand*\impliedby{\;\mst@impliedby\;}
1004 \DeclareRobustCommand*\iff{\;\mst@impliedby\mathrel{\mkern-3mu}\mst@implies\;}
1005 \DeclareMathSymbol{\mst@iff}{\mathrel}{mtpsymbol}{219}
1006 \DeclareRobustCommand*\shortiff{\;\mst@iff\;}
1007 \DeclareMathSymbol{\mst@to}{\mathrel}{mtpsymbol}{174}
1008 \DeclareMathSymbol{\mst@trait}{\mathrel}{mtpsymbol}{190}
1009 \DeclareRobustCommand*\to{\mst@to}
1010 \DeclareRobustCommand*\longto{\mkern2mu\mst@trait\mathrel{\mkern-10mu}\mst@to}
1011 \DeclareRobustCommand*\mapsto{\mapstochar\mathrel{\mkern0.2mu}\mst@to}
1012 \DeclareRobustCommand*\longmapsto{%
1013 \mapstochar\mathrel{\mkern2mu}\mst@trait\mathrel{\mkern-10mu}\mst@to}
1014 \DeclareMathSymbol{\aleph}{\mathord}{mtpsymbol}{192}
1015 \DeclareMathSymbol{\infty}{\mathord}{mtpsymbol}{165}
1016 \DeclareMathSymbol{\emptyset}{\mathord}{mtpsymbol}{198}
1017 \let\varnothing\emptyset
1018 \DeclareMathSymbol{\nabla}{\mathord}{mtpsymbol}{209}
1019 \DeclareMathSymbol{\surd}{\mathop}{mtpsymbol}{214}
1020 \let\angle\undefined
1021 \DeclareMathSymbol{\angle}{\mathord}{mtpsymbol}{208}
1022 \DeclareMathSymbol{\forall}{\mathord}{mtpsymbol}{34}
1023 \DeclareMathSymbol{\exists}{\mathord}{mtpsymbol}{36}
1024 \DeclareMathSymbol{\neg}{\mathord}{mtpsymbol}{216}
1025 \DeclareMathSymbol{\clubsuit}{\mathord}{mtpsymbol}{167}
1026 \DeclareMathSymbol{\diamondsuit}{\mathord}{mtpsymbol}{168}
1027 \DeclareMathSymbol{\heartsuit}{\mathord}{mtpsymbol}{169}

```

```

1028 \DeclareMathSymbol{\spadesuit}{\mathord}{mtpsymbol}{170}
1029 \DeclareMathSymbol{\smallint}{\mathop}{mtpsymbol}{242}
1030 \DeclareMathSymbol{\wedge}{\mathbin}{mtpsymbol}{217}
1031 \DeclareMathSymbol{\vee}{\mathbin}{mtpsymbol}{218}
1032 \DeclareMathSymbol{\cap}{\mathbin}{mtpsymbol}{199}
1033 \DeclareMathSymbol{\cup}{\mathbin}{mtpsymbol}{200}
1034 \DeclareMathSymbol{\bullet}{\mathbin}{mtpsymbol}{183}
1035 \DeclareMathSymbol{\div}{\mathbin}{mtpsymbol}{184}
1036 \DeclareMathSymbol{\otimes}{\mathbin}{mtpsymbol}{196}
1037 \DeclareMathSymbol{\oplus}{\mathbin}{mtpsymbol}{197}
1038 \DeclareMathSymbol{\pm}{\mathbin}{mtpsymbol}{177}
1039 \DeclareMathSymbol{\times}{\mathbin}{mtpsymbol}{180}
1040 \DeclareMathSymbol{\propto}{\mathrel}{mtpsymbol}{181}
1041 \DeclareMathSymbol{\mid}{\mathrel}{mtpsymbol}{124}
1042 \DeclareMathSymbol{\leq}{\mathrel}{mtpsymbol}{163}
1043 \DeclareMathSymbol{\geq}{\mathrel}{mtpsymbol}{179}
1044 \DeclareMathSymbol{\approx}{\mathrel}{mtpsymbol}{187}
1045 \DeclareMathSymbol{\supset}{\mathrel}{mtpsymbol}{201}
1046 \DeclareMathSymbol{\subset}{\mathrel}{mtpsymbol}{204}
1047 \DeclareMathSymbol{\supseteq}{\mathrel}{mtpsymbol}{202}
1048 \DeclareMathSymbol{\subseteq}{\mathrel}{mtpsymbol}{205}
1049 \DeclareMathSymbol{\in}{\mathrel}{mtpsymbol}{206}
1050 \DeclareMathSymbol{\sim}{\mathrel}{mtpsymbol}{126}
1051 \let\cong\undefined
1052 \DeclareMathSymbol{\cong}{\mathrel}{mtpsymbol}{64}
1053 \DeclareMathSymbol{\perp}{\mathrel}{mtpsymbol}{94}
1054 \DeclareMathSymbol{\equiv}{\mathrel}{mtpsymbol}{186}
1055 \let\notin\undefined
1056 \DeclareMathSymbol{\notin}{\mathrel}{mtpsymbol}{207}
1057 \DeclareMathDelimiter{\rangle}
1058   {\mathclose}{mtpsymbol}{241}{largesymbols}{"0B}
1059 \DeclareMathDelimiter{\langle}
1060   {\mathopen}{mtpsymbol}{225}{largesymbols}{"0A}
1061 \fi

```

symbolre I like the `\Re` and `\Im` from Symbol, so I overwrite the CM ones.

```

1062 \ifmst@symbolre\typeout{** symbolre: \string\Re\space and \string\Im\space from Sym-
    bol font}
1063 \DeclareMathSymbol{\Re}{\mathord}{mtpsymbol}{C2}
1064 \DeclareMathSymbol{\Im}{\mathord}{mtpsymbol}{C1}
1065 \DeclareMathSymbol{\DotTriangle}{\mathord}{mtpsymbol}{92}
1066 \fi

```

Greek letters LGRgreek > selfGreek > eulergreek > symbolgreek

1.11 I correct some bugs on how eulergreek and symbolgreek interacted.

1.12b more bug fixes.

1.13

\* Option LGRgreek.

\* Also, a behavior has been changed: it regards the selfGreek case, the default shape is now the one for letters, not for operator-names and digits. This complies to the ISO standard.

\* bugfix: version 1.12b did not define the `\omicron` in the case when no Greek-related option was passed to the package.

1.13d has new macros `\MTstandardgreek` and `\MTcustomgreek`. And in the subdued case `\MTstandardgreek` is done when switching to the normal or bold math versions (previously something like this was only done in case of `LGRgreek` option. )

```

1067 \let\mst@mathord\mathalpha
1068 \mst@goaheadtrue
1069 \ifmst@selfGreek
1070   \def\mst@font@tbu{mtselfGreekfont}
1071 \else
1072   \ifmst@eulergreek
1073     \def\mst@font@tbu{mteulervm}
1074   \else
1075     \ifmst@symbolgreek
1076       \def\mst@font@tbu{mtpsymboll}
1077       \let\mst@mathord\mathord
1078     \else
1079       \ifmst@LGRgreek
1080         \mst@goaheadfalse
1081       \else

```

The `\omicron` requires special treatment. By default we use the o from the (original) normal alphabet, if eulergreek or symbolgreek we adapt. There is also a special adjustment if the package `fourier` was loaded in its upright variant: we then take `\omicron` from the (original) rm alphabet.

```

1082       \mst@goaheadfalse
1083       \def\mst@omicron {\mst@alph@omicron{o}}
1084     \fi
1085   \fi
1086 \fi
1087 \fi
1088 \ifmst@goahead
1089   \DeclareMathSymbol{\mst@Alpha}{\mst@mathord}{\mst@font@tbu}{41}
1090   \DeclareMathSymbol{\mst@Beta}{\mst@mathord}{\mst@font@tbu}{42}
1091   \DeclareMathSymbol{\mst@Epsilon}{\mst@mathord}{\mst@font@tbu}{45}
1092   \DeclareMathSymbol{\mst@Zeta}{\mst@mathord}{\mst@font@tbu}{5A}
1093   \DeclareMathSymbol{\mst@Eta}{\mst@mathord}{\mst@font@tbu}{48}
1094   \DeclareMathSymbol{\mst@Iota}{\mst@mathord}{\mst@font@tbu}{49}
1095   \DeclareMathSymbol{\mst@Kappa}{\mst@mathord}{\mst@font@tbu}{4B}
1096   \DeclareMathSymbol{\mst@Mu}{\mst@mathord}{\mst@font@tbu}{4D}
1097   \DeclareMathSymbol{\mst@Nu}{\mst@mathord}{\mst@font@tbu}{4E}
1098   \DeclareMathSymbol{\mst@Omicron}{\mst@mathord}{\mst@font@tbu}{4F}
1099   \DeclareMathSymbol{\mst@Rho}{\mst@mathord}{\mst@font@tbu}{50}
1100   \DeclareMathSymbol{\mst@Tau}{\mst@mathord}{\mst@font@tbu}{54}
1101   \DeclareMathSymbol{\mst@Chi}{\mst@mathord}{\mst@font@tbu}{58}

```

When we in fact use `Symbol`, we have to correct `\Rho` and `\Chi`. And `\Digamma` is non-existent in fact (no F in `Symbol`, F codes a `\Phi`).

```

1102   \ifx\mst@mathord\mathord
symbolgreek but neither eulergreek nor selfGreek

```

```

1103 %% attention le P de Symbol est un \Pi pas un \Rho
1104 \DeclareMathSymbol{\mst@Rho}{\mathord}{mtpsymbol}{52}
1105 %% attention le X de Symbol est un \Xi pas un \Chi
1106 \DeclareMathSymbol{\mst@Chi}{\mathord}{mtpsymbol}{43}
1107 %% attention le F de Symbol est un \Phi. Il n'y a pas de \Digamma
1108 \DeclareMathSymbol{\mst@Gamma}{\mathord}{mtpsymbol}{47}
1109 \DeclareMathSymbol{\mst@Delta}{\mathord}{mtpsymbol}{44}
1110 \DeclareMathSymbol{\mst@Theta}{\mathord}{mtpsymbol}{51}
1111 \DeclareMathSymbol{\mst@Lambda}{\mathord}{mtpsymbol}{4C}
1112 \DeclareMathSymbol{\mst@Xi}{\mathord}{mtpsymbol}{58}
1113 \DeclareMathSymbol{\mst@Pi}{\mathord}{mtpsymbol}{50}
1114 \DeclareMathSymbol{\mst@Sigma}{\mathord}{mtpsymbol}{53}
1115 \DeclareMathSymbol{\mst@Upsilon}{\mathord}{mtpsymbol}{A1}
1116 \DeclareMathSymbol{\mst@Phi}{\mathord}{mtpsymbol}{46}
1117 \DeclareMathSymbol{\mst@Psi}{\mathord}{mtpsymbol}{59}
1118 \DeclareMathSymbol{\mst@Omega}{\mathord}{mtpsymbol}{57}
1119 \else % de \mst@mathord=\mathord

```

not symbolgreek but eulergreek or selfGreek. Note 2015/10/31 : apparemment à un moment dans le passé je considérais eulergreek et selfGreek comme pouvant être utilisés simultanément car j'avais ici "or both". Mais je laisse tomber tout effort réel de m'en préoccuper.

```

1120 \DeclareMathSymbol\mst@Digamma {\mathalpha}{\mst@font@tbu}{46}
1121 \DeclareMathSymbol\mst@Gamma {\mathalpha}{\mst@font@tbu}{00}
1122 \DeclareMathSymbol\mst@Delta {\mathalpha}{\mst@font@tbu}{01}
1123 \DeclareMathSymbol\mst@Theta {\mathalpha}{\mst@font@tbu}{02}
1124 \DeclareMathSymbol\mst@Lambda {\mathalpha}{\mst@font@tbu}{03}
1125 \DeclareMathSymbol\mst@Xi {\mathalpha}{\mst@font@tbu}{04}
1126 \DeclareMathSymbol\mst@Pi {\mathalpha}{\mst@font@tbu}{05}
1127 \DeclareMathSymbol\mst@Sigma {\mathalpha}{\mst@font@tbu}{06}
1128 \DeclareMathSymbol\mst@Upsilon {\mathalpha}{\mst@font@tbu}{07}
1129 \DeclareMathSymbol\mst@Phi {\mathalpha}{\mst@font@tbu}{08}
1130 \DeclareMathSymbol\mst@Psi {\mathalpha}{\mst@font@tbu}{09}
1131 \DeclareMathSymbol\mst@Omega {\mathalpha}{\mst@font@tbu}{0A}
1132 \fi % de \mst@mathord=\mathord
1133 \fi % fin de goahead

```

There are differences regarding Euler and Symbol with respect to the available var-letters. We include one or two things like the `wp` and the `partial`.

The lower case Greek letters in default L<sup>A</sup>T<sub>E</sub>X are of type `mathord`. If we use the Euler font it is perhaps better to have them be of type `mathalpha`

```

1134 \ifmst@goahead
1135 \ifmst@eulergreek
1136 \DeclareMathSymbol{\mst@alpha} {\mathalpha}{mteulervm}{0B}
1137 \DeclareMathSymbol{\mst@beta} {\mathalpha}{mteulervm}{0C}
1138 \DeclareMathSymbol{\mst@gamma} {\mathalpha}{mteulervm}{0D}
1139 \DeclareMathSymbol{\mst@delta} {\mathalpha}{mteulervm}{0E}
1140 \DeclareMathSymbol{\mst@epsilon} {\mathalpha}{mteulervm}{0F}
1141 \DeclareMathSymbol{\mst@zeta} {\mathalpha}{mteulervm}{10}
1142 \DeclareMathSymbol{\mst@eta} {\mathalpha}{mteulervm}{11}
1143 \DeclareMathSymbol{\mst@theta} {\mathalpha}{mteulervm}{12}

```

```

1144 \DeclareMathSymbol{\mst@iota} {\mathalpha}{mteulervm}{13}
1145 \DeclareMathSymbol{\mst@kappa} {\mathalpha}{mteulervm}{14}
1146 \DeclareMathSymbol{\mst@lambda} {\mathalpha}{mteulervm}{15}
1147 \DeclareMathSymbol{\mst@mu} {\mathalpha}{mteulervm}{16}
1148 \DeclareMathSymbol{\mst@nu} {\mathalpha}{mteulervm}{17}
1149 \DeclareMathSymbol{\mst@xi} {\mathalpha}{mteulervm}{18}
1150 \DeclareMathSymbol{\mst@omicron} {\mathalpha}{mteulervm}{6F}
1151 \DeclareMathSymbol{\mst@pi} {\mathalpha}{mteulervm}{19}
1152 \DeclareMathSymbol{\mst@rho} {\mathalpha}{mteulervm}{1A}
1153 \DeclareMathSymbol{\mst@sigma} {\mathalpha}{mteulervm}{1B}
1154 \DeclareMathSymbol{\mst@tau} {\mathalpha}{mteulervm}{1C}
1155 \DeclareMathSymbol{\mst@upsilon} {\mathalpha}{mteulervm}{1D}
1156 \DeclareMathSymbol{\mst@phi} {\mathalpha}{mteulervm}{1E}
1157 \DeclareMathSymbol{\mst@chi} {\mathalpha}{mteulervm}{1F}
1158 \DeclareMathSymbol{\mst@psi} {\mathalpha}{mteulervm}{20}
1159 \DeclareMathSymbol{\mst@omega} {\mathalpha}{mteulervm}{21}
1160 %
1161 \DeclareMathSymbol{\mst@varepsilon} {\mathalpha}{mteulervm}{22}
1162 \DeclareMathSymbol{\mst@vartheta} {\mathalpha}{mteulervm}{23}
1163 \DeclareMathSymbol{\mst@varpi} {\mathalpha}{mteulervm}{24}
1164 \let\mst@varrho=\mst@rho
1165 \let\mst@varsigma=\mst@sigma
1166 \DeclareMathSymbol{\mst@varphi} {\mathalpha}{mteulervm}{27}
1167 %
1168 \DeclareMathSymbol{\mst@partial} {\mathalpha}{mteulervm}{40}
1169 \DeclareMathSymbol{\mst@wp} {\mathalpha}{mteulervm}{7D}
1170 \DeclareMathSymbol{\mst@ell} {\mathalpha}{mteulervm}{60}
1171 \else
1172 \ifmst@symbolgreek
1173 \DeclareMathSymbol{\mst@alpha} {\mathord}{mtpsymbol}{61}
1174 \DeclareMathSymbol{\mst@beta} {\mathord}{mtpsymbol}{62}
1175 \DeclareMathSymbol{\mst@gamma} {\mathord}{mtpsymbol}{67}
1176 \DeclareMathSymbol{\mst@delta} {\mathord}{mtpsymbol}{64}
1177 \DeclareMathSymbol{\mst@epsilon} {\mathord}{mtpsymbol}{65}
1178 \DeclareMathSymbol{\mst@zeta} {\mathord}{mtpsymbol}{7A}
1179 \DeclareMathSymbol{\mst@eta} {\mathord}{mtpsymbol}{68}
1180 \DeclareMathSymbol{\mst@theta} {\mathord}{mtpsymbol}{71}
1181 \DeclareMathSymbol{\mst@iota} {\mathord}{mtpsymbol}{69}
1182 \DeclareMathSymbol{\mst@kappa} {\mathord}{mtpsymbol}{6B}
1183 \DeclareMathSymbol{\mst@lambda} {\mathord}{mtpsymbol}{6C}
1184 \DeclareMathSymbol{\mst@mu} {\mathord}{mtpsymbol}{6D}
1185 \DeclareMathSymbol{\mst@nu} {\mathord}{mtpsymbol}{6E}
1186 \DeclareMathSymbol{\mst@xi} {\mathord}{mtpsymbol}{78}
1187 \DeclareMathSymbol{\mst@omicron} {\mathord}{mtpsymbol}{6F}
1188 \DeclareMathSymbol{\mst@pi} {\mathord}{mtpsymbol}{70}
1189 \DeclareMathSymbol{\mst@rho} {\mathord}{mtpsymbol}{72}
1190 \DeclareMathSymbol{\mst@sigma} {\mathord}{mtpsymbol}{73}
1191 \DeclareMathSymbol{\mst@tau} {\mathord}{mtpsymbol}{74}
1192 \DeclareMathSymbol{\mst@upsilon} {\mathord}{mtpsymbol}{75}

```

```

1193 \DeclareMathSymbol{\mst@phi}{\mathord}{\mtpsymbol}{66}
1194 \DeclareMathSymbol{\mst@chi}{\mathord}{\mtpsymbol}{63}
1195 \DeclareMathSymbol{\mst@psi}{\mathord}{\mtpsymbol}{79}
1196 \DeclareMathSymbol{\mst@omega}{\mathord}{\mtpsymbol}{77}
1197 \let\mst@varepsilon=\mst@epsilon
1198 \DeclareMathSymbol{\mst@vartheta}{\mathord}{\mtpsymbol}{4A}
1199 \DeclareMathSymbol{\mst@varpi}{\mathord}{\mtpsymbol}{76}
1200 \let\mst@varrho=\mst@rho
1201 \DeclareMathSymbol{\mst@varsigma}{\mathord}{\mtpsymbol}{56}
1202 \DeclareMathSymbol{\mst@varphi}{\mathord}{\mtpsymbol}{6A}
1203 \DeclareMathSymbol{\mst@partial}{\mathord}{\mtpsymbol}{B6}
1204 \DeclareMathSymbol{\mst@wp}{\mathord}{\mtpsymbol}{C3}
1205 \fi
1206 \fi
1207 \fi
1208 \ifmst@LGRgreek
1209 % cf http://milde.users.sourceforge.net/LGR/lgrxenc.def.html
1210 % et greek.ldf du package babel
1211 \DeclareMathSymbol{\mst@Alpha}{\mathalpha}{\mtlgrfontupper}{65}
1212 \DeclareMathSymbol{\mst@Beta}{\mathalpha}{\mtlgrfontupper}{66}
1213 \DeclareMathSymbol{\mst@Epsilon}{\mathalpha}{\mtlgrfontupper}{69}
1214 \DeclareMathSymbol{\mst@Zeta}{\mathalpha}{\mtlgrfontupper}{90}
1215 \DeclareMathSymbol{\mst@Eta}{\mathalpha}{\mtlgrfontupper}{72}
1216 \DeclareMathSymbol{\mst@Iota}{\mathalpha}{\mtlgrfontupper}{73}
1217 \DeclareMathSymbol{\mst@Kappa}{\mathalpha}{\mtlgrfontupper}{75}
1218 \DeclareMathSymbol{\mst@Mu}{\mathalpha}{\mtlgrfontupper}{77}
1219 \DeclareMathSymbol{\mst@Nu}{\mathalpha}{\mtlgrfontupper}{78}
1220 \DeclareMathSymbol{\mst@Omicron}{\mathalpha}{\mtlgrfontupper}{79}
1221 \DeclareMathSymbol{\mst@Rho}{\mathalpha}{\mtlgrfontupper}{82}
1222 \DeclareMathSymbol{\mst@Tau}{\mathalpha}{\mtlgrfontupper}{84}
1223 \DeclareMathSymbol{\mst@Chi}{\mathalpha}{\mtlgrfontupper}{81}
1224 %
1225 \DeclareMathSymbol{\mst@Digamma}{\mathalpha}{\mtlgrfontlower}{195}
1226 %
1227 \DeclareMathSymbol{\mst@Gamma}{\mathalpha}{\mtlgrfontupper}{71}
1228 \DeclareMathSymbol{\mst@Delta}{\mathalpha}{\mtlgrfontupper}{68}
1229 \DeclareMathSymbol{\mst@Theta}{\mathalpha}{\mtlgrfontupper}{74}
1230 \DeclareMathSymbol{\mst@Lambda}{\mathalpha}{\mtlgrfontupper}{76}
1231 \DeclareMathSymbol{\mst@Xi}{\mathalpha}{\mtlgrfontupper}{88}
1232 \DeclareMathSymbol{\mst@Pi}{\mathalpha}{\mtlgrfontupper}{80}
1233 \DeclareMathSymbol{\mst@Sigma}{\mathalpha}{\mtlgrfontupper}{83}
1234 \DeclareMathSymbol{\mst@Upsilon}{\mathalpha}{\mtlgrfontupper}{85}
1235 \DeclareMathSymbol{\mst@Phi}{\mathalpha}{\mtlgrfontupper}{70}
1236 \DeclareMathSymbol{\mst@Psi}{\mathalpha}{\mtlgrfontupper}{89}
1237 \DeclareMathSymbol{\mst@Omega}{\mathalpha}{\mtlgrfontupper}{87}
1238 %
1239 \DeclareMathSymbol{\mst@alpha}{\mathalpha}{\mtlgrfontlower}{97}
1240 \DeclareMathSymbol{\mst@beta}{\mathalpha}{\mtlgrfontlower}{98}
1241 \DeclareMathSymbol{\mst@gamma}{\mathalpha}{\mtlgrfontlower}{103}

```

```

1242 \DeclareMathSymbol{\mst@delta}{\mathalpha}{mtlgrfontlower}{100}
1243 \DeclareMathSymbol{\mst@epsilon}{\mathalpha}{mtlgrfontlower}{101}
1244 \DeclareMathSymbol{\mst@zeta}{\mathalpha}{mtlgrfontlower}{122}
1245 \DeclareMathSymbol{\mst@eta}{\mathalpha}{mtlgrfontlower}{104}
1246 \DeclareMathSymbol{\mst@theta}{\mathalpha}{mtlgrfontlower}{106}
1247 \DeclareMathSymbol{\mst@iota}{\mathalpha}{mtlgrfontlower}{105}
1248 \DeclareMathSymbol{\mst@kappa}{\mathalpha}{mtlgrfontlower}{107}
1249 \DeclareMathSymbol{\mst@lambda}{\mathalpha}{mtlgrfontlower}{108}
1250 \DeclareMathSymbol{\mst@mu}{\mathalpha}{mtlgrfontlower}{109}
1251 \DeclareMathSymbol{\mst@nu}{\mathalpha}{mtlgrfontlower}{110}
1252 \DeclareMathSymbol{\mst@xi}{\mathalpha}{mtlgrfontlower}{120}
1253 \DeclareMathSymbol{\mst@omicron}{\mathalpha}{mtlgrfontlower}{111}
1254 \DeclareMathSymbol{\mst@pi}{\mathalpha}{mtlgrfontlower}{112}
1255 \DeclareMathSymbol{\mst@rho}{\mathalpha}{mtlgrfontlower}{114}
1256 \DeclareMathSymbol{\mst@sigma}{\mathalpha}{mtlgrfontlower}{115}
1257 \DeclareMathSymbol{\mst@tau}{\mathalpha}{mtlgrfontlower}{116}
1258 \DeclareMathSymbol{\mst@upsilon}{\mathalpha}{mtlgrfontlower}{117}
1259 \DeclareMathSymbol{\mst@phi}{\mathalpha}{mtlgrfontlower}{102}
1260 \DeclareMathSymbol{\mst@chi}{\mathalpha}{mtlgrfontlower}{113}
1261 \DeclareMathSymbol{\mst@psi}{\mathalpha}{mtlgrfontlower}{121}
1262 \DeclareMathSymbol{\mst@omega}{\mathalpha}{mtlgrfontlower}{119}
1263 %
1264 \DeclareMathSymbol{\mst@digamma}{\mathalpha}{mtlgrfontlower}{147}
1265 % only varsigma defined (I should check this again)
1266 \DeclareMathSymbol{\mst@varsigma}{\mathalpha}{mtlgrfontlower}{99}
1267 \fi

```

`\MTstandardgreek` 1.3d 2014/05/23 defines the commands `\MTstandardgreek` and `\MTcustomgreek` for package  
`\MTcustomgreek` and user. I leave `\MTrecordstandardgreek` undocumented as I don't want to encourage people  
`recordstandardgreek` to load math packages after **mathastext**.

1.3h 2015/10/31: corrected `\MTcustomgreek` as it caused `\ell` to become undefined under  
option `symbolgreek` and, much more catastrophic, caused `\alpha`, etc.. to become undefined  
under option `selfGreek` !

```

1268 \newcommand*{\MTstandardgreek}{}
1269 \newcommand*{\MTcustomgreek}{}
1270 \newcommand*{\MTrecordstandardgreek}{}
1271 \ifmst@customgreek
1272 \renewcommand*{\MTrecordstandardgreek}{%
1273   \let\mst@origAlpha\Alpha
1274   \let\mst@origBeta\Beta
1275   \let\mst@origGamma\Gamma
1276   \let\mst@origDelta\Delta
1277   \let\mst@origEpsilon\Epsilon
1278   \let\mst@origZeta\Zeta
1279   \let\mst@origEta\Eta
1280   \let\mst@origTheta\Theta
1281   \let\mst@origIota\Iota
1282   \let\mst@origKappa\Kappa
1283   \let\mst@origLambda\Lambda

```

1284 \let\mst@origMu\Mu  
1285 \let\mst@origNu\Nu  
1286 \let\mst@origXi\Xi  
1287 \let\mst@origOmicron\Omicron  
1288 \let\mst@origPi\Pi  
1289 \let\mst@origRho\Rho  
1290 \let\mst@origSigma\Sigma  
1291 \let\mst@origTau\Tau  
1292 \let\mst@origUpsilon\Upsilon  
1293 \let\mst@origPhi\Phi  
1294 \let\mst@origChi\Chi  
1295 \let\mst@origPsi\Psi  
1296 \let\mst@origOmega\Omega  
1297 %  
1298 \let\mst@origalpha\alpha  
1299 \let\mst@origbeta\beta  
1300 \let\mst@origgamma\gamma  
1301 \let\mst@origdelta\delta  
1302 \let\mst@origepsilon\epsilon  
1303 \let\mst@origvarepsilon\varepsilon  
1304 \let\mst@origzeta\zeta  
1305 \let\mst@origeta\eta  
1306 \let\mst@origtheta\theta  
1307 \let\mst@origvartheta\vartheta  
1308 \let\mst@origiota\iota  
1309 \let\mst@origkappa\kappa  
1310 \let\mst@origlambda\lambda  
1311 \let\mst@origmu\mu  
1312 \let\mst@orignu\nu  
1313 \let\mst@origxi\xi  
1314 \let\mst@origomicron\omicron  
1315 \let\mst@origpi\pi  
1316 \let\mst@origvarpi\varpi  
1317 \let\mst@origrho\rho  
1318 \let\mst@origvarrho\varrho  
1319 \let\mst@origsigma\sigma  
1320 \let\mst@origvarsigma\varsigma  
1321 \let\mst@origtau\tau  
1322 \let\mst@origupsilon\upsilon  
1323 \let\mst@origphi\phi  
1324 \let\mst@origvarphi\varphi  
1325 \let\mst@origchi\chi  
1326 \let\mst@origpsi\psi  
1327 \let\mst@origomega\omega  
1328 \let\mst@origDigamma\Digamma  
1329 \let\mst@origdigamma\digamma  
1330 %  
1331 \let\mst@origpartial\partial  
1332 \let\mst@origwp\wp



```

1333 \let\mst@origell\ell }% \MTrecordstandardgreek
1334 \MTrecordstandardgreek
1335 \renewcommand*{\MTstandardgreek}{%
1336 \let\Alpha\mst@origAlpha
1337 \let\Beta\mst@origBeta
1338 \let\Gamma\mst@origGamma
1339 \let\Delta\mst@origDelta
1340 \let\Epsilon\mst@origEpsilon
1341 \let\Zeta\mst@origZeta
1342 \let\Eta\mst@origEta
1343 \let\Theta\mst@origTheta
1344 \let\Iota\mst@origIota
1345 \let\Kappa\mst@origKappa
1346 \let\Lambda\mst@origLambda
1347 \let\Mu\mst@origMu
1348 \let\Nu\mst@origNu
1349 \let\Xi\mst@origXi
1350 \let\Omicron\mst@origOmicron
1351 \let\Pi\mst@origPi
1352 \let\Rho\mst@origRho
1353 \let\Sigma\mst@origSigma
1354 \let\Tau\mst@origTau
1355 \let\Upsilon\mst@origUpsilon
1356 \let\Phi\mst@origPhi
1357 \let\Chi\mst@origChi
1358 \let\Psi\mst@origPsi
1359 \let\Omega\mst@origOmega
1360 %
1361 \let\alpha\mst@origalpha
1362 \let\beta\mst@origbeta
1363 \let\gamma\mst@origgamma
1364 \let\delta\mst@origdelta
1365 \let\epsilon\mst@origepsilon
1366 \let\varepsilon\mst@origvarepsilon
1367 \let\zeta\mst@origzeta
1368 \let\eta\mst@origeta
1369 \let\theta\mst@origtheta
1370 \let\vartheta\mst@origvartheta
1371 \let\iota\mst@origiota
1372 \let\kappa\mst@origkappa
1373 \let\lambda\mst@origlambda
1374 \let\mu\mst@origmu
1375 \let\nu\mst@orignu
1376 \let\xi\mst@origxi
1377 \let\omicron\mst@origomicron
1378 \let\pi\mst@origpi
1379 \let\varpi\mst@origvarpi
1380 \let\rho\mst@origrho
1381 \let\varrho\mst@origvarrho

```

```

1382 \let\sigma\mst@origsigma
1383 \let\varsigma\mst@origvarsigma
1384 \let\tau\mst@origtau
1385 \let\upsilon\mst@origupsilon
1386 \let\phi\mst@origphi
1387 \let\varphi\mst@origvarphi
1388 \let\chi\mst@origchi
1389 \let\psi\mst@origpsi
1390 \let\omega\mst@origomega
1391 \let\Digamma\mst@origDigamma
1392 \let\digamma\mst@origdigamma
1393 %
1394 \let\partial\mst@origpartial
1395 \let\wp\mst@origwp
1396 \let\ell\mst@origell
1397 }% \MTstandardgreek
1398 \renewcommand*{\MTcustomgreek}{%
1399 \let\Alpha\mst@Alpha
1400 \let\Beta\mst@Beta
1401 \let\Epsilon\mst@Epsilon
1402 \let\Zeta\mst@Zeta
1403 \let\Eta\mst@Eta
1404 \let\Iota\mst@Iota
1405 \let\Kappa\mst@Kappa
1406 \let\Mu\mst@Mu
1407 \let\Nu\mst@Nu
1408 \let\Omicron\mst@Omicron
1409 \let\Rho\mst@Rho
1410 \let\Tau\mst@Tau
1411 \let\Chi\mst@Chi
1412 % 1.3h: \mst@Digamma not defined if symbolgreek option
1413 \ifmst@symbolgreek\else\let\Digamma\mst@Digamma\fi
1414 %
1415 \let\Gamma\mst@Gamma
1416 \let\Delta\mst@Delta
1417 \let\Theta\mst@Theta
1418 \let\Lambda\mst@Lambda
1419 \let\Xi\mst@Xi
1420 \let\Pi\mst@Pi
1421 \let\Sigma\mst@Sigma
1422 \let\Upsilon\mst@Upsilon
1423 \let\Phi\mst@Phi
1424 \let\Psi\mst@Psi
1425 \let\Omega\mst@Omega

1.3h 2015/10/31 adds this conditional to correct the bad bug in 1.3d 2014/05/23 which caused
\alpha etc... to become undefined under option selfGreek.
1426 \ifmst@selfGreek\else
1427 \let\alpha\mst@alpha
1428 \let\beta\mst@beta

```

```

1429 \let\gamma\mst@gamma
1430 \let\delta\mst@delta
1431 \let\epsilon\mst@epsilon
1432 \let\zeta\mst@zeta
1433 \let\eta\mst@eta
1434 \let\theta\mst@theta
1435 \let\iota\mst@iota
1436 \let\kappa\mst@kappa
1437 \let\lambda\mst@lambda
1438 \let\mu\mst@mu
1439 \let\nu\mst@nu
1440 \let\xi\mst@xi
1441 \let\omicron\mst@omicron
1442 \let\pi\mst@pi
1443 \let\rho\mst@rho
1444 \let\sigma\mst@sigma
1445 \let\tau\mst@tau
1446 \let\upsilon\mst@upsilon
1447 \let\phi\mst@phi
1448 \let\chi\mst@chi
1449 \let\psi\mst@psi
1450 \let\omega\mst@omega
1451 % 1.3h: digamma only defined with option LGRgreek:
1452 \ifmst@LGRgreek\let\digamma\mst@digamma\fi
1453 %
1454 \let\varsigma\mst@varsigma
1455 % conditional added 1.3h 2015/10/31
1456 \ifmst@LGRgreek\else
1457 \let\varepsilon\mst@varepsilon
1458 \let\vartheta\mst@vartheta
1459 \let\varpi\mst@varpi
1460 \let\varrho\mst@varrho
1461 \let\varphi\mst@varphi
1462 %
1463 \let\partial\mst@partial
1464 \let\wp\mst@wp
1465 % 1.3h: no \mst@ell if symbolgreek (bugfix 1.3h 2015/10/31)
1466 \ifmst@symbolgreek\else\let\ell\mst@ell\fi
1467 \fi
1468 \fi
1469 }% \MTcustomgreek
1470 \fi
1471 \let\Mathastextstandardgreek\MTstandardgreek
1472 \let\Mathastextcustomgreek\MTcustomgreek
1473 \ifmst@subdued\else\MTcustomgreek\fi

```

\inodot In 1.0, I had them of type mathord, here I choose mathalpha. If I used \i and \j from the text font the problem would be with the fontsize, if in scriptstyle. The amsmath \text would do the trick.

1.14b 2011/04/02: again this bug in the EU1/EU2 encoding part, as in the code redefining \$ etc in math mode (see above). Fixed.

1.3l 2016/01/29: anticipating TL2016 fontspec's switch to TU.

1.3t 2018/08/22 removes the definitions done of \i and \j since 1.12 (as robust commands usable both in text and math mode).

1.3u lets the \imath and \jmath react to the font encoding at each math version.

```

1474 \def\mst@subdued\inodot{%
1475   \let\inodot\mst@original\imath
1476   \let\jnodot\mst@original\jmath
1477 }%
1478 \def\mst@nonsubdued\inodot{%
1479   \expandafter\let\expandafter\inodot
1480     \csname mst@inodot@mv\math@version\endcsname
1481   \expandafter\let\expandafter\jnodot
1482     \csname mst@jnodot@mv\math@version\endcsname
1483 }%
1484 \def\mst@dothe@inodotstuff#1#2#3{%
1485   \edef\mst@tmp@enc{#3}%
1486   \if1\mst@OneifUniEnc
1487     % Unicode engine and font
1488     \mst@Umathchardef#1="7 \symmtletterfont "0131 \relax
1489     \mst@Umathchardef#2="7 \symmtletterfont "0237 \relax
1490   \else
1491     \DeclareMathSymbol{#1}{\mathalpha}{\mtletterfont}
1492       {\csname\mst@tmp@enc\string\i\endcsname}
1493     \DeclareMathSymbol{#2}{\mathalpha}{\mtletterfont}
1494       {\csname\mst@tmp@enc\string\j\endcsname}
1495   \fi}% \mst@dothe@inodotstuff
1496 \ifmst@default\math\else\typeout{** \string\imath\space and \string\jmath\space}
1497   \AtEndOfPackage{\AtBeginDocument{%
1498     \renewcommand*{\imath}{\inodot}%
1499     \renewcommand*{\jmath}{\jnodot}%
1500   }}%
1501 \fi

```

**math accents** *Obsolete comments relative to the 2011 code:*

I don't know how to get from the encoding to the slot positions of the accents (apart from going to look at all possible encodings definition files and putting this info here). In standard L<sup>A</sup>T<sub>E</sub>X, the math accents are taken from the 'operators' font. So we do the same here. Of course there is the problem that the user can define math versions with different encodings. Here I take T1 if it was the default at the time of loading the package, else OT1. 1.12b: I add LY1 which is quasi like OT1.

At 1.3u 2019/08/20 I decide to remove the hard-coded slot positions for OT1, T1 and LY1, and replace them with some hack which assumes LaTeX2e way of handling text accents got executed by the encoding definition file. If not, some breakage on package loading could occur, but this whole thing is conditional on the **mathaccents** option anyway, which per default is not executed.

The `\vec` accent is not considered here because it has no suitable available glyph in a standard 8bits text font encodings.

Also at 1.3u the math accents adapt to the font encoding at each math version.

```

1502 \let\mst@subduedmathaccents\@empty
1503 \let\mst@nonsubduedmathaccents\@empty
1504 \ifmst@mathaccents
1505 \def\mst@subduedmathaccents{%
1506   \@tfor\@tempa:={grave}{acute}{check}{breve}{bar}%
1507                 {dot}{ddot}{mathring}{hat}{tilde}%
1508   \do
1509   {\expandafter\let\csname\@tempa\expandafter\endcsname
1510     \csname mst@original@\@tempa\endcsname}%
1511 }%
1512 \def\mst@nonsubduedmathaccents{%
1513   \@tfor\@tempa:={grave}{acute}{check}{breve}{bar}%
1514                 {dot}{ddot}{mathring}{hat}{tilde}%
1515   \do
1516   {\expandafter\let\csname\@tempa\expandafter\endcsname
1517     \csname mst@\@tempa @mv\math@version\endcsname}%
1518 }%
1519 \def\mst@dothe@mathaccentsstuff#1#2{%
1520   \begingroup
1521   \edef\mst@tmp@enc{#2}%
1522   \def\@text@composite##1\@text@composite##2{##2}%
1523   \let\add@accent\@firstoftwo
1524   \let\add@unicode@accent\@firstoftwo
1525   \if1\mst@OneifUniEnc
1526     \ifmst@unimathaccents
1527       % \` -> \grave
1528       \expandafter\xdef\csname mst@grave@mv#1\endcsname
1529         {\mst@Umathaccent
1530           7
1531           \number\symmtooperatorfont\space
1532           \csname#2\string`\endcsname{}\relax}%
1533       % \' -> \acute
1534       \expandafter\xdef\csname mst@acute@mv#1\endcsname
1535         {\mst@Umathaccent
1536           7
1537           \number\symmtooperatorfont\space
1538           \csname#2\string'\endcsname{}\relax}%
1539       % \v -> \check
1540       \expandafter\xdef\csname mst@check@mv#1\endcsname
1541         {\mst@Umathaccent
1542           7
1543           \number\symmtooperatorfont\space
1544           \csname#2\string\v\endcsname{}\relax}%
1545       % \u -> \breve
1546       \expandafter\xdef\csname mst@breve@mv#1\endcsname
1547         {\mst@Umathaccent

```

```

1548      7
1549      \number\symmoperatorfont\space
1550      \csname#2\string\u\endcsname{}\relax}%
1551 % \= -> \bar
1552 \expandafter\xdef\csname mst@bar@mv#1\endcsname
1553 {\mst@Umathaccent
1554      7
1555      \number\symmoperatorfont\space
1556      \csname#2\string=\endcsname{}\relax}%
1557 % \. -> \dot
1558 \expandafter\xdef\csname mst@dot@mv#1\endcsname
1559 {\mst@Umathaccent
1560      7
1561      \number\symmoperatorfont\space
1562      \csname#2\string\.\endcsname{}\relax}%
1563 % \" -> \ddot
1564 \expandafter\xdef\csname mst@ddot@mv#1\endcsname
1565 {\mst@Umathaccent
1566      7
1567      \number\symmoperatorfont\space
1568      \csname#2\string\"\endcsname{}\relax}%
1569 % \r -> \mathring
1570 \expandafter\xdef\csname mst@mathring@mv#1\endcsname
1571 {\mst@Umathaccent
1572      7
1573      \number\symmoperatorfont\space
1574      \csname#2\string\r\endcsname{}\relax}%
1575 % \^ -> \hat
1576 \expandafter\xdef\csname mst@hat@mv#1\endcsname
1577 {\mst@Umathaccent
1578      7
1579      \number\symmoperatorfont\space
1580      \csname#2\string\^\endcsname{}\relax}%
1581 % \~ -> \tilde
1582 \expandafter\xdef\csname mst@tilde@mv#1\endcsname
1583 {\mst@Umathaccent
1584      7
1585      \number\symmoperatorfont\space
1586      \csname#2\string\~\endcsname{}\relax}%
1587 \else
1588   \@tfor\@tempa:={grave}{acute}{check}{breve}{bar}%
1589                 {dot}{ddot}{mathring}{hat}{tilde}%
1590   \do
1591     {\expandafter\gdef\csname mst@\@tempa @mv#1\expandafter\endcsname
1592      \expandafter{\csname mst@original@\@tempa\endcsname}}%
1593   \fi
1594 \else
1595   % \` -> \grave
1596   \expandafter\DeclareMathAccent\expandafter

```

```

1597         {\csname mst@grave@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1598         {\csname#2\string`\endcsname{}}
1599 % \' -> \acute
1600 \expandafter\DeclareMathAccent\expandafter
1601         {\csname mst@acute@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1602         {\csname#2\string'\endcsname{}}
1603 % \v -> \check
1604 \expandafter\DeclareMathAccent\expandafter
1605         {\csname mst@check@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1606         {\csname#2\string\v\endcsname{}}
1607 % \u -> \breve
1608 \expandafter\DeclareMathAccent\expandafter
1609         {\csname mst@breve@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1610         {\csname#2\string\u\endcsname{}}
1611 % \= -> \bar
1612 \expandafter\DeclareMathAccent\expandafter
1613         {\csname mst@bar@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1614         {\csname#2\string=\endcsname{}}
1615 % \. -> \dot
1616 \expandafter\DeclareMathAccent\expandafter
1617         {\csname mst@dot@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1618         {\csname#2\string.\endcsname{}}
1619 % \" -> \ddot
1620 \expandafter\DeclareMathAccent\expandafter
1621         {\csname mst@ddot@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1622         {\csname#2\string"\endcsname{}}
1623 % \r -> \mathring
1624 \expandafter\DeclareMathAccent\expandafter
1625         {\csname mst@mathring@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1626         {\csname#2\string\r\endcsname{}}
1627 % \^ -> \hat
1628 \expandafter\DeclareMathAccent\expandafter
1629         {\csname mst@hat@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1630         {\csname#2\string\^{\endcsname{}}
1631 % \~ -> \tilde
1632 \expandafter\DeclareMathAccent\expandafter
1633         {\csname mst@tilde@mv#1\endcsname}{\mathalpha}{\moperatorfont}%
1634         {\csname#2\string\~{\endcsname{}}
1635 \fi
1636 \endgroup
1637 }%
1638 \fi % \ifmst@mathaccents

```

**\MTDeclareVersion** The `\MTDeclareVersion` command is to be used in the preamble to declare a math version. A more complicated variant would also specify a choice of series for the Euler and Symbol font: anyhow Symbol only has the medium series, and Euler has medium and bold, so what is lacking is the possibility to create a version with a bold Euler. There is already one such version: the default bold one. And there is always the possibility to add to the preamble `\SetSymbolFont{mteulervm}{versionname}{U}{zeur}{bx}{n}` if one wants to have a math

version with bold Euler characters.

For version 1.1 we add an optional parameter specifying the shape to be used for letters.

Note: (2012/10/24) I really should check whether the user attempts to redefine the ‘normal’ and ‘bold’ versions and issue a warning in that case!

1.3c (2013/12/14) adds an extra optional parameter after all previous ones, to inherit the settings from another version. Typically to be used with [bold]. I take this opportunity to sanitize a bit some line endings to avoid generating (in the preamble, document macros were already careful of course) too many space tokens, at least inside macros. And I modify (correct? perhaps it was on purpose) the strange way I used \@onlypreamble in earlier version.

1.3u adds storage of macros holding the needed meanings for \imath, \hbar, math accents, and the minus symbol, version wise.

```

1639 \newcommand*{\MTDeclareVersion}[6][]{%
1640   \edef\mst@declareversionargs{{#1}{#2}{#3}{#4}{#5}{#6}}%
1641   \edef\mst@version{#2}%
1642   \DeclareMathVersion{\mst@version}%
1643   \MTDeclareVersion@
1644 }% \MTDeclareVersion
1645 \newcommand*{\MTDeclareVersion@[1][]{%
1646   \edef\mst@tmp{#1}%
1647   \ifx\mst@tmp\empty\else
1648     \global\expandafter\let\csname mv@\mst@version\expandafter\endcsname
1649       \csname mv@#1\endcsname
1650     \typeout{** Math version '\mst@version\string' inherits from '#1\string'.}%
1651   \fi
1652   \expandafter\MTDeclareVersion@@\mst@declareversionargs
1653 }% \MTDeclareVersion@
1654 \newcommand*{\MTDeclareVersion@@[6]{%
1655   \expandafter\edef\csname mst@encoding@\mst@version\endcsname{#3}%
1656   \expandafter\edef\csname mst@family@\mst@version\endcsname{#4}%
1657   \expandafter\edef\csname mst@series@\mst@version\endcsname{#5}%
1658   \expandafter\edef\csname mst@shape@\mst@version\endcsname{#6}%
1659   \expandafter\edef\csname mst@boldvariant@\mst@version\endcsname{\mst@bold}%
1660   \expandafter\edef\csname mst@itdefault@\mst@version\endcsname{\itdefault}%
1661   \expandafter\edef\csname mst@rmdefault@\mst@version\endcsname{\rmdefault}%
1662   \expandafter\edef\csname mst@sfdefault@\mst@version\endcsname{\sfdefault}%
1663   \expandafter\edef\csname mst@ttdefault@\mst@version\endcsname{\ttdefault}%
1664   \expandafter\edef\csname mst@exists@skip@\mst@version\endcsname
1665     {\mst@exists@skip}%
1666   \expandafter\edef\csname mst@forall@skip@\mst@version\endcsname
1667     {\mst@forall@skip}%
1668   \expandafter\edef\csname mst@prime@skip@\mst@version\endcsname
1669     {\mst@prime@skip}%
1670   \def\mst@tmp{#1}%
1671   \ifx\mst@tmp\empty
1672     \ifmst@italic
1673       \SetSymbolFont{mtletterfont}{#2}{#3}{#4}{#5}{\mst@ltsh}%
1674       \typeout{** Latin letters in math version '#2\string' will use the font
1675         #3/#4/#5/\mst@ltsh^^J}
1676       ** Other characters (digits, ...) and \protect\log-like names

```



```

1677         will be in #6 shape.}%
1678     \expandafter\edef\csname mst@ltshape@\mst@version\endcsname{\mst@ltsh}%
1679 \else
1680     \SetSymbolFont{mtletterfont}{#2}{#3}{#4}{#5}{#6}%
1681     \typeout{** Latin letters in math version `#2\string' will use the fonts
1682         #3/#4/#5(\mst@bold)/#6}%
1683     \expandafter\edef\csname mst@ltshape@\mst@version\endcsname{#6}%
1684 \fi
1685 \else
1686     \SetSymbolFont{mtletterfont}{#2}{#3}{#4}{#5}{#1}%
1687     \typeout{** Latin letters in math version `#2\string' will use the font
1688         #3/#4/#5/#1^^J%
1689         ** Other characters (digits, ...) and \protect\log-like
1690         names will be in #6 shape.}%
1691     \expandafter\edef\csname mst@ltshape@\mst@version\endcsname{#1}%
1692 \fi
1693 \ifmst@nonormalbold\else
1694     \SetMathAlphabet{\mathnormalbold}{#2}{#3}{#4}{\mst@bold}%
1695     {\csname mst@ltshape@\mst@version\endcsname}%
1696 \fi
1697 \SetSymbolFont{mtooperatorfont}{#2}{#3}{#4}{#5}{#6}%
1698 \ifmst@defaultbf\else\SetMathAlphabet{\Mathbf}{#2}{#3}{#4}{\mst@bold}{#6}\fi
1699 \ifmst@defaultit\else\SetMathAlphabet{\Mathit}{#2}{#3}{#4}{#5}{\itdefault}\fi
1700 \ifmst@defaultsf\else\SetMathAlphabet{\Mathsf}{#2}{#3}{\sfdefault}{#5}{#6}\fi
1701 \ifmst@defaultttt\else\SetMathAlphabet{\Mathtt}{#2}{#3}{\ttdefault}{#5}{#6}\fi
1702 \ifmst@needeuler
1703     \SetMathAlphabet{\MathEulerBold}{#2}{U}{zeur}{\mst@bold}{n}%
1704 \fi

```

**LGRgreeks** In the case of option LGRgreeks (selfGreeks), it is expected that the fonts used in each math  
**selfGreeks** versions exist in LGR (OT1) encoding. We first recalculate the shapes to be used for lowercase  
and uppercase Greek letters depending on the frenchmath and [it/up][g/G]reek options as well  
as on the (local to this version) shapes for letters and digits.

```

1705 \def\mst@greek@lsh@loc{\csname mst@ltshape@\mst@version\endcsname}%
1706 \def\mst@greek@ush@loc{\csname mst@shape@\mst@version\endcsname}%
1707 \ifmst@itgreek\def\mst@greek@lsh@loc{\itdefault}%
1708 \def\mst@greek@ush@loc{\itdefault}%
1709 \fi
1710 \ifmst@upgreek\def\mst@greek@lsh@loc{\updefault}%
1711 \def\mst@greek@ush@loc{\updefault}%
1712 \fi
1713 \ifmst@frenchmath
1714     \ifmst@itgreek\else
1715     \ifmst@upgreek\else
1716         \def\mst@greek@lsh@loc{\csname mst@shape@\mst@version\endcsname}%
1717         \def\mst@greek@ush@loc{\csname mst@shape@\mst@version\endcsname}%
1718     \fi\fi
1719 \fi
1720 \ifcase\mst@greek@select

```

```

1721         \or\def\mst@greek@ush@loc{\itdefault}%
1722         \or\def\mst@greek@ush@loc{\updefault}%
1723     \fi
1724     \ifmst@LGRgreeks
1725         \SetSymbolFont{mtlgrfontlower}{#2}{LGR}{#4}{#5}{\mst@greek@lsh@loc}%
1726         \SetSymbolFont{mtlgrfontupper}{#2}{LGR}{#4}{#5}{\mst@greek@ush@loc}%
1727         \typeout{** Greek letters (\mst@greek@lsh@loc/\mst@greek@ush@loc) will use
1728             LGR font #4\ifmst@subdued ^^J** (in non subdued versions)\fi}%
1729     \else
1730         \ifmst@selfGreeks
1731             \SetSymbolFont{mtselfGreefont}{#2}{OT1}{#4}{#5}{\mst@greek@ush@loc}%
1732             \typeout{** Capital Greek letters (\mst@greek@lsh@loc/\mst@greek@ush@loc)
1733                 will use OT1 font #4\ifmst@subdued ^^J** (in non subdued ver-
sions)\fi}%
1734         \else
1735             \ifmst@LGRgreek
1736                 \SetSymbolFont{mtlgrfontlower}{#2}{LGR}{\mst@greekfont}{#5}{\mst@greek@lsh@loc}%
1737                 \SetSymbolFont{mtlgrfontupper}{#2}{LGR}{\mst@greekfont}{#5}{\mst@greek@ush@loc}%
1738                 \typeout{** Greek letters (\mst@greek@lsh@loc/\mst@greek@ush@loc) will use
1739                     LGR font \mst@greekfont\ifmst@subdued ^^J** (in non subdued ver-
sions)\fi}%
1740             \else
1741                 \ifmst@selfGreek
1742                     \SetSymbolFont{mtselfGreefont}{#2}{OT1}{\mst@greekfont}{#5}{\mst@greek@ush@loc}%
1743                     \typeout{** Capital Greek letters (\mst@greek@lsh@loc/\mst@greek@ush@loc)
1744                         will use OT1 font \mst@greekfont\ifmst@subdued ^^J** (in non sub-
dued versions)\fi}%
1745             \fi
1746         \fi
1747     \fi
1748 \fi
1749 \edef\mst@tmp{\expandafter\noexpand\csname mst@hbar@mv#2\endcsname
1750     \expandafter\noexpand\csname mst@ltbar@mv#2\endcsname}%
1751 \expandafter\mst@dothe@hbarstuff\mst@tmp{#3}%
1752 \edef\mst@tmp{\expandafter\noexpand\csname mst@inodot@mv#2\endcsname
1753     \expandafter\noexpand\csname mst@jnodot@mv#2\endcsname}%
1754 \expandafter\mst@dothe@inodotstuff\mst@tmp{#3}%
1755 \ifmst@mathaccents
1756     \mst@dothe@mathaccentsstuff{#2}{#3}%
1757 \fi
1758 \edef\mst@tmp{\expandafter\noexpand\csname mst@minus@mv#2\endcsname
1759     \expandafter\noexpand\csname mst@varfam@minus@mv#2\endcsname}%
1760 \ifmst@endash
1761     \expandafter\mst@dothe@endashstuff\mst@tmp{#3}%
1762 \else
1763     \ifmst@emdash
1764         \expandafter\mst@dothe@emdashstuff\mst@tmp{#3}%
1765     \else
1766         \expandafter\mst@dothe@hyphenstuff\mst@tmp

```

```

1767 \fi
1768 \fi
1769 }% \MTDeclareVersion@@
1770 \let\MathastextDeclareVersion\MTDeclareVersion

```

`\MTversion` This is a wrapper around L<sup>A</sup>T<sub>E</sub>X's `\mathversion`: here we have an optional argument allowing a quick and easy change of the text fonts additionally to the math fonts. Present already in the `\MTversion@s` initial version of the package (January 2011.)

`\MTversion@@` 1.15: some modifications for the subdued option vs LGRgreek and for the math muskips after `\exists` and `\forall`.

1.2: with the subdued option sets the math alphabets in the normal and bold math versions do not apply to operator names and non-alphabetical symbols. The switch for braces is left as it is.

1.2b: with the subdued option, the italic corrections are not added. Else, we check the shape of letters in this version. Also, there was a bug since 1.15: the values of the math skips were taken not from the settings for the math version (#2) but from those of the optional argument (#1), if present...

1.3: activation of italic corrections is now separated from actual math activation of letters.

1.3c: a starred variant is added which does not modify the text fonts, only the math set-up.

1.3d: replaced in `\MTversion@` things like `\edef\mst@encoding{...}` and `\renewcommand{\encodingdefault}{...}` by `\edef\encodingdefault{...}` etc... All those `\mst@@...` things were useless. I also redefine `\seriesdefault` rather than `\mddefault`.

1.3d: mechanism of restoration of Greek in subdued normal and bold versions has been to all cases, and not only for the LGRgreek option.

1.3u: version savvy (i.e. font-encoding savvy) minus sign, `\hbar`, `\imath`, math accents.

```

1771 \newcommand*\MTversion {\@ifstar\MTversion@s\MTversion@ }
1772 \newcommand*\MTversion@s [1]{\mathversion{#1}\MTversion@@ }
1773 \newcommand*\MTversion@ [2] [] {%
1774   \mathversion{#2}% defines \math@version as expanded #2
1775   \edef\mst@tmpa{#1}%
1776   \ifx\mst@tmpa\empty
1777     \let\mst@tmp\math@version
1778   \else
1779     \let\mst@tmp\mst@tmpa
1780   \fi
1781   \edef\encodingdefault {\csname mst@encoding@\mst@tmp\endcsname}%
1782   \edef\familydefault   {\csname mst@family@\mst@tmp\endcsname}%
1783   \edef\seriesdefault   {\csname mst@series@\mst@tmp\endcsname}%
1784   \edef\shapedefault     {\csname mst@shape@\mst@tmp\endcsname}%
1785   \edef\bfdefault       {\csname mst@boldvariant@\mst@tmp\endcsname}%
1786   \edef\itdefault       {\csname mst@itdefault@\mst@tmp\endcsname}%
1787   \edef\rmdefault       {\csname mst@rmdefault@\mst@tmp\endcsname}%
1788   \edef\sfdefault       {\csname mst@sfdefault@\mst@tmp\endcsname}%
1789   \edef\ttdefault       {\csname mst@ttdefault@\mst@tmp\endcsname}%
1790   \usefont{\encodingdefault}{\familydefault}{\seriesdefault}{\shapedefault}%
1791   \MTversion@@
1792 }% \MTversion@

```

1.3j has a stronger subdued which does `\MTnormalprime`, `\MTnormalexists`, `\MTnormalforall` rather than setting the skips to 0mu. Hence `\MTversion` by default should do `\MTprimedoesskip`,

`\MTexistsdoesskip, \MTforalldoesskip.`

1.3u drops the argument, as the info is in `\math@version` from L<sup>A</sup>T<sub>E</sub>X2e code.

```

1793 \newcommand*\MTversion@@ {%
1794     \MTexistsdoesskip
1795     \MTforalldoesskip
1796     \MTprimedoesskip

```

v1.15e: muskips.

```

1797     \mst@exists@muskip\csname mst@exists@skip@\math@version\endcsname\relax
1798     \mst@forall@muskip\csname mst@forall@skip@\math@version\endcsname\relax

```

v1.2: muskip for `\prime`.

```

1799     \mst@prime@muskip\csname mst@prime@skip@\math@version\endcsname\relax

```

v1.2b: italic corrections except for italic/slanted (sic) letters, and of course except in the subdued normal and bold math versions.

v1.3: by default, letters are made mathematically active, even if italic corrections are not used, to allow the action of `\MTsetmathskips`.

```

1800     \edef\mst@tmpa{\csname mst@ltshape@\math@version\endcsname}%
1801     \edef\mst@tmpb{\csname mst@shape@\math@version\endcsname}%

```

v1.15c: extending subdued to LGRgreek.

v1.15f: subdueing math alphabets in a simpler way than in 1.15e.

v1.2b: subdueing the activation of characters in math mode.

v1.2d: special treatment of the asterisk.

v1.3d: extended LGRgreek mechanism of activation/restoration of Greek to all cases.

v1.3j: use of `\MTeverymathdefault`, which includes `\MTicinmath`, but must be corrected then according to shape of letters and presence or absence of option `frenchmath`. We do only `\def\mst@ITcorr{\ifnum\fam=\m@ne/>\fi}` and not `\MTICinmath` to not overwrite some user-defined `\MTeverymathdefault`. Code for italic corrections or not according to letter shape is executed after `\MTeverymathdefault` which limits a bit user customizing possibilities, but if I moved it later, I would possibly have to put inside the `\MTicinmath` the check for `it` or `sl`. Similarly the `\MTcustomgreek` always executed (if not subdued).

```

1802     \MTmathoperatorsobeymathxx
1803     \MTeverymathdefault
1804     \MTcustomizenewmcodes
1805     \@for\mst@tmpc:=it,sl\do{\ifx\mst@tmpc\mst@tmpa\MTnoicinmath\fi}%
1806     \ifmst@frenchmath
1807         \def\mst@ITcorr{\ifnum\fam=\m@ne/>\fi}%
1808         \@for\mst@tmpc:=it,sl\do{\ifx\mst@tmpc\mst@tmpb\MTnoICinmath\fi}%
1809     \fi

```

1.3j has a stronger subdued which does `\MTnormalprime, \MTnormalexists, \MTnormalforall` rather than simply setting the skips to 0mu. Note: `\MTnormalprime` is done as part of `\MTeverymathoff`.

```

1810     \ifmst@subdued
1811         \def\mst@tmpa{normal}%
1812         \ifx\math@version\mst@tmpa
1813             \mst@restorealphabets
1814             \MTstandardgreek
1815             \MTmathoperatorsdonotobeymathxx

```

```

1816      \MTnormalexists
1817      \MTnormalforall
1818      \MTeverymathoff
1819      \MTresetnewmcodes

```

1.3t adds better compatibility with subdued mode for `\imath/\jmath` and perfect compatibility for the minus sign.

1.3u extends this further to allow per-math-version meanings for them.

```

1820      \mst@subduedhbar
1821      \mst@subduedinodot
1822      \mst@subduedmathaccents
1823      \mst@subduedminus
1824      \else
1825      \def\mst@tmpa{bold}%
1826      \ifx\math@version\mst@tmpa
1827      \mst@restorealphabets
1828      \MTstandardgreek
1829      \MTmathoperatorsdonotobeymathxx
1830      \MTnormalexists
1831      \MTnormalforall
1832      \MTeverymathoff
1833      \MTresetnewmcodes
1834      \mst@subduedhbar
1835      \mst@subduedinodot
1836      \mst@subduedmathaccents
1837      \mst@subduedminus
1838      \else
1839      \mst@setalphabets
1840      \MTcustomgreek
1841      \mst@nonsubduedhbar
1842      \mst@nonsubduedinodot
1843      \mst@nonsubduedmathaccents
1844      \mst@nonsubduedminus
1845      \fi
1846      \fi
1847      \else
1848      \MTcustomgreek % new with 1.3d
1849      \mst@nonsubduedhbar
1850      \mst@nonsubduedinodot
1851      \mst@nonsubduedmathaccents
1852      \mst@nonsubduedminus
1853      \fi
1854      }% \MTversion@@
1855      \let\MathastextVersion\MTversion
1856      \let\Mathastextversion\MTversion
1857      \let\MTVersion\MTversion
1858      \let\mathastextversion\MTversion

```

`\MTWillUse` This is a preamble-only command, which can be used more than once, only the latest one counts. Sets up the math fonts in the normal and bold versions, as does `\Mathastext`.

```

1859 \newcommand*\MTWillUse[5][]{
1860   \MTencoding{#2}
1861   \MTfamily{#3}
1862   \MTseries{#4}
1863   \MTshape{#5}
1864   \ifmst@italic\MTlettershape{\itdefault}\fi % was missing in v 1.14 and prior
1865   \edef\mst@tmp{#1}
1866   \ifx\mst@tmp\empty\else\MTlettershape{#1}\fi
1867   \Mathastext}
1868 \let\MathastextWillUse\MTWillUse
1869 \let\Mathastextwilluse\MTWillUse

```

`\Mathastext` The command `\Mathastext` can be used anywhere in the preamble and any number of time, the last one is the one that counts.

In version 1.1 we have two fonts: they only differ in shape. The `mtletterfont` is for letters, and the `mtoperatorfont` for digits and log-like operator names. The default is that both are upright.

Starting with version 1.12, an optional argument makes `\Mathastext` act as the declaration of a math version, to be later used in the document.

Versions 1.15x brought some adaptations related to the subdued option.

1.3c adds a second optional parameter to inherit previous settings from another version; mostly done to inherit the bold version fonts for symbols and large symbols. This is done in `\MTDeclareVersion`.

1.3j moves the code related to `\MTicinmath` from `\Mathastext@` to `\AtBeginDocument` (code depending on whether `subdued` option in use). But we omit for this from `\MTicinmath` the `\MTmathactiveletters` and issue the latter during loading of package, hence allowing `\MTmathstandardletters` to be effective in the preamble.

I forgot to document that under `subdued` option the `\Mathastext` command without optional parameter does not any `\SetSymbolFont` etc... but it has a few other tasks to complete nevertheless.

1.3u fixes some long-standing bug that `\Mathastext` did not repeat some font-encoding dependent things: they got done only once during package loading (things regarding the `\hbar`, `\imath`, the math accents and the minus sign). They are now part of the contents of `\Mathastext` macro itself (which is executed during package loading).

```

1870 \def\Mathastext {\@ifnextchar [\Mathastext@declare\Mathastext@ }
1871 \def\Mathastext@declare [#1]{%
1872   \edef\mst@tmp{#1}%
1873   \ifx\mst@tmp\empty
1874     \expandafter\@firstoftwo
1875   \else\expandafter\@secondoftwo
1876   \fi
1877   \Mathastext@
1878   {\MTDeclareVersion[\mst@ltsh]{#1}{\mst@enc}{\mst@fam}{\mst@ser}{\mst@opsh}}%
1879 }% \Mathastext@declare
1880 \def\Mathastext@ {%
1881   \mst@update@greeksh
1882   \edef\mst@encoding@normal{\mst@enc}%
1883   \edef\mst@family@normal{\mst@fam}%
1884   \edef\mst@series@normal{\mst@ser}%

```

```

1885 \edef\mst@shape@normal{\mst@opsh}%
1886 \edef\mst@ltshape@normal{\mst@ltsh}%
1887 \edef\mst@itdefault@normal{\itdefault}%
1888 \edef\mst@rmdefault@normal{\rmdefault}%
1889 \edef\mst@sfdefault@normal{\sfdefault}%
1890 \edef\mst@ttdefault@normal{\ttdefault}%
1891 \edef\mst@boldvariant@normal{\mst@bold}%
1892 \edef\mst@exists@skip@normal{\mst@exists@skip}%
1893 \edef\mst@forall@skip@normal{\mst@forall@skip}%
1894 \edef\mst@prime@skip@normal{\mst@prime@skip}%
1895 \edef\mst@encoding@bold{\mst@enc}%
1896 \edef\mst@family@bold{\mst@fam}%
1897 \edef\mst@series@bold{\mst@bold}%
1898 \edef\mst@shape@bold{\mst@opsh}%
1899 \edef\mst@ltshape@bold{\mst@ltsh}%
1900 \edef\mst@boldvariant@bold{\mst@bold}%
1901 \edef\mst@itdefault@bold{\itdefault}%
1902 \edef\mst@rmdefault@bold{\rmdefault}%
1903 \edef\mst@sfdefault@bold{\sfdefault}%
1904 \edef\mst@ttdefault@bold{\ttdefault}%
1905 \edef\mst@exists@skip@bold{\mst@exists@skip}%
1906 \edef\mst@forall@skip@bold{\mst@forall@skip}%
1907 \edef\mst@prime@skip@bold{\mst@prime@skip}%
1908 \ifmst@subdued

```

Since 1.3j this branch is actually almost superfluous, as entering `normal` or `bold` with `\MTversion` does `\MTnormalexists`, `\MTnormalforall`, and `\MTnormalprime`. But some default values are needed if the user insists on issuing `\MTexistsdoesskip`, etc... nevertheless.

```

1909 \def\mst@exists@skip@normal{0mu}%
1910 \def\mst@forall@skip@normal{0mu}%
1911 \def\mst@prime@skip@normal{0mu}%
1912 \def\mst@exists@skip@bold{0mu}%
1913 \def\mst@forall@skip@bold{0mu}%
1914 \def\mst@prime@skip@bold{0mu}%
1915 \else % not subdued
1916 \ifmst@italic
1917 \ifmst@frenchmath
1918 \mst@exists@muskip\mst@exists@skip\relax
1919 \mst@forall@muskip\mst@forall@skip\relax
1920 \mst@prime@muskip\mst@prime@skip\relax
1921 \else
1922 \def\mst@exists@skip@normal{0mu}%
1923 \def\mst@forall@skip@normal{0mu}%
1924 \def\mst@prime@skip@normal{0mu}%
1925 \def\mst@exists@skip@bold{0mu}%
1926 \def\mst@forall@skip@bold{0mu}%
1927 \def\mst@prime@skip@bold{0mu}%
1928 \fi
1929 \else
1930 \mst@exists@muskip\mst@exists@skip\relax

```

```

1931      \mst@forall@muskip\mst@forall@skip\relax
1932      \mst@prime@muskip\mst@prime@skip\relax
1933      \fi
1934      \fi
1935      %% v1.15f
1936      \ifmst@nonormalbold\else
1937      \SetMathAlphabet{\mathnormalbold}{normal}{\mst@encoding@normal}%
1938                      {\mst@family@normal}%
1939                      {\mst@boldvariant@normal}%
1940                      {\mst@ltshape@normal}%
1941      \SetMathAlphabet{\mathnormalbold}{bold}{\mst@encoding@bold}%
1942                      {\mst@family@bold}%
1943                      {\mst@boldvariant@bold}%
1944                      {\mst@ltshape@bold}%
1945      \fi
1946      %% v1.15f adds \ifmst@default.. checks
1947      \ifmst@subdued\else
1948      \SetSymbolFont{mtletterfont}{normal}{\mst@encoding@normal}%
1949                      {\mst@family@normal}%
1950                      {\mst@series@normal}%
1951                      {\mst@ltshape@normal}%
1952      \SetSymbolFont{mtletterfont}{bold}{\mst@encoding@bold}%
1953                      {\mst@family@bold}%
1954                      {\mst@series@bold}%
1955                      {\mst@ltshape@bold}%
1956      \SetSymbolFont{mtoperatorfont}{normal}{\mst@encoding@normal}%
1957                      {\mst@family@normal}%
1958                      {\mst@series@normal}%
1959                      {\mst@shape@normal}%
1960      \SetSymbolFont{mtoperatorfont}{bold}{\mst@encoding@bold}%
1961                      {\mst@family@bold}%
1962                      {\mst@series@bold}%
1963                      {\mst@shape@bold}%
1964      \ifmst@defaultbf\else
1965      \SetMathAlphabet{\Mathbf}{normal}{\mst@encoding@normal}%
1966                      {\mst@family@normal}%
1967                      {\mst@series@bold}%
1968                      {\mst@shape@normal}%
1969      \SetMathAlphabet{\Mathbf}{bold}{\mst@encoding@bold}%
1970                      {\mst@family@bold}%
1971                      {\mst@series@bold}%
1972                      {\mst@shape@bold}%
1973      \fi
1974      \ifmst@defaultit\else
1975      \SetMathAlphabet{\Mathit}{normal}{\mst@encoding@normal}%
1976                      {\mst@family@normal}%
1977                      {\mst@series@normal}%
1978                      {\mst@itdefault@normal}%
1979      \SetMathAlphabet{\Mathit}{bold}{\mst@encoding@bold}%

```



```

1980          {\mst@family@bold}%
1981          {\mst@series@bold}%
1982          {\mst@itdefault@bold}%
1983 \fi
1984 \ifmst@defaultsf\else
1985   \SetMathAlphabet{\Mathsf}{normal}{\mst@encoding@normal}%
1986                       {\mst@sfdefault@normal}%
1987                       {\mst@series@normal}%
1988                       {\mst@shape@normal}%
1989   \SetMathAlphabet{\Mathsf}{bold}{\mst@encoding@bold}%
1990                       {\mst@sfdefault@bold}%
1991                       {\mst@series@bold}%
1992                       {\mst@shape@bold}%
1993 \fi
1994 \ifmst@defaultttt\else
1995   \SetMathAlphabet{\Mathtt}{normal}{\mst@encoding@normal}%
1996                       {\mst@ttdefault@normal}%
1997                       {\mst@series@normal}%
1998                       {\mst@shape@normal}%
1999   \SetMathAlphabet{\Mathtt}{bold}{\mst@encoding@bold}%
2000                       {\mst@ttdefault@bold}%
2001                       {\mst@series@bold}%
2002                       {\mst@shape@bold}%
2003 \fi
2004 \fi % de \ifmst@subdued

```

**\MathEulerBold** 1.14c: We reset mteulervm and \MathEulerBold here as the variant for bold may have been changed by the user via \Mathastextboldvariant{m}; and we should keep this local to math versions.

```

2005 \ifmst@needeuler
2006   \SetSymbolFont{mteulervm}{bold}{U}{zeur}{\mst@boldvariant@normal}{n}%
2007   \SetMathAlphabet{\MathEulerBold}{normal}%
2008       {U}{zeur}{\mst@boldvariant@normal}{n}%
2009   \SetMathAlphabet{\MathEulerBold}{bold}%
2010       {U}{zeur}{\mst@boldvariant@normal}{n}%
2011 \fi

2012 \ifmst@needsymbol\SetSymbolFont{mtpsymbol}{bold}%
2013       {U}{psy}{\mst@boldvariant@normal}{n}%
2014 \fi

```

**LGRgreek\*** LGRgreek, LGRgreeks, selfGreek, and selfGreeks options.

```

selfGreek* 2015 \ifmst@subdued\else
2016   \ifmst@LGRgreek
2017     \SetSymbolFont{mtlgrfontlower}{normal}{LGR}%
2018         {\mst@greekfont}{\mst@series@normal}{\mst@greek@lsh}%
2019     \SetSymbolFont{mtlgrfontlower}{bold}{LGR}%
2020         {\mst@greekfont}{\mst@boldvariant@normal}{\mst@greek@lsh}%
2021     \SetSymbolFont{mtlgrfontupper}{normal}{LGR}%

```

```

2022         {\mst@greekfont}{\mst@series@normal}{\mst@greek@ush}%
2023     \SetSymbolFont{mtlgrfontupper}{bold}{LGR}%
2024         {\mst@greekfont}{\mst@boldvariant@bold}{\mst@greek@ush}%
2025 \else
2026     \ifmst@selfGreek
2027         \SetSymbolFont{mtselfGreekfont}{normal}{OT1}%
2028             {\mst@greekfont}{\mst@series@normal}{\mst@greek@ush}%
2029         \SetSymbolFont{mtselfGreekfont}{bold}{OT1}%
2030             {\mst@greekfont}{\mst@boldvariant@bold}{\mst@greek@ush}%
2031     \fi
2032 \fi
2033 \fi

2034 \ifmst@subdued
2035     \typeout{** subdued mode will be activated for the normal and bold math ver-
sions}%
2036 \else
2037     \typeout{** Latin letters in the normal (resp. bold) math versions are now^^J%
2038         ** set up to use the fonts
2039         \mst@encoding@normal/\mst@family@normal/\mst@series@normal%
2040             (\mst@boldvariant@normal)/\mst@ltshape@normal}%
2041     \ifmst@LGRgreek\typeout{** Greek letters (\mst@greek@lsh/\mst@greek@ush)
2042         will use LGR/\mst@greekfont}%
2043     \fi
2044     \ifmst@nodigits\else
2045         \typeout{** Other characters (digits, ...) and \protect\log-like names will be^^J%
2046             ** typeset with the \mst@shape@normal\space shape.}%
2047     \fi
2048 \fi
2049 \ifmst@nohbar\else
2050     \typeout{** \string\hbar}%
2051     \mst@dothe@hbarstuff
2052         \mst@hbar@mvnormal\mst@ltbar@mvnormal\mst@encoding@normal
2053     \let\mst@hbar@mvbold\mst@hbar@mvnormal
2054 \fi
2055 \mst@dothe@inodotstuff\inodot\jnodot\mst@encoding@normal
2056 \let\mst@inodot@mvnormal\inodot
2057 \let\mst@inodot@mvbold\inodot
2058 \let\mst@jnodot@mvnormal\jnodot
2059 \let\mst@jnodot@mvbold\jnodot
2060 \ifmst@mathaccents
2061     \typeout{** math accents}%
2062     \mst@dothe@mathaccentsstuff{normal}\mst@encoding@normal
2063 \fi
2064 \ifmst@nominus\else
2065     \typeout{** minus as endash}%
2066     \ifmst@endash
2067         \mst@dothe@endashstuff\mst@minus@mvnormal\mst@varfam@minus@mvnormal
2068         \mst@encoding@normal

```

```

2069 \mst@dothe@endashstuff\mst@minus@mvbold\mst@varfam@minus@mvbold
2070 \mst@encoding@normal
2071 \else
2072 \ifmst@emdash
2073 \mst@dothe@emdashstuff\mst@minus@mvnormal\mst@varfam@minus@mvnormal
2074 \mst@encoding@normal
2075 \mst@dothe@emdashstuff\mst@minus@mvbold\mst@varfam@minus@mvbold
2076 \mst@encoding@normal
2077 \else
2078 \mst@dothe@hyphenstuff\mst@minus@mvnormal\mst@varfam@minus@mvnormal
2079 \let\mst@minus@mvbold\mst@minus@mvnormal
2080 \let\mst@varfam@minus@mvbold\mst@varfam@minus@mvnormal
2081 \fi
2082 \fi
2083 \fi
2084 }% \Mathastext@
2085 \let\mathastext\Mathastext
2086 \Mathastext

```

Additional appropriate messages to the terminal and the log.

```

2087 \ifmst@eulergreek
2088 \typeout{** Greek letters will use the Euler font. Use \protect\MathastextEulerScale{
2089 font.}%
2090 \ifmst@subdued{\typeout{** (subdued mode: normal and bold math
2091 version with default Greek letters.)}}\fi
2092 \else
2093 \ifmst@symbolgreek
2094 \typeout{** Greek letters will use the PostScript Symbol font. Use ^~J%
2095 ** \protect\MathastextSymbolScale{<factor>} to scale the font.}%
2096 \ifmst@subdued{\typeout{** (subdued mode: normal and bold math
2097 version with default Greek letters.)}}\fi
2098 \fi\fi

```

**Math sizes** I took the code for \Huge and \HUGE from the moresize package of Christian CORNELSEN

```

2099 \ifmst@defaultsizes\else
2100 \providecommand\@xxxpt{29.86}
2101 \providecommand\@xxxvpt{35.83}
2102 \ifmst@twelve
2103 \def\Huge{\@setfontsize\Huge\@xxxpt{36}}
2104 \def\HUGE{\@setfontsize\HUGE\@xxxvpt{43}}
2105 \typeout{** \protect\Huge\space and \protect\HUGE\space have been (re)-defined.}
2106 \else
2107 \def\HUGE{\@setfontsize\HUGE\@xxxpt{36}}
2108 \typeout{** \protect\HUGE\space has been (re)-defined.}
2109 \fi

```

I choose rather big subscripts.

```

2110 \def\defaultscriptratio{.8333}
2111 \def\defaultscriptscriptratio{.7}
2112 \DeclareMathSizes{9}{9}{7}{5}

```

```

2113 \DeclareMathSizes{\@xpt}{\@xpt}{8}{6}
2114 \DeclareMathSizes{\@xipt}{\@xipt}{9}{7}
2115 \DeclareMathSizes{\@xiipt}{\@xiipt}{10}{8}
2116 \DeclareMathSizes{\@xivpt}{\@xivpt}{\@xiipt}{10}
2117 \DeclareMathSizes{\@xvipt}{\@xvipt}{\@xivpt}{\@xiipt}
2118 \DeclareMathSizes{\@xxpt}{\@xxpt}{\@xvipt}{\@xivpt}
2119 \DeclareMathSizes{\@xxvpt}{\@xxvpt}{\@xxpt}{\@xvipt}
2120 \DeclareMathSizes{\@xxxpt}{\@xxxpt}{\@xxvpt}{\@xxpt}
2121 \DeclareMathSizes{\@xxxvpt}{\@xxxvpt}{\@xxxpt}{\@xxvpt}
2122 \typeout{** mathastext has declared larger sizes for subscripts.^^J%
2123 ** To keep LaTeX defaults, use option `defaultmathsizes\string'.}
2124 \fi

```

`\MTeverymathoff` 1.3i 2016/01/06 Compatibility patch with `\url` from `url.sty` and `\url/\nolinkurl` from `hyperref.sty`.

1.3j 2016/01/15 renamed the macro from `\MTactivemathoff` to `\MTeverymathoff`, as it is not exclusively a matter of math active characters due to `\MTeasynonlettersdonotobeymathxx`.

1.3o 2016/05/03 adds `\MTdonotfixfonts`. Operant with Lua<sup>A</sup>T<sub>E</sub>X only.

```

2125 \newcommand*\MTeverymathoff {%
2126     \MTnormalasterisk
2127     \MTnormalprime
2128     \MTnonlettersdonotobeymathxx
2129     \MTeasynonlettersdonotobeymathxx
2130     \MTmathstandardletters
2131     \MTdonotfixfonts
2132 }%
2133 \AtBeginDocument {%
2134     \@ifpackageloaded{hyperref}
2135     {\def\Hurl{\begingroup\MTeverymathoff\Url}}
2136     {\@ifpackageloaded{url}{\DeclareUrlCommand\url{\MTeverymathoff}}{}}%
2137 }%

```

`\MTeverymathdefault` 1.3j 2016/01/15 Customizable command which gets executed by `\MTversion` except when switching to `normal/bold` if option `subdued`. The included `\MTicinmath` does `\MTmathactiveletters` which will also activate the math skips around letters.

The `\MTeverymathdefault` does not include `\MTmathoperatorsobeymathxx` as the latter does not correspond to something done during execution of `\the\everymath`.

Should I put `\let\newmcodes@mst@newmcodes@` here too ? No, it is not done at `everymath`.

During the loading, the (non subdued) package does `\MTactiveasterisk` (if option `asterisk`), `\MTprimedoesskip`, `\MTeasynonlettersobeymathxx` and `\MTmathactiveletters`. There is some code at begin document for decisions about italic corrections, this code does not emit again `\MTmathactiveletters`, hence a `\MTmathstandardletters` in the preamble is not overruled. Furthermore the at begin document code will not overrule user emitted `\MTnoicinmath` etc... commands in the preamble.

And user can employ `\MTnormalexists`, etc..., from inside the preamble, it will not be overruled (as it is delayed at begin document to after `mathastext` dealings).

1.3o 2016/05/03 adds `\MTfixfonts`. Operant with Lua<sup>A</sup>T<sub>E</sub>X only.

```

2138 \newcommand*\MTeverymathdefault {%
2139     \MTactiveasterisk

```

```

2140 \MTprimedoesskip
2141 \MTeasynonlettersobeymathxx
2142 \MTicinmath
2143 \MTfixfonts
2144 }%

```

Things to do last "at begin document"

```

2145 \AtBeginDocument{%
2146 \everymath\expandafter{\the\everymath
2147 \mst@the\mst@do@nonletters \let\mst@the\@gobble
2148 \mst@theeasy\mst@do@easynonletters \let\mst@theeasy\@gobble
2149 \mst@thef\mst@do@az \let\mst@thef\@gobble
2150 \mst@theF\mst@do@AZ \let\mst@theF\@gobble}%
2151 \everydisplay\expandafter{\the\everydisplay
2152 \mst@the\mst@do@nonletters \let\mst@the\@gobble
2153 \mst@theeasy\mst@do@easynonletters \let\mst@theeasy\@gobble
2154 \mst@thef\mst@do@az \let\mst@thef\@gobble
2155 \mst@theF\mst@do@AZ \let\mst@theF\@gobble}%

```

1.3j: moved here to be executed at begin document (and not from inside `\Mathastext@`.)  
The `\MTeverymathoff` does: `\MTnormalasterisk`, `\MTnormalprime`, `\MTnonlettersdonotobeymathxx`, `\MTeasynonlettersdonotobeymathxx`, `\MTmathstandardletters`.

1.3m: doing `\MTmathactiveletters` in subduded mode immediately after `\begin{document}` resulted in errors because `\mst@itcorr` had been left undefined. We thus add `\MTnoicinmath` to the subduded initialization.

Since 1.3n there is `\MTresetnewmcodes` which needs `\mst@originalnewmcodes@`, itself defined at begin document. Thus we have wrapped the whole thing in `\AtEndOfPackage` (at 1.3u whole code directly moved at end of package).

And 1.3p adds here `\MTcustomizenewmcodes` which had been regrettably forgotten by 1.3n.

1.3t adds some extras to handle correctly the minus sign and dotless i and j in subduded mode, even in case of usage with fontspec.

1.3u similarly lets math accents be correctly subduded.

```

2156 \MTcustomizenewmcodes
2157 \let\mst@original@hbar\hbar
2158 \let\mst@original@imath\imath
2159 \let\mst@original@jmath\jmath
2160 \@tfor\@tempa:={grave}{acute}{check}{breve}{bar}%
2161             {dot}{ddot}{mathring}{hat}{tilde}%
2162 \do
2163 {\expandafter\let\csname mst@original@\@tempa\expandafter\endcsname
2164 \csname \@tempa\endcsname}%
2165 \ifmst@XeOrLua
2166 \edef\mst@subdudedminus
2167 {\mst@Umathcodenum`\noexpand\-=\the\mst@Umathcodenum`\-\relax}%
2168 \else
2169 \edef\mst@subdudedminus{\mathcode`\noexpand\-=\the\mathcode`\-\relax}%
2170 \fi
2171 \ifmst@subduded
2172 \MTeverymathoff
2173 \MTresetnewmcodes

```

```

2174 \MTnoicinmath
2175 \MTmathoperatorsdonotobeymathxx
2176 %\mst@subduedhbar
2177 \let\inodot\imath
2178 \let\jnodot\jmath
2179 %\mst@subduedmathaccents
2180 \mst@subduedminus
2181 \else
2182 \mst@nonsubduedhbar
2183 \mst@nonsubduedmathaccents
2184 \mst@nonsubduedminus

```

1.3j: an earlier version of this code was earlier part of `\Mathastext@`. As we are now in `\AtBeginDocument` we try to be careful not to overwrite `\MTicinmath`, `\MTnoicinmath`, `\MTicalsoinmathxx`, ... if issued by the user in the preamble, though. And we do not execute `\MTmathactiveletters`, it is issued by the package at loading time in order to allow user to cancel it if desired from inside the preamble.

```

2185 \ifx\mst@itcorr\@undefined
2186 \def\mst@itcorr{\ifnum\fam=\m@ne\fi}%
2187 \@for\mst@tmp:=it,sl\do
2188 {\ifx\mst@tmp\mst@ltshape@normal\let\mst@itcorr\@empty\fi }%
2189 \fi
2190 \ifx\mst@ITcorr\@undefined
2191 \let\mst@ITcorr\mst@itcorr
2192 \ifmst@frenchmath
2193 \def\mst@ITcorr{\ifnum\fam=\m@ne\fi}%
2194 \@for\mst@tmp:=it,sl\do
2195 {\ifx\mst@tmp\mst@shape@normal\let\mst@ITcorr\@empty\fi }%
2196 \fi
2197 \fi
2198 \fi
2199 }% \AtBeginDocument

```

subdued 1.15: The subdued code was initiated in May 2011. I returned to `mathastext` on Sep 24, 2012, and decided to complete what I had started then, but in the mean time I had forgotten almost all of the little I knew about L<sup>A</sup>T<sub>E</sub>X macro programming.

The point was to extract the data about how are ‘letters’ and ‘operators’ in the normal and bold versions, through obtaining the math families of ‘a’ and ‘1’, respectively<sup>1</sup>. Due to the reassignments done for characters by `mathastext` I also had decided in 2011 that the OT1 encoding, if detected, should be replaced by T1 ((1): but the *euler* package for example assigns the digits to the *letters* symbol font...)

1.15d: Oct 13, 2012. The `\mathcode` thing has to be used with care under Unicode engines. Unfortunately the `\luatexumathcode` macro is helpless as it is not possible to know if it will return a legacy mathcode or a Unicode mathcode. On the other hand the much saner `\XeTeXmathcodenum` always return a Unicode mathcode.

UPDATE for `mathastext` 1.3 (2013/09/02): since the release of `lualatex` as included in TL2013, `\luatexumathcodenum` behaves as `\XeTeXmathcodenum` so `mathastext` 1.3 treats identically under both unicode engines the equal and minus signs (and the vertical bar).

1.15e: Oct 22, 2012. I add the necessary things to also subdue the `\mathbf`, `\mathit`, `\mathsf` and `\mathtt` macros (previous version only took care of the symbol alphabets `\mathnormal` and

`\mathrm.`) [update: 1.15f does that in a completely different and much simpler way] Notice that the package defines a `\mathnormalbold` macro, but it will not be subdued in the normal and bold math versions.

1.15f: Oct 23, 2012. The previous version of the code queried the math family of a, respectively 1, to guess and then extract the fonts to be reassigned to `mtletterfont` and `mtoperatorfont` (which is done at the end of this .sty file). The present code simply directly uses letters and operators (so `mathastext` could not subdue itself... if it was somehow cloned), but obtains indeed the corresponding font specifications in normal and bold in a cleaner manner. But it is so much shorter (and avoids the Lua<sup>A</sup>T<sub>E</sub>X problem with `\luatexUmathcode`). Anyhow, for example the euler package puts the digits in the letters math family! so the previous method was also error prone. In fact there is no way to do this subdued mechanism on the basis of the legacy code of `mathastext`. The only way is to rewrite entirely the package to query all mathcodes of things it changes in order to be able to revert these changes (and one would have to do even more hacking for `\mathversion{normal}` and not only `\MTversion{normal}` to work).

1.15f: and also I take this opportunity to do the subdued math alphabets things in a much much easier way, see below.

1.3s 2018/08/21: I have half-forgotten the reasons for modifying the font encoding to current `\encodingdefault`, but at any rate this should not be done in a `fontspec` context, encoding default being (now) TU it is very unlikely modifying from TU or to TU from something else will do any good. I add workaround here for case of `fontspec` being detected via the `\encodingdefault` setting.

1.3t 2018/08/22: the 1.3s fix erroneously removed the OT1->T1 replacement in TU context.

1.3u: the whole thing will only get executed At Begin Document.

```

2200 \ifmst@subdued
2201 \AtBeginDocument{%
2202   \def\mst@reserved#1\getanddefine@fonts\symletters#2#3\@nil{%
2203     \def\mst@normalmv@letter{#2}}%
2204   \expandafter\mst@reserved\mv@normal\@nil
2205   \def\mst@reserved#1\getanddefine@fonts\symletters#2#3\@nil{%
2206     \def\mst@boldmv@letter{#2}}%
2207   \expandafter\mst@reserved\mv@bold\@nil
2208   \def\mst@reserved#1\getanddefine@fonts\symoperators#2#3\@nil{%
2209     \def\mst@normalmv@operator{#2}}%
2210   \expandafter\mst@reserved\mv@normal\@nil
2211   \def\mst@reserved#1\getanddefine@fonts\symoperators#2#3\@nil{%
2212     \def\mst@boldmv@operator{#2}}%
2213   \expandafter\mst@reserved\mv@bold\@nil
2214   \edef\mst@tmp@enc{\mst@encoding@normal}%
2215   \def\mst@reserved#1/#2/#3/#4/{\gdef\mst@debut{#1}\gdef\mst@reste{#2/#3/#4}}%
2216   \begingroup\escapechar\m@ne
2217     \xdef\mst@funnyoti{\expandafter\string\csname OT1\endcsname}%
2218     \expandafter\expandafter\expandafter
2219       \mst@reserved\expandafter\string\mst@normalmv@operator/%
2220   \endgroup
2221   \ifx\mst@debut\mst@funnyoti\ifx\mst@tmp@enc\mst@oti\def\mst@tmp@enc{T1}\fi\fi
2222   \edef\mst@normalmv@operator{\expandafter\noexpand\csname
2223     \if1\mst@OneifUniEnc
2224       \ifx\mst@debut\mst@funnyoti T1\else\mst@debut\fi
2225     \else

```

```

2226      \mst@tmp@enc
2227      \fi/\mst@reste\endcsname}%
2228      \edef\mst@tmp@enc{\mst@encoding@bold}%
2229      \begingroup\escapechar\m@ne
2230      \expandafter\expandafter\expandafter
2231      \mst@reserved\expandafter\string\mst@boldmv@operator/%
2232      \endgroup
2233      \ifx\mst@debut\mst@funnyoti\ifx\mst@tmp@enc\mst@oti\def\mst@tmp@enc{T1}\fi\fi
2234      \edef\mst@boldmv@operator{\expandafter\noexpand\csname
2235      \if1\mst@OneifUniEnc
2236      \ifx\mst@debut\mst@funnyoti T1\else\mst@debut\fi
2237      \else
2238      \mst@tmp@enc
2239      \fi/\mst@reste\endcsname}%
2240      \typeout{** ...entering subdued mode...}%
2241      \expandafter\SetSymbolFont@ \expandafter\mv@normal\mst@normalmv@letter\symmtletterfont
2242      \expandafter\SetSymbolFont@ \expandafter\mv@bold\mst@boldmv@letter\symmtletterfont
2243      \expandafter\SetSymbolFont@ \expandafter\mv@normal\mst@normalmv@operator\symmtooperatorfont
2244      \expandafter\SetSymbolFont@ \expandafter\mv@bold\mst@boldmv@operator\symmtooperatorfont
2245      \typeout{** ...done.}%
2246      }% \AtBeginDocument
2247      \fi % \ifmst@subdued

```

Preamble-only... “Only preamble” restrictions. I was way too much obedient back in 2011, particularly taking into account how much of a pain it has been and still is that things such as `\DeclareMathSymbol` or `\DeclareMathAccent` are preamble-only. But keeping this for time being, however not using `\@onlypreamble` which breaks one’s heart when tracing to see how much place it takes, so we do it in one go.

```

2248 \expandafter \gdef \expandafter \@preamblecmds \expandafter {\@preamblecmds
2249 \do\MTitgreek
2250 \do\MTupgreek
2251 \do\MTitGreek
2252 \do\MTitGreek
2253 \do\Mathastextitgreek
2254 \do\Mathastextupgreek
2255 \do\MathastextitGreek
2256 \do\MathastextitGreek
2257 \do\MTgreekfont
2258 \do\Mathastextgreekfont
2259 \do\MTDeclareVersion
2260 \do\MathastextDeclareVersion
2261 \do\MTWillUse
2262 \do\MathastextWillUse
2263 \do\Mathastextwilluse
2264 \do\Mathastext
2265 \do\mathastext
2266 }
2267 \endinput

```