The mathastext package

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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.
```

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Contents

1 What mathastext does

If you have used the package before please make sure to check first section 4 where all changes across releases are recorded.

1.1 Aim of this package and basic usage

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.

mathastext's basic aim is thus to have the same font for text and mathematics. With hundreds of free text fonts packaged for LaTeX 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 TeX fonts and engines, and that compatibility with Unicode engines and OpenType fonts is partial.

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, 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 mode will then be typeset in Times.[1] The exact list of characters concerned by `mathastext` is a subset of the basic `ASCII` set:

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

As one can see, this is a very limited list! Some possibilities exist regarding Greek letters and will be described later.

1.2 Miscellanea

Please note that most of this section was written many years ago. But it should still be valid!

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.

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.[2] This customization is suppressed in `subdued` mode for the `normal` and `bold` math versions. (1.3n)

hbar: the default LaTeX 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

[1] 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. *This was written many years ago, nowadays,* `newtx` *is the successor of* `txfonts`.

[2] 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 LuaLaTeX not applying the curly right quote contrarily to XeLaTeX.

shape), but with a bar accross 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`.

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 do 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.[3]

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[4] 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'[5] and `$R^*$` or `$R^\ast$` *must* be input as `$R^{*}$` and `$R^{\ast}$`. Furthermore, they will obey the math alphabet commands.

XeTeX and LuaLaTeX: 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 (XeTeX, old fontspec), EU2 (LuaLaTeX, old fontspec), TU

[3] 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)

[4] 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`.

[5] in a hopefully safe way, for example `$\label{eq*1}$` is ok.

(XeTeX and LuaLaTeX, 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 XeTeX/LuaLaTeX 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.[6]

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 `amsbsy` package). As it does not exist in the default LaTeX 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).
- new: `\mathgreekup` and `\mathgreekit` are math alphabets modifying the shape of Greek letters, only available under `LGRgreek` (or `LGRgreeks`) option. (1.3x)
- 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 1.8 and subsection 1.9) 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 (1.3u)

[6] this costs a math family, as I never came back to this to try to do otherwise.

as an option to the `fontenc` package (and of course providing the ten needed text accents which will mock math accents).[7]

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.

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 XeTeX and LuaTeX 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.[8] 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.

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

1.3 Examples

Here is another simple example:

```
\usepackage{libertinus-type1}
\usepackage[italic,LGRgreek,defaultmathsizes]{mathastext}
```

The `LGRgreek` option is there to take advantage that the `libertinus-type1` package[9] also provides Greek letters in LGR encoding, which can thus be used by

[7] The code will raise low-level TeX errors if the user attempts to use an 8bits font encoding whose LaTeX definition file is lacking the suitable uses of `\DeclareTextAccent` or if the low level LaTeX 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!

[8] 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}`.

[9] Bob Tennent, *Support for using Libertinus fonts with LaTeX/pdfLaTeX*, https://ctan.org/pkg/libertinus-type1.

mathastext in math mode. And we do here as if we did not know about the existence of the **libertinust1math** package![10] This would have been the obvious choice, but then one wouldn't need **mathastext** and I couldn't even start this documentation.

More sophisticated preambles will use multiple times the **\Mathastext** command in the preamble with its optional argument [⟨*math_version*⟩] in order to define *math versions* corresponding to a given font configuration. These **mathastext**-enriched math versions are then activated in the document body via the **\MTversion**{⟨*math_version*⟩} command, which modifies *both* the text font and the math font.

We now give some examples with a verbatim copy of the preamble code corresponding to them, as can be found in the source of this documentation. The detailed option and command descriptions will be given later.

First of all, the package was loaded using this:

```
\usepackage[subdued,%
            asterisk,%
            defaultmathsizes,%
            symbolmisc,symbolre,%
            LGRgreek]{mathastext}
```

In the definitions of the **mathastext**-enriched *math versions* we keep commands which may have been redundant in the original preamble, because they were issued earlier for a previous math version definition.

Let's start with Latin Modern typewriter proportional. Its usage was configured in the preamble using this:

```
\MTlettershape{n}
\MTupgreek
\MTgreekfont{cmtt}
\MTfamily{lmvtt}
\Mathastext[lmvtt]
```

Its usage is triggered using

```
\MTversion{lmvtt}
```

in the document. Here is an example:

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

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

[10] Michael Sharpe, *A Type 1 font and LaTeX support for Libertinus Math*, https://ctan.org/pkg/libertinust1math.

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

Test of uppercase Greek in math: $AB\Gamma\Delta\Xi\Omega$.

Both the Latin and Greek letters are upright, in conformity to the way the `lmvtt` version was defined.

Now with the fonts from the `libertinus-type1` distribution[11]. The preamble code is:

```
\MTfamily{LibertinusSerif-TLF}
\MTlettershape{n}
\MTseries{m}
\MTgreekfont{LibertinusSerif-TLF}
\MTupgreek
\Mathastext[libertinus]
\MTseries{sb}
\Mathastext[libertinussemibold]
```

Its usage in the document body for the example below is triggered via

`\MTversion[libertinus]{libertinussemibold}`

This syntax modifies the text fonts to be those which were defined to hold for the **mathastext**-math version passed as optional argument, and sets the math fonts according to the mandatory argument. Hence the math mode uses semibold font but the text font uses the normal weight.

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

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

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

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

[11] Bob Tennent, *Support for using Libertinus fonts with LaTeX/pdfLaTeX*, https://ctan.org/pkg/libertinus-type1.

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

Test of uppercase Greek in math: $\mathbf{AB\Gamma\Delta\Xi\Omega}$.

Now with a Times clone. We will configure Latin letters to be in italic shape, and Greek letters to be italic for lowercase and upright for uppercase:

```
\usepackage{times}% it modifies the \{rm,sf,tt}default's
\MTfamily{\rmdefault}
\MTlettershape{it}
\MTseries{m}
\MTgreekfont{txr}
\MTitgreek\MTupGreek
\Mathastext[times]
% \MTversion{times} will change not only math but also text, so it
% will re-enact the \rmdefault, \sfdefault, \ttdefault from loading times.sty
```

We now use this in the document body via

```
\MTversion{times}
```

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

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

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

Test of uppercase Greek in math: $\mathrm{AB\Gamma\Delta\Xi\Omega}$.

Let us 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. Also we want Greek letters (both lowercase and uppercase) to be in italic shape. The preamble code was:

```
\usepackage{newcent}% attention that it modifies all three of \rmdefault,
                    % \sfdefault and \ttdefault
\MTfamily{\rmdefault}
\MTlettershape{it}
% \MTitgreek\MTupGreek % our demo does not use newcent for math anyway
```

```
\Mathastext[newcent]

\usepackage[scaled]{helvet}
\MTfamily{\sfdefault}
\MTlettershape{it}  % redundant here
\MTseries{m}
\MTitgreek          % make both lowercase and uppercase Greek italic
\MTgreekfont{cmss}
\Mathastext[helvet]
```

And the next demo is configured in the document body via

```
\MTversion[newcent]{helvet}
```

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

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

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

Test of uppercase Greek in math: $AB\Gamma\Delta\Xi\Omega$.

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 ...). This is easy because all previous usages were enclosed in braces `{...}` so as to limit the scope. As **mathastext** was loaded with option **subdued** the default rendering (i.e. in the *normal* and *bold* math versions) is (almost) as if the package was not loaded at all, and it simply matches the document font configuration. Here it thus matches the

```
\usepackage{mlmodern}
```

which was included in the document preamble prior to loading **mathastext**.

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

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

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

Test of uppercase Greek in math: ΓΔΞΩ (no \Alpha, no \Beta).

If the scope of our earlier examples using **mathastext**-enriched math versions had not been limited we would have issued

```
\MTversion{normal}
```

to return to the normal (almost not influenced by **mathastext**) math version.

The Greek letters varied across our examples thanks to the **LGRgreek** option which made the **\MTgreekfont** command active for configuration of the math versions.[12]

*Since **1.3x** this documentation uses globally the **mlmodern**[13] font package and has added an example using the Libertinus font in type-1 format[14] although there is an existing accompanying math font[15].*

1.4 Main options

1.4.1 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[16] questions[17] 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 (1.1)

[12] The document used the `cmtt`, `cmss`, `txr`, as well as `LibertinusSerif-TLF` font families in `LGR` encoding. The first two are available (with no need to load explicitly any package in the document) if the LaTeX installation provides the `cbfonts` (or `cbgreek-complete`) & `babel` packages, and the `LGR` encoded `txr` font (again no package loading is necessary) is part of the files of the `txfontsb` package. For `LibertinusSerif-TLF`, the files of the `libertinus-type1` package must be present.

[13] Daniel Benjamin Miller, *A blacker Type 1 version of Computer Modern, with multilingual support*, https://ctan.org/pkg/mlmodern. I have added to the preamble

```
\DeclareEncodingSubset{TS1}{mlmtt}{0}
```

to circumvent some LaTeX complaints about `\textasciigrave` (this is a widespread problem when not using default fonts) related to occurrences of the backtick character in verbatim displays.

[14] Bob Tennent, *Support for using Libertinus fonts with LaTeX/pdfLaTeX*, https://ctan.org/pkg/libertinus-type1.

[15] Michael Sharpe, *A Type 1 font and LaTeX support for Libertinus Math*, https://ctan.org/pkg/libertinust1math. Note that it is then highly advantageous to use `latex+dvipdfmx` and not `pdflatex` for reasons of PDF file size.

[16] this means "more then one."

[17] I thank in particular Tariq Perwez and Kevin Klement for their kind remarks (chronological order).

math mode in italic shape.[18] There is also an option `frenchmath` to make the uppercase letters nevertheless upright, because this is the way of traditional French mathematical typography.[19]

1.4.2 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`.

1.4.3 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 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 LaTeX math

[18] more precisely stated, the value of `\itdefault` is used.
[19] more precisely stated, the value of `\shapedefault` is used.

mode set-up to three distinct fonts whereas **mathastext** will pick (even subdued) the three of them in the same font,[20] and although it will make a reasonable choice of this font, this is not an exact re-installement 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.[21] [22] [23] 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.

1.4.4 The LGRgreek option

There is the issue of Greek letters. Sometimes the text font has Greek glyphs, in LGR encoding[24] (this should be mentioned in the documentation of the font package). Then option **LGRgreek** tells **mathastext** to pick up these Greek letters.

It is naturally possible to leave the responsability 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. The command **\MTcustomgreek** reenables the customization done by **mathastext**, if it was loaded with the **LGRgreek** or one of the other Greek related options.

> Release 1.3x has added important new aspects to the handling of Greek letters via the **LGRgreek** option. Make sure to read the subsubsection 1.7.3.

1.5 More miscellanea

This may repeat information already given.

1.5.1 Derivative, minus, asterisk

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

[20] 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 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)

[21] 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)

[22] The \imath and \jmath now obey the subdued regime. (1.3t)

[23] Also \hbar and the math accents (see **mathaccents** option) obey the subdued regime. (1.3u)

[24] For example 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.

- the derivative sign ′ is left to its default as the text font glyph ’ is not, as a rule, a satisfying alternative.[25]
- for the minus sign **mathastext** uses the endash character –, if available, and not the hyphen character -.[26]
- 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[27] (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 ∏ and ∑ in inline math which, like here: ∏∑, 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.

1.5.2 load mathastext always 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**.

1.5.3 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}
```

1.5.4 using mathastext with beamer

Starting with release 3.34 of beamer[28], **mathastext** is recognized as a “math font package”.

[25] 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'.

[26] see the **unicodeminus** option if using an OpenType font.

[27] the amount of lowering can be customized.

[28] Till Tantau, Joseph Wright, Vedran Miletić, *A LaTeX class for producing presentations and slides*, https://ctan.org/pkg/beamer.

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}
```

1.5.5 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.[29]

> 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`.

1.5.6 using **mathastext** with frenchmath

To use **mathastext** concurrently with the frenchmath package[30] of Antoine Missier:

[29] 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.

[30] Antoine Missier, *Typesetting mathematics according to French rules*, https://ctan.org/pkg/frenchmath.

- load frenchmath with its option `capsit`,
- and load **mathastext** second (after perhaps some relevant font packages) and with the option **frenchmath***.

Also, frenchmath must be at least at version `1.6` of `2022/10/16`.

Limited testing indicated that the combination (using the options as indicated above) works as expected but that some adjustments may be needed for some of the macros defined by frenchmath: we observed in particular that the `\paral` command (which produces //) may not work well if the / is picked up from the text font due to **mathastext** (alternative could be for most text fonts `\def\paral{\mathrel{//}}`), and that macros such as `\Oijk` may not work well due to the font lacking a dotless `j` (use then option **defaultimath**).

You can either use the Greek related options of frenchmath (since its version `2.0` of `2022/10/24`) or those of **mathastext**.

To handle properly intervals in French mathematical typesetting it is recommended to use the mathtools[31] package facilities in order to define suitable macros for example like this for open intervals:

```
\DeclarePairedDelimiterX\Ioo[2]{]}{[}{#1;#2}
```

Use then `$I = \Ioo{A}{B}$` type mark-up in your source, with variants `\Ioo*` and `\Ioo[\Big]` for example. We used the semi-colon, as is observed in some French mathematical texts, often educational, as they have to handle intervals with decimal numbers as extremities, and the comma is used as decimal separator. With the **frenchmath*** option, **mathastext** will let the semi-colon use `\mathbin` type spacing, matching observed practice in such mathematical texts.

Very advanced expert note: if using **\MTnonlettersobeymathxx**, the above macro `\Ioo` will raise errors except if used as `\Ioo*`. Replace `]` by `{]}` and `[` by `{[}` in the above to get an `\Ioo` which does not raise errors and can be used also with the optional argument for example `\Ioo[\Bigg]`. Unfortunately then the starred form `\Ioo*` will fail. This is known limitation and explains why **mathastext** does not execute **\MTnonlettersobeymathxx** per default.

1.6 Math versions

LaTeX has the concept of *math versions*[32], but most font packages do not define any such version beyond the default normal and bold (the package `unicode-math` for unicode engines does use this concept).

mathastext extends the concept of 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.

Most math symbols (sums, products, integrals, logical signs, etc...) are kept the same throughout the document though as it is not in **mathastext** power to modify them.

[31] Morten Høgholm, Lars Madsen and the LaTeX3 project, *Mathematical tools to use with amsmath*, https://ctan.org/pkg/mathtools. As explained elsewhere in this documentation always load **mathastext** after `mathtools`.

[32] `math versions` are discussed in the document `fntguide.pdf` from your TeX distribution.

For examples see the earlier subsection 1.3. The interface to define a **math version** includes the commands **\Mathastext** and **\MTDeclareVersion**.

Once such a **math versions** has been defined in the preamble, **\MTversion{name_of_version}**, or equivalently **\Mathastextversion{name_of_version}**, enacts the font switches when encountered in the body of the document. As is usual with LaTeX one can limit the scope to inside a group, or also switch back to the main set-up via **\Mathastextversion{normal}**.

When **\Mathastext** is used in the preamble, it records the current text font defaults (**\familydefault** et al. or what has been configured by **\MTfamily** and similar commands) and (except for the **normal** and **bold** versions if in **subdued** regime) sets up *both* the math font and the text font in the defined **mathastext**-math version to be this text font. It is still possible to switch on via **\MTversion** in the document body distinct fonts for text and math: an optional argument (the name of another **mathastext**-declared math version) to **\MTversion** is allowed (such as for example **\MTversion[newcent]{helvet}** for one of the examples of the subsection 1.3). It instructs to use as text font the font which was configured to be used in this second **mathastext**-math version.[33]

The native LaTeX command **\mathversion{**⟨*version_name*⟩**}** would change only the fonts for the math mode, not the text mode fonts. 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.* As explained above tt is possible to 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:

[33] When not using math versions at all (so not using subdued mode either) another way to achieve distinct fonts in text and math is naturally to modify the document text font *after* having loaded **mathastext** (or after last usage of \Mathastext without optional argument). Another way is to use \MTfamily, \MTencoding, \MTseries, \MTshape, \MTlettershape in the preamble before a call to \Mathastext which will configure math fonts without having modified the document text fonts. However if one does \MTversion{normal} in the document then the text font will be reset to what was recorded as math font by the \Mathastext call in the preamble (as said above, when not using subdued option).

- 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 1.8 and 1.9) 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 1.10) it resets the extra spaces after the symbols ∃, ∀ and before the derivative ′ to the values as decided by the user in the preamble on a *per version* basis,
- (see section 1.11) it re-issues the commands \MTmathoperatorsobeymathxx and \MTeasynonlettersobeymathxx 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 LaTeX 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.[34] But one can use instead \renewcommand{\rmdefault}{epigrafica},[35] 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}.

1.7 Greek letters

1.7.1 The Greek-related options

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:

[34] may typically give a 'too many math alphabets' error message.

[35] 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 arcanes of finding .fd files in one's TeX 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.

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 was substantially updated at `1.3x`, make sure to read the new documentation at subsubsection 1.7.3) this option is for fonts which additionally to Latin letters also provide Greek letters in `LGR` encoding. Here is a list from a 2012 standard TEX 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 \MTcustomgreek reactivates it.

1.7.2 Shape of Greek letters

Classic TEX 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 is 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 : says that Greek letters (both lowercase and uppercase) will be in 'it' shape. More precisely the expansion of \MTgreekitdefault is used. changed: (1.3x)

This was changed at 1.3x, formerly the value of \itdefault which was in force at the time of using \Mathastext (or at time of loading the package if no use is made of \Mathastext) was used.

upgreek : says that Greek letters (both lowercase and uppercase) will be in 'n' shape. More precisely the expansion of \MTgreekupdefault is used. changed: (1.3x)

This was changed at 1.3x, formerly the value of \updefault which was in force at the time of using \Mathastext (or at time of loading the package if no use is made of \Mathastext) was used. But since LATEX 2020-02-02 this caused many Font Warnings in the log because \updefault is now 'up', not 'n' as formerly.

itGreek, upGreek: same but they apply only to the uppercase Greek letters. Their effect is computed after having taken into account either itgreek or upgreek presence.

So, the default gives the classic TEX behavior when option italic was passed. Each call to \Mathastext (or \MathastextWillUse) macros (described in a later section) reinitializes the computation of the shapes.

The commands \MTitgreek, \MTupgreek, \MTitGreek and \MTupGreek were added at 1.15c, they act like the options with the analogous names, as if these options were activated only at time of use of these commands in the preamble, prior to some \Mathastext, or \Mathastext[⟨*math_version*⟩], or \MTDeclareVersion.

> These commands have some effect only if one of the LGRgreek, LGRgreeks, selfGreek or selfGreeks options was passed to the package.
>
> Once anyone of these commands has been made use of, changes in the shape configuration of the Latin letters for new math versions (or prior to using \Mathastext to redefine the default configuration) via \MTlettershape, or to the shape of letters of operator names via \MTshape (or via the arguments of \MTDeclareVersion), will stop being kept in sync with the shape of the Greek letters. The shape of the Greek letters will respond only to the way mathastext-math versions (or default behaviour if using \Mathastext in the preamble) are subsequently re-configured via usage of the \MTitgreek, \MTupgreek, \MTitGreek and \MTupGreek commands in the preamble.

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 \MTgreekfont{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...

1.7.3 New with 1.3x: alphabets \mathgreekup and \mathgreekit, control sequences to access directly upright or italic Greek letters

Some changes were made at 1.3x to enhance the LGRgreek (and LGRgreeks) options with new features. Everything which will be explained here applies only to these two options.

First of all the package now makes available control sequences to access either the upright or italic shape of the Greek letters. Which shape is meant by 'upright' or 'italic' is configured via defining \MTgreekupdefault and \MTgreekitdefault respectively. Their default definitions are to expand to 'n' and 'it' respectively.

new: See the Table 1 and Table 2 for illustrations (using here the Libertinus Serif font). (1.3x)

\Alphaup A	\Xiup Ξ	\alphaup α	\xiup ξ
\Betaup B	\Omicronup O	\betaup β	\omicronup o
\Gammaup Γ	\Piup Π	\gammaup ɣ	\piup π
\Deltaup Δ	\Rhoup P	\deltaup δ	\rhoup ρ
\Epsilonup E	\Sigmaup Σ	\epsilonup ε	\sigmaup σ
\Zetaup Z	\Tauup T	\zetaup ζ	\tauup τ
\Etaup H	\Upsilonup Y	\etaup η	\upsilonup υ
\Thetaup Θ	\Phiup Φ	\thetaup θ	\phiup ϕ
\Iotaup I	\Chiup X	\iotaup ι	\chiup χ
\Kappaup K	\Psiup Ψ	\kappaup κ	\psiup ψ
\Lambdaup Λ	\Omegaup Ω	\lambdaup λ	\omegaup ω
\Muup M	\Digammaup F	\muup μ	\digammaup ϝ
\Nuup N		\nuup ν	\varsigmaup ς

Table 1: Greek letters via 'up' control sequences (math mode only)

The regular control sequences without '**up**' or '**it**' postfix will map to either one of the two versions according to how the shapes were configured, i.e. in almost all cases via usage of either the **itgreek**, **upgreek**, etc... options or **\MTitgreek** et al. commands. This is on a per **mathastext**-enriched math version basis, depending only on how the options or commands were used in the preamble.

new: Furthermore two math alphabets are provided (1.3x)

\mathgreekup
\mathgreekit

which can be used to map a letter to the corresponding Greek fonts. For example (using here the semi-bold LGR encoded **LibertinusSerif-TLF**, which was stored as a **mathastext**-enriched math version with name **libertinussemibold**):

```
$\mathgreekup{a}=\mathgreekup{\alpha}=\mathgreekup{\alphait}=\alphaup$
```
$\mathgreekup{a}=\mathgreekup{\alpha}=\mathgreekup{\alphait}=\alphaup$

```
$\mathgreekup{G}=\mathgreekup{\Gamma}=\mathgreekup{\Gammait}=\Gammaup$
```
$\mathgreekup{G}=\mathgreekup{\Gamma}=\mathgreekup{\Gammait}=\Gammaup$

```
$\mathgreekit{z}=\mathgreekit{\zeta}=\mathgreekit{\zetaup}=\zetait$
```
$\mathgreekit{z}=\mathgreekit{\zeta}=\mathgreekit{\zetaup}=\zetait$

```
$\mathgreekit{W}=\mathgreekit{\Omega}=\mathgreekit{\Omegaup}=\Omegait$
```
$\mathgreekit{W}=\mathgreekit{\Omega}=\mathgreekit{\Omegaup}=\Omegait$

changed! Some refactoring[36] was required to achieve this at **1.3x** and it is not 100% back- (1.3x)

[36] Technically, formerly two symbol fonts were declared, one for the lowercase Greek letters and one for the uppercase Greek letters; now those are dropped and replaced by two symbol fonts, one for 'italic' Greek letters, the other for 'upright' Greek letters.

\Alphait A	\Xiit Ξ	\alphait α	\xiit ξ
\Betait B	\Omicronit O	\betait β	\omicronit o
\Gammait Γ	\Piit Π	\gammait γ	\piit π
\Deltait Δ	\Rhoit P	\deltait δ	\rhoit ρ
\Epsilonit E	\Sigmait Σ	\epsilonit ε	\sigmait σ
\Zetait Z	\Tauit T	\zetait ζ	\tauit τ
\Etait H	\Upsilonit Y	\etait η	\upsilonit υ
\Thetait Θ	\Phiit Φ	\thetait θ	\phiit ϕ
\Iotait I	\Chiit X	\iotait ι	\chiit χ
\Kappait K	\Psiit Ψ	\kappait κ	\psiit ψ
\Lambdait Λ	\Omegait Ω	\lambdait λ	\omegait ω
\Muit M	\Digammait F	\muit μ	\digammait $\digamma$
\Nuit N		\nuit ν	\varsigmait ς

Table 2: Greek letters via 'it' control sequences (math mode only)

wards compatible: if none of the `itgreek` etc... things was used, the Greek letters formerly would follow the shape of Latin letters (for lowercase Greek) and of operator names (for uppercase Greek). Now, some check is made for each of these two shapes whether it is '`it`' or '`sl`' and then the 'italic' shape, i.e. `\MTgreekitdefault` which by default is '`it`' (without the quotes) is used, else the 'upright' shape, i.e. `\MTgreekupdefault` which by default expands to '`n`' (without the quotes) is used. Naturally these checks are done on a per `mathastext`-math version basis, if multiple math versions are used.

So for example those who used some adventurous '`sc`' for the main shape (the one used per default for operator names) and used the option `LGRgreek` but none of the `itgreek` et al. options, and none of the `\MTitgreek` et al. commands, now will need to adjust `\MTgreekupdefault` to expand to '`sc`' prior to some `\Mathastext` or `\Mathastext`[⟨*version_name*⟩] or `\MTDeclareVersion` in the preamble depending on context.

It is hoped most documents, even those using multiple math versions, which made use of the `LGRgreek` (or `LGRgreeks`) option will simply produce unmodified output. Please report to the author unexpected results not fitting the above attempted description of the only partial backwards compatibility.

1.8 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}%
```

Here is what `$wxtytz^{wxtytz}=BAC^{BAC}$` 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 TEX group or LATEX 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.

1.9 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 TEX 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[37] for the letter f in the math italic font to the one from the text italic font: $\boxed{f}$ vs. $\boxed{\textit{f}}$.

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 `$f(x)$` is wider with the standard math italic $\boxed{f(x)}$ (`21.31474pt`) than it is with the text italic font used in math:[38] $\boxed{f(x)}$ (`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?

[37] let's be honest, we are lying here about what exactly the first of these is bounding; this is explained later!

[38] we used simply `$\mathit{f(x)}$`.

The explanation is that TEX 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 `$f$` without us having to ask anything. Its value is `1.17865pt` for the math italic *f* and `1.8919pt` for the text italic *f*.[39] With the italic corrections included our bounding boxes are indeed more alike: $\boxed{f}$ vs $\boxed{f}$.

Without the italic corrections[40] it is $\boxed{f}$ vs $\boxed{f}$. 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:

abcdefghijklmnopqrstuvwxyz	`text italic in text`
abcdefghijklmnopqrstuvwxyz	`text italic in math`
$abcdefghijklmnopqrstuvwxyz$	`math italic in math`
$abcdefghijklmnopqrstuvwxyz$	`math italic in text`

Where are our italic corrections gone? the last line was done with `\use-font{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:

$abcdefghijklmnopqrstuvwxyz$	`text italic in math`
$abcdefghijklmnopqrstuvwxyz$	`math italic in math`

We saw that the italic correction was taken into acount 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 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: $\boxed{f^j}$ vs. $\boxed{f^j}$. 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. f_i. Printing them one on another gives 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: f_i^j,

[39] these values are for the Latin Modern fonts of course.

[40] here we give correctly the bounding box for the math italic *f*... without its italic correction!

or, going back now to the standard math italics f_i^j. In the next paragraphs we use 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 f_i^i. Our overlapping game with `\rlap{$f_i^i$}${f\/}_i^i$` gives $f_{\!i}^{\,i}$. We discover that the effect of the explicit italic correction has mainly been to translate the subscript horizontally to be positioned exactly below the superscript![41] 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 TEX 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 TEX 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 TEX has been told to use it. Let's try Latin Modern Upright for letters in math: `$f_i^i$` now gives[42] $\mathrm{f_i^i}$. We see the italic correction in action for the positioning of the superscript! Compare with `$\mathrm{\hbox{f}_i^i}$`: $\mathrm{\hbox{f}_i^i}$. Overlapping with `\rlap{$\mathrm{f_i^i}$}$\mathrm{\hbox{f}_i^i}$` gives $\mathrm{f_{\!i}^{\,i}}$ 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 `$\mathrm{{f\/}_i^i}$`: this gives $\mathrm{{f\/}_i^i}$ 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, `\rlap{$\mathrm{f_i^i}$}$\mathrm{{f\/}_i^i}$` gives $\mathrm{f_{\!i}^{\,i}}$.

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 `$\mathrm{ff}$`, `$\mathit{ff}$`, `$\mathbf{ff}$`, `$\mathsf{ff}$` all give ligatures ff, *ff*, **ff**, and ff and we would like to preserve this behavior).

[41] there are also some tiny vertical displacements of the sub- and superscripts.

[42] we just use `$\mathrm{f_i^i}$`.

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.[43]

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 TEX font set-up in math.[44]

The feature-implementing commands `\MTicinmath`, `\MTnoicinmath`, `\MTicalsoinmathxx` are described in section 2.2.1.

Note: *from brief testing on 2012/12/28, XeTEX seems not to obey in math mode italic corrections for OpenType fonts. Hence the TEX 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 XeTEX engine. On the other hand LuaLATEX 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 TEX 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 pdfLATEX. All three outputs are different on my TEX installation. XeTEX does not have the italic corrections. LuaLATEX does, but only for the italic font. pdfLATEX has them for both the italic and the upright font.*[45]

1.10 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

[43] the situation is rather ironical! by the way, the warnings in section 1.11 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.

[44] Formerly, italic corrections were added to the `\mathnormal` arguments. (1.3i)

[45] 2016/11/04: the situation hasn't changed, at least on current TL2016.
2022/10/29: no change with current TL2022.

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` for the skip after $\forall$, `1mu` for the skip after $\exists$, and `0.5mu` for the skip before the prime. The examples above become $\forall$B, $\exists$N and f$'$.[46]

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 $'$.[47]

1.11 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 TEX, 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 `amsmath` `\DeclareMathOperator` or equivalent) operator names obey the math alphabet commands,[48]

[46] the derivative glyph from the `txfonts` math symbols adapts itself better to an upright letter, no skip seems to be needed then.

[47] Formerly, skips of zero widths were inserted. (1.3j)

[48] contrarily to the next feature, this one is not likely to create incompatibilities with other packages, so it is activated by default.

2. and, *optionally*, all non alphabetical characters[49] treated by **mathastext**, *i.e.*, if not disabled by options, ! ? , : ; + − = ( ) [ ] < > { }, the asterisk ∗, and . / | \ # $ % &[50] will also obey the math alphabet commands (when not used as delimiters). The important thing is that the spaces added by TEX before and after are not modified.

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

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

with the traditional default behavior:

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

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 `$R^{*}$`. The remaining 'difficult' cases create similar constraints, which will be commented more upon next. The commands[51] for deactivation are:

`\MTmathoperatorsdonotobeymathxx`,
`\MTeasynonlettersdonotobeymathxx`,
`\MTnonlettersdonotobeymathxx`,

and those for activation:

`\MTmathoperatorsobeymathxx` regards operator names and is executed by default,

`\MTeasynonlettersobeymathxx` is done by default and applies to

$ % & . / | \

and also to ∗ under package option **asterisk**,

`\MTnonlettersobeymathxx` is *not* done by default (see explanations why in the framed box next) and regards

[49] of course some of them are input preceded by a backslash, and the backslash itself is input as `\backslash`.

[50] # $ % & 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 TEX around them, and the procedure is then activated by default since `1.2` for these characters as they are 'easy non-letters'. But for `\mid` and `\setminus` which are | and \ with special spacing (of type `\mathrel` and `\mathbin` resp.) the procedure has some constraints explained in the framed box on next page and the activation requires `\MTnonlettersobeymathxx`.

[51] these commands are to be used outside of math mode. Their scope is limited to the current LATEX 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.

$$!\,?\,,:;+-=()\,[]<>$$

and also `\mid` and `\setminus` but applies to the braces { } only if `\MTexplicitbracesobeymathxx` is also used.

> **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 TEX 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).
>
> 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}, $\{\mathbf{a, a > b}\}$, {a, a > b}, or even $\{\boldsymbol{a, a > b}\}$.[52][53]

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 $\langle b\rangle$.) Notice that this differs from standard LaTeX for which `$\left< x\right>$` gives $\langle x\rangle$. As it is perhaps a bit strange to have $<x>$ next to $\langle X\rangle$ 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

[52] this last example uses the `\mathnormalbold` additional alphabet defined by `mathastext`.

[53] 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`.

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 TEX, and the way **mathastext** handles these things. Examples: `\mathbf{<a,b>}` gives $\mathbf{<a,b>}$ (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 $\langle\mathbf{a,b}\rangle$ (brackets used with `\left/\right` do not obey the math alphabets), `\mathbf{\mathopen{<}a,b \mathclose{>}}` gives $\mathbf{<a,b>}$ (no `\left/\right`, brackets do obey the math alphabets).

For comparison, the LATEX standard behavior for

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

is $\mathbf{<a,b>}$ (neither brackets nor the comma do respond).

1.12 Unicode engines

mathastext is minimally Unicode aware since `1.12` and can be used with XETEX or 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.

However **mathastext** applies only to (a subset of) the `32-127` ascii range, and optionally to Greek letters, but for the latter only if provided via "TEX fonts" such as Euler, Symbol or LGR-encoded fonts. It does not know how to use a given Unicode font simultaneously for Latin and Greek letters.

Thus, first consider much better alternatives:

- Since 2018, the package **mathfont**[54] adapts Unicode text fonts to usage in math mode. It works with both XETEX and LuaTEX.
- For XETEX only, **mathspec**[55] also allows usage of arbitrary text fonts in mathematics.
- and of course **unicode-math**[56] is the standard package for using OpenType fonts which are equipped with the needed extra support being used in TEX math mode.

If using any one of the above you probably don't need, don't want, and should not use **mathastext**.

Let me insist that **mathastext** has not been tested in any systematic manner under the Unicode engines; and that it is expected to be most definitely incompat-

[54] Conrad Kosowsky, *Use TrueType and OpenType fonts in math mode* https://ctan.org/pkg/mathfont.

[55] Andrew Gilbert Moschou, *Specify arbitrary fonts for mathematics in XETEX* https://ctan.org/pkg/mathspec.

[56] Will Robertson, et al., *Unicode mathematics with support for XeTeX and LuaTeX* https://ctan.org/pkg/unicode-math.

ible with **unicode-math**, although your mileage may vary and some features may appear to work.

When using **mathastext** with either XeTeX or LuaTeX it is recommended to use the **fontspec** package (see remark below on **\encodingdefault**). Furthermore, if using **fontspec** it is *necessary* to load it 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 **lualatex** engine, it is recommended to also load the package **lualatex-math**.

I already mentioned in the section 1.9 the fact that the italic corrections were not available for OpenType fonts under the XeTeX engine and only partially available for the LuaTeX engine, with the result that the spacings in math mode when using for the letters an upright text font will be less satisfying than with the standard PDFTeX engine (the OpenType fonts not being usable with the latter engine, this is not a criterion of choice anyhow).

To define math versions when using unicode fonts, use **fontspec**'s **\setmainfont** before the **\Mathastext**[⟨*version*⟩] command, or simply before loading **mathastext** for the default math versions.

It is possible to mix usage of Unicode fonts and classical TeX fonts. All used 8bits font encoding must have been passed as options to the **fontenc** package.

1.12.1 The unicodeminus option

For legacy reason, **mathastext** uses by default the **EN DASH U+2013** for the minus sign in math mode, if the font is determined to be a "Unicode" font.

There is now the **unicodeminus** to use rather **MINUS SIGN U+2212**.[57] Check **its documentation** on page 49. (1.3q)

[57] Thanks to Tobias Brink who asked for this feature.

1.12.2 Two examples

I include here two examples which compiled successfully with XeTeX and LuaLaTeX, the first one on a Linux machine, the second one on a Mac OS X machine.[58]

```
\documentclass{article}
\usepackage[hscale=0.8]{geometry}
\usepackage{multicol}
\usepackage[no-math]{fontspec}
\usepackage{lmodern}
\usepackage[subdued,italic]{mathastext}
\setmainfont[Color=999999]{Verdana}      \Mathastext[Verdana]
\setmainfont[Color=0000FF]{Arial}        \Mathastext[Arial]
\setmainfont[Color=00FF00]{DejaVu Serif} \Mathastext[DejaVu]
\MTDeclareVersion{times}{T1}{ptm}{m}{n}
\setmainfont[Color=FF0000]{Andale Mono}  \Mathastext[Andale]
\begin{document}
\newcommand\TEST[1]{\MTversion{#1}%
\begin{multicols}{2}
\hbox to\columnwidth{\hbox to\columnwidth{\hfil
                $abcdefghijklmnopqrstuvwxyz$\hfil}\kern-2.5em{#1}}
   \centerline{ $ABCDEFGHIJKLMNOPQRSTUVWXYZ$ }
   \centerline{ $0123456789$ }
   \centerline{ $!\,?\,*\,,\,.\,:\,;\,+\,-\,=\,(\,)\,[\,]\,/\,\#\,%
   \$\,\%\,\&\,<\,>\,|\,\{\,\}\,\backslash$ }
\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}
```

[58] A `tex mathastext.dtx` (in a temporary repertory) on a copy of `kpsewhich mathastext.dtx` will extract extended versions of these examples as test files.

```
\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}
```

1.13 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**, **defaulttt**, 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[59] 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

[59] italic correction insertion for the latin letters, receptivity to the math alphabet action for the other characters.

inactive.[60]

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.[61] 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, 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 1.11, 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

[60] only the characters ; , : ! ? + − = < > ( ) [ ] * mentioned in section 1.11 as 'difficult non letters' (and the right quote ') and the latin letters are concerned here; it seems highly unprobable that a latin letter $\in \{a\text{–}z, A\text{–}Z\}$ 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 ...

[61] This seems to still be the case with Babel `3.9f` and frenchb.ldf `2.6e`, as tested on Sep. 2, 2013. Again tested with up-to-date TL2015 Jan. 15, 2016 with same result.

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 commands

2.1 Commands for regular usage

2.1.1 Preamble-only commands

These commands mainly facilitate the definition of math versions, in a **mathastext** 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.[62] 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.[63]
  - **inheritance:** starting with version `1.3c` a second optional argument `[`⟨*other_version*⟩`]` will transfer its set-up for things not affected by **mathastext** 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 (1.3c)

[62] `\Mathastext` updates also the font and shapes for the Greek letters (`LGRgreek` option), and the skips to be inserted after the symbols ∀ and ∃, see *infra*.

[63] 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.

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:

\MTversion{newcent}: $abcde \oint \bigvee \biguplus \bigotimes \bigoplus$

\MTversion{boldnewcent}: $\boldsymbol{abcde} \oint \bigvee \biguplus \bigotimes \bigoplus$

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[64] \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:

  ```
  \MTDeclareVersion[sc]{palatino}{T1}{ppl}{b}{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 be in caps and small caps (and bold).[65] When the initial optional argument is absent, and **mathastext** was loaded with the **italic** option, then the default

[64] these commands exist also with long names: \Mathastextencoding, etc... The same applies to the other commands mentioned in this section.

[65] I do not especially recommend to use this in real life!

letter shape will be `it`,[66] 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`: these commands are active in case the `LGRgreek` option was used; they act as the options of the similar names `itgreek`, `upgreek`, `itGreek`, `upGreek`, but only for the Greek letters in the versions yet to be defined.

- `\MTgreekfont{`⟨*fontfamily*⟩`}`: a command with a mandatory argument which specifies the font family for Greek letters in all `mathastext` math versions declared afterwards via `\Mathastext` or `\MTDeclareVersion`. Only effective if `LGRgreek` option was passed to the package.

2.1.2 Commands for body or math

- `\MTversion[`⟨*nametext*⟩`]{`⟨*namemath*⟩`}`, `\MTversion*{`⟨*namemath*⟩`}`, also known as `\Mathastextversion` (and as `\MTVersion`, and `\mathastextversion`):
  - 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 1.6 for a description of the math set-up, which summarizes what is done additionally to only using LaTeX's `\mathversion`). (1.3c)

[66] 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.

`\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 1.9). Under the `frenchmath` option the package checks separately the letter shape for lowercase and uppercase.

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

- `\hbar`: this macro is by default redefined (in a way compatible with the `italic` option) combining the `h` letter and the ¯ 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 LaTeX way.[67] [68] (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` to use the mathastextified font. The underlying internal LaTeX structures related to the original commands are not overwritten, so the original commands can be saved under other names before `\usepackage{mathastext}`, to be used in case of necessity (this is what option `subdued` does.)

- `\mathnormalbold`: a bold version of `\mathnormal`. Differs from `\mathbf` when the `italic` option has been used, or when use has been made of `\MTlettershape` to specify a shape for letters distinct from the one for digits and operator names, or similarly when the math version has been declared via `\MTDeclareVersion` with its optional parameter for shape of letters.

new: - `\mathgreekup`: math alphabet, only available under `LGRgreek` (or `LGRgreeks`) option (and if with `subdued` only in the non-`normal` and non-`bold` `mathastext`-enriched math versions) which gives access to 'upright' Greek letters (picked up from a font available in `LGR`-encoding). The actual shape is configurable via re-defining `\MTgreekupdefault`. (1.3x)

[67] 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)

[68] The `\hbar` redefinition is canceled in normal and bold math versions under the `subdued` option. (1.3u)

new: • `\mathgreekit`: math alphabet, only available under `LGRgreek` (or `LGRgreeks`) option (and if with `subdued` only in the non-`normal` and non-`bold` `mathastext`-enriched math versions) which gives access to 'italic' Greek letters (picked up from a font available in `LGR`-encoding). The actual shape is configurable via re-defining `\MTgreekitdefault`. (1.3x)

- `\inodot`, `\jnodot`: the corresponding glyphs in the `mathastext`-ified font for use in math mode. By default, `\imath` and `\jmath` are redefined to use them. Since `1.3t`, these macros obey the `subdued` regime. [69]

- `\MathEuler`, `\MathEulerBold`: math alphabets to access all the glyphs of the Euler font, if option `eulergreek` (or `eulerdigits` was passed to the package.

- `\MathPSymbol`: math alphabet to access the Symbol font.

- when one of the options `symbolgreek`, `eulergreek`, or `selfGreek` is passed to the package the capital Greek letters which look like their Latin counterparts acquire names: `\Digamma`, `\Alpha`, `\Beta`, `\Epsilon`, `\Zeta`, `\Eta`, `\Iota`, `\Kappa`, `\Mu`, `\Nu`, `\Omicron`, `\Rho`, `\Tau`, `\Chi` (no `\Digamma` for Symbol). Also an `\omicron` control sequence is provided.

- `LGR` Greek and 'var'-letters: only the `\varsigma` is available in this encoding, so using for example `\varphi` will load the previous default math font. It might thus be suitable when recompiling already written LaTeX sources to add to the preamble `\let\varphi=\phi`, `\let\varepsilon=\epsilon`, etc..., in case only the 'variant' form of the letter was used in the documents.

- Miscelleneous mathematical symbols from the postscript Symbol font are made available (or replaced) by option `symbolmisc`.[70] They are `\prod` $\prod$ `\sum` $\sum$ `\implies` $\Rightarrow$ `\impliedby` $\Leftarrow$ `\iff` $\Longleftrightarrow$ `\shortiff` $\Leftrightarrow$ `\to` $\to$ `\longto` $\longrightarrow$ `\mapsto` $\mapsto$ `\longmapsto` $\longmapsto$ `\aleph` $\aleph$ `\inftypsy` ∞ `\emptyset` $\emptyset$ `\surd` $\surd$ `\nabla` ∇ `\angle` $\angle$ `\forall` $\forall$ `\exists` $\exists$ `\neg` $\neg$ `\clubsuit` $\clubsuit$ `\diamondsuit` $\diamondsuit$ `\heartsuit` $\heartsuit$ `\spadesuit` $\spadesuit$ `\smallint` $\smallint$ `\wedge` $\wedge$ `\vee` $\vee$ `\cap` $\cap$ `\cup` $\cup$ `\bullet` $\bullet$ `\div` $\div$ `\otimes` $\otimes$ `\oplus` $\oplus$ `\pm` $\pm$ `\ast` $\ast$ `\times` $\times$ `\proptopsy` $\propto$ `\mid` $\mid$ `\leq` $\leq$ `\geq` $\geq$ `\approx` $\approx$ `\supset` $\supset$ `\subset` $\subset$ `\supseteq` $\supseteq$ `\subseteq` $\subseteq$ `\in` $\in$ `\sim` $\sim$ `\cong` $\cong$ `\perp` $\perp$ `\equiv` $\equiv$ `\notin` $\notin$ `\langle` $\langle$ `\rangle` $\rangle$. And a `\DotTriangle` $\therefore$ is made available by option `symbolre` (which overwrites `\Re` and `\Im`: $\Re, \Im$). The `\inftypsy` and `\proptopsy` have these names to leave up to the user the choice to replace (or no) the original (larger) `\infty` ∞ and `\propto` $\propto$.

[69] Formerly (i.e. since `1.12`) `mathastext` redefined the `\i` and `\j` as robust commands usable both in text and math mode and using the above macros in the latter. I have decided it wasn't such a good idea and there is from now on `1.3t` no such redefinition of `\i` and `\j`! (1.3t)

[70] option `asterisk` is also required to treat the `*`. Recall from subsection 1.11 that the asterisk in math mode (also when using the control sequence `\ast`) appears then to TeX to be a composite object.

Regarding the `\prod` and `\sum` commands: they will use the Symbol glyphs $\prod\sum$ 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`):

$$\prod\sum$$

The package provides `\prodpsy` and `\sumpsy`: if one really wants in all situations the Symbol glyphs, one can do `\let\prod\prodpsy` and `\let\sum\sumpsy`. 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.

2.2 Commands for expert usage

A few preliminary comments, mainly destined to advanced users aware of some TEX 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.

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 1.13 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**.

2.2.1 Expert commands usable everywhere

- `\MTsetmathskips{`⟨*a-z/A-Z*⟩`}{`⟨*muglue_before*⟩`}{`⟨*muglue_after*⟩`}`: 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 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 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 thoughout 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 ∃ math symbol. Indeed, upright letters (or digits for that matter) often appear to be positioned a bit too close to the quantifier: ∃B. The package default is to add a 1mu skip (this default is set to zero in the case of italic): ∃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.[71] In the case of the option italic, the default skip is set to zero.

- \MTnormalexists, \MTexistsdoesskip: 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 ∃ 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 ∀ (except with the option italic for which the default skip is set to zero). Compare ∀F (has the skip) with ∀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.[72] In the case of the option italic, the default skip is 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 ∀ takes into account the math glue as specified by \MTforallskip. The former is its opposite. (1.3j)

- \MTprimeskip{⟨*math glue*⟩}: 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.[73]

- \MTlowerast{⟨*dimen*⟩}: 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

[71] Formerly, it was set to 0mu. (1.3j)
[72] Formerly, it was set to 0mu. (1.3j)
[73] Formerly, it was set to 0mu. (1.3j)

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 1.11. 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)

2.2.2 Expert commands which are preamble-only

new: • `\MTgreekupdefault`: a command with no argument whose expansion specifies, under `LGRgreek` regime, the shape for the '`up`' Greek control sequences (and for the no-postfix Greek control sequences under `upgreek` option) in all `mathastext` math versions declared *afterwards* via `\Mathastext` or `\MTDeclareVersion`. The a priori default for this shape is '`n`' (without the quotes). See subsubsection 1.7.3. (1.3x)

This command can also be defined *prior* to loading the package. Indeed it is defined this way:

```
\providecommand*\MTgreekupdefault{n}
```

new: • `\MTgreekitdefault`: a command with no argument whose expansion specifies, under `LGRgreek` regime, the shape for the '`it`' Greek control sequences (and for the no-postfix Greek control sequences under `itgreek` option) in all `mathastext` math versions declared *afterwards* via `\Mathastext` or `\MTDeclareVersion`. The a priori default for this shape is '`it`' (without the quotes). See subsubsection 1.7.3. (1.3x)

This command can also be used *prior* to loading the package. Indeed it is defined this way:

```
\providecommand*\MTgreekitdefault{it}
```

2.2.3 Expert 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.[74] 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[75] to insert the extra skips as specified by `\MTsetmathskips` (see section 1.8), and also possibly the italic corrections when using upright fonts (see section 1.9).

- `\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.[76]

  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.

[74] Formerly, it was also executed from each `\Mathastext` in the preamble. (1.3j)
[75] the `mathcode`'s are only modified at the time of execution of `\everymath`, `\everydisplay`.
[76] Formerly, italic corrections were added to the (non-oblique) letters of `\mathnormal` arguments. (1.3i)

- \MTnormalasterisk, \MTactiveasterisk: the latter will use for * and \ast the text font asterisk, suitably lowered; the former tells mathastext to not modify the LaTeX 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 1.11. 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.

> 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*⟩}, (1.3j)

except under option **subdued** when switching to the *normal* or *bold* math versions. Its default meaning is:

```
\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 \MTeverymathoff 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 LuaLaTeX. 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 LuaTeX+**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 LuaLaTeX. (1.3o)

2.2.4 Expert commands usable only in math mode

- \MTfixmathfonts: this used to be an internal package macro but it is given a public name at **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 LuaLaTeX and only for such rare cases where it may be needed. (1.3p)

3 Package options

3.1 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).

3.2 Complete list of options

Some items are described succinctly as more developed descriptions were given earlier. They may sometimes simplify by omission and not consider all possible configurations, particularly those resulting from usage of the package commands in the preamble to configure math versions.

- 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 Latin letters (both lowercase and uppercase) use the italic shape (`\itdefault`) in math mode; if the package handles Greek letters, also lowercase (but not uppercase) Greek letters will use this a priori italic shape except if some other option such as `upgreek` was used.[77]

- `frenchmath`: it configures for lowercase Latin letters to use italic shape (`\itdefault`), and uppercase Latin letters to be in same shape as for digits and operator names (i.e. a priori `\shapedefault`). If the package handles Greek letters both lowercase[78] and uppercase Greek letters will use the same shape as operator names, except if some other option such as `itgreek` was used.[79]

new: (1.3x)
- `ncccomma`: it triggers the loading of the ncccomma package[80] and configures `mathastext` for compatibility (this is canceled if `nopunctuation` option is used, or `basic` as it implies it).

  The effect of the ncccomma package will apply to the entire document body, even to portions using the *normal* or *bold* math versions with `mathastext` having been loaded with the `subdued` option. Also, in case of usage of package `babel` with `french` option, the effect of ncccomma will also apply to those parts of the document using another language than French.[81]

new: (1.3x)
- `binarysemicolon`: sets (except if `nopunctuation` is used) the semi-colon to let TEX use spacing of binary type, not punctuation type, around the semi-colon (it is often used in French mathematical typesetting as separator in interval denotations, when the extremities are decimal numbers, as the comma is used as decimal separator).

  The effect applies to all math versions, even the *normal* and *bold* math versions with `mathastext` having been loaded with the `subdued` option.

new: (1.3x)
- `frenchmath*`: does all three of `frenchmath`, `ncccomma` and `binarysemicolon`.

- `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 (1.3q)

[77] Since `1.3x`, in presence of the `LGRgreek` option in addition to `italic`, the `\MTgreekitdefault` shape is then used for lowercase Greek letters and `\MTgreekupdefault` for uppercase.

[78] If under control of the package.

[79] Under `LGRgreek` and since `1.3x`, the `\MTgreekupdefault` is used for Greek letters if no other option such as `itgreek` was employed.

[80] Alexander I. ROZHENKO, *Use comma as decimal separator in mathematics*, https://ctan.org/pkg/ncccomma.

[81] There is a 'feature' of `babel-french` that the effect of package ncccomma is canceled if one switches from French to English; and switching back to French does not reenact it. For background on this issue see https://github.com/latex3/babel/issues/190.

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.

- 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 TEX 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.[82]
- 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 \DotTriangle command ($\therefore$).
- 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.

[82] 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.

- **eulergreek**, **eulerdigits**: to let Greek letters (digits) use the Euler font.
- **LGRgreek**: this configures the Greek letters in math mode to use the text font in LGR-encoding (it is up to user to ascertain that the font familty is indeed available in the LGR encoding). It also activates the command **\MTgreekfont** which can be used to set a specific (LGR-encoded) font family for Greek, possibly not related to the font family for Latin letters. But each use **\MTgreekfont** must be followed by a **\Mathastext** or **\Mathastext**[⟨*version_name*⟩] to be effective.
- **LGRgreeks**: each declared math version will be supposed to be with a font which is also available in LGR-encoding. Attention that macro **\MTgreekfont** becomes then inoperant.
- **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.

changed: These options now use **\MTgreekitdefault** and **\MTgreekupdefault** rather. (1.3x)

- **mathaccents**: use the text font also for the math accents. As in vanilla LaTeX, they are taken from the font for the digits and **\log**-like names. Obey the alphabet changing commands.
- **unimathaccents**: extends **mathaccents** to OpenType fonts. Gave bad results in my brief testing. (1.3u)
- **defaultbf**, **defaultit**, **defaultsf**, **defaulttt**: 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' LaTeX error.
- **defaulnormal**, **defaultrm**: do not identify the default **\mathnormal** (resp. **\mathrm**) with the newly created **\Mathnormal** (resp. **\Mathrm**) commands which use the mathastextified 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 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

4 Change log

1.3y [2022/11/04]
(the 1.3x had an annoying documentation bug, and had already been pushed to CTAN, hence the version increase to 1.3y)

* mathastext now requires the \expanded primitive (which is available with all major engines since TeXLive 2019).

* Revisit parts of the documentation (mainly the Examples, and the section on Greek letters) and shuffle the other parts to surely improve things. Mention the [mathfont](https://ctan.org/pkg/mathfont) and [frenchmath](https://ctan.org/pkg/frenchmath) packages.

* Add the ncccomma option which loads the [ncccomma](https://ctan.org/pkg/ncccomma) package to allow the comma as decimal separator.

* Add the binarysemicolon option to let the semi-colon be of type \mathbin, not \mathpunct.

* Add the frenchmath* option which does all three of frenchmath, ncccomma and binarysemicolon.

* Under the LGRgreek and LGRgreeks options only:
- make available upright and italic Greek letters in math mode via \alphaup, \alphait, ... control sequences, in addition to those not using such postfixed-names.
- add \mathgreekup and \mathgreekit math alphabets.
- add \MTgreekupdefault and \MTgreekitdefault. The former replaces \updefault which was used in some places and since LaTeX 2020-02-02 caused systematic Font Warnings about the substitution of up by n.

These new features required an extensive internal refactoring which is expected to not induce changes to most existing documents. But it may induce changes to those using some unusual configuration in the preamble, as made possible via the package macros; this can apply only to documents authored by those few people who actually read the documentation. For full details make sure to read the PDF documentation about this change.

* Fix "\Digamma under LGRgreek option uses the shape for lowercase not uppercase Greek".

* Fix some incongruities in log messages related to Greek letters and emitted during math version creation in the preamble.

1.3w [2019/11/16]

* LaTeX 2019-10-01 release (up to patch level 3 inclusive) together with amsmath conspired :-) to break mathastext, in connexion with math accents. This has been fixed upstream, but I am releasing nevertheless a hot fix to this https://github.com/latex3/latex2e/issues/216 issue (this is compatible with future LaTeX releases).

* Fix: the \hbar is originally a robust command but becomes a \mathchardef token if (e.g.) amsfonts is loaded and then with recent LaTeX \hbar<space> is made undefined and mathastext definition of it remained without effect. The \mathastext own \hbar is now defined \protected.

* Fix: option noendash (or symboldelimiters which implies it) caused (since 1.3u) a bug under Unicode engines when setting up the minus sign.

* Version names declared via the optional argument of \Mathastext or as first argument of \MTDeclareVersion must not be normal or bold. Enforce that! (this was marked as a bug to fix since 2012/10/24...)

1.3v [2019/09/19]

* LaTeX 2019-10-01 release has made more math macros robust. This applies in particular to the math accents and to the \hbar. This required for mathastext to adapt. Also \leftarrowfill and \rightarrowfill are now defined robust by the kernel, hence mathastext does the same. These changes are dropped if mathastext detects an older LaTeX format.

* These LaTeX kernel changes motivated an examination of some redefinitions done (optionally) by mathastext:
- The user math alphabet macros got redefined as expanding to some other (robust) math alphabet macros, but were not robust in the strict sense. This does cause some issues for moving arguments in the context of multiple math versions, hence it was a bug. The special behaviour of the math alphabet commands (they redefine themselves and other macros on first use) makes is somewhat

problematic for mathastext to keep them updated across math versions and at the same time strictly LaTeX2e robust. Thus mathastext now requires the e-TeX primitive \protected and uses it for the definitions of the user level math alphabet macros.

- There are a number of \mathchardef tokens which (under certain options and/or configuration via the package user interface), mathastext redefines as macros. These macros cause no issue in moving arguments (they are not "fragile"), still it is probably better if they expand only at the time of typesetting. To this effect they are now also \protected: \exists, \forall, \colon, \setminus, \mid, \prod, \sum, \imath, \jmath.

- The macro \vert (which expands to a \delimiter) is now defined robust by LaTeX. Its mathastext redefinition is a \protected one rather.

- The \{ and \} (which get redefined only under \MTexplicitbracesobeymathxx regime) are now strictly robust in the LaTeX2e sense (formerly they were \let to some robust macros, and this did not make them strictly LaTeX2e-robust entities).

* The various changes in mathastext described in the previous item apply independently of the LaTeX release version. The LaTeX format itself requires the e-TeX extensions since 2015.

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 \MTnonlettersobeymathxx 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 compatibility with fontspec was deficient.

* bugfix: very old (v1.2, 2012/12/20) bug causing low-level TeX error during package loading (with pdflatex) 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 amsmath 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 mathsastext.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 \MTexistsdoesskip, \MTforalldoesskip, \MTprimedoesskip, \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 \Mathastext.

* 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 \everymath 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, selfGreeks 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 nosmalldelims, \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 \usefonttheme{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/LGRgreeks).

* \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 mathastextification 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.

5 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 LaTeX2e 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!

Should I require `2005/12/01` LaTeX? (not sure about the month).

```
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage {mathastext}
  [2022/11/04 v1.3y Use the text font in math mode (JFB)]
```

LaTeX `2019-10-01` release has made robust math macros such as the math accents and `\hbar`.

```
\newif\ifmst@robust@obsessed@LaTeX@era
\@ifl@t@r\fmtversion{2019/10/01}{\mst@robust@obsessed@LaTeX@eratrue}{}
\edef\mst@robustifyingspace{\ifmst@robust@obsessed@LaTeX@era\space\fi}
```

Testing for XeTeX and LuaLaTeX.

`1.3g 2015/10/15`: update for the naming of primitives, the situation has evolved both on XeTeX side and on the LuaLaTeX side (LaTeX base `2015/10/01`): I was told "U" named math primitives were always available for LuaLaTeX. For XeTeX, the 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.

```
  \let\mst@Umathcharnumdef\Umathcharnumdef
  \let\mst@Umathcodenum   \Umathcodenum
  \let\mst@Umathcode      \Umathcode
  \let\mst@Umathchardef   \Umathchardef
  \let\mst@Umathaccent    \Umathaccent
\newif\ifmst@XeTeX
\ifx\XeTeXinterchartoks\@undefined
  \mst@XeTeXfalse
\else
  \mst@XeTeXtrue
  \ifx\mst@Umathcharnumdef\@undefined
    \let\mst@Umathcharnumdef\XeTeXmathcharnumdef
    \let\mst@Umathcodenum   \XeTeXmathcodenum
    \let\mst@Umathcode      \XeTeXmathcode
    \let\mst@Umathchardef   \XeTeXmathchardef
    \let\mst@Umathaccent    \XeTeXmathaccent
  \fi
\fi
\newif\ifmst@LuaTeX
\ifx\directlua\@undefined
  \mst@LuaTeXfalse
```

```
\else
  \mst@LuaTeXtrue
  \ifx\mst@Umathcharnumdef\@undefined
    \let\mst@Umathcharnumdef\luatexUmathcharnumdef
    \let\mst@Umathcodenum   \luatexUmathcodenum
    \let\mst@Umathcode      \luatexUmathcode
    \let\mst@Umathchardef   \luatexUmathchardef
    \let\mst@Umathaccent    \luatexUmathaccent
  \fi
\fi
\newif\ifmst@XeOrLua
\ifmst@LuaTeX\mst@XeOrLuatrue\fi
\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`...

```
\def\mst@oti{OT1}
\def\mst@eui{EU1}\def\mst@euii{EU2}\def\mst@tu{TU}
\def\mst@OneifUniEnc {%
    \ifx \mst@tmp@enc\mst@tu   1\else
    \ifx \mst@tmp@enc\mst@eui  1\else
    \ifx \mst@tmp@enc\mst@euii 1\else 0\fi\fi\fi }
\newif\ifmst@goahead
\newif\ifmst@abort
```

`\mst@enc` `\mst@fam` `\mst@ser` `\mst@opsh` `\mst@bold` `\mst@ltsh` Macros to store the font settings, each math version will store its own records.

```
  \def\mst@enc{\encodingdefault}
  \def\mst@fam{\familydefault}
  \def\mst@ser{\seriesdefault}
  \def\mst@opsh{\shapedefault}  %% will be default shape for operator names
  \def\mst@bold{\bfdefault}
  \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`.

```
  \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.

1.3x of 2022/11/03 adds `ncccomma`, `binarysemicolon` and `frenchmath*` options.

```
\newif\ifmst@italic
```

```
\newif\ifmst@frenchmath
\newif\ifmst@ncccomma
\newif\ifmst@binarysemicolon
    \DeclareOption{italic}{\mst@italictrue
        \def\mst@ltsh{\itdefault}}
    \DeclareOption{frenchmath}{\mst@frenchmathtrue\mst@italictrue
      \def\mst@ltsh{\itdefault}}
    \DeclareOption{ncccomma}{\mst@ncccommatrue}
    \DeclareOption{binarysemicolon}{\mst@binarysemicolontrue}
    \DeclareOption{frenchmath*}{\mst@frenchmathtrue\mst@italictrue
      \def\mst@ltsh{\itdefault}\mst@ncccommatrue\mst@binarysemicolontrue}
\newif\ifmst@endash\mst@endashtrue
    \DeclareOption{endash}{\mst@endashtrue}
    \DeclareOption{noendash}{\mst@endashfalse}
\newif\ifmst@emdash
    \DeclareOption{emdash}{\mst@emdashtrue\mst@endashfalse}
\newif\ifmst@alldelims
\edef\mst@tmp{\encodingdefault}\ifx\mst@oti\mst@tmp\else\mst@alldelimstrue\fi
    \DeclareOption{alldelims}{\mst@alldelimstrue}
    \DeclareOption{nolessnomore}{\mst@alldelimsfalse}
\newif\ifmst@nosmalldelims
    \DeclareOption{nosmalldelims}{\mst@nosmalldelimstrue}
\newif\ifmst@noplus
    \DeclareOption{noplus}{\mst@noplustrue}
\newif\ifmst@nominus
    \DeclareOption{nominus}{\mst@nominustrue}
\DeclareOption{noplusnominus}{\ExecuteOptions{noplus,nominus}}
\newif\ifmst@noparen
    \DeclareOption{noparenthesis}{\mst@noparentrue}
\newif\ifmst@nopunct
    \DeclareOption{nopunctuation}{\mst@nopuncttrue}
\newif\ifmst@noequal
    \DeclareOption{noequal}{\mst@noequaltrue}
\newif\ifmst@noexclam
    \DeclareOption{noexclam}{\mst@noexclamtrue}
\newif\ifmst@asterisk
    \DeclareOption{noasterisk}{\PackageWarningNoLine{mathastext}
        {option `noasterisk\string' is deprecated.^^J\space\space\space
         Check the documentation}}
    \DeclareOption{asterisk}{\mst@asterisktrue}
\newif\ifmst@nospecials
    \DeclareOption{nospecials}{\mst@nospecialstrue}
\newif\ifmst@basic % 1.3 to avoid unnecessary patch of amsmath \newmcodes@
    \DeclareOption{basic}{\mst@basictrue
    \ExecuteOptions{noparenthesis,nopunctuation,%
                    noplusnominus,noequal,noexclam,nospecials,nolessnomore}}
\newif\ifmst@nohbar
    \DeclareOption{nohbar}{\mst@nohbartrue}
\newif\ifmst@nodigits
```

```
    \DeclareOption{nodigits}{\mst@nodigitstrue}
\newif\ifmst@defaultimath
    \DeclareOption{defaultimath}{\mst@defaultimathtrue}
\newif\ifmst@mathaccents
    \DeclareOption{mathaccents}{\mst@mathaccentstrue}
\newif\ifmst@unimathaccents % 1.3u
    \DeclareOption{unimathaccents}{\mst@mathaccentstrue\mst@unimathaccentstrue}
\newif\ifmst@needsymbol
\newif\ifmst@symboldelimiters
    \DeclareOption{symboldelimiters}{\mst@needsymboltrue\mst@symboldelimiterstrue}
\newif\ifmst@symboldigits
    \DeclareOption{symboldigits}{\mst@needsymboltrue\mst@symboldigitstrue}
\newif\ifmst@symbolgreek
\newif\ifmst@customgreek %% new with 1.3d
    \DeclareOption{symbolgreek}{\mst@needsymboltrue\mst@symbolgreektrue
                                \mst@customgreektrue }
\newif\ifmst@symbolre
    \DeclareOption{symbolre}{\mst@needsymboltrue\mst@symbolretrue}
\newif\ifmst@symbolmisc
    \DeclareOption{symbolmisc}{\mst@needsymboltrue\mst@symbolmisctrue}
    \DeclareOption{symbol}{\ExecuteOptions{symbolgreek,symbolmisc,symbolre}}
    \DeclareOption{symbolmax}{\ExecuteOptions{symbol,symboldelimiters}}
\newif\ifmst@needeuler
\newif\ifmst@eulerdigits
    \DeclareOption{eulerdigits}{\mst@needeulertrue\mst@eulerdigitstrue}
\newif\ifmst@eulergreek
    \DeclareOption{eulergreek}{\mst@needeulertrue\mst@eulergreektrue
                               \mst@customgreektrue }
\newif\ifmst@selfGreek
    \DeclareOption{selfGreek}{\mst@selfGreektrue\mst@customgreektrue}
\newif\ifmst@selfGreeks
    \DeclareOption{selfGreeks}{\mst@selfGreekstrue\mst@selfGreektrue
                               \mst@customgreektrue }
\newif\ifmst@LGRgreek
    \DeclareOption{LGRgreek}{\mst@LGRgreektrue\mst@customgreektrue}
\newif\ifmst@LGRgreeks
    \DeclareOption{LGRgreeks}{\mst@LGRgreekstrue\mst@LGRgreektrue
                              \mst@customgreektrue}
\def\mst@greek@select{0}
\newif\ifmst@itgreek
\newif\ifmst@upgreek
    \DeclareOption{itgreek}{\mst@itgreektrue}
    \DeclareOption{upgreek}{\mst@upgreektrue}
    \DeclareOption{itGreek}{\def\mst@greek@select{1}}
    \DeclareOption{upGreek}{\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.

```
\newif\ifmst@defaultnormal
    \DeclareOption{defaultnormal}{\mst@defaultnormaltrue}
\newif\ifmst@defaultrm
    \DeclareOption{defaultrm}{\mst@defaultrmtrue}
\newif\ifmst@defaultbf
    \DeclareOption{defaultbf}{\mst@defaultbftrue}
\newif\ifmst@defaultit
    \DeclareOption{defaultit}{\mst@defaultittrue}
\newif\ifmst@defaultsf
    \DeclareOption{defaultsf}{\mst@defaultsftrue}
\newif\ifmst@defaulttt
    \DeclareOption{defaulttt}{\mst@defaulttttrue}
\newif\ifmst@nonormalbold
\DeclareOption{defaultalphabets}{\ExecuteOptions{defaultnormal,defaultrm,%
defaultbf,defaultit,defaultsf,defaulttt}\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.

```
\newif\ifmst@defaultsizes
    \DeclareOption{defaultmathsizes}{\mst@defaultsizestrue}
\newif\ifmst@twelve
    \DeclareOption{12pt}{\mst@twelvetrue}
\newif\ifmst@fouriervec
    \DeclareOption{fouriervec}{\mst@fouriervectrue}
```

`1.15`: the subdued option.

```
\newif\ifmst@subdued
    \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.

```
\def\mst@unicodeminus {2013}
\def\mst@checkoption #1unicodeminus#2\mst@#3\mst@@
   {\ifx\\#3\\\PackageWarningNoLine{mathastext}
                {Unknown option `\CurrentOption\string'}\else
    \ifx\\#2\\\def\mst@unicodeminus {2212}\else
    \expandafter\def\expandafter\mst@unicodeminus\expandafter{\@secondoftwo#2}%
    \fi\fi}
\DeclareOption*%
  {\expandafter\mst@checkoption\CurrentOption\mst@ unicodeminus\mst@\mst@@}

\ProcessOptions\relax
```

`t@DeclareMathAccent`

I somehow missed realizing LaTeX `2019-10-01` if used together with `amsmath` made repeated usage of `\DeclareMathAccent` trigger an error: https://github.com/latex3/latex2e/issues/216.

This broke usage of `\Mathastext` macro in preamble.

`1.3w` works around this via `\mst@DeclareMathAccent`. And other changes were made in `mathastext` code to cope with these complications around robustness.

```
\def\mst@DeclareMathAccent#1{\let#1\mst@undefined
  \expandafter
```

```
\let\csname\expandafter\@gobble\string#1\space\endcsname\mst@undefined
\DeclareMathAccent{#1}}
```

Helper macros to test math version names. User is not allowed to redefine via `\Mathastext` with optional argument or via `\MTDeclareVersion` the `normal` and `bold` math versions! Added at `1.3w`, about 7 years late.

```
\def\mst@normalversionname{normal}%
\def\mst@boldversionname{bold}%
```

`\exists` `\mst@exists@skip` `\forall` `\mst@forall@skip` `\MTnormalexists` `\MTexistsdoesskip` `\MTnormalforall` `\MTforalldoesskip`

`1.15e 2012/10/21`: math skip/glue *after* `\exists` and `\forall`, 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 ∃ and ∀ are done only at the end of the package as the `symbol` option will also want to redefine these math symbols.

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.

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

Earlier to `1.3j`, `\let\mst@exists@original\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 ∃ and ∀ is part of the things not included inside `\everymath/\everydisplay`.

`1.3v` The `mathastext`-defined `\exists` and `\forall` are created `\protected`. We feel this matches better with their default definition as `\mathchardef` tokens than dealing with LaTeX2e robust macros. Besides, the coding is simpler.

```
\newmuskip\mst@exists@muskip  %% v 1.15e
\newmuskip\mst@forall@muskip
\def\mst@exists@skip{1mu}
\def\mst@forall@skip{.6667mu}
\ifmst@italic\ifmst@frenchmath\else
    \def\mst@exists@skip{0mu}
    \def\mst@forall@skip{0mu}
    \def\mst@prime@skip {0mu}
\fi\fi
\protected\def\mst@exists{\mst@exists@original\mskip\mst@exists@muskip}
\protected\def\mst@forall{\mst@forall@original\mskip\mst@forall@muskip}
\AtBeginDocument{%
   \let\mst@exists@original\exists
   \let\mst@forall@original\forall
   \def\MTnormalexists   {\let\exists\mst@exists@original }%
   \def\MTexistsdoesskip {\let\exists\mst@exists }%
   \def\MTnormalforall   {\let\forall\mst@forall@original }%
   \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 ∀ and ∃.

```
    \ifmst@subdued
    \else
      \MTexistsdoesskip
      \MTforalldoesskip
    \fi
}%
\newcommand*\MTnormalexists   {\AtBeginDocument {\MTnormalexists   }}
\newcommand*\MTexistsdoesskip {\AtBeginDocument {\MTexistsdoesskip }}
\newcommand*\MTnormalforall   {\AtBeginDocument {\MTnormalforall   }}
\newcommand*\MTforalldoesskip {\AtBeginDocument {\MTforalldoesskip }}
```

\prime
\mst@prime@skip
\active@math@prime
\MTnormalprime
\MTprimedoesskip

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

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**.

```
\newmuskip\mst@prime@muskip   %% v 1.2
\def\mst@prime@skip{.5mu}
\ifmst@italic\ifmst@frenchmath\else\def\mst@prime@skip{0mu}\fi\fi
\def\mst@active@math@prime{\sp\bgroup\mskip\mst@prime@muskip\prim@s}
{\catcode`\'=12
\gdef\mst@@modifyprime{\mst@mathactivate'{}\mst@active@math@prime}}
\newcommand*\MTnormalprime   {\let\mst@modifyprime\@empty }
\newcommand*\MTprimedoesskip {\let\mst@modifyprime\mst@@modifyprime}
\ifmst@subdued
    \MTnormalprime
\else
    \MTprimedoesskip
\fi
\AtBeginDocument{%
  \everymath\expandafter
            {\the\everymath    \mst@modifyprime \MTnormalprime}%
```

```
  \everydisplay\expandafter
            {\the\everydisplay \mst@modifyprime \MTnormalprime}%
}
```

\MTexistsskip
\MTforallskip
\MTprimeskip

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, 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; \MTsetprimeskipto for example would have been a better choice.

```
\newcommand*\MTexistsskip[1]{\edef\mst@exists@skip{#1}%
    \mst@exists@muskip\mst@exists@skip\relax}
\newcommand*\MTforallskip[1]{\edef\mst@forall@skip{#1}%
    \mst@forall@muskip\mst@forall@skip\relax}
\newcommand*\MTprimeskip[1]{\edef\mst@prime@skip{#1}%
    \mst@prime@muskip\mst@prime@skip\relax}
\let\Mathastextexistsskip\MTexistsskip
\let\Mathastextforallskip\MTforallskip
\let\Mathastextprimeskip\MTprimeskip
\let\mathastextexistsskip\MTexistsskip
\let\mathastextforallskip\MTforallskip
\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 \every@math@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 LaTeX source files.

```
\ifmst@noparen\else
\AtBeginDocument{%
    \@ifundefined{resetMathstrut@}{% nothing to do, no amsmath
    }{% amsmath loaded, and possibly patched by things such as lualatex-math
    \let\mst@savedresetMathstrut@\resetMathstrut@
    \PackageInfo{mathastext}{current meaning of amsmath
      \string\resetMathstrut@\space saved}%
    \ifx\mst@the\the % means that \MTnonlettersobeymathxx was used in preamble
      \let\mst@the\@gobble\MTnonlettersobeymathxx
   \fi}}
\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.

Incidently, 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` `\mst@do@AZ` `\mst@addtodo@az` `\mst@addtodo@AZ` `\mst@the`

`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.

`\MTmathactiveletters`
`\MTmathstandardletters`

`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.

`\MTnonlettersobeymathxx`
`\MTnonlettersdonotobeymathxx`
`\resetMathstrut@`

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@savedresetMathstrut@`.

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 immediately 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.

```
\newtoks\mst@do@nonletters
\newtoks\mst@do@easynonletters
\newtoks\mst@do@az
\newtoks\mst@do@AZ
\let\mst@the\@gobble
\newcommand*\MTnonlettersdonotobeymathxx{%
    \ifx\mst@the\@gobble
    \else
      \@ifundefined{mst@savedresetMathstrut@}{}{%
```

```
        \PackageInfo{mathastext}{restoring (for this group or environment) amsmath \string\resetMathstrut@}%
      \let\resetMathstrut@\mst@savedresetMathstrut@}%
    \fi
    \let\mst@the\@gobble
}%
```

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

```
\def\mst@OnlyIfNotSubdued#1{%
    \ifmst@subdued
      \ifx\math@version\mst@normalversionname
      \else
        \ifx\math@version\mst@boldversionname
        \else
          #1%
        \fi
      \fi
    \else
      #1%
    \fi
}%
\def\mst@nonlettersobeymathxx{%
    \ifx\mst@the\the
    \else
      \@ifundefined{mst@savedresetMathstrut@}{}{%
        \ifmst@symboldelimiters
          \def\resetMathstrut@{%
           \setbox\z@\hbox{\the\textfont\symmtpsymbol\char40
                        \the\textfont\symmtoperatorfont\char40
                        \the\textfont\symoperators\char40}%
           \ht\Mathstrutbox@\ht\z@ \dp\Mathstrutbox@\dp\z@}%
        \else
          \def\resetMathstrut@{%
           \setbox\z@\hbox{\the\textfont\symmtoperatorfont\char40
                        \the\textfont\symoperators\char40}%
           \ht\Mathstrutbox@\ht\z@ \dp\Mathstrutbox@\dp\z@}%
        \fi
      \PackageInfo{mathastext}{\string\resetMathstrut@\space
      from amsmath replaced (for this group or environment)}}%
    \fi
    \let\mst@the\the
}%
\newcommand*\MTnonlettersobeymathxx
   {\mst@OnlyIfNotSubdued\mst@nonlettersobeymathxx}%
\newcommand*\MTeasynonlettersdonotobeymathxx{\let\mst@theeasy\@gobble}%
\def\mst@easynonlettersobeymathxx{\let\mst@theeasy\the}%
\newcommand*\MTeasynonlettersobeymathxx
   {\mst@OnlyIfNotSubdued\mst@easynonlettersobeymathxx}%
\MTeasynonlettersobeymathxx % no-op here if subdued mode
```

```
\def\mst@mathactiveletters{\let\mst@thef\the \let\mst@theF\the}%
\newcommand*\MTmathactiveletters
   {\mst@OnlyIfNotSubdued\mst@mathactiveletters}%
\MTmathactiveletters % no-op here if subdued mode
\def\mst@mathactiveLetters{\let\mst@theF\the}%
\newcommand*\MTmathactiveLetters
   {\mst@OnlyIfNotSubdued\mst@mathactiveLetters}%
\newcommand*\MTmathstandardletters{\let\mst@thef\@gobble \let\mst@theF\@gobble}%
```

\MTicinmath
\MTICinmath
\MTnoicinmath
\MTicalsoinmathxx

\MTnoicinmath can also be used from inside math mode.

\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\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.

```
\newcommand*\MTicinmath{%
    \MTmathactiveletters
    \def\mst@itcorr{\ifnum\fam=\m@ne\/\fi}%
    \let\mst@ITcorr\mst@itcorr}
\newcommand*\MTICinmath{%
    \MTmathactiveLetters
    \def\mst@ITcorr{\ifnum\fam=\m@ne\/\fi}}
\newcommand*\MTnoicinmath{\let\mst@itcorr\@empty\let\mst@ITcorr\@empty}
\newcommand*\MTnoICinmath{\let\mst@ITcorr\@empty}
\newcommand*\MTicalsoinmathxx{%
    \ifx\mst@itcorr\@empty\else\def\mst@itcorr{\/}\fi
    \ifx\mst@ITcorr\@empty\else\def\mst@ITcorr{\/}\fi}
```

\MTsetmathskips
\MTunsetmathskips

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`.

```
\newcommand*\MTsetmathskips[3]{%
    \@namedef{mst@before#1}{\ifnum\fam=\m@ne\mskip#2\relax\fi }%
    \@namedef{mst@after#1}{\ifnum\fam=\m@ne\mskip#3\relax\fi }%
}
\newcommand*\MTunsetmathskips[1]{%
    \@namedef{mst@before#1}{}%
    \@namedef{mst@after#1}{}%
}
```

`\mst@mathactivate`
`\mst@addtodo@nonletters`
`\mst@addtodo@easynonletters`
`\mst@addtodo@az`
`\mst@addtodo@AZ`

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).

```
\def\mst@magic@v #1#2#3#4#5{#1#3#4}
\def\mst@magic@vi #1#2#3#4#5#6{#1#2#4#5}
\def\mst@fork{\ifmmode\mst@magic@v\fi\@thirdofthree}
\def\mst@safefork{\ifmmode\if@safe@actives\else\mst@magic@vi\fi\fi\@thirdofthree}
\def\mst@do@activecase#1#2#3{% #1 is a category 11 or 12 character token
    \@ifundefined{active@char#1}{}{%
         \ifcat #1a\mathcode`#1=#2\else
         \ifx\relax #2\relax\mathcode`#1=`#1 \else\mathcode`#1=#3\fi\fi
    \expandafter\expandafter\expandafter\let\expandafter\expandafter
                    \csname mst@orig@user@active#1\endcsname
                    \csname user@active#1\endcsname
    \expandafter\expandafter\expandafter\let\expandafter\expandafter
                    \csname mst@orig@normal@char#1\endcsname
                    \csname normal@char#1\endcsname
    \ifcat #1a%
      \expandafter\edef\csname user@active#1\endcsname
                    {\noexpand\mst@fork {{#2\noexpand#3}}{}\expandafter
                     \noexpand\csname mst@orig@user@active#1\endcsname
                    }%
      \expandafter\edef\csname normal@char#1\endcsname
                    {\noexpand\mst@safefork {{#2\noexpand#3}}{}\expandafter
                     \noexpand\csname mst@orig@normal@char#1\endcsname
                    }%
    \else
      \expandafter\edef\csname user@active#1\endcsname
                    {\noexpand\mst@fork {#2}\noexpand#3\expandafter
                     \noexpand\csname mst@orig@user@active#1\endcsname
                    }%
```

```
      \expandafter\edef\csname normal@char#1\endcsname
                    {\noexpand\mst@safefork {#2}\noexpand#3\expandafter
                     \noexpand\csname mst@orig@normal@char#1\endcsname
                    }%
    \fi}}
\begingroup
  \catcode`\~=\active
  \def\x{\endgroup
    \def\mst@mathactivate##1##2##3{% ##1 guaranteed of cat 11 or 12
      \begingroup
      \lccode`~=`##1
      \lccode`##1=`##1
      \lowercase{\endgroup
          \ifnum\catcode`##1=\active
            \mst@do@activecase ##1{##2}##3%
            % careful as ##2 is empty in the asterisk and
            % prime case!
          \else
            \mathcode`##1="8000
            % version 1.3 adds the possibility of extra skips around letters,
            % (only if non catcode active at the time of use).
            \ifcat##1a\edef~{% extra braces for a^b for example
               {\expandafter\noexpand\csname mst@before##1\endcsname
                ##2\noexpand##3%
                \expandafter\noexpand\csname mst@after##1\endcsname}}%
            \else\def~{##2##3}\fi
          \fi}}}
\x
\def\mst@addtodo@nonletters#1#2#3{%
  % #1 will be of cat 11 or 12.
  % #2 is empty for asterisk and right quote
  \mst@do@nonletters\expandafter
      {\the\mst@do@nonletters \mst@mathactivate#1{#2}#3}%
}
\def\mst@addtodo@easynonletters#1#2{% #1 is a one char control sequence
  \mst@do@easynonletters\expandafter{\the\mst@do@easynonletters\mathcode`#1=#2}%
}
\def\mst@addtodo@az#1#2{%
  \mst@do@az\expandafter{\the\mst@do@az\mst@mathactivate#1#2\mst@itcorr}
}
\def\mst@addtodo@AZ#1#2{%
  \mst@do@AZ\expandafter{\the\mst@do@AZ\mst@mathactivate#1#2\mst@ITcorr}%
}
```

`\newmcodes@` `\mst@newmcodes@` `\MTresetnewmcodes` `\Tcustomizenewmcodes`

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 LuaLaTeX.

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 ε-TeX 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 LuaTeX, not with XeTeX.
- 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 `symmtoperatorfont` I am perhaps doing unnecessary efforts.
- I noticed that LuaLaTeX does not apply the "TeX Ligature" (bad name) regarding the right tick APOSTROPHE being transformed into RIGHT SINGLE QUOTATION MARK in math mode, but XeLaTeX does. From the point of view of `mathastext`, the behaviour of XeLaTeX is the coherent one. It appears that LuaLaTeX use in math mode of a text font does not obey the set features.I opened a ticket at https://github.com/wspr/fontspec/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 `\symmtoperatorfont` 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.

Since `1.3v` we require e-TEX extensions, so a test for `\numexpr` has been dropped here.

```
\ifmst@basic
\else
 \ifmst@XeOrLua
  \AtBeginDocument {%
  \ifx\newmcodes@\@undefined\else
  \edef\mst@newmcodes@{%
   \mst@Umathcode `\noexpand\' 0 \symmtoperatorfont 39\relax
   \ifmst@asterisk
    \mst@Umathcode `\noexpand\* 0 \symmtoperatorfont 42\relax
   \else\mathcode`\noexpand\* 42
   \fi
   \ifmst@nopunct\mathcode `\noexpand\."613A \mathcode `\noexpand\: "603A
   \else
    \mst@Umathcode `\noexpand\. 6 \symmtoperatorfont 46\relax
    \mst@Umathcode `\noexpand\: 6 \symmtoperatorfont 58\relax
   \fi
   \ifmst@nominus\mathcode`\noexpand\- 45
   \else
      \mst@Umathcode `\noexpand\- 0 \symmtoperatorfont 45\relax
   \fi
   \ifmst@noparen\mathcode `\noexpand\/  47
   \else
      \mst@Umathcode `\noexpand\/ 0 \symmtoperatorfont 47\relax
   \fi
  }%
  \let\mst@originalnewmcodes@\newmcodes@
  \fi
  }% end of AtBeginDocument
 \else
  \AtBeginDocument {%
  \ifx\newmcodes@\@undefined\else
  \edef\mst@newmcodes@{%
    \mathcode`\noexpand\' \the\numexpr\symmtoperatorfont*\@cclvi+39\relax
    \mathcode`\noexpand\*
      \the\numexpr\ifmst@asterisk\symmtoperatorfont*\@cclvi\fi+42\relax
    \ifmst@nopunct\mathcode `\noexpand\."613A \mathcode `\noexpand\: "603A
    \else
      \mathcode`\noexpand\. \the\numexpr\mst@varfam@dot-"1000\relax
      \mathcode`\noexpand\: \the\numexpr\mst@varfam@colon-"1000\relax
    \fi
    \mathcode`\noexpand\-
```

```
      \the\numexpr\unless\ifmst@nominus\symmtoperatorfont*\@cclvi\fi+45\relax
     \mathcode`\noexpand\/
      \the\numexpr\unless\ifmst@noparen\symmtoperatorfont*\@cclvi\fi+47\relax\relax
     }%
   \let\mst@originalnewmcodes@\newmcodes@
   \fi
   }% end of second AtBeginDocument
 \fi % mst@XeOrLua
\fi % mst@basic
\newcommand*\MTresetnewmcodes{\ifx\mst@originalnewmcodes@\undefined\else
                                \let\newmcodes@\mst@originalnewmcodes@\fi}
\newcommand*\MTcustomizenewmcodes{\ifx\mst@originalnewmcodes@\undefined\else
                                \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.

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

`\operator@font` We modify this LaTeX 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-obeymathxx` `\MTmathoperators-donot-obeymathxx` 1.2: rather than just replacing `\symoperators` by `\symmtoperatorfont` I add a modification which makes the declared operator names sensitive to the math alphabets... ouh le vilain!

```
\newcommand*{\MTmathoperatorsobeymathxx}
{\def\operator@font{\mathgroup\ifnum\fam=\m@ne\symmtoperatorfont\else\fam\fi}}
\newcommand*{\MTmathoperatorsdonotobeymathxx}
{\def\operator@font{\mathgroup\symmtoperatorfont}}
\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.

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

`\MTfixmathfonts` There is a long-standing issue https://github.com/lualatex/luaotfload/issues/204 on LuaLaTeX not applying OpenType features in math mode (this impacts `\url` macro too, as it uses math mode.) LuaTeX 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 dwelve at all with the details of LaTeX's handling of math fonts, of size changes, of math versions etc... perhaps in the future LaTeX will fix the issue upstream by modifying `\DeclareSymbolFont` under LuaLaTeX + `luaotfload` 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/luaotfload/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.

```
\begingroup
\catcode`N 12
\catcode`O 12
\catcode`D 12
\catcode`E 12
\lowercase{\gdef\mst@fixmathfonts@ #1=NODE;#2#3\relax #4\@empty #5}%
  {\ifx#2\empty\else\font\mst@mathfont=#1=base;#2#3\relax#5=\mst@mathfont\fi}
\lowercase{\gdef\MTfixmathfonts
{\expandafter\mst@fixmathfonts@
  \fontname\textfont\symmtoperatorfont\relax\relax=NODE;\empty\relax\@empty
   {\textfont\symmtoperatorfont}%
 \expandafter\mst@fixmathfonts@
  \fontname\scriptfont\symmtoperatorfont\relax\relax=NODE;\empty\relax\@empty
   {\scriptfont\symmtoperatorfont}%
 \expandafter\mst@fixmathfonts@
  \fontname\scriptscriptfont\symmtoperatorfont\relax\relax=NODE;\empty\relax\@empty
   {\scriptscriptfont\symmtoperatorfont}%
 \expandafter\mst@fixmathfonts@
  \fontname\textfont\symmtletterfont\relax\relax=NODE;\empty\relax\@empty
   {\textfont\symmtletterfont}%
 \expandafter\mst@fixmathfonts@
  \fontname\scriptfont\symmtletterfont\relax\relax=NODE;\empty\relax\@empty
   {\scriptfont\symmtletterfont}%
 \expandafter\mst@fixmathfonts@
  \fontname\scriptscriptfont\symmtletterfont\relax\relax=NODE;\empty\relax\@empty
   {\scriptscriptfont\symmtletterfont}%
  }%
}%
\endgroup
\ifmst@LuaTeX
  \everymath\expandafter{\the\everymath\mst@fixmathfonts}%
  \everydisplay\expandafter{\the\everydisplay\mst@fixmathfonts}%
\fi
\newcommand*\MTfixfonts{\let\mst@fixmathfonts\MTfixmathfonts}%
\newcommand*\MTdonotfixfonts{\let\mst@fixmathfonts\empty}%
\MTfixfonts
```

\Mathnormal
\Mathrm
\Mathbf
\Mathit
\Mathsf
\Mathtt
\mathnormalbold

We redefine the default normal, rm, bf, it, sf, and tt alphabets, but this will be done via `\renewcommand*{\mathrm}{\Mathrm}` etc... (not anymore, see comment below).

We follow the standard LaTeX behavior for `\mathbf`, which is to pick up the bold series of the roman font (digits and operator names).

We will access (if no option is passed for Greek) the `\omicron` via `\mathnormal`. But unfortunately 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`.

Actually math alphabet macros are created robust since LaTeX from 2005, so at `1.3v 2019/09/19` I decided to modify the old `mathastext` approach a bit. Indeed with the old approach a `\mathtt` in a moving argument translates ultimately into `\Mathtt` but if for example the new context where it gets expanded is a subdued normal math version, this does not give the same as `\mathtt` would have given there. This was a bug: imagine `\section{$\mathtt{X}$}` issued in a math version, but the TOC is done in subdued normal version; the output in TOC will often differ (fontsize being put aside) both from out it looked at the section title and from what direct usage of `\mathtt` in the TOC would have given. I have no strong preference between the two possibilities (to be as in section title, or to be as if `\mathtt` gets executed in TOC and obeys its local regime), but it is a bug if the result is still a third one. Thus I decided to follow LaTeX2e and that `\mathtt` had to remain `\mathtt` when moving.

But a math alphabet command such as `\Mathtt` redefines its unprotected meaning on first use as well as the one of the math version macro, hence a `\letrobustmacro\mathtt\Mathtt` of sorts is no good at all. I thus opted to not hack into the math LaTeX font support across math versions and to simply use `\protected\def` in place of obeying strictly LaTeX2e robustness (except of course in the subdued math versions as there the math alphabets acquire back their original robust meanings.)

```
\let\mst@alph@omicron\mathnormal
\@ifpackageloaded{fourier}{\ifsloped\else\let\mst@alph@omicron\mathrm\fi}{}
\DeclareSymbolFontAlphabet{\Mathnormal}{mtletterfont}
\DeclareSymbolFontAlphabet{\Mathrm}{mtoperatorfont}
\ifmst@nonormalbold\else
   \DeclareMathAlphabet{\mathnormalbold}{\mst@enc}{\mst@fam}{\mst@bold}{\mst@ltsh}
\fi
\ifmst@defaultbf\else
   \DeclareMathAlphabet{\Mathbf}{\mst@enc}{\mst@fam}{\mst@bold}{\mst@opsh}
\fi
\ifmst@defaultit\else
   \DeclareMathAlphabet{\Mathit}{\mst@enc}{\mst@fam}{\mst@ser}{\itdefault}
\fi
\ifmst@defaultsf\else
   \DeclareMathAlphabet{\Mathsf}{\mst@enc}{\sfdefault}{\mst@ser}{\mst@opsh}
\fi
\ifmst@defaultttt\else
   \DeclareMathAlphabet{\Mathtt}{\mst@enc}{\ttdefault}{\mst@ser}{\mst@opsh}
\fi
```

The `\mathxx` macros being LaTeX2e robust, or course the meanings here are known, and «original» macros are sort of superfluous but well it works.

```
\let\mst@original@normal\mathnormal
\let\mst@original@rm\mathrm
```

```
\let\mst@original@bf\mathbf
\let\mst@original@it\mathit
\let\mst@original@sf\mathsf
\let\mst@original@tt\mathtt
\def\mst@restorealphabets{% for subdued
    \let\mathnormal\mst@original@normal
    \let\mathrm\mst@original@rm
    \let\mathbf\mst@original@bf
    \let\mathit\mst@original@it
    \let\mathsf\mst@original@sf
    \let\mathtt\mst@original@tt}
\def\mst@setalphabets{%
    \ifmst@defaultnormal\else\protected\def\mathnormal{\Mathnormal}\fi
    \ifmst@defaultrm\else\protected\def\mathrm{\Mathrm}\fi
    \ifmst@defaultbf\else\protected\def\mathbf{\Mathbf}\fi
    \ifmst@defaultit\else\protected\def\mathit{\Mathit}\fi
    \ifmst@defaultsf\else\protected\def\mathsf{\Mathsf}\fi
    \ifmst@defaultmtt\else\protected\def\mathtt{\Mathtt}\fi}
\ifmst@subdued\else\mst@setalphabets\fi
```

LGRgreek
\MTgreekupdefault
\MTgreekitdefault
selfGreek

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.

Note that \mst@ltsh expands to \shapedefault or \itdefault at this location.

Note added 2022/11/02: using \MTitgreek etc... once implies that from then on, for subsequent mathastext-math versions, the shape of Greek letters will not be kept in sync with the shape and lettershape version parameters, but only react to the configuration decided by these commands (and italic/frenchmath options).

Note 2022/10/29: for some time \updefault was made into up by LaTeX (since 2020-02-02 now that I check this out). As a result this triggered Font Warnings in the log about the replacement of up by n.

1.3x refactors completely the handling of Greek letter shapes under the LGRgreek(s) options (and only under them). Under these options we don't use one font for lowercase Greek and anotherone for uppercase Greek (some above code comments have not been updated) but one math font mtgreekit for italic Greek and one math font mtgreekup for upright Greek. What 'italic' and 'upright' mean is decided by the expansion of \MTgreekitdefault and \MTgreekupdefault,

which give respectively `it` and `n` per default.

If no `itgreek` et al. options or `\MTitgreek` et al. commands have been used, we need to map `\mst@ltsh` (which was used for lowercase Greek, except under `frenchmath` option) and `\mst@opsh` to either 'italic' or 'upright'. This is done by testing if they hold 'it' or 'sl'. If yes we map to 'italic' by setting to false an 'up' Boolean, if not we leave the 'up' Boolean to true.

In order to maintain perfect identical code for non-`LGRgreek`, the `LGRgreek` related code is simply added to previously shared constructions. The `LGRgreek` behaviour will remain identical in most documents, but for example those who used some adventurous '`sc`' for the main shape (the one used per default for operator names) need to adjust `\MTgreekupdefault` to be '`sc`', for the math version being defined, or the default one if this is followed by usage of `\Mathastext`.

The new `LGRgreek`-specific commands `\MTgreekupdefault` and `\MTgreekitdefault` are the only ones in the package which can possibly be defined previously to loading it. (Perhaps some other macros could be also converted to being modifiable prior to loading `mathastext`, thus avoiding potential need to use `\Mathastext` at least once after loading the package; to be examined next time — which may be a long time in future!).

```
\providecommand*\MTgreekupdefault{n}
\providecommand*\MTgreekitdefault{it}
\newif\ifmst@lgr@lower@up
\newif\ifmst@lgr@upper@up
\def\mst@update@greeksh{
    \def\mst@lgr@lsh{\mst@ltsh}
    \def\mst@lgr@ush{\mst@opsh}
      \mst@lgr@lower@uptrue
      \expandafter\in@\expanded{{\mst@ltsh.}}{it.,sl.}%
      \ifin@\mst@lgr@lower@upfalse\fi
      \mst@lgr@upper@uptrue
      \expandafter\in@\expanded{{\mst@opsh.}}{it.,sl.}%
      \ifin@\mst@lgr@upper@upfalse\fi
    \ifmst@itgreek
      \def\mst@lgr@lsh{\MTgreekitdefault}
      \def\mst@lgr@ush{\MTgreekitdefault}
        \mst@lgr@lower@upfalse
        \mst@lgr@upper@upfalse
    \fi
    \ifmst@upgreek
      \def\mst@lgr@lsh{\MTgreekupdefault}
      \def\mst@lgr@ush{\MTgreekupdefault}
        \mst@lgr@lower@uptrue
        \mst@lgr@upper@uptrue
    \fi
    \ifmst@frenchmath
      \ifmst@itgreek\else
      \ifmst@upgreek\else
        \def\mst@lgr@lsh{\mst@opsh}
        \def\mst@lgr@ush{\mst@opsh}
          \mst@lgr@lower@uptrue
          \mst@lgr@upper@uptrue
      \fi\fi
    \fi
```

```
    \ifcase\mst@greek@select
        \or
          \def\mst@lgr@ush{\MTgreekitdefault}
            \mst@lgr@upper@upfalse
       \or
          \def\mst@lgr@ush{\MTgreekupdefault}
            \mst@lgr@upper@uptrue
    \fi
}
\mst@update@greeksh
```

mtgreekup
mtgreekit
\mathgreekup
\mathgreekit

The `1.3x` refactoring was done in order to be able to define `\alphaup`, etc ... control sequences (`\mathchar`'s), as well as the italic ones. Formerly two math fonts were created but to be used respectively with lowercase or uppercase Greek. Now we have two fonts indexed by their shape, and we take advantage to create two math alphabets mapping to the two defined symbol fonts `mtgreekup` and `mtgreekit`.

```
\ifmst@LGRgreek
    \DeclareFontEncoding{LGR}{}{}
    \DeclareSymbolFont{mtgreekup}{LGR}{\mst@fam}{\mst@ser}{\MTgreekupdefault}
    \DeclareSymbolFont{mtgreekit}{LGR}{\mst@fam}{\mst@ser}{\MTgreekitdefault}
    \DeclareSymbolFontAlphabet{\mathgreekup}{mtgreekup}
    \DeclareSymbolFontAlphabet{\mathgreekit}{mtgreekit}
\else
```

mtselfGreekfont

```
\ifmst@selfGreek
    \DeclareSymbolFont{mtselfGreekfont}{OT1}{\mst@fam}{\mst@ser}{\mst@greek@ush}
\fi\fi
```

mteulervm
\MathEuler
\MathEulerBold

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

```
\ifmst@needeuler\typeout{** will use Euler font; command \string\MTEulerScale}
\DeclareSymbolFont{mteulervm}{U}{zeur}{m}{n}
\DeclareSymbolFontAlphabet{\MathEuler}{mteulervm}
\DeclareMathAlphabet{\MathEulerBold}{U}{zeur}{\mst@bold}{n}
\fi
\newcommand*\MTEulerScale[1]{\edef\zeu@Scale{#1}}
\let\MathastextEulerScale\MTEulerScale
```

LaTeX 2_ε 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 `\mathbold` 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 defineed \MathEuler and \MathEuler-Bold alphabet commands (the eulervm package does this only for the bold font).

mtpsymbol
\MathPSymbol

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

```
\ifmst@needsymbol\typeout{** will use Symbol font; command \string\MTSymbolScale}
 \def\psy@scale{1}
 \DeclareSymbolFont{mtpsymbol}{U}{psy}{m}{n}
 \DeclareSymbolFontAlphabet{\MathPSymbol}{mtpsymbol}
\AtBeginDocument{%
  \DeclareFontFamily{U}{psy}{}%
  \DeclareFontShape{U}{psy}{m}{n}{<->s*[\psy@scale] psyr}{}%
}
\fi
\newcommand*\MTSymbolScale[1]{\edef\psy@scale{#1}}
\let\MathastextSymbolScale\MTSymbolScale
```

I did not choose for name \MathSymbol as this may be defined somewhere for another thing. There is no bold for the postscript Symbol font distributed with the LaTeX 2_ε psnffs core package.

\pmvec

Definition of a poor man version of the \vec accent

```
\DeclareRobustCommand*\pmvec[1]{\mathord{\stackrel{\raisebox{-.5ex}%
{\tiny\boldmath$\mathord{\rightarrow}$}}{{}#1}}}
```

\fouriervec

The glyph is taken from the Fourier font of Michel Bovani. Note: (oct 2012) I should not allocate an entire symbol font just for one glyph! But I have not given any serious thought to what one can do to simulate a math accent without doing such a wasteful thing.

```
\ifmst@fouriervec
  \DeclareFontEncoding{FML}{}{}
  \DeclareFontSubstitution{FML}{futm}{m}{it}
  \DeclareSymbolFont{mathastextfourier}{FML}{futm}{m}{it}
  \SetSymbolFont{mathastextfourier}{bold}{FML}{futm}{b}{it}
  \mst@DeclareMathAccent{\fouriervec}{\mathord}{mathastextfourier}{"7E}
\fi
```

\MTencoding
\MTfamily
\MTseries
\MTshape
\MTboldvariant
\MTlettershape

Some public macros to modify our private internals, and we will use them also ourself.

In version 1.1 we add the possibility to have two distinct font shapes for letters and digits. So in fact we could as well have two really unrelated fonts but this is really not the spirit of the package.

Note that using these macros in the preamble allows \Mathastext to set up math versions with a given font for math mode, and at the same time not modifying the \familydefault or \romandefault etc...

```
\newcommand*\MTencoding[1]{\def\mst@enc{#1}}
```

```
\newcommand*\MTfamily[1]{\def\mst@fam{#1}}
\newcommand*\MTseries[1]{\def\mst@ser{#1}}
\newcommand*\MTshape[1]{\def\mst@opsh{#1}\ifmst@italic\else\def\mst@ltsh{#1}\fi}
\newcommand*\MTboldvariant[1]{\def\mst@bold{#1}}
\newcommand*\MTlettershape[1]{\def\mst@ltsh{#1}}
\let\Mathastextencoding\MTencoding
\let\Mathastextfamily\MTfamily
\let\Mathastextseries\MTseries
\let\Mathastextshape\MTshape
\let\Mathastextboldvariant\MTboldvariant
\let\Mathastextlettershape\MTlettershape
```

\MTitgreek
\MTupgreek
\MTitGreek
\MTupGreek
\MTgreekfont

1.15c: These new macros can be used in-between calls to \Mathastext. They reset the shapes for Greek letters (applies to LGRgreek(s) and selfGreek(s) options). The \MTgreekfont presupposes either LGRgreek or selfGreek (it is inoperant under LGRgreeks or selfGreeks). \MTgreekfont{\familydefault} is somewhat like using LGRgreeks or selfGreeks.

```
\newcommand*\MTitgreek{\mst@itgreektrue\mst@upgreekfalse\def\mst@greek@select{0}}
\newcommand*\MTupgreek{\mst@upgreektrue\mst@itgreekfalse\def\mst@greek@select{0}}
\newcommand*\MTitGreek{\def\mst@greek@select{1}}
\newcommand*\MTupGreek{\def\mst@greek@select{2}}
\let\Mathastextitgreek\MTitgreek
\let\Mathastextupgreek\MTupgreek
\let\MathastextitGreek\MTitGreek
\let\MathastextupGreek\MTupGreek
    \newcommand*\MTgreekfont[1]{\def\mst@greekfont{#1}}
\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.

```
\def\mst@DeclareMathLetter #1{%
    \DeclareMathSymbol {#1}{\mathalpha}{mtletterfont}{`#1}%
    \expandafter
    \DeclareMathSymbol \csname mst@#1\endcsname{\mathalpha}{mtletterfont}{`#1}%
    \expandafter\mst@addtodo@az\expandafter #1\csname mst@#1\endcsname
}%
\@tfor\mst@tmp:=abcdefghijklmnopqrstuvwxyz\do
     {\expandafter\mst@DeclareMathLetter\mst@tmp}%
\ifmst@frenchmath \def\mst@font@tbu{mtoperatorfont}%
   \else          \def\mst@font@tbu{mtletterfont}%
\fi
\def\mst@DeclareMathLetter #1{%
    \DeclareMathSymbol {#1}{\mathalpha}{\mst@font@tbu}{`#1}%
    \expandafter
    \DeclareMathSymbol \csname mst@#1\endcsname{\mathalpha}{\mst@font@tbu}{`#1}%
    \expandafter\mst@addtodo@AZ\expandafter #1\csname mst@#1\endcsname
}%
```

```
\@tfor\mst@tmp:=ABCDEFGHIJKLMNOPQRSTUVWXYZ\do
     {\expandafter\mst@DeclareMathLetter\mst@tmp}%
\let\mst@DeclareMathLetter\relax
\ifmst@nodigits\else
\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.

```
\ifmst@symboldigits \def\mst@font@tbu{mtpsymbol} \fi
\ifmst@eulerdigits \def\mst@font@tbu{mteulervm} \fi
\DeclareMathSymbol{0}{\mathalpha}{\mst@font@tbu}{`0}%
\DeclareMathSymbol{1}{\mathalpha}{\mst@font@tbu}{`1}%
\DeclareMathSymbol{2}{\mathalpha}{\mst@font@tbu}{`2}%
\DeclareMathSymbol{3}{\mathalpha}{\mst@font@tbu}{`3}%
\DeclareMathSymbol{4}{\mathalpha}{\mst@font@tbu}{`4}%
\DeclareMathSymbol{5}{\mathalpha}{\mst@font@tbu}{`5}%
\DeclareMathSymbol{6}{\mathalpha}{\mst@font@tbu}{`6}%
\DeclareMathSymbol{7}{\mathalpha}{\mst@font@tbu}{`7}%
\DeclareMathSymbol{8}{\mathalpha}{\mst@font@tbu}{`8}%
\DeclareMathSymbol{9}{\mathalpha}{\mst@font@tbu}{`9}%
\fi
```

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

```
\ifmst@symboldelimiters
\def\mst@font@tbu{mtpsymbol}%
\mst@endashfalse
\mst@emdashfalse
\else
\def\mst@font@tbu{mtoperatorfont}%
\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.

```
\ifmst@noexclam\else\typeout{** \string! and \string?}%
\DeclareMathSymbol{!}{\mathclose}{\mst@font@tbu}{"21}%
\DeclareMathSymbol{\mst@varfam@exclam}{\mathalpha}{\mst@font@tbu}{"21}%
\expandafter\mst@addtodo@nonletters\string!\mathclose\mst@varfam@exclam
\DeclareMathSymbol{?}{\mathclose}{\mst@font@tbu}{"3F}%
\DeclareMathSymbol{\mst@varfam@question}{\mathalpha}{\mst@font@tbu}{"3F}%
\expandafter\mst@addtodo@nonletters\string?\mathclose\mst@varfam@question
\fi
```

\MTlowerast
\mst@doasterisk
\mst@@doasterisk
\MTnormalasterisk
\MTactiveasterisk

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. The package now leaves by default both * and \ast untouched, and if passed option asterisk replaces both of them with a lowered text asterisk (or the one from the Symbol font), and of 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`.

```
\def\mst@@doasterisk{\let\ast\mst@ast\mst@mathactivate*{}\mst@ast}%
\newcommand*\MTnormalasterisk {\let\mst@doasterisk\relax}
\newcommand*\MTactiveasterisk {\let\mst@doasterisk\mst@@doasterisk}
\ifmst@asterisk\typeout{** asterisk: \string\ast\space and *}
    \AtBeginDocument{%
     \everymath\expandafter
               {\the\everymath   \mst@doasterisk \MTnormalasterisk }%
     \everydisplay\expandafter
               {\the\everydisplay\mst@doasterisk \MTnormalasterisk }}
  \ifmst@symbolmisc
    \def\mst@bin@ast{%
    \mathbin{\mathchoice{\raisebox{-.1\height}%
                          {\the\textfont\symmtpsymbol\char42}}%
                        {\raisebox{-.1\height}%
                          {\the\textfont\symmtpsymbol\char42}}%
                        {\raisebox{-.1\height}%
                          {\the\scriptfont\symmtpsymbol\char42}}%
                        {\raisebox{-.1\height}%
                          {\the\scriptscriptfont\symmtpsymbol\char42}}}}%
  \else
    \def\mst@bin@ast{%
    \mathbin{\mathchoice{\raisebox{-\mst@lowerast}%
                          {\the\textfont\symmtoperatorfont\char42}}%
                        {\raisebox{-\mst@lowerast}%
                          {\the\textfont\symmtoperatorfont\char42}}%
                        {\raisebox{-\mst@lowerast}%
                          {\the\scriptfont\symmtoperatorfont\char42}}%
                        {\raisebox{-\mst@lowerast}%
                          {\the\scriptscriptfont\symmtoperatorfont\char42}}}}%
  \fi
  \def\mst@varfam@ast{\ifnum\fam=\m@ne\mst@bin@ast\else
    \mathbin{\mathchoice{\raisebox{-\mst@lowerast}%
                          {\the\textfont\fam\char42}}%
                        {\raisebox{-\mst@lowerast}%
                          {\the\textfont\fam\char42}}%
                        {\raisebox{-\mst@lowerast}%
                          {\the\scriptfont\fam\char42}}%
                        {\raisebox{-\mst@lowerast}%
                          {\the\scriptscriptfont\fam\char42}}}\fi}%
  \MTactiveasterisk
  \DeclareRobustCommand*{\mst@ast}{\mst@bin@ast}
  \newcommand*\MTlowerast[1]{\def\mst@lowerast{#1}}
```

```
  \MTlowerast{.3\height}
  \mst@do@easynonletters\expandafter\expandafter\expandafter
    {\expandafter\the\expandafter\mst@do@easynonletters
     \expandafter\def\csname mst@ast \endcsname{\mst@varfam@ast}}
\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?]

`1.3x` of `2022/11/03` adds support for `ncccomma` option.

Some non-obvious hack is needed for compatibility with our home-made mechanism of non-letters obeying math alphabet commands. Alternative would have been to not load at all this package and provide the functionality purely by our own means (rewriting entirely its two macros after loading the package would not have made much sense).

```
\ifmst@nopunct\else\typeout{** punctuation\string: \string, \string. \string:
    \string; and \string\colon}
  \DeclareMathSymbol{,}{\mathpunct}{\mst@font@tbu}{"2C}
  \DeclareMathSymbol{\mst@varfam@comma}{\mathalpha}{\mst@font@tbu}{"2C}
  \ifmst@ncccomma
    \typeout{** loading package ncccomma for `smart comma\string'}
    \RequirePackage{ncccomma}%
```

Work around some bad interaction of `ncccomma`, `numprint` with `autolanguage` and `babel-frenchb`. Some hesitation whether I should use the `\noextrasfrench` to work around `babel-frenchb` code influencing non-French sections in the document.

```
    \AtBeginDocument{\mathcode`\,="8000\relax
    \@ifpackageloaded{babel}{%
                \addto\noextrasfrench{\mathcode`\,="8000\relax}%
                \addto\extrasfrench{\mathcode`\,="8000\relax}%
                }{}}
    \let\mathcomma\relax
    \DeclareMathSymbol{\mathcomma}{\mathpunct}{\mst@font@tbu}{"2C}
```

Complications for compatibility with the `\MTnonlettersobeymathxx` mechanism.

```
    \edef\mst@NCC@comma{\let\noexpand\@empty\mathpunct
                        \unexpanded\expandafter{\NCC@comma}%
                        \let\noexpand\@empty\noexpand\empty}
    \mst@do@nonletters\expandafter{\the\mst@do@nonletters
      \let\mathcomma\mst@varfam@comma
      \let\NCC@comma\mst@NCC@comma
      }
  \else
    \expandafter\mst@addtodo@nonletters\string,\mathpunct\mst@varfam@comma
  \fi % ncccomma true
  \DeclareMathSymbol{.}{\mathord}{\mst@font@tbu}{"2E}
  \DeclareMathSymbol{\mst@varfam@dot}{\mathalpha}{\mst@font@tbu}{"2E}
  \mst@addtodo@easynonletters\.\mst@varfam@dot
```

```
\DeclareMathSymbol{:}{\mathrel}{\mst@font@tbu}{"3A} % relation spacing
\DeclareMathSymbol{\mst@varfam@colon}{\mathalpha}{\mst@font@tbu}{"3A}
\expandafter\mst@addtodo@nonletters\string:\mathrel\mst@varfam@colon
\@ifpackageloaded{amsmath}
{} % \colon defined in amsmath.sty in terms of : with some enlarged explicit
   % spacing. No need to intervene.
{% no amsmath, use standard punctuation spacing
  \let\colon\undefined
  % the reason is if some package has redefined \colon which then
  % can not be used in \cs{DeclareMathSymbol} anymore (we
  % shamelessly overwrite...)
  \DeclareMathSymbol{\colon}{\mathpunct}{\mst@font@tbu}{"3A}
  \mst@do@nonletters\expandafter{\the\mst@do@nonletters
```

`1.3v` uses `\protected` for the (optional) `\colon` redefinition.

```
      \protected\def\colon{\mathpunct{\mst@varfam@colon}}}%
}
\DeclareMathSymbol{\mst@varfam@pointvirgule}{\mathalpha}{\mst@font@tbu}{"3B}
```

`1.3x` adds `binarysemicolon` option.

```
\ifmst@binarysemicolon
  \typeout{** semi-colon set to be of type \string\mathbin}
  \DeclareMathSymbol{;}{\mathbin}{\mst@font@tbu}{"3B}
  \expandafter\mst@addtodo@nonletters\string;\mathbin\mst@varfam@pointvirgule
\else
  \DeclareMathSymbol{;}{\mathpunct}{\mst@font@tbu}{"3B}
  \expandafter\mst@addtodo@nonletters\string;\mathpunct\mst@varfam@pointvirgule
\fi % binarysemicolno
\fi % end \ifmst@nopunct else branch
```

`\relbar` Due to the way = and - are used by LaTeX 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 XeTeX, not for LuaLaTeX. Also I do my modifications to `\relbar` in a manner testing for the presence of amsmath.

`1.3v 2019/09/19`: LaTeX of `2019-10-01` defines `\leftarrowfill` and `\rightarrowfill` as robust macros, so we do the same.

I need to put amsmath under surveillance to check if it decides to robustify `\relbar` at some point, now that the LaTeX team has taken over maintenance.

`2019/09/16` Use `\protected` for `\right|leftarrowfill` in the non `\DeclareRobustCommand` branch?

```
\ifmst@nominus
\else
  \ifmst@XeOrLua
    \mst@Umathcharnumdef\mst@minus@sign=\mst@Umathcodenum`\-\relax
%^^A I used this prior to the new \luatexUmathcodenum, as available since TL2013:
%^^A \mathchardef\mst@minus@sign=8704\relax % "2200
  \else
    \mathchardef\mst@minus@sign=\mathcode`\-\relax
```

```
  \fi
  \@ifpackageloaded{amsmath}
    {\def\relbar{\mathrel{\mathpalette\mathsm@sh\mst@minus@sign}}}
    {\DeclareRobustCommand\relbar{\mathrel{\smash\mst@minus@sign}}}
  \ifmst@robust@obsessed@LaTeX@era\expandafter\DeclareRobustCommand
   \else\expandafter\def\fi
  \rightarrowfill{$\m@th\mathord{\relbar}\mkern-7mu%
  \cleaders\hbox{$\mkern-2mu\relbar\mkern-2mu$}\hfill
  \mkern-7mu\mathord\rightarrow$}
  \ifmst@robust@obsessed@LaTeX@era\expandafter\DeclareRobustCommand
   \else\expandafter\def\fi
  \leftarrowfill{$\m@th\mathord\leftarrow\mkern-7mu%
  \cleaders\hbox{$\mkern-2mu\relbar\mkern-2mu$}\hfill
  \mkern-7mu\mathord{\relbar}$}
\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.

1.31 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 (PDFTEX engine).

`\mst@subduedminus` `\mst@nonsubduedminus`

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.

1.3u improves the handling of the minus sign by letting it be compatible with math versions (and not only with the with subdued mechanism but all math versions) having varying font encodings, even possibly classic 8bit font encoding mixed with TU encoding for Unicode engines. For this it is needed to work around a feature of XeTeX/LuaLaTeX, here is original comment:

> afaict it is impossible to use straightforwardly in extended mathcode assignments a control sequence as created by `\Umathchardef`. This is counter-intuitive and breaks expectations.

But the 1.3u mechanism with `\mst@UmathchardefWorkAround@i` introduced a bug which showed under option `noendash` (hence also `symboldelimiters`) with Unicode engines. Fixed at 1.3w.

```
\let\mst@subduedminus\empty
\let\mst@nonsubduedminus\empty
```

```
\def\mst@dothe@endashstuff#1#2#3{%
  \edef\mst@tmp@enc{#3}%
  \if1\mst@OneifUniEnc
    \mst@Umathchardef#1=2 \symmtoperatorfont "\mst@unicodeminus\relax
    \mst@Umathchardef#2=7 \symmtoperatorfont "\mst@unicodeminus\relax
  \else
    \DeclareMathSymbol{#1}{\mathbin}{mtoperatorfont}
                      {\csname\mst@tmp@enc\string\textendash\endcsname}
    \DeclareMathSymbol{#2}{\mathalpha}{mtoperatorfont}
                      {\csname\mst@tmp@enc\string\textendash\endcsname}
  \fi}% mst@dothe@endashstuff
\def\mst@dothe@emdashstuff#1#2#3{%
  \edef\mst@tmp@enc{#3}%
  \if1\mst@OneifUniEnc
    \mst@Umathchardef#1=2 \symmtoperatorfont "2014\relax
    \mst@Umathchardef#2=7 \symmtoperatorfont "2014\relax
  \else
    \DeclareMathSymbol{#1}{\mathbin}{mtoperatorfont}
                      {\csname\mst@tmp@enc\string\textemdash\endcsname}
    \DeclareMathSymbol{#2}{\mathalpha}{mtoperatorfont}
                      {\csname\mst@tmp@enc\string\textemdash\endcsname}
  \fi}% mst@dothe@emdashstuff
\def\mst@dothe@hyphenstuff#1#2{%
  \DeclareMathSymbol{#1}{\mathbin}{\mst@font@tbu}{"2D}%
  \DeclareMathSymbol{#2}{\mathalpha}{\mst@font@tbu}{"2D}%
}%
\def\mst@varfam@minus{\@nameuse{mst@varfam@minus@mv\math@version}}%
\ifmst@nominus\else
  \expandafter\mst@addtodo@nonletters\string-\mathbin\mst@varfam@minus
  \def\mst@nonsubduedminus{%
    \edef\mst@tmp@enc{\csname mst@encoding@\math@version\endcsname}%
    \if1\mst@OneifUniEnc
     \mst@Umathcode`\-=\expandafter
                        \mst@UmathchardefWorkAround@i
                        \csname mst@minus@mv\math@version\endcsname
                        \relax
    \else
     \mathcode`\-=\@nameuse{mst@minus@mv\math@version}% self-delimiting
    \fi
   }% \mst@nonsubduedminus
```

The above works only if the `\mst@minus@mv<name>` was really defined via `\Umathchardef`. If it was defined via `\DeclareMathSymbol` then it is a `\mathchar`, not a `\Umathchar`. At least currently (2019). So we need to correct the definition of `\mst@nonsubduedminus`.

```
  \ifmst@endash\else\ifmst@emdash\else
    \def\mst@nonsubduedminus{%
      \mathcode`\-=\@nameuse{mst@minus@mv\math@version}% self-delimiting
      }% non Umathchardef \mst@minus@mv<mathversion> macros
  \fi\fi
\fi
```

```
\def\mst@UmathchardefWorkAround@i
    {\expandafter\mst@UmathchardefWorkAround@ii\meaning}%
\def\mst@UmathchardefWorkAround@ii#1"{"}%
```

\mst@hbar@mvnormal
\mst@ltbar@mvnormal

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

`1.3l 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.

`1.3v 2019/09/19` adapts to maintain the robustness of `\hbar` which now applies with LaTeX `2019-10-01`.

`1.3w` works around https://github.com/latex3/latex2e/issues/216 via `\mst@DeclareMathAccent`. The upstream bug affected the definition of `\mst@ltbar@mvnormal` and broke usage of `\Mathastext` in preamble.

`1.3w` also fixes oversight that `\hbar` may have been redefined via `\DeclareMathSymbol` by some package (e.g. `amsfonts`) and with LaTeX `2019-10-01` this means `\hbar<space>` is now undefined. Modifying it changed nothing to `\hbar` behaviour in such circumstances. Finally we opt for a `\protected \hbar` and choose to ignore completely if there is a `\hbar<space>` or not. To avoid extra steps we do not undefine it if it exists, because we would need to restore it in subdued math versions.

```
\let\mst@subduedhbar\@empty
\let\mst@nonsubduedhbar\@empty
\ifmst@nohbar\else
  \def\mst@subduedhbar{\let\hbar\mst@original@hbar}%
  \def\mst@nonsubduedhbar{\expandafter
       \let\expandafter\hbar\csname mst@hbar@mv\math@version\endcsname}%
\fi
\def\mst@mathrlap{\mathpalette\mst@mathrlapinternal}
\def\mst@mathrlapinternal#1#2{\rlap{$\mathsurround=0pt#1{#2}$}}
\def\mst@dothe@hbarstuff#1#2#3{%
  \edef\mst@tmp@enc{#3}%
  \if1\mst@OneifUniEnc % Unicode engine and font
    \mst@Umathchardef#1="7 \symmtletterfont "0127 \relax %% or 210F?
  \else
    \begingroup
    \def\@text@composite##1\@text@composite##2{##2}%
    \let\add@accent\@firstoftwo
    \mst@DeclareMathAccent{#2}{\mathalpha}{mtletterfont}%
                          {\csname\mst@tmp@enc\string\=\endcsname{}}%
    \endgroup
```

```
    \protected\def#1{\mst@mathrlap{#2{\ }}\mst@h}%
  \fi
}% end of \mst@dothe@hbarstuff
```

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

`+,=,\Relbar`

```
\ifmst@noplus\else\typeout{** \string+ and \string=}
\DeclareMathSymbol{+}{\mathbin}{\mst@font@tbu}{"2B}
\DeclareMathSymbol{\mst@varfam@plus}{\mathalpha}{\mst@font@tbu}{"2B}
\expandafter\mst@addtodo@nonletters\string+\mathbin\mst@varfam@plus
\fi
\ifmst@noequal\else
\ifmst@XeOrLua
    \mst@Umathcharnumdef\mst@equal@sign=\mst@Umathcodenum`\=\relax
\else
    \mathchardef\mst@equal@sign=\mathcode`\=\relax
\fi
\@ifpackageloaded{amsmath}
{\def\Relbar{\mathrel\mst@equal@sign}}
{\DeclareRobustCommand\Relbar{\mathrel{\mst@equal@sign}}}
\DeclareMathSymbol{=}{\mathrel}{\mst@font@tbu}{"3D}
\DeclareMathSymbol{\mst@varfam@equal}{\mathalpha}{\mst@font@tbu}{"3D}
```

`\nfss@catcodes` 2012/12/18: Activating = (only in math mode actually) seems very bad but surprisingly works well. However I had a problem with `eu2lmtt.fd` which should not be loaded with an active =. 2012/12/25: Since then I had switched to only math activation. And in fact the problematic = from `eu2lmtt.fd` end up in `\csname...\endcsname` and I have learnt since that TEX does not look at the `mathcode` inside a `\csname...\endcsname`. Example:

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

We need nevertheless to inactivate the =, for the following reason. Imagine someone did `\catcode`==\active\def={\string=}`, or another definition which would not lead to a tragedy in a `\csname...\endcsname`. Then the = is active and the re-definition done by `mathastext` will not be compatible with loading `eu2lmtt.fd` (for the first time) from math mode, as this re-definition can not be expanded inside a `\csname...\endcsname`.

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

```
\typeout{** adding \string= \string; and \string+ to \string\nfss@catcodes}
\g@addto@macro\nfss@catcodes{%
  \@makeother\=%
```

```
  \@makeother\;%
  \@makeother\+%
}
\expandafter\mst@addtodo@nonletters\string=\mathrel\mst@varfam@equal
\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.

```
\ifmst@noparen\else\typeout{** parentheses \string( \string) \string[ \string] and slash \s
\ifmst@nosmalldelims
    \DeclareMathSymbol{(}{\mathopen}{\mst@font@tbu}{"28}
    \DeclareMathSymbol{)}{\mathclose}{\mst@font@tbu}{"29}
    \DeclareMathSymbol{[}{\mathopen} {\mst@font@tbu}{"5B}
    \DeclareMathSymbol{]}{\mathclose}{\mst@font@tbu}{"5D}
    \DeclareMathSymbol{/}{\mathord}{\mst@font@tbu}{"2F}
\else
    \DeclareMathDelimiter{(}{\mathopen}{\mst@font@tbu}{"28}{largesymbols}{"00}
    \DeclareMathDelimiter{)}{\mathclose}{\mst@font@tbu}{"29}{largesymbols}{"01}
    \DeclareMathDelimiter{[}{\mathopen} {\mst@font@tbu}{"5B}{largesymbols}{"02}
    \DeclareMathDelimiter{]}{\mathclose}{\mst@font@tbu}{"5D}{largesymbols}{"03}
    \DeclareMathDelimiter{/}{\mathord}{\mst@font@tbu}{"2F}{largesymbols}{"0E}
\fi
\DeclareMathSymbol{\mst@varfam@lparen}{\mathalpha}{\mst@font@tbu}{40}
\DeclareMathSymbol{\mst@varfam@rparen}{\mathalpha}{\mst@font@tbu}{41}
\DeclareMathSymbol{\mst@varfam@lbrack}{\mathalpha}{\mst@font@tbu}{"5B}
\DeclareMathSymbol{\mst@varfam@rbrack}{\mathalpha}{\mst@font@tbu}{"5D}
\DeclareMathSymbol{\mst@varfam@slash}{\mathalpha}{\mst@font@tbu}{"2F}
\expandafter\mst@addtodo@nonletters\string(\mathopen\mst@varfam@lparen
\expandafter\mst@addtodo@nonletters\string)\mathclose\mst@varfam@rparen
\expandafter\mst@addtodo@nonletters\string[\mathopen\mst@varfam@lbrack
\expandafter\mst@addtodo@nonletters\string]\mathclose\mst@varfam@rbrack
\mst@addtodo@easynonletters\/\mst@varfam@slash
\fi
```

alldelims <,>,\setminus \backslash

```
\ifmst@alldelims\typeout{** alldelims: \string< \string>
  \string\backslash\space\string\setminus\space\string|
  \string\vert\space\string\mid\space\string\{\space and \string\}}
\ifmst@nosmalldelims
```

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.

```
    \DeclareMathDelimiter{\mst@varfam@backslash}
        {\mathalpha}{symbols}{"6E}{largesymbols}{"0F}
```

```
\else
    \DeclareMathDelimiter{<}{\mathopen}{\mst@font@tbu}{"3C}{largesymbols}{"0A}
    \DeclareMathDelimiter{>}{\mathclose}{\mst@font@tbu}{"3E}{largesymbols}{"0B}
```

There is no backslash in the Symbol font hence `mtoperatorfont` here.

```
    \DeclareMathDelimiter{\backslash}
        {\mathord}{mtoperatorfont}{"5C}{largesymbols}{"0F}
    \DeclareMathDelimiter{\mst@varfam@backslash}
        {\mathalpha}{mtoperatorfont}{"5C}{largesymbols}{"0F}
\fi
\DeclareMathSymbol{<}{\mathrel}{\mst@font@tbu}{"3C}
\DeclareMathSymbol{>}{\mathrel}{\mst@font@tbu}{"3E}
\DeclareMathSymbol{\mst@varfam@less}{\mathalpha}{\mst@font@tbu}{"3C}
\DeclareMathSymbol{\mst@varfam@more}{\mathalpha}{\mst@font@tbu}{"3E}
\expandafter\mst@addtodo@nonletters\string<\mathrel\mst@varfam@less
\expandafter\mst@addtodo@nonletters\string>\mathrel\mst@varfam@more
\mst@do@easynonletters\expandafter{\the\mst@do@easynonletters
            \let\backslash\mst@varfam@backslash}
\DeclareMathSymbol{\setminus}{\mathbin}{mtoperatorfont}{"5C}
\DeclareMathSymbol{\mst@varfam@setminus}{\mathalpha}{mtoperatorfont}{"5C}
```

`1.3v` adds a `\protected` here for `\setminus`.

```
\mst@do@nonletters\expandafter{\the\mst@do@nonletters
            \protected\def\setminus{\mathbin{\mst@varfam@setminus}}}
```

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

```
\ifmst@XeOrLua
  \mst@Umathcharnumdef\mst@vert@bar=\mst@Umathcodenum`\|\relax
\else
  \mathchardef\mst@vert@bar=\mathcode`\|\relax
\fi
\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. Or not (2019)? maybe I *should* do something here...

`1.3v 2019/09/19`: I discover this rather radical legacy `\def\vert{|}`, which is done here once in the preamble, but I leave it unmodified apart from prefixing it with `\protected`. I also add a `\protected` for the definition of `\mid` (which applies only under `\MTnonlettersobeymathxx` regime).

```
\ifmst@nosmalldelims
    \DeclareMathSymbol{|}{\mathord}{\mst@font@tbu}{124}
\else
    \DeclareMathDelimiter{|}{\mathord}{\mst@font@tbu}{124}{largesymbols}{"0C}
\fi
\protected\def\vert{|}
\DeclareMathSymbol{\mst@varfam@vbar}{\mathalpha}{\mst@font@tbu}{124}
\mst@addtodo@easynonletters\|\mst@varfam@vbar
\let\mid\undefined % 1.3: to avoid problems with some packages
\DeclareMathSymbol{\mid}{\mathrel}{\mst@font@tbu}{124}
```

```
\mst@do@nonletters\expandafter{\the\mst@do@nonletters
    \protected\def\mid{\mathrel\mst@varfam@vbar}}
```

\MTexplicitbraces-obeymathxx
\MTexplicitbraces-donotobeymathxx

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

For 1.3 I make \lbrace and \rbrace undefined first, else problems may arise with some packages.

1.3e suppresses under option nosmalldelims the definitions of \lbrace and \rbrace as math symbols as this made \left\lbrace cause an error, it was a bug.

LaTeX2e defines \{ and \} as robust commands for a long time (I don't know since when). The mathastext redefinition is done only if user has executed \MTexplicitbracesobeymathxx, and it is done only when entering math mode, but there could be some \hbox inside math, hence it has to be careful to be valid in text too.

1.3v maintains strict LaTeX2e robustness for \{ and \}. This assumes no one fiddled with \{ and \} proper (without space in the name).

```
  \ifmst@nosmalldelims
  \else
     \let\lbrace\undefined \let\rbrace\undefined
     \DeclareMathDelimiter{\lbrace}
        {\mathopen}{\mst@font@tbu}{123}{largesymbols}{"08}
     \DeclareMathDelimiter{\rbrace}
        {\mathclose}{\mst@font@tbu}{125}{largesymbols}{"09}
  \fi
\DeclareMathSymbol{\mst@varfam@lbrace}{\mathalpha}{\mst@font@tbu}{123}
\DeclareMathSymbol{\mst@varfam@rbrace}{\mathalpha}{\mst@font@tbu}{125}
\DeclareRobustCommand*{\mst@lbrace}
        {\ifmmode\mathopen\mst@varfam@lbrace\else\textbraceleft\fi}
\DeclareRobustCommand*{\mst@rbrace}
        {\ifmmode\mathclose\mst@varfam@rbrace\else\textbraceright\fi}
\mst@do@nonletters\expandafter{\the\mst@do@nonletters
    \mst@dobraces{\expandafter\let\csname\string{ \expandafter\endcsname
                                    \csname mst@lbrace \endcsname
                  \expandafter\let\csname\string} \expandafter\endcsname
                                    \csname mst@rbrace \endcsname}}
\fi % end of \ifmst@alldelims
\newcommand*{\MTexplicitbracesobeymathxx}{\let\mst@dobraces\@firstofone}
\newcommand*{\MTexplicitbracesdonotobeymathxx}{\let\mst@dobraces\@gobble}
\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 command 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 corresponding 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, LuaTeX or default. Removed.

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

```
\ifmst@nospecials
\else
   \typeout{** \string\#\space\string\mathdollar\space
               \string\%\space\string\&\space}
  \ifmst@XeOrLua
  \mst@Umathcode`\#=0 \symmtoperatorfont "23 \relax
  \mst@Umathchardef\mathdollar=0 \symmtoperatorfont "24 \relax
  \mst@Umathcode`\%=0 \symmtoperatorfont "25 \relax
  \mst@Umathcode`\&=0 \symmtoperatorfont "26 \relax
  \mst@do@easynonletters\expandafter{%
    \the\mst@do@easynonletters
    \mst@Umathcode`\#=7 \symmtoperatorfont "23 \relax
    \mst@Umathchardef\mathdollar=7 \symmtoperatorfont "24 \relax
    \mst@Umathcode`\%=7 \symmtoperatorfont "25 \relax
    \mst@Umathcode`\&=7 \symmtoperatorfont "26 \relax
    }
  \else
  \count@=\symmtoperatorfont
  \multiply\count@ by \@cclvi
  \advance\count@ by 35
      \mathcode`\#\count@
  \advance\count@ by \@ne
      \mathchardef\mathdollar\count@
  \advance\count@ by \@ne
      \mathcode`\%\count@
  \advance\count@ by \@ne
      \mathcode`\&\count@
  \count@=\symmtoperatorfont
  \multiply\count@ by \@cclvi
  \advance\count@ by 28707 % = "7023
      \mathchardef\mst@varfam@mathhash\count@
  \advance\count@ by \@ne
      \mathchardef\mst@varfam@mathdollar\count@
  \advance\count@ by \@ne
      \mathchardef\mst@varfam@mathpercent\count@
  \advance\count@ by \@ne
```

```
      \mathchardef\mst@varfam@mathampersand\count@
  \mst@do@easynonletters\expandafter{\the\mst@do@easynonletters
    \mathcode`\#=\mst@varfam@mathhash
    \let\mathdollar\mst@varfam@mathdollar
    \mathcode`\%=\mst@varfam@mathpercent
    \mathcode`\&=\mst@varfam@mathampersand}
  \fi
\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 LaTeX, 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 \sum `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.

October 2012: maybe I should re-examine what I did?

`1.3c` (2013/12/14) renames `\defaultprod` to `\MToriginalprod` and `\defaultsum` to `\MToriginalsum`.

`1.3v` hesitates about making robust here `\prod` and `\sum`. Finally I use `\protected` for them.

```
\ifmst@symbolmisc\typeout{** symbolmisc: miscellaneous math symbols from Symbol font}
\let\mst@prod\prod
\let\MToriginalprod\prod
\DeclareMathSymbol{\prodpsy}{\mathop}{mtpsymbol}{213}
\protected\def\prod{\ifinner\prodpsy\else\mst@prod\fi}
\let\mst@sum\sum
\let\MToriginalsum\sum
\DeclareMathSymbol{\sumpsy}{\mathop}{mtpsymbol}{229}
\protected\def\sum{\ifinner\sumpsy\else\mst@sum\fi}

\DeclareMathSymbol{\mst@implies}{\mathrel}{mtpsymbol}{222}
\DeclareRobustCommand*{\implies}{\;\mst@implies\;}
\DeclareMathSymbol{\mst@impliedby}{\mathrel}{mtpsymbol}{220}
\DeclareRobustCommand*{\impliedby}{\;\mst@impliedby\;}
\DeclareRobustCommand*{\iff}{\;\mst@impliedby\mathrel{\mkern-3mu}\mst@implies\;}
\DeclareMathSymbol{\mst@iff}{\mathrel}{mtpsymbol}{219}
\DeclareRobustCommand*{\shortiff}{\;\mst@iff\;}
\DeclareMathSymbol{\mst@to}{\mathrel}{mtpsymbol}{174}
\DeclareMathSymbol{\mst@trait}{\mathrel}{mtpsymbol}{190}
\DeclareRobustCommand*\to{\mst@to}
\DeclareRobustCommand*\longto{\mkern2mu\mst@trait\mathrel{\mkern-10mu}\mst@to}
\DeclareRobustCommand*\mapsto{\mapstochar\mathrel{\mkern0.2mu}\mst@to}
\DeclareRobustCommand*\longmapsto{%
\mapstochar\mathrel{\mkern2mu}\mst@trait\mathrel{\mkern-10mu}\mst@to}
```

```
\DeclareMathSymbol{\aleph}{\mathord}{mtpsymbol}{192}
\DeclareMathSymbol{\inftypsy}{\mathord}{mtpsymbol}{165}
\DeclareMathSymbol{\emptyset}{\mathord}{mtpsymbol}{198}
\let\varnothing\emptyset
\DeclareMathSymbol{\nabla}{\mathord}{mtpsymbol}{209}
\DeclareMathSymbol{\surd}{\mathop}{mtpsymbol}{214}
\let\angle\undefined
\DeclareMathSymbol{\angle}{\mathord}{mtpsymbol}{208}
\DeclareMathSymbol{\forall}{\mathord}{mtpsymbol}{34}
\DeclareMathSymbol{\exists}{\mathord}{mtpsymbol}{36}
\DeclareMathSymbol{\neg}{\mathord}{mtpsymbol}{216}
\DeclareMathSymbol{\clubsuit}{\mathord}{mtpsymbol}{167}
\DeclareMathSymbol{\diamondsuit}{\mathord}{mtpsymbol}{168}
\DeclareMathSymbol{\heartsuit}{\mathord}{mtpsymbol}{169}
\DeclareMathSymbol{\spadesuit}{\mathord}{mtpsymbol}{170}
\DeclareMathSymbol{\smallint}{\mathop}{mtpsymbol}{242}
\DeclareMathSymbol{\wedge}{\mathbin}{mtpsymbol}{217}
\DeclareMathSymbol{\vee}{\mathbin}{mtpsymbol}{218}
\DeclareMathSymbol{\cap}{\mathbin}{mtpsymbol}{199}
\DeclareMathSymbol{\cup}{\mathbin}{mtpsymbol}{200}
\DeclareMathSymbol{\bullet}{\mathbin}{mtpsymbol}{183}
\DeclareMathSymbol{\div}{\mathbin}{mtpsymbol}{184}
\DeclareMathSymbol{\otimes}{\mathbin}{mtpsymbol}{196}
\DeclareMathSymbol{\oplus}{\mathbin}{mtpsymbol}{197}
\DeclareMathSymbol{\pm}{\mathbin}{mtpsymbol}{177}
\DeclareMathSymbol{\times}{\mathbin}{mtpsymbol}{180}
\DeclareMathSymbol{\proptopsy}{\mathrel}{mtpsymbol}{181}
\DeclareMathSymbol{\mid}{\mathrel}{mtpsymbol}{124}
\DeclareMathSymbol{\leq}{\mathrel}{mtpsymbol}{163}
\DeclareMathSymbol{\geq}{\mathrel}{mtpsymbol}{179}
\DeclareMathSymbol{\approx}{\mathrel}{mtpsymbol}{187}
\DeclareMathSymbol{\supset}{\mathrel}{mtpsymbol}{201}
\DeclareMathSymbol{\subset}{\mathrel}{mtpsymbol}{204}
\DeclareMathSymbol{\supseteq}{\mathrel}{mtpsymbol}{202}
\DeclareMathSymbol{\subseteq}{\mathrel}{mtpsymbol}{205}
\DeclareMathSymbol{\in}{\mathrel}{mtpsymbol}{206}
\DeclareMathSymbol{\sim}{\mathrel}{mtpsymbol}{126}
\let\cong\undefined
\DeclareMathSymbol{\cong}{\mathrel}{mtpsymbol}{64}
\DeclareMathSymbol{\perp}{\mathrel}{mtpsymbol}{94}
\DeclareMathSymbol{\equiv}{\mathrel}{mtpsymbol}{186}
\let\notin\undefined
\DeclareMathSymbol{\notin}{\mathrel}{mtpsymbol}{207}
\DeclareMathDelimiter{\rangle}
    {\mathclose}{mtpsymbol}{241}{largesymbols}{"0B}
\DeclareMathDelimiter{\langle}
    {\mathopen}{mtpsymbol}{225}{largesymbols}{"0A}
\fi
```

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

```
\ifmst@symbolre\typeout{** symbolre: \string\Re\space and \string\Im\space from Symbol font}
\DeclareMathSymbol{\Re}{\mathord}{mtpsymbol}{"C2}
\DeclareMathSymbol{\Im}{\mathord}{mtpsymbol}{"C1}
\DeclareMathSymbol{\DotTriangle}{\mathord}{mtpsymbol}{92}
\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.)

```
\let\mst@mathord\mathalpha
\mst@goaheadtrue
\ifmst@selfGreek
    \def\mst@font@tbu{mtselfGreekfont}
\else
    \ifmst@eulergreek
        \def\mst@font@tbu{mteulervm}
    \else
      \ifmst@symbolgreek
        \def\mst@font@tbu{mtpsymbol}
        \let\mst@mathord\mathord
      \else
         \ifmst@LGRgreek
            \mst@goaheadfalse
         \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.

```
            \mst@goaheadfalse
            \def\mst@omicron {\mst@alph@omicron{o}}
         \fi
      \fi
   \fi
\fi
\ifmst@goahead
  \DeclareMathSymbol{\mst@Alpha}{\mst@mathord}{\mst@font@tbu}{"41}
  \DeclareMathSymbol{\mst@Beta}{\mst@mathord}{\mst@font@tbu}{"42}
```

```
  \DeclareMathSymbol{\mst@Epsilon}{\mst@mathord}{\mst@font@tbu}{"45}
  \DeclareMathSymbol{\mst@Zeta}{\mst@mathord}{\mst@font@tbu}{"5A}
  \DeclareMathSymbol{\mst@Eta}{\mst@mathord}{\mst@font@tbu}{"48}
  \DeclareMathSymbol{\mst@Iota}{\mst@mathord}{\mst@font@tbu}{"49}
  \DeclareMathSymbol{\mst@Kappa}{\mst@mathord}{\mst@font@tbu}{"4B}
  \DeclareMathSymbol{\mst@Mu}{\mst@mathord}{\mst@font@tbu}{"4D}
  \DeclareMathSymbol{\mst@Nu}{\mst@mathord}{\mst@font@tbu}{"4E}
  \DeclareMathSymbol{\mst@Omicron}{\mst@mathord}{\mst@font@tbu}{"4F}
  \DeclareMathSymbol{\mst@Rho}{\mst@mathord}{\mst@font@tbu}{"50}
  \DeclareMathSymbol{\mst@Tau}{\mst@mathord}{\mst@font@tbu}{"54}
  \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`).

```
  \ifx\mst@mathord\mathord
```

symbolgreek but neither eulergreek nor selfGreek

```
%% attention le P de Symbol est un \Pi pas un \Rho
    \DeclareMathSymbol{\mst@Rho}{\mathord}{mtpsymbol}{"52}
%% attention le X de Symbol est un \Xi pas un \Chi
    \DeclareMathSymbol{\mst@Chi}{\mathord}{mtpsymbol}{"43}
%% attention le F de Symbol est un \Phi. Il n'y a pas de \Digamma
    \DeclareMathSymbol{\mst@Gamma}{\mathord}{mtpsymbol}{"47}
    \DeclareMathSymbol{\mst@Delta}{\mathord}{mtpsymbol}{"44}
    \DeclareMathSymbol{\mst@Theta}{\mathord}{mtpsymbol}{"51}
    \DeclareMathSymbol{\mst@Lambda}{\mathord}{mtpsymbol}{"4C}
    \DeclareMathSymbol{\mst@Xi}{\mathord}{mtpsymbol}{"58}
    \DeclareMathSymbol{\mst@Pi}{\mathord}{mtpsymbol}{"50}
    \DeclareMathSymbol{\mst@Sigma}{\mathord}{mtpsymbol}{"53}
    \DeclareMathSymbol{\mst@Upsilon}{\mathord}{mtpsymbol}{"A1}
    \DeclareMathSymbol{\mst@Phi}{\mathord}{mtpsymbol}{"46}
    \DeclareMathSymbol{\mst@Psi}{\mathord}{mtpsymbol}{"59}
    \DeclareMathSymbol{\mst@Omega}{\mathord}{mtpsymbol}{"57}
  \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.

```
    \DeclareMathSymbol\mst@Digamma  {\mathalpha}{\mst@font@tbu}{"46}
    \DeclareMathSymbol\mst@Gamma    {\mathalpha}{\mst@font@tbu}{"00}
    \DeclareMathSymbol\mst@Delta    {\mathalpha}{\mst@font@tbu}{"01}
    \DeclareMathSymbol\mst@Theta    {\mathalpha}{\mst@font@tbu}{"02}
    \DeclareMathSymbol\mst@Lambda   {\mathalpha}{\mst@font@tbu}{"03}
    \DeclareMathSymbol\mst@Xi       {\mathalpha}{\mst@font@tbu}{"04}
    \DeclareMathSymbol\mst@Pi       {\mathalpha}{\mst@font@tbu}{"05}
    \DeclareMathSymbol\mst@Sigma    {\mathalpha}{\mst@font@tbu}{"06}
    \DeclareMathSymbol\mst@Upsilon  {\mathalpha}{\mst@font@tbu}{"07}
    \DeclareMathSymbol\mst@Phi      {\mathalpha}{\mst@font@tbu}{"08}
    \DeclareMathSymbol\mst@Psi      {\mathalpha}{\mst@font@tbu}{"09}
    \DeclareMathSymbol\mst@Omega    {\mathalpha}{\mst@font@tbu}{"0A}
  \fi % de \mst@mathord=\mathord
```

```
\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 LaTeX are of type `mathord`. If we use the Euler font it is perhaps better to have them be of type `mathalpha`

```
\ifmst@goahead
 \ifmst@eulergreek
  \DeclareMathSymbol{\mst@alpha}  {\mathalpha}{mteulervm}{"0B}
  \DeclareMathSymbol{\mst@beta}   {\mathalpha}{mteulervm}{"0C}
  \DeclareMathSymbol{\mst@gamma}  {\mathalpha}{mteulervm}{"0D}
  \DeclareMathSymbol{\mst@delta}  {\mathalpha}{mteulervm}{"0E}
  \DeclareMathSymbol{\mst@epsilon}{\mathalpha}{mteulervm}{"0F}
  \DeclareMathSymbol{\mst@zeta}   {\mathalpha}{mteulervm}{"10}
  \DeclareMathSymbol{\mst@eta}    {\mathalpha}{mteulervm}{"11}
  \DeclareMathSymbol{\mst@theta}  {\mathalpha}{mteulervm}{"12}
  \DeclareMathSymbol{\mst@iota}   {\mathalpha}{mteulervm}{"13}
  \DeclareMathSymbol{\mst@kappa}  {\mathalpha}{mteulervm}{"14}
  \DeclareMathSymbol{\mst@lambda} {\mathalpha}{mteulervm}{"15}
  \DeclareMathSymbol{\mst@mu}     {\mathalpha}{mteulervm}{"16}
  \DeclareMathSymbol{\mst@nu}     {\mathalpha}{mteulervm}{"17}
  \DeclareMathSymbol{\mst@xi}     {\mathalpha}{mteulervm}{"18}
  \DeclareMathSymbol{\mst@omicron}{\mathalpha}{mteulervm}{"6F}
  \DeclareMathSymbol{\mst@pi}     {\mathalpha}{mteulervm}{"19}
  \DeclareMathSymbol{\mst@rho}    {\mathalpha}{mteulervm}{"1A}
  \DeclareMathSymbol{\mst@sigma}  {\mathalpha}{mteulervm}{"1B}
  \DeclareMathSymbol{\mst@tau}    {\mathalpha}{mteulervm}{"1C}
  \DeclareMathSymbol{\mst@upsilon}{\mathalpha}{mteulervm}{"1D}
  \DeclareMathSymbol{\mst@phi}    {\mathalpha}{mteulervm}{"1E}
  \DeclareMathSymbol{\mst@chi}    {\mathalpha}{mteulervm}{"1F}
  \DeclareMathSymbol{\mst@psi}    {\mathalpha}{mteulervm}{"20}
  \DeclareMathSymbol{\mst@omega}  {\mathalpha}{mteulervm}{"21}
%
  \DeclareMathSymbol{\mst@varepsilon}{\mathalpha}{mteulervm}{"22}
  \DeclareMathSymbol{\mst@vartheta}{\mathalpha}{mteulervm}{"23}
  \DeclareMathSymbol{\mst@varpi}  {\mathalpha}{mteulervm}{"24}
  \let\mst@varrho=\mst@rho
  \let\mst@varsigma=\mst@sigma
  \DeclareMathSymbol{\mst@varphi} {\mathalpha}{mteulervm}{"27}
%
  \DeclareMathSymbol{\mst@partial}{\mathalpha}{mteulervm}{"40}
  \DeclareMathSymbol{\mst@wp}{\mathalpha}{mteulervm}{"7D}
  \DeclareMathSymbol{\mst@ell}{\mathalpha}{mteulervm}{"60}
 \else
  \ifmst@symbolgreek
  \DeclareMathSymbol{\mst@alpha}{\mathord}{mtpsymbol}{"61}
  \DeclareMathSymbol{\mst@beta}{\mathord}{mtpsymbol}{"62}
  \DeclareMathSymbol{\mst@gamma}{\mathord}{mtpsymbol}{"67}
  \DeclareMathSymbol{\mst@delta}{\mathord}{mtpsymbol}{"64}
  \DeclareMathSymbol{\mst@epsilon}{\mathord}{mtpsymbol}{"65}
```

```
  \DeclareMathSymbol{\mst@zeta}{\mathord}{mtpsymbol}{"7A}
  \DeclareMathSymbol{\mst@eta}{\mathord}{mtpsymbol}{"68}
  \DeclareMathSymbol{\mst@theta}{\mathord}{mtpsymbol}{"71}
  \DeclareMathSymbol{\mst@iota}{\mathord}{mtpsymbol}{"69}
  \DeclareMathSymbol{\mst@kappa}{\mathord}{mtpsymbol}{"6B}
  \DeclareMathSymbol{\mst@lambda}{\mathord}{mtpsymbol}{"6C}
  \DeclareMathSymbol{\mst@mu}{\mathord}{mtpsymbol}{"6D}
  \DeclareMathSymbol{\mst@nu}{\mathord}{mtpsymbol}{"6E}
  \DeclareMathSymbol{\mst@xi}{\mathord}{mtpsymbol}{"78}
  \DeclareMathSymbol{\mst@omicron}{\mathord}{mtpsymbol}{"6F}
  \DeclareMathSymbol{\mst@pi}{\mathord}{mtpsymbol}{"70}
  \DeclareMathSymbol{\mst@rho}{\mathord}{mtpsymbol}{"72}
  \DeclareMathSymbol{\mst@sigma}{\mathord}{mtpsymbol}{"73}
  \DeclareMathSymbol{\mst@tau}{\mathord}{mtpsymbol}{"74}
  \DeclareMathSymbol{\mst@upsilon}{\mathord}{mtpsymbol}{"75}
  \DeclareMathSymbol{\mst@phi}{\mathord}{mtpsymbol}{"66}
  \DeclareMathSymbol{\mst@chi}{\mathord}{mtpsymbol}{"63}
  \DeclareMathSymbol{\mst@psi}{\mathord}{mtpsymbol}{"79}
  \DeclareMathSymbol{\mst@omega}{\mathord}{mtpsymbol}{"77}
  \let\mst@varepsilon=\mst@epsilon
  \DeclareMathSymbol{\mst@vartheta}{\mathord}{mtpsymbol}{"4A}
  \DeclareMathSymbol{\mst@varpi}{\mathord}{mtpsymbol}{"76}
  \let\mst@varrho=\mst@rho
  \DeclareMathSymbol{\mst@varsigma}{\mathord}{mtpsymbol}{"56}
  \DeclareMathSymbol{\mst@varphi}{\mathord}{mtpsymbol}{"6A}
  \DeclareMathSymbol{\mst@partial}{\mathord}{mtpsymbol}{"B6}
  \DeclareMathSymbol{\mst@wp}{\mathord}{mtpsymbol}{"C3}
  \fi
 \fi
\fi
```

`\alphaup etc...` Completely refactored at `1.3x` to define `\Alphaup`, `\Alphait`, `\alphaup`, `\alphait`, etc... and prepare templates `\Alpha`, ..., `\alpha`, ..., which when activating a math version will be submitted to an `\expanded`, whose behaviour will depend on version-specific conditionals.

```
\ifmst@LGRgreek
% cf http://milde.users.sourceforge.net/LGR/lgrxenc.def.html
% et greek.ldf du package babel
  \DeclareMathSymbol{\Alphaup}{\mathalpha}{mtgreekup}{65}
  \DeclareMathSymbol{\Betaup}{\mathalpha}{mtgreekup}{66}
  \DeclareMathSymbol{\Epsilonup}{\mathalpha}{mtgreekup}{69}
  \DeclareMathSymbol{\Zetaup}{\mathalpha}{mtgreekup}{90}
  \DeclareMathSymbol{\Etaup}{\mathalpha}{mtgreekup}{72}
  \DeclareMathSymbol{\Iotaup}{\mathalpha}{mtgreekup}{73}
  \DeclareMathSymbol{\Kappaup}{\mathalpha}{mtgreekup}{75}
  \DeclareMathSymbol{\Muup}{\mathalpha}{mtgreekup}{77}
  \DeclareMathSymbol{\Nuup}{\mathalpha}{mtgreekup}{78}
  \DeclareMathSymbol{\Omicronup}{\mathalpha}{mtgreekup}{79}
  \DeclareMathSymbol{\Rhoup}{\mathalpha}{mtgreekup}{82}
  \DeclareMathSymbol{\Tauup}{\mathalpha}{mtgreekup}{84}
```

```
\DeclareMathSymbol{\Chiup}{\mathalpha}{mtgreekup}{81}
%
\DeclareMathSymbol{\Alphait}{\mathalpha}{mtgreekit}{65}
\DeclareMathSymbol{\Betait}{\mathalpha}{mtgreekit}{66}
\DeclareMathSymbol{\Epsilonit}{\mathalpha}{mtgreekit}{69}
\DeclareMathSymbol{\Zetait}{\mathalpha}{mtgreekit}{90}
\DeclareMathSymbol{\Etait}{\mathalpha}{mtgreekit}{72}
\DeclareMathSymbol{\Iotait}{\mathalpha}{mtgreekit}{73}
\DeclareMathSymbol{\Kappait}{\mathalpha}{mtgreekit}{75}
\DeclareMathSymbol{\Muit}{\mathalpha}{mtgreekit}{77}
\DeclareMathSymbol{\Nuit}{\mathalpha}{mtgreekit}{78}
\DeclareMathSymbol{\Omicronit}{\mathalpha}{mtgreekit}{79}
\DeclareMathSymbol{\Rhoit}{\mathalpha}{mtgreekit}{82}
\DeclareMathSymbol{\Tauit}{\mathalpha}{mtgreekit}{84}
\DeclareMathSymbol{\Chiit}{\mathalpha}{mtgreekit}{81}
```

`1.3w` and earlier had a bug regarding Digamma which was set up to use same font shape as for lowercase digamma.

```
\DeclareMathSymbol{\Digammaup}{\mathalpha}{mtgreekup}{195}
\DeclareMathSymbol{\Digammait}{\mathalpha}{mtgreekit}{195}
%
\DeclareMathSymbol{\Gammaup}{\mathalpha}{mtgreekup}{71}
\DeclareMathSymbol{\Deltaup}{\mathalpha}{mtgreekup}{68}
\DeclareMathSymbol{\Thetaup}{\mathalpha}{mtgreekup}{74}
\DeclareMathSymbol{\Lambdaup}{\mathalpha}{mtgreekup}{76}
\DeclareMathSymbol{\Xiup}{\mathalpha}{mtgreekup}{88}
\DeclareMathSymbol{\Piup}{\mathalpha}{mtgreekup}{80}
\DeclareMathSymbol{\Sigmaup}{\mathalpha}{mtgreekup}{83}
\DeclareMathSymbol{\Upsilonup}{\mathalpha}{mtgreekup}{85}
\DeclareMathSymbol{\Phiup}{\mathalpha}{mtgreekup}{70}
\DeclareMathSymbol{\Psiup}{\mathalpha}{mtgreekup}{89}
\DeclareMathSymbol{\Omegaup}{\mathalpha}{mtgreekup}{87}
%
\DeclareMathSymbol{\Gammait}{\mathalpha}{mtgreekit}{71}
\DeclareMathSymbol{\Deltait}{\mathalpha}{mtgreekit}{68}
\DeclareMathSymbol{\Thetait}{\mathalpha}{mtgreekit}{74}
\DeclareMathSymbol{\Lambdait}{\mathalpha}{mtgreekit}{76}
\DeclareMathSymbol{\Xiit}{\mathalpha}{mtgreekit}{88}
\DeclareMathSymbol{\Piit}{\mathalpha}{mtgreekit}{80}
\DeclareMathSymbol{\Sigmait}{\mathalpha}{mtgreekit}{83}
\DeclareMathSymbol{\Upsilonit}{\mathalpha}{mtgreekit}{85}
\DeclareMathSymbol{\Phiit}{\mathalpha}{mtgreekit}{70}
\DeclareMathSymbol{\Psiit}{\mathalpha}{mtgreekit}{89}
\DeclareMathSymbol{\Omegait}{\mathalpha}{mtgreekit}{87}
%
\def\mst@Alpha{\ifmst@lgr@upper@up\Alphaup\else\Alphait\fi}%
\def\mst@Beta{\ifmst@lgr@upper@up\Betaup\else\Betait\fi}%
\def\mst@Epsilon{\ifmst@lgr@upper@up\Epsilonup\else\Epsilonit\fi}%
\def\mst@Zeta{\ifmst@lgr@upper@up\Zetaup\else\Zetait\fi}%
\def\mst@Eta{\ifmst@lgr@upper@up\Etaup\else\Etait\fi}%
```

```
\def\mst@Iota{\ifmst@lgr@upper@up\Iotaup\else\Iotait\fi}%
\def\mst@Kappa{\ifmst@lgr@upper@up\Kappaup\else\Kappait\fi}%
\def\mst@Mu{\ifmst@lgr@upper@up\Muup\else\Muit\fi}%
\def\mst@Nu{\ifmst@lgr@upper@up\Nuup\else\Nuit\fi}%
\def\mst@Omicron{\ifmst@lgr@upper@up\Omicronup\else\Omicronit\fi}%
\def\mst@Rho{\ifmst@lgr@upper@up\Rhoup\else\Rhoit\fi}%
\def\mst@Tau{\ifmst@lgr@upper@up\Tauup\else\Tauit\fi}%
\def\mst@Chi{\ifmst@lgr@upper@up\Chiup\else\Chiit\fi}%
%
\def\mst@Digamma{\ifmst@lgr@upper@up\Digammaup\else\Digammait\fi}%
%
\def\mst@Gamma{\ifmst@lgr@upper@up\Gammaup\else\Gammait\fi}%
\def\mst@Delta{\ifmst@lgr@upper@up\Deltaup\else\Deltait\fi}%
\def\mst@Theta{\ifmst@lgr@upper@up\Thetaup\else\Thetait\fi}%
\def\mst@Lambda{\ifmst@lgr@upper@up\Lambdaup\else\Lambdait\fi}%
\def\mst@Xi{\ifmst@lgr@upper@up\Xiup\else\Xiit\fi}%
\def\mst@Pi{\ifmst@lgr@upper@up\Piup\else\Piit\fi}%
\def\mst@Sigma{\ifmst@lgr@upper@up\Sigmaup\else\Sigmait\fi}%
\def\mst@Upsilon{\ifmst@lgr@upper@up\Upsilonup\else\Upsilonit\fi}%
\def\mst@Phi{\ifmst@lgr@upper@up\Phiup\else\Phiit\fi}%
\def\mst@Psi{\ifmst@lgr@upper@up\Psiup\else\Psiit\fi}%
\def\mst@Omega{\ifmst@lgr@upper@up\Omegaup\else\Omegait\fi}%
%
\DeclareMathSymbol{\alphaup}{\mathalpha}{mtgreekup}{97}
\DeclareMathSymbol{\betaup}{\mathalpha}{mtgreekup}{98}
\DeclareMathSymbol{\gammaup}{\mathalpha}{mtgreekup}{103}
\DeclareMathSymbol{\deltaup}{\mathalpha}{mtgreekup}{100}
\DeclareMathSymbol{\epsilonup}{\mathalpha}{mtgreekup}{101}
\DeclareMathSymbol{\zetaup}{\mathalpha}{mtgreekup}{122}
\DeclareMathSymbol{\etaup}{\mathalpha}{mtgreekup}{104}
\DeclareMathSymbol{\thetaup}{\mathalpha}{mtgreekup}{106}
\DeclareMathSymbol{\iotaup}{\mathalpha}{mtgreekup}{105}
\DeclareMathSymbol{\kappaup}{\mathalpha}{mtgreekup}{107}
\DeclareMathSymbol{\lambdaup}{\mathalpha}{mtgreekup}{108}
\DeclareMathSymbol{\muup}{\mathalpha}{mtgreekup}{109}
\DeclareMathSymbol{\nuup}{\mathalpha}{mtgreekup}{110}
\DeclareMathSymbol{\xiup}{\mathalpha}{mtgreekup}{120}
\DeclareMathSymbol{\omicronup}{\mathalpha}{mtgreekup}{111}
\DeclareMathSymbol{\piup}{\mathalpha}{mtgreekup}{112}
\DeclareMathSymbol{\rhoup}{\mathalpha}{mtgreekup}{114}
\DeclareMathSymbol{\sigmaup}{\mathalpha}{mtgreekup}{115}
\DeclareMathSymbol{\tauup}{\mathalpha}{mtgreekup}{116}
\DeclareMathSymbol{\upsilonup}{\mathalpha}{mtgreekup}{117}
\DeclareMathSymbol{\phiup}{\mathalpha}{mtgreekup}{102}
\DeclareMathSymbol{\chiup}{\mathalpha}{mtgreekup}{113}
\DeclareMathSymbol{\psiup}{\mathalpha}{mtgreekup}{121}
\DeclareMathSymbol{\omegaup}{\mathalpha}{mtgreekup}{119}
%
\DeclareMathSymbol{\digammaup}{\mathalpha}{mtgreekup}{147}
```

```
% only varsigma defined (I should check this again)
  \DeclareMathSymbol{\varsigmaup}{\mathalpha}{mtgreekup}{99}
  %
  \DeclareMathSymbol{\alphait}{\mathalpha}{mtgreekit}{97}
  \DeclareMathSymbol{\betait}{\mathalpha}{mtgreekit}{98}
  \DeclareMathSymbol{\gammait}{\mathalpha}{mtgreekit}{103}
  \DeclareMathSymbol{\deltait}{\mathalpha}{mtgreekit}{100}
  \DeclareMathSymbol{\epsilonit}{\mathalpha}{mtgreekit}{101}
  \DeclareMathSymbol{\zetait}{\mathalpha}{mtgreekit}{122}
  \DeclareMathSymbol{\etait}{\mathalpha}{mtgreekit}{104}
  \DeclareMathSymbol{\thetait}{\mathalpha}{mtgreekit}{106}
  \DeclareMathSymbol{\iotait}{\mathalpha}{mtgreekit}{105}
  \DeclareMathSymbol{\kappait}{\mathalpha}{mtgreekit}{107}
  \DeclareMathSymbol{\lambdait}{\mathalpha}{mtgreekit}{108}
  \DeclareMathSymbol{\muit}{\mathalpha}{mtgreekit}{109}
  \DeclareMathSymbol{\nuit}{\mathalpha}{mtgreekit}{110}
  \DeclareMathSymbol{\xiit}{\mathalpha}{mtgreekit}{120}
  \DeclareMathSymbol{\omicronit}{\mathalpha}{mtgreekit}{111}
  \DeclareMathSymbol{\piit}{\mathalpha}{mtgreekit}{112}
  \DeclareMathSymbol{\rhoit}{\mathalpha}{mtgreekit}{114}
  \DeclareMathSymbol{\sigmait}{\mathalpha}{mtgreekit}{115}
  \DeclareMathSymbol{\tauit}{\mathalpha}{mtgreekit}{116}
  \DeclareMathSymbol{\upsilonit}{\mathalpha}{mtgreekit}{117}
  \DeclareMathSymbol{\phiit}{\mathalpha}{mtgreekit}{102}
  \DeclareMathSymbol{\chiit}{\mathalpha}{mtgreekit}{113}
  \DeclareMathSymbol{\psiit}{\mathalpha}{mtgreekit}{121}
  \DeclareMathSymbol{\omegait}{\mathalpha}{mtgreekit}{119}
  %
  \DeclareMathSymbol{\digammait}{\mathalpha}{mtgreekit}{147}
  \DeclareMathSymbol{\varsigmait}{\mathalpha}{mtgreekit}{99}
  %
  \def\mst@alpha{\ifmst@lgr@lower@up\alphaup\else\alphait\fi}%
  \def\mst@beta{\ifmst@lgr@lower@up\betaup\else\betait\fi}%
  \def\mst@gamma{\ifmst@lgr@lower@up\gammaup\else\gammait\fi}%
  \def\mst@delta{\ifmst@lgr@lower@up\deltaup\else\deltait\fi}%
  \def\mst@epsilon{\ifmst@lgr@lower@up\epsilonup\else\epsilonit\fi}%
  \def\mst@zeta{\ifmst@lgr@lower@up\zetaup\else\zetait\fi}%
  \def\mst@eta{\ifmst@lgr@lower@up\etaup\else\etait\fi}%
  \def\mst@theta{\ifmst@lgr@lower@up\thetaup\else\thetait\fi}%
  \def\mst@iota{\ifmst@lgr@lower@up\iotaup\else\iotait\fi}%
  \def\mst@kappa{\ifmst@lgr@lower@up\kappaup\else\kappait\fi}%
  \def\mst@lambda{\ifmst@lgr@lower@up\lambdaup\else\lambdait\fi}%
  \def\mst@mu{\ifmst@lgr@lower@up\muup\else\muit\fi}%
  \def\mst@nu{\ifmst@lgr@lower@up\nuup\else\nuit\fi}%
  \def\mst@xi{\ifmst@lgr@lower@up\xiup\else\xiit\fi}%
  \def\mst@omicron{\ifmst@lgr@lower@up\omicronup\else\omicronit\fi}%
  \def\mst@pi{\ifmst@lgr@lower@up\piup\else\piit\fi}%
  \def\mst@rho{\ifmst@lgr@lower@up\rhoup\else\rhoit\fi}%
  \def\mst@sigma{\ifmst@lgr@lower@up\sigmaup\else\sigmait\fi}%
```

```
  \def\mst@tau{\ifmst@lgr@lower@up\tauup\else\tauit\fi}%
  \def\mst@upsilon{\ifmst@lgr@lower@up\upsilonup\else\upsilonit\fi}%
  \def\mst@phi{\ifmst@lgr@lower@up\phiup\else\phiit\fi}%
  \def\mst@chi{\ifmst@lgr@lower@up\chiup\else\chiit\fi}%
  \def\mst@psi{\ifmst@lgr@lower@up\psiup\else\psiit\fi}%
  \def\mst@omega{\ifmst@lgr@lower@up\omegaup\else\omegait\fi}%
    %
  \def\mst@digamma{\ifmst@lgr@lower@up\digammaup\else\digammait\fi}%
  \def\mst@varsigma{\ifmst@lgr@lower@up\varsigmaup\else\varsigmait\fi}%
\fi
```

\MTstandardgreek
\MTcustomgreek
\recordstandardgreek

1.3d 2014/05/23 defines the commands **\MTstandardgreek** and **\MTcustomgreek** for package and user. I leave **\MTrecordstandardgreek** undocumented as I don't want to encourage people 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** !

```
\newcommand*{\MTstandardgreek}{}
\newcommand*{\MTcustomgreek}{}
\newcommand*{\MTrecordstandardgreek}{}
\ifmst@customgreek
 \renewcommand*{\MTrecordstandardgreek}{%
    \let\mst@origAlpha\Alpha
    \let\mst@origBeta\Beta
    \let\mst@origGamma\Gamma
    \let\mst@origDelta\Delta
    \let\mst@origEpsilon\Epsilon
    \let\mst@origZeta\Zeta
    \let\mst@origEta\Eta
    \let\mst@origTheta\Theta
    \let\mst@origIota\Iota
    \let\mst@origKappa\Kappa
    \let\mst@origLambda\Lambda
    \let\mst@origMu\Mu
    \let\mst@origNu\Nu
    \let\mst@origXi\Xi
    \let\mst@origOmicron\Omicron
    \let\mst@origPi\Pi
    \let\mst@origRho\Rho
    \let\mst@origSigma\Sigma
    \let\mst@origTau\Tau
    \let\mst@origUpsilon\Upsilon
    \let\mst@origPhi\Phi
    \let\mst@origChi\Chi
    \let\mst@origPsi\Psi
    \let\mst@origOmega\Omega
%
    \let\mst@origalpha\alpha
    \let\mst@origbeta\beta
```

```
    \let\mst@origgamma\gamma
    \let\mst@origdelta\delta
    \let\mst@origepsilon\epsilon
    \let\mst@origvarepsilon\varepsilon
    \let\mst@origzeta\zeta
    \let\mst@origeta\eta
    \let\mst@origtheta\theta
    \let\mst@origvartheta\vartheta
    \let\mst@origiota\iota
    \let\mst@origkappa\kappa
    \let\mst@origlambda\lambda
    \let\mst@origmu\mu
    \let\mst@orignu\nu
    \let\mst@origxi\xi
    \let\mst@origomicron\omicron
    \let\mst@origpi\pi
    \let\mst@origvarpi\varpi
    \let\mst@origrho\rho
    \let\mst@origvarrho\varrho
    \let\mst@origsigma\sigma
    \let\mst@origvarsigma\varsigma
    \let\mst@origtau\tau
    \let\mst@origupsilon\upsilon
    \let\mst@origphi\phi
    \let\mst@origvarphi\varphi
    \let\mst@origchi\chi
    \let\mst@origpsi\psi
    \let\mst@origomega\omega
    \let\mst@origDigamma\Digamma
    \let\mst@origdigamma\digamma
%
    \let\mst@origpartial\partial
    \let\mst@origwp\wp
    \let\mst@origell\ell }% \MTrecordstandardgreek
\MTrecordstandardgreek
\renewcommand*{\MTstandardgreek}{%
    \let\Alpha\mst@origAlpha
    \let\Beta\mst@origBeta
    \let\Gamma\mst@origGamma
    \let\Delta\mst@origDelta
    \let\Epsilon\mst@origEpsilon
    \let\Zeta\mst@origZeta
    \let\Eta\mst@origEta
    \let\Theta\mst@origTheta
    \let\Iota\mst@origIota
    \let\Kappa\mst@origKappa
    \let\Lambda\mst@origLambda
    \let\Mu\mst@origMu
    \let\Nu\mst@origNu
```

```
    \let\Xi\mst@origXi
    \let\Omicron\mst@origOmicron
    \let\Pi\mst@origPi
    \let\Rho\mst@origRho
    \let\Sigma\mst@origSigma
    \let\Tau\mst@origTau
    \let\Upsilon\mst@origUpsilon
    \let\Phi\mst@origPhi
    \let\Chi\mst@origChi
    \let\Psi\mst@origPsi
    \let\Omega\mst@origOmega
%
    \let\alpha\mst@origalpha
    \let\beta\mst@origbeta
    \let\gamma\mst@origgamma
    \let\delta\mst@origdelta
    \let\epsilon\mst@origepsilon
    \let\varepsilon\mst@origvarepsilon
    \let\zeta\mst@origzeta
    \let\eta\mst@origeta
    \let\theta\mst@origtheta
    \let\vartheta\mst@origvartheta
    \let\iota\mst@origiota
    \let\kappa\mst@origkappa
    \let\lambda\mst@origlambda
    \let\mu\mst@origmu
    \let\nu\mst@orignu
    \let\xi\mst@origxi
    \let\omicron\mst@origomicron
    \let\pi\mst@origpi
    \let\varpi\mst@origvarpi
    \let\rho\mst@origrho
    \let\varrho\mst@origvarrho
    \let\sigma\mst@origsigma
    \let\varsigma\mst@origvarsigma
    \let\tau\mst@origtau
    \let\upsilon\mst@origupsilon
    \let\phi\mst@origphi
    \let\varphi\mst@origvarphi
    \let\chi\mst@origchi
    \let\psi\mst@origpsi
    \let\omega\mst@origomega
    \let\Digamma\mst@origDigamma
    \let\digamma\mst@origdigamma
%
    \let\partial\mst@origpartial
    \let\wp\mst@origwp
    \let\ell\mst@origell
}% \MTstandardgreek
```

Under `selfGreek` or other Greek option but not `LGRgreek`, these Greek letter control sequences are already `\mathchar`'s, but under `LGRgreek` they need (well not really, but I feel it is cleaner) expansion which will react to the Boolean saying if using 'upright' or 'italic'. This Boolean setting is recorded when declaring a math version and reenacted when `\MTversion` is encountered in the document body. We must be careful not to contaminate things in the principal mode from math version declarations but I think my (now quite old) code is globally designed to achieve this protection see how `\MTDeclareVersion` is done. The `\MTcustomgreek` will always be executed in preamble at least once, except under `subdued` option.

The `\expanded`'s act on unexpanding tokens if not used under `LGRgreek` regimen.

```
\renewcommand*{\MTcustomgreek}{%
  \expanded{%
    \let\noexpand\Alpha\mst@Alpha
    \let\noexpand\Beta\mst@Beta
    \let\noexpand\Epsilon\mst@Epsilon
    \let\noexpand\Zeta\mst@Zeta
    \let\noexpand\Eta\mst@Eta
    \let\noexpand\Iota\mst@Iota
    \let\noexpand\Kappa\mst@Kappa
    \let\noexpand\Mu\mst@Mu
    \let\noexpand\Nu\mst@Nu
    \let\noexpand\Omicron\mst@Omicron
    \let\noexpand\Rho\mst@Rho
    \let\noexpand\Tau\mst@Tau
    \let\noexpand\Chi\mst@Chi
  }% end of first big \expanded
% 1.3h: \mst@Digamma not defined if symbolgreek option
    \ifmst@symbolgreek\else
        \expanded{\let\noexpand\Digamma\mst@Digamma}%
    \fi
  \expanded{%
    \let\noexpand\Gamma\mst@Gamma
    \let\noexpand\Delta\mst@Delta
    \let\noexpand\Theta\mst@Theta
    \let\noexpand\Lambda\mst@Lambda
    \let\noexpand\Xi\mst@Xi
    \let\noexpand\Pi\mst@Pi
    \let\noexpand\Sigma\mst@Sigma
    \let\noexpand\Upsilon\mst@Upsilon
    \let\noexpand\Phi\mst@Phi
    \let\noexpand\Psi\mst@Psi
    \let\noexpand\Omega\mst@Omega
  }% end of second big \expanded
```

`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`.

```
\ifmst@selfGreek\else
  \expanded{%
    \let\noexpand\alpha\mst@alpha
    \let\noexpand\beta\mst@beta
```

```
    \let\noexpand\gamma\mst@gamma
    \let\noexpand\delta\mst@delta
    \let\noexpand\epsilon\mst@epsilon
    \let\noexpand\zeta\mst@zeta
    \let\noexpand\eta\mst@eta
    \let\noexpand\theta\mst@theta
    \let\noexpand\iota\mst@iota
    \let\noexpand\kappa\mst@kappa
    \let\noexpand\lambda\mst@lambda
    \let\noexpand\mu\mst@mu
    \let\noexpand\nu\mst@nu
    \let\noexpand\xi\mst@xi
    \let\noexpand\omicron\mst@omicron
    \let\noexpand\pi\mst@pi
    \let\noexpand\rho\mst@rho
    \let\noexpand\sigma\mst@sigma
    \let\noexpand\tau\mst@tau
    \let\noexpand\upsilon\mst@upsilon
    \let\noexpand\phi\mst@phi
    \let\noexpand\chi\mst@chi
    \let\noexpand\psi\mst@psi
    \let\noexpand\omega\mst@omega
    \let\noexpand\varsigma\mst@varsigma
  }% end of third big \expanded
% 1.3h: digamma only defined with option LGRgreek:
    \ifmst@LGRgreek
        \expanded{\let\noexpand\digamma\mst@digamma}%
    \fi
% conditional added 1.3h 2015/10/31
    \ifmst@LGRgreek\else
      \let\varepsilon\mst@varepsilon
      \let\vartheta\mst@vartheta
      \let\varpi\mst@varpi
      \let\varrho\mst@varrho
      \let\varphi\mst@varphi
%
      \let\partial\mst@partial
      \let\wp\mst@wp
% 1.3h: no \mst@ell if symbolgreek (bugfix 1.3h 2015/10/31)
      \ifmst@symbolgreek\else\let\ell\mst@ell\fi
    \fi
 \fi
}% \MTcustomgreek
\fi% end of \ifcustomgreek
\let\Mathastextstandardgreek\MTstandardgreek
\let\Mathastextcustomgreek\MTcustomgreek
\ifmst@subdued\else\MTcustomgreek\fi
```

`\inodot` `\jnodot` 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.

`1.31 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.

`1.3v` lets the redefined `\imath` and `\jmath` be `\protected`.

```
\def\mst@subduedinodot{%
   \let\inodot\mst@original@imath
   \let\jnodot\mst@original@jmath
}%
\def\mst@nonsubduedinodot{%
   \expandafter\let\expandafter\inodot
                \csname mst@inodot@mv\math@version\endcsname
   \expandafter\let\expandafter\jnodot
                \csname mst@jnodot@mv\math@version\endcsname
}%
\def\mst@dothe@inodotstuff#1#2#3{%
  \edef\mst@tmp@enc{#3}%
  \if1\mst@OneifUniEnc
    % Unicode engine and font
    \mst@Umathchardef#1="7 \symmtletterfont "0131 \relax
    \mst@Umathchardef#2="7 \symmtletterfont "0237 \relax
  \else
   \DeclareMathSymbol{#1}{\mathalpha}{mtletterfont}
                      {\csname\mst@tmp@enc\string\i\endcsname}
   \DeclareMathSymbol{#2}{\mathalpha}{mtletterfont}
                      {\csname\mst@tmp@enc\string\j\endcsname}
  \fi}% \mst@dothe@inodotstuff
\ifmst@defaultimath\else\typeout{** \string\imath\space and \string\jmath\space}
    \AtEndOfPackage{\AtBeginDocument{%
        \protected\def\imath{\inodot}%
        \protected\def\jmath{\jnodot}%
    }}%
\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 LaTeX, 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.

`1.3v` adapts to LaTeX `2019-10-01` which now comes with robust math accent macros. The «original»-named macros are without the robustifying space (NOT true anymore, see `1.3w` next), as they only serve as meaning holders.

On the other hand the macros indexed by math version names are (in the pdflatex branch) always defined via `\DeclareMathAccent` hence they will be robust with `2019-10-01` or later and we must use the `\mst@robustifyingspace` with them to access their real meaning (this thus differs from the situation with `\hbar`).

`1.3w` The above was a bit optimistic as `amsmath` for example modifies LaTeX internals and handles math accents differently.

We thus needed to double our `\let`'s as, if `amsmath` is loaded, the cs with space will exist but not be paired in expected way with the original cs. This breaks things by the way if some math accent is written to an external file under a certain context and executed in another context. The new context will be probably ignored if `amsmath` is loaded, as the external file will have an already expanded-once meaning.

Some macros with space in name might thus be created as `\relax`. Should I rather create `\protected` macros for the math accents with Unicode engines? Anyway, the construct does give good result with the few OpenType text fonts I tested.

```
\let\mst@subduedmathaccents\@empty
\let\mst@nonsubduedmathaccents\@empty
\ifmst@mathaccents
\def\mst@subduedmathaccents{%
  \@tfor\@tempa:={grave}{acute}{check}{breve}{bar}%
                 {dot}{ddot}{mathring}{hat}{tilde}%
  \do
  {\expandafter\let\csname\@tempa\expandafter\endcsname
                   \csname mst@original@\@tempa\endcsname
   \expandafter\let\csname\@tempa\space\expandafter\endcsname
                   \csname mst@original@\@tempa\space\endcsname
   }%
}%
\def\mst@nonsubduedmathaccents{%
  \@tfor\@tempa:={grave}{acute}{check}{breve}{bar}%
                 {dot}{ddot}{mathring}{hat}{tilde}%
  \do
  {\expandafter\let\csname\@tempa\expandafter\endcsname
                   \csname mst@\@tempa @mv\math@version\endcsname
   \expandafter\let\csname\@tempa\space\expandafter\endcsname
                   \csname mst@\@tempa @mv\math@version\space\endcsname
}%
}%
\def\mst@dothe@mathaccentsstuff#1#2{%
  \begingroup
  \edef\mst@tmp@enc{#2}%
  \def\@text@composite##1\@text@composite##2{##2}%
```

```
\let\add@accent\@firstoftwo
\let\add@unicode@accent\@firstoftwo
\if1\mst@OneifUniEnc
  \ifmst@unimathaccents
    % \` -> \grave
    \expandafter\xdef\csname mst@grave@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
      7
      \number\symmtoperatorfont\space
      \csname#2\string\`\endcsname{}\relax}%
    % \' -> \acute
    \expandafter\xdef\csname mst@acute@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
      7
      \number\symmtoperatorfont\space
      \csname#2\string\'\endcsname{}\relax}%
    % \v -> \check
    \expandafter\xdef\csname mst@check@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
      7
      \number\symmtoperatorfont\space
      \csname#2\string\v\endcsname{}\relax}%
    % \u -> \breve
    \expandafter\xdef\csname mst@breve@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
      7
      \number\symmtoperatorfont\space
      \csname#2\string\u\endcsname{}\relax}%
    % \= -> \bar
    \expandafter\xdef\csname mst@bar@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
      7
      \number\symmtoperatorfont\space
      \csname#2\string\=\endcsname{}\relax}%
    % \. -> \dot
    \expandafter\xdef\csname mst@dot@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
      7
      \number\symmtoperatorfont\space
      \csname#2\string\.\endcsname{}\relax}%
    % \" -> \ddot
    \expandafter\xdef\csname mst@ddot@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
      7
      \number\symmtoperatorfont\space
      \csname#2\string\"\endcsname{}\relax}%
    % \r -> \mathring
    \expandafter\xdef\csname mst@mathring@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
```

```
      7
      \number\symmtoperatorfont\space
      \csname#2\string\r\endcsname{}\relax}%
    % \^ -> \hat
    \expandafter\xdef\csname mst@hat@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
      7
      \number\symmtoperatorfont\space
      \csname#2\string\^\endcsname{}\relax}%
    % \~ -> \tilde
    \expandafter\xdef\csname mst@tilde@mv#1\mst@robustifyingspace\endcsname
     {\mst@Umathaccent
      7
      \number\symmtoperatorfont\space
      \csname#2\string\~\endcsname{}\relax}%
  \else % false branch of ifmst@unimathaccents
```

`1.3u` used some `\def` but this made the accent macro meanings look slightly different depending on whether the math version being set-up was with an 8bit encoding or TU encoding.

For the sake of uniform treatment we modify this at `1.3v`, but this is a bit complicated regarding timing: we need, in absence of `unimathaccents` option, in math versions with an OpenType font, to let the `\acute` etc... acquire back some prior non-`mathastext` meanings. To allow maximal flexibility, these original meaning get stored at begin document only. But `\mst@nonsubduedmathaccents` assigns to `\acute` etc... (in the robust sense with LaTeX `2019-10-01` or later) the meaning stored in the macros with the math version in their names. Such `\mst@acute@mvnormal` etc... must thus be ready before `\mst@nonsubduedmathaccents` (or at least before the last such) execution: the code here must get executed after the definition of the «original»-named macros but prior to the (last one, if multiple) `\mst@nonsubduedmathaccents`.

Hence `1.3v` delayed a bit the initial execution of this macro (see further down in the code) compared to what happened in `1.3u`.

We are in a group but `\AtEndOfPackage` does the right thing.

```
    \AtEndOfPackage{\AtBeginDocument{%
    \@tfor\@tempa:={grave}{acute}{check}{breve}{bar}%
                   {dot}{ddot}{mathring}{hat}{tilde}%
    \do
    {\expandafter\let
        \csname mst@\@tempa @mv#1\expandafter\endcsname
        \csname mst@original@\@tempa\endcsname
     \expandafter\let
        \csname mst@\@tempa @mv#1\space\expandafter\endcsname
        \csname mst@original@\@tempa\space\endcsname}%
    }}%
  \fi
```

This is needed because the pdflatex engine branch will use `\DeclareMathAccent` and it creates robust macros with LaTeX `2019-10-01` or later. As we want elsewhere in the package code not to have to check if under Unicode engine or not, we need to handle here also some definition of robust macros.

But wouldn't it be simpler to manage `\protected` macros?

```
  \ifmst@robust@obsessed@LaTeX@era
```

```
      \@tfor\@tempa:={grave}{acute}{check}{breve}{bar}%
                     {dot}{ddot}{mathring}{hat}{tilde}%
      \do
      {\expandafter\xdef\csname mst@\@tempa @mv#1\endcsname
         {\noexpand\protect
          \expandafter\noexpand\csname mst@\@tempa @mv#1 \endcsname}%
      }%
    \fi
  \else % false branch of ifUniEnc
```

`\DeclareMathAccent` works `\global`ly. And with LaTeX `2019-10-01` or later it creates robust macros.

`\mst@DeclareMathAccent` to work around https://github.com/latex3/latex2e/issues/216

```
    % \` -> \grave
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@grave@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\`\endcsname{}}
    % \' -> \acute
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@acute@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\'\endcsname{}}
    % \v -> \check
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@check@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\v\endcsname{}}
    % \u -> \breve
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@breve@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\u\endcsname{}}
    % \= -> \bar
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@bar@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\=\endcsname{}}
    % \. -> \dot
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@dot@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\.\endcsname{}}
    % \" -> \ddot
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@ddot@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\"\endcsname{}}
    % \r -> \mathring
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@mathring@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\r\endcsname{}}
    % \^ -> \hat
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@hat@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\^\endcsname{}}
```

```
    % \~ -> \tilde
    \expandafter\mst@DeclareMathAccent\expandafter
                {\csname mst@tilde@mv#1\endcsname}{\mathalpha}{mtoperatorfont}%
                {\csname#2\string\~\endcsname{}}
  \fi
  \endgroup
}%
\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! Finally done at `1.3w 2019/11/16`! Better late than never...

`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 modifiy (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.

`1.3w` adds the check to forbid `normal` and `bold` as version names.

```
\newcommand*\MTDeclareVersion[6][]{%
  \edef\mst@declareversionargs{{#1}{#2}{#3}{#4}{#5}{#6}}%
  \edef\mst@version{#2}%
  \if0\ifx\mst@version\mst@normalversionname0\else
      \ifx\mst@version\mst@boldversionname0\else
      1\fi\fi
   \expandafter\expandafter\expandafter
   \MTDoNotDeclareVersion@\expandafter\@gobblefour
  \fi
  \relax\DeclareMathVersion{\mst@version}\MTDeclareVersion@
}% \MTDeclareVersion
\newcommand*\MTDoNotDeclareVersion@[1][]{%
   \PackageWarningNoLine{mathastext}{You asked to declare a version with name
   `\mst@version'.^^J%
   \@spaces Sorry but you are not allowed to do that.^^J%
   \@spaces \ifmst@subdued Anyway the `subdued' option is in force\else
         Use rather \string\Mathastext\space macro (with no optional argument)\fi
}}%\MTDoNotDeclareVersion@
\newcommand*\MTDeclareVersion@[1][]{%
    \edef\mst@tmp{#1}%
    \ifx\mst@tmp\empty\else
```

```
      \global\expandafter\let\csname mv@\mst@version\expandafter\endcsname
                                \csname mv@#1\endcsname
      \typeout{** Math version `\mst@version\string' inherits from `#1\string'.}%
    \fi
    \expandafter\MTDeclareVersion@@\mst@declareversionargs
}% \MTDeclareVersion@
\newcommand*\MTDeclareVersion@@[6]{%
  \expandafter\edef\csname mst@encoding@\mst@version\endcsname{#3}%
  \expandafter\edef\csname mst@family@\mst@version\endcsname{#4}%
  \expandafter\edef\csname mst@series@\mst@version\endcsname{#5}%
  \expandafter\edef\csname mst@shape@\mst@version\endcsname{#6}%
  \expandafter\edef\csname mst@boldvariant@\mst@version\endcsname{\mst@bold}%
  \expandafter\edef\csname mst@itdefault@\mst@version\endcsname{\itdefault}%
  \expandafter\edef\csname mst@rmdefault@\mst@version\endcsname{\rmdefault}%
  \expandafter\edef\csname mst@sfdefault@\mst@version\endcsname{\sfdefault}%
  \expandafter\edef\csname mst@ttdefault@\mst@version\endcsname{\ttdefault}%
  \expandafter\edef\csname mst@exists@skip@\mst@version\endcsname
        {\mst@exists@skip}%
  \expandafter\edef\csname mst@forall@skip@\mst@version\endcsname
        {\mst@forall@skip}%
  \expandafter\edef\csname mst@prime@skip@\mst@version\endcsname
        {\mst@prime@skip}%
  \def\mst@tmp{#1}%
  \ifx\mst@tmp\empty
    \ifmst@italic
      \SetSymbolFont{mtletterfont}{#2}{#3}{#4}{#5}{\mst@ltsh}%
      \typeout{** Latin letters in math version `#2\string' will use the font
                  #3/#4/#5/\mst@ltsh^^J%
               ** Other characters (digits, ...) and \protect\log-like names
                    will be in `#6\string' shape.}%
      \expandafter\edef\csname mst@ltshape@\mst@version\endcsname{\mst@ltsh}%
    \else
      \SetSymbolFont{mtletterfont}{#2}{#3}{#4}{#5}{#6}%
       \typeout{** Latin letters in math version `#2\string' will use the fonts
                   #3/#4/#5(\mst@bold)/#6}%
      \expandafter\edef\csname mst@ltshape@\mst@version\endcsname{#6}%
    \fi
  \else
    \SetSymbolFont{mtletterfont}{#2}{#3}{#4}{#5}{#1}%
    \typeout{** Latin letters in math version `#2\string' will use the font
                #3/#4/#5/#1^^J%
             ** Other characters (digits, ...) and \protect\log-like
                names will be in `#6\string' shape.}%
      \expandafter\edef\csname mst@ltshape@\mst@version\endcsname{#1}%
  \fi
  \ifmst@nonormalbold\else
       \SetMathAlphabet{\mathnormalbold}{#2}{#3}{#4}{\mst@bold}%
                   {\csname mst@ltshape@\mst@version\endcsname}%
  \fi
```

```
\SetSymbolFont{mtoperatorfont}{#2}{#3}{#4}{#5}{#6}%
\ifmst@defaultbf\else\SetMathAlphabet{\Mathbf}{#2}{#3}{#4}{\mst@bold}{#6}\fi
\ifmst@defaultit\else\SetMathAlphabet{\Mathit}{#2}{#3}{#4}{#5}{\itdefault}\fi
\ifmst@defaultsf\else\SetMathAlphabet{\Mathsf}{#2}{#3}{\sfdefault}{#5}{#6}\fi
\ifmst@defaultttt\else\SetMathAlphabet{\Mathtt}{#2}{#3}{\ttdefault}{#5}{#6}\fi
\ifmst@needeuler
    \SetMathAlphabet{\MathEulerBold}{#2}{U}{zeur}{\mst@bold}{n}%
\fi
```

LGRgreeks
selfGreeks

In the case of option LGRgreeks (selfGreeks), it is expected that the fonts used in each math 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.

`1.3x` replaces `\updefault` by `\MTgreekupdefault` and `\itdefault` by `\MTgreekitdefault`. It also prepares to store two Boolean settings saying whether lowercase respectively uppercase Greek letters will use 'upright' or 'italic' (`LGRgreek(s)` only).

The `1.3x` refactoring of `LGRgreek` is done via a decoupling, thus things are done here under `selfGreek` or other Greek options which ultimately serve nothing and conversely things are done here for `LGRgreek` which are superfluous.

```
\def\mst@greek@lsh@loc{\csname mst@ltshape@\mst@version\endcsname}%
\def\mst@greek@ush@loc{\csname mst@shape@\mst@version\endcsname}%
\mst@lgr@lower@uptrue
    \expandafter\in@\expanded{{\mst@greek@lsh@loc.}}{it.,sl.}%
    \ifin@\mst@lgr@lower@upfalse\fi
\mst@lgr@upper@uptrue
    \expandafter\in@\expanded{{\mst@greek@ush@loc.}}{it.,sl.}%
    \ifin@\mst@lgr@upper@upfalse\fi
\ifmst@itgreek
  \def\mst@greek@lsh@loc{\MTgreekitdefault}%
  \def\mst@greek@ush@loc{\MTgreekitdefault}%
    \mst@lgr@lower@upfalse
    \mst@lgr@upper@upfalse
\fi
\ifmst@upgreek
  \def\mst@greek@lsh@loc{\MTgreekupdefault}%
  \def\mst@greek@ush@loc{\MTgreekupdefault}%
    \mst@lgr@lower@uptrue
    \mst@lgr@upper@uptrue
\fi
\ifmst@frenchmath
    \ifmst@itgreek\else
    \ifmst@upgreek\else
      \def\mst@greek@lsh@loc{\csname mst@shape@\mst@version\endcsname}%
      \def\mst@greek@ush@loc{\csname mst@shape@\mst@version\endcsname}%
      \mst@lgr@lower@uptrue
      \mst@lgr@upper@uptrue
    \fi\fi
\fi
\ifcase\mst@greek@select
```

```
      \or
        \def\mst@greek@ush@loc{\MTgreekitdefault}%
        \mst@lgr@upper@upfalse
      \or
        \def\mst@greek@ush@loc{\MTgreekupdefault}%
        \mst@lgr@upper@uptrue
\fi
\ifmst@LGRgreeks
  \SetSymbolFont{mtgreekup}{#2}{LGR}{#4}{#5}{\MTgreekupdefault}%
  \SetSymbolFont{mtgreekit}{#2}{LGR}{#4}{#5}{\MTgreekitdefault}%
```

This is where the shape of uppercase/lowercase Greek letters is recorded, for `\MTversion`'s triggered `\MTcustomgreek` to do the right thing. Also `1.3x` fixes some strange log messages which did not recall the math version name and referred to 'non subdued versions' (strange).

```
  \expandafter\let\csname ifmst@lgr@\mst@version @upper@up\expandafter\endcsname
                  \csname ifmst@lgr@upper@up\endcsname
  \expandafter\let\csname ifmst@lgr@\mst@version @lower@up\expandafter\endcsname
                  \csname ifmst@lgr@lower@up\endcsname
  \typeout{** Greek letters (upper:
    `\ifmst@lgr@upper@up\MTgreekupdefault\else\MTgreekitdefault\fi\string',
                              lower:
    `\ifmst@lgr@lower@up\MTgreekupdefault\else\MTgreekitdefault\fi\string')
              will use
              font family `#4\string' (LGR)^^J**
              in mathastext math version `\mst@version\string'.}%
\else
 \ifmst@selfGreeks
    \SetSymbolFont{mtselfGreekfont}{#2}{OT1}{#4}{#5}{\mst@greek@ush@loc}%
  \typeout{** Capital Greek letters (shape `\mst@greek@ush@loc\string')
              will use font family `#4\string' (OT1)^^J**
              in mathastext math version `\mst@version\string'.}%
 \else
  \ifmst@LGRgreek
    \SetSymbolFont{mtgreekup}{#2}{LGR}{\mst@greekfont}{#5}{\MTgreekupdefault}%
    \SetSymbolFont{mtgreekit}{#2}{LGR}{\mst@greekfont}{#5}{\MTgreekitdefault}%
```

This is where the shape of uppercase/lowercase Greek letters is recorded, for `\MTversion`'s triggered `\MTcustomgreek` to do the right thing.

```
    \expandafter\let\csname ifmst@lgr@\mst@version @upper@up\expandafter\endcsname
                    \csname ifmst@lgr@upper@up\endcsname
    \expandafter\let\csname ifmst@lgr@\mst@version @lower@up\expandafter\endcsname
                    \csname ifmst@lgr@lower@up\endcsname
    \typeout{** Greek letters (upper:
    `\ifmst@lgr@upper@up\MTgreekupdefault\else\MTgreekitdefault\fi\string',
                              lower:
    `\ifmst@lgr@lower@up\MTgreekupdefault\else\MTgreekitdefault\fi\string')
              will use font family `\mst@greekfont\string' (LGR)^^J**
              in mathastext math version `\mst@version\string'.}%
  \else
   \ifmst@selfGreek
```

```
      \SetSymbolFont{mtselfGreekfont}{#2}{OT1}{\mst@greekfont}{#5}{\mst@greek@ush@loc}%
      \typeout{** Capital Greek letters
                  (shape `\mst@greek@ush@loc\string')
                  will use font family `\mst@greekfont\string' (OT1)^^J**
                  in mathastext math version `\mst@version\string'.}%
    \fi
   \fi
  \fi
 \fi
 \edef\mst@tmp{\expandafter\noexpand\csname mst@hbar@mv#2\endcsname
               \expandafter\noexpand\csname mst@ltbar@mv#2\endcsname}%
 \expandafter\mst@dothe@hbarstuff\mst@tmp{#3}%
 \edef\mst@tmp{\expandafter\noexpand\csname mst@inodot@mv#2\endcsname
               \expandafter\noexpand\csname mst@jnodot@mv#2\endcsname}%
 \expandafter\mst@dothe@inodotstuff\mst@tmp{#3}%
 \ifmst@mathaccents
   \mst@dothe@mathaccentsstuff{#2}{#3}%
 \fi
 \edef\mst@tmp{\expandafter\noexpand\csname mst@minus@mv#2\endcsname
               \expandafter\noexpand\csname mst@varfam@minus@mv#2\endcsname}%
 \ifmst@endash
   \expandafter\mst@dothe@endashstuff\mst@tmp{#3}%
 \else
   \ifmst@emdash
     \expandafter\mst@dothe@emdashstuff\mst@tmp{#3}%
   \else
     \expandafter\mst@dothe@hyphenstuff\mst@tmp
   \fi
 \fi
}% \MTDeclareVersion@@
\let\MathastextDeclareVersion\MTDeclareVersion
```

`\MTversion` `\MTversion@` `\MTversion@s` `\MTversion@@`

This is a wrapper around LaTeX'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 initial version of the package (January 2011.)

`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-tup.

`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.

1.3x: Booleans recovered from stored data in the math version will configure the things \MTcustomgreek do, under LGRgreek option.

```
\newcommand*\MTversion {\@ifstar\MTversion@s\MTversion@ }
\newcommand*\MTversion@s [1]{\mathversion{#1}\MTversion@@ }
\newcommand*\MTversion@ [2][]{%
    \mathversion{#2}% defines \math@version as expanded #2
    \edef\mst@tmpa{#1}%
    \ifx\mst@tmpa\empty
        \let\mst@tmp\math@version
    \else
        \let\mst@tmp\mst@tmpa
    \fi
    \edef\encodingdefault {\csname mst@encoding@\mst@tmp\endcsname}%
    \edef\familydefault   {\csname mst@family@\mst@tmp\endcsname}%
    \edef\seriesdefault   {\csname mst@series@\mst@tmp\endcsname}%
    \edef\shapedefault    {\csname mst@shape@\mst@tmp\endcsname}%
    \edef\bfdefault {\csname mst@boldvariant@\mst@tmp\endcsname}%
    \edef\itdefault {\csname mst@itdefault@\mst@tmp\endcsname}%
    \edef\rmdefault {\csname mst@rmdefault@\mst@tmp\endcsname}%
    \edef\sfdefault {\csname mst@sfdefault@\mst@tmp\endcsname}%
    \edef\ttdefault {\csname mst@ttdefault@\mst@tmp\endcsname}%
    \usefont{\encodingdefault}{\familydefault}{\seriesdefault}{\shapedefault}%
    \MTversion@@
}% \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 LaTeX2e code.

```
\newcommand*\MTversion@@ {%
    \MTexistsdoesskip
    \MTforalldoesskip
    \MTprimedoesskip
```

v1.15e: muskips.

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

v1.2: muskip for \prime.

```
     \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.

```
    \edef\mst@tmpa{\csname mst@ltshape@\math@version\endcsname}%
    \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 ot sl. Similary the \MTcustomgreek always executed (if not subdued).

```
    \MTmathoperatorsobeymathxx
    \MTeverymathdefault
    \MTcustomizenewmcodes
    \@for\mst@tmpc:=it,sl\do{\ifx\mst@tmpc\mst@tmpa\MTnoicinmath\fi}%
    \ifmst@frenchmath
      \def\mst@ITcorr{\ifnum\fam=\m@ne\/\fi}%
      \@for\mst@tmpc:=it,sl\do{\ifx\mst@tmpc\mst@tmpb\MTnoICinmath\fi}%
    \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.

```
    \ifmst@subdued
      \ifx\math@version\mst@normalversionname
        \mst@restorealphabets
        \MTstandardgreek
        \MTmathoperatorsdonotobeymathxx
        \MTnormalexists
        \MTnormalforall
        \MTeverymathoff
        \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.

```
        \mst@subduedhbar
        \mst@subduedinodot
        \mst@subduedmathaccents
        \mst@subduedminus
      \else
        \ifx\math@version\mst@boldversionname
          \mst@restorealphabets
          \MTstandardgreek
          \MTmathoperatorsdonotobeymathxx
          \MTnormalexists
          \MTnormalforall
          \MTeverymathoff
          \MTresetnewmcodes
```

```
          \mst@subduedhbar
          \mst@subduedinodot
          \mst@subduedmathaccents
          \mst@subduedminus
        \else
          \mst@setalphabets
```

1.3x addition for `\MTcustomgreek` under `LGRgreeks` option.

```
    \expandafter\let\csname ifmst@lgr@upper@up\expandafter\endcsname
                    \csname ifmst@lgr@\math@version @upper@up\endcsname
    \expandafter\let\csname ifmst@lgr@lower@up\expandafter\endcsname
                    \csname ifmst@lgr@\math@version @lower@up\endcsname
          \MTcustomgreek
          \mst@nonsubduedhbar
          \mst@nonsubduedinodot
          \mst@nonsubduedmathaccents
          \mst@nonsubduedminus
        \fi
      \fi
    \else
```

1.3x addition for `\MTcustomgreek` under `LGRgreek` option.

```
    \expandafter\let\csname ifmst@lgr@upper@up\expandafter\endcsname
                    \csname ifmst@lgr@\math@version @upper@up\endcsname
    \expandafter\let\csname ifmst@lgr@lower@up\expandafter\endcsname
                    \csname ifmst@lgr@\math@version @lower@up\endcsname
      \MTcustomgreek % new with 1.3d
      \mst@nonsubduedhbar
      \mst@nonsubduedinodot
      \mst@nonsubduedmathaccents
      \mst@nonsubduedminus
    \fi
}% \MTversion@@
\let\MathastextVersion\MTversion
\let\Mathastextversion\MTversion
\let\MTVersion\MTversion
\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`.

```
\newcommand*\MTWillUse[5][]{
  \MTencoding{#2}
  \MTfamily{#3}
  \MTseries{#4}
  \MTshape{#5}
    \ifmst@italic\MTlettershape{\itdefault}\fi % was missing in v 1.14 and prior
  \edef\mst@tmp{#1}
  \ifx\mst@tmp\empty\else\MTlettershape{#1}\fi
  \Mathastext}
\let\MathastextWillUse\MTWillUse
```

```
\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).

`1.3x` has refactored the `LGRgreek` associated math fonts.

```
\def\Mathastext {\@ifnextchar [\Mathastext@declare\Mathastext@ }
\def\Mathastext@declare [#1]{%
  \edef\mst@tmp{#1}%
  \ifx\mst@tmp\empty
       \expandafter\@firstoftwo
  \else\expandafter\@secondoftwo
  \fi
  \Mathastext@
  {\MTDeclareVersion[\mst@ltsh]{#1}{\mst@enc}{\mst@fam}{\mst@ser}{\mst@opsh}}%
}% \Mathastext@declare
\def\Mathastext@ {%
  \mst@update@greeksh
  \edef\mst@encoding@normal{\mst@enc}%
  \edef\mst@family@normal{\mst@fam}%
  \edef\mst@series@normal{\mst@ser}%
  \edef\mst@shape@normal{\mst@opsh}%
  \edef\mst@ltshape@normal{\mst@ltsh}%
  \edef\mst@itdefault@normal{\itdefault}%
  \edef\mst@rmdefault@normal{\rmdefault}%
  \edef\mst@sfdefault@normal{\sfdefault}%
  \edef\mst@ttdefault@normal{\ttdefault}%
  \edef\mst@boldvariant@normal{\mst@bold}%
  \edef\mst@exists@skip@normal{\mst@exists@skip}%
  \edef\mst@forall@skip@normal{\mst@forall@skip}%
```

```
  \edef\mst@prime@skip@normal{\mst@prime@skip}%
  \edef\mst@encoding@bold{\mst@enc}%
  \edef\mst@family@bold{\mst@fam}%
  \edef\mst@series@bold{\mst@bold}%
  \edef\mst@shape@bold{\mst@opsh}%
  \edef\mst@ltshape@bold{\mst@ltsh}%
  \edef\mst@boldvariant@bold{\mst@bold}%
  \edef\mst@itdefault@bold{\itdefault}%
  \edef\mst@rmdefault@bold{\rmdefault}%
  \edef\mst@sfdefault@bold{\sfdefault}%
  \edef\mst@ttdefault@bold{\ttdefault}%
  \edef\mst@exists@skip@bold{\mst@exists@skip}%
  \edef\mst@forall@skip@bold{\mst@forall@skip}%
  \edef\mst@prime@skip@bold{\mst@prime@skip}%
  \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.

```
    \def\mst@exists@skip@normal{0mu}%
    \def\mst@forall@skip@normal{0mu}%
    \def\mst@prime@skip@normal{0mu}%
    \def\mst@exists@skip@bold{0mu}%
    \def\mst@forall@skip@bold{0mu}%
    \def\mst@prime@skip@bold{0mu}%
  \else % not subdued
    \ifmst@italic
      \ifmst@frenchmath
        \mst@exists@muskip\mst@exists@skip\relax
        \mst@forall@muskip\mst@forall@skip\relax
        \mst@prime@muskip\mst@prime@skip\relax
      \else
       \def\mst@exists@skip@normal{0mu}%
       \def\mst@forall@skip@normal{0mu}%
       \def\mst@prime@skip@normal{0mu}%
       \def\mst@exists@skip@bold{0mu}%
       \def\mst@forall@skip@bold{0mu}%
       \def\mst@prime@skip@bold{0mu}%
      \fi
    \else
        \mst@exists@muskip\mst@exists@skip\relax
        \mst@forall@muskip\mst@forall@skip\relax
        \mst@prime@muskip\mst@prime@skip\relax
    \fi
  \fi
%% v1.15f
  \ifmst@nonormalbold\else
   \SetMathAlphabet{\mathnormalbold}{normal}{\mst@encoding@normal}%
                                   {\mst@family@normal}%
                                   {\mst@boldvariant@normal}%
```

```
                                  {\mst@ltshape@normal}%
  \SetMathAlphabet{\mathnormalbold}{bold}{\mst@encoding@bold}%
                                  {\mst@family@bold}%
                                  {\mst@boldvariant@bold}%
                                  {\mst@ltshape@bold}%
 \fi
%% v1.15f adds \ifmst@default.. checks
 \ifmst@subdued\else
  \SetSymbolFont{mtletterfont}{normal}{\mst@encoding@normal}%
                                      {\mst@family@normal}%
                                      {\mst@series@normal}%
                                      {\mst@ltshape@normal}%
  \SetSymbolFont{mtletterfont}{bold}  {\mst@encoding@bold}%
                                      {\mst@family@bold}%
                                      {\mst@series@bold}%
                                      {\mst@ltshape@bold}%
  \SetSymbolFont{mtoperatorfont}{normal}{\mst@encoding@normal}%
                                      {\mst@family@normal}%
                                      {\mst@series@normal}%
                                      {\mst@shape@normal}%
  \SetSymbolFont{mtoperatorfont}{bold} {\mst@encoding@bold}%
                                      {\mst@family@bold}%
                                      {\mst@series@bold}%
                                      {\mst@shape@bold}%
  \ifmst@defaultbf\else
   \SetMathAlphabet{\Mathbf}{normal}{\mst@encoding@normal}%
                                  {\mst@family@normal}%
                                  {\mst@series@bold}%
                                  {\mst@shape@normal}%
   \SetMathAlphabet{\Mathbf}{bold}{\mst@encoding@bold}%
                                  {\mst@family@bold}%
                                  {\mst@series@bold}%
                                  {\mst@shape@bold}%
  \fi
  \ifmst@defaultit\else
   \SetMathAlphabet{\Mathit}{normal}{\mst@encoding@normal}%
                                  {\mst@family@normal}%
                                  {\mst@series@normal}%
                                  {\mst@itdefault@normal}%
   \SetMathAlphabet{\Mathit}{bold}{\mst@encoding@bold}%
                                  {\mst@family@bold}%
                                  {\mst@series@bold}%
                                  {\mst@itdefault@bold}%
  \fi
  \ifmst@defaultsf\else
   \SetMathAlphabet{\Mathsf}{normal}{\mst@encoding@normal}%
                                  {\mst@sfdefault@normal}%
                                  {\mst@series@normal}%
                                  {\mst@shape@normal}%
```

```
    \SetMathAlphabet{\Mathsf}{bold}{\mst@encoding@bold}%
                                    {\mst@sfdefault@bold}%
                                    {\mst@series@bold}%
                                    {\mst@shape@bold}%
   \fi
   \ifmst@defaulttt\else
    \SetMathAlphabet{\Mathtt}{normal}{\mst@encoding@normal}%
                                    {\mst@ttdefault@normal}%
                                    {\mst@series@normal}%
                                    {\mst@shape@normal}%
    \SetMathAlphabet{\Mathtt}{bold}{\mst@encoding@bold}%
                                    {\mst@ttdefault@bold}%
                                    {\mst@series@bold}%
                                    {\mst@shape@bold}%
   \fi
  \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.

```
  \ifmst@needeuler
    \SetSymbolFont{mteulervm}{bold}{U}{zeur}{\mst@boldvariant@normal}{n}%
    \SetMathAlphabet{\MathEulerBold}{normal}%
                {U}{zeur}{\mst@boldvariant@normal}{n}%
    \SetMathAlphabet{\MathEulerBold}{bold}%
                {U}{zeur}{\mst@boldvariant@normal}{n}%
  \fi

  \ifmst@needsymbol\SetSymbolFont{mtpsymbol}{bold}%
                      {U}{psy}{\mst@boldvariant@normal}{n}%
  \fi
```

`LGRgreek*` `selfGreek*` LGRgreek, LGRgreeks, selfGreek, and selfGreeks options. `1.3x` has refactored the `LGRgreek` associated math fonts.

```
  \ifmst@subdued\else
   \ifmst@LGRgreek
    \SetSymbolFont{mtgreekup}{normal}{LGR}%
            {\mst@greekfont}{\mst@series@normal}{\MTgreekupdefault}%
    \SetSymbolFont{mtgreekup}{bold}{LGR}%
            {\mst@greekfont}{\mst@boldvariant@normal}{\MTgreekupdefault}%
    \SetSymbolFont{mtgreekit}{normal}{LGR}%
            {\mst@greekfont}{\mst@series@normal}{\MTgreekitdefault}%
    \SetSymbolFont{mtgreekit}{bold}{LGR}%
            {\mst@greekfont}{\mst@boldvariant@bold}{\MTgreekitdefault}%
   \else
    \ifmst@selfGreek
     \SetSymbolFont{mtselfGreekfont}{normal}{OT1}%
            {\mst@greekfont}{\mst@series@normal}{\mst@greek@ush}%
     \SetSymbolFont{mtselfGreekfont}{bold}{OT1}%
```

```
            {\mst@greekfont}{\mst@boldvariant@bold}{\mst@greek@ush}%
    \fi
   \fi
  \fi

  \ifmst@subdued
   \typeout{** subdued mode will be activated for the `normal\string' and `bold\string' mat
sions}%
  \else
   \typeout{** Latin letters in the `normal\string' (resp. `bold\string') math ver-
sions are now^^J%
            ** set up to use the fonts
   \mst@encoding@normal/\mst@family@normal/\mst@series@normal%
               (\mst@boldvariant@normal)/\mst@ltshape@normal}%
   \ifmst@LGRgreek\typeout{** Greek letters (upper:
      `\ifmst@lgr@upper@up\MTgreekupdefault\else\MTgreekitdefault\fi\string',
                                              lower:
      `\ifmst@lgr@lower@up\MTgreekupdefault\else\MTgreekitdefault\fi\string')
      will use font family `\mst@greekfont\string' (LGR)}%
   \fi
   \ifmst@nodigits\else
     \typeout{** Other characters (digits, ...) and \protect\log-like names will be^^J%
              ** typeset with the \mst@shape@normal\space shape.}%
   \fi
  \fi
  \ifmst@nohbar\else
     \typeout{** \string\hbar}%
     \mst@dothe@hbarstuff
         \mst@hbar@mvnormal\mst@ltbar@mvnormal\mst@encoding@normal
     \let\mst@hbar@mvbold\mst@hbar@mvnormal
  \fi
  \mst@dothe@inodotstuff\inodot\jnodot\mst@encoding@normal
  \let\mst@inodot@mvnormal\inodot
  \let\mst@inodot@mvbold\inodot
  \let\mst@jnodot@mvnormal\jnodot
  \let\mst@jnodot@mvbold\jnodot
  \ifmst@mathaccents
    \typeout{** math accents}%
    \mst@dothe@mathaccentsstuff{normal}\mst@encoding@normal
  \fi
  \ifmst@nominus\else
   \typeout{** minus as endash}%
   \ifmst@endash
    \mst@dothe@endashstuff\mst@minus@mvnormal\mst@varfam@minus@mvnormal
                           \mst@encoding@normal
    \mst@dothe@endashstuff\mst@minus@mvbold\mst@varfam@minus@mvbold
                           \mst@encoding@normal
   \else
    \ifmst@emdash
```

```
      \mst@dothe@emdashstuff\mst@minus@mvnormal\mst@varfam@minus@mvnormal
                              \mst@encoding@normal
      \mst@dothe@emdashstuff\mst@minus@mvbold\mst@varfam@minus@mvbold
                              \mst@encoding@normal
    \else
      \mst@dothe@hyphenstuff\mst@minus@mvnormal\mst@varfam@minus@mvnormal
      \let\mst@minus@mvbold\mst@minus@mvnormal
      \let\mst@varfam@minus@mvbold\mst@varfam@minus@mvnormal
    \fi
   \fi
  \fi
}% \Mathastext@
\let\mathastext\Mathastext
\Mathastext
```

Additional appropriate messages to the terminal and the log.

```
\ifmst@eulergreek
      \typeout{** Greek letters will use the Euler font. Use \protect\MathastextEulerScale{
               font.}%
      \ifmst@subdued{\typeout{** (subdued mode: `normal\string' and `bold\string' math
          version with default Greek letters.)}}\fi
\else
\ifmst@symbolgreek
       \typeout{** Greek letters will use the PostScript Symbol font. Use^^J%
                ** \protect\MathastextSymbolScale{<factor>} to scale the font.}%
      \ifmst@subdued{\typeout{** (subdued mode: `normal\string' and `bold\string' math
          version with default Greek letters.)}}\fi
\fi\fi
```

`Math sizes` I took the code for `\Huge` and `\HUGE` from the `moresize` package of Christian Cornelssen

```
\ifmst@defaultsizes\else
\providecommand\@xxxpt{29.86}
\providecommand\@xxxvipt{35.83}
\ifmst@twelve
  \def\Huge{\@setfontsize\Huge\@xxxpt{36}}
  \def\HUGE{\@setfontsize\HUGE\@xxxvipt{43}}
\typeout{** \protect\Huge\space and \protect\HUGE\space have been (re)-defined.}
\else
  \def\HUGE{\@setfontsize\HUGE\@xxxpt{36}}
\typeout{** \protect\HUGE\space has been (re)-defined.}
\fi
```

I choose rather big subscripts.

```
\def\defaultscriptratio{.8333}
\def\defaultscriptscriptratio{.7}
\DeclareMathSizes{9}{9}{7}{5}
\DeclareMathSizes{\@xpt}{\@xpt}{8}{6}
\DeclareMathSizes{\@xipt}{\@xipt}{9}{7}
\DeclareMathSizes{\@xiipt}{\@xiipt}{10}{8}
\DeclareMathSizes{\@xivpt}{\@xivpt}{\@xiipt}{10}
```

```
\DeclareMathSizes{\@xviipt}{\@xviipt}{\@xivpt}{\@xiipt}
\DeclareMathSizes{\@xxpt}{\@xxpt}{\@xviipt}{\@xivpt}
\DeclareMathSizes{\@xxvpt}{\@xxvpt}{\@xxpt}{\@xviipt}
\DeclareMathSizes{\@xxxpt}{\@xxxpt}{\@xxvpt}{\@xxpt}
\DeclareMathSizes{\@xxxvipt}{\@xxxvipt}{\@xxxpt}{\@xxvpt}
\typeout{** mathastext has declared larger sizes for subscripts.^^J%
** To keep LaTeX defaults, use option `defaultmathsizes\string'.}
\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 LuaLaTeX only.

```
\newcommand*\MTeverymathoff {%
    \MTnormalasterisk
    \MTnormalprime
    \MTnonlettersdonotobeymathxx
    \MTeasynonlettersdonotobeymathxx
    \MTmathstandardletters
    \MTdonotfixfonts
}%
\AtBeginDocument {%
   \@ifpackageloaded{hyperref}
   {\def\Hurl{\begingroup\MTeverymathoff\Url}}
   {\@ifpackageloaded{url}{\DeclareUrlCommand\url{\MTeverymathoff}}{}}%
}%
```

`\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 LuaLaTeX only.

```
\newcommand*\MTeverymathdefault {%
    \MTactiveasterisk
    \MTprimedoesskip
    \MTeasynonlettersobeymathxx
    \MTicinmath
    \MTfixfonts
```

```
}%
```

Things to do last "at begin document"

```
\AtBeginDocument{%
  \everymath\expandafter{\the\everymath
    \mst@the\mst@do@nonletters \let\mst@the\@gobble
    \mst@theeasy\mst@do@easynonletters  \let\mst@theeasy\@gobble
    \mst@thef\mst@do@az \let\mst@thef\@gobble
    \mst@theF\mst@do@AZ \let\mst@theF\@gobble}%
  \everydisplay\expandafter{\the\everydisplay
    \mst@the\mst@do@nonletters \let\mst@the\@gobble
    \mst@theeasy\mst@do@easynonletters  \let\mst@theeasy\@gobble
    \mst@thef\mst@do@az \let\mst@thef\@gobble
    \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 subdued mode immediately after \begin{document} resulted in errors because \mst@itcorr had been left undefined. We thus add \MTnoicinmath to the subdued 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 subdued mode, even in case of usage with fontspec.

1.3u similarly lets math accents be correctly subdued.

1.3v adapts to \hbar and math accents now being robust with LaTeX 2019-10-01 or later.

1.3w pays attention to the fact that \hbar may well be a \mathchar and not a robust macro! And no need to worry about \hbar<space> finally in revised code.

```
  \MTcustomizenewmcodes
  \let\mst@original@hbar\hbar
  \let\mst@original@imath\imath
  \let\mst@original@jmath\jmath
  \@tfor\@tempa:={grave}{acute}{check}{breve}{bar}%
                 {dot}{ddot}{mathring}{hat}{tilde}%
  \do
  {\expandafter\let\csname mst@original@\@tempa\expandafter\endcsname
                   \csname \@tempa\endcsname
   \expandafter\let\csname mst@original@\@tempa\space\expandafter\endcsname
                   \csname \@tempa\space\endcsname
  }%
  \ifmst@XeOrLua
     \edef\mst@subduedminus
         {\mst@Umathcodenum`\noexpand\-=\the\mst@Umathcodenum`\-\relax}%
  \else
     \edef\mst@subduedminus{\mathcode`\noexpand\-=\the\mathcode`\-\relax}%
  \fi
  \ifmst@subdued
```

```
    \MTeverymathoff
    \MTresetnewmcodes
    \MTnoicinmath
    \MTmathoperatorsdonotobeymathxx
    %\mst@subduedhbar
    \let\inodot\imath
    \let\jnodot\jmath
    %\mst@subduedmathaccents
    \mst@subduedminus
  \else
    \mst@nonsubduedhbar
```

1.3v needs this `\mst@nonsubduedmathaccents` to get executed later (see code comments for `\mst@dothe@mathaccentsstuff`).

```
    % \mst@nonsubduedmathaccents % will get executed later
    \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.

```
    \ifx\mst@itcorr\@undefined
        \def\mst@itcorr{\ifnum\fam=\m@ne\/\fi}%
        \@for\mst@tmp:=it,sl\do
          {\ifx\mst@tmp\mst@ltshape@normal\let\mst@itcorr\@empty\fi }%
    \fi
    \ifx\mst@ITcorr\@undefined
        \let\mst@ITcorr\mst@itcorr
        \ifmst@frenchmath
          \def\mst@ITcorr{\ifnum\fam=\m@ne\/\fi}%
          \@for\mst@tmp:=it,sl\do
               {\ifx\mst@tmp\mst@shape@normal\let\mst@ITcorr\@empty\fi }%
        \fi
    \fi
  \fi
}% \AtBeginDocument
\AtEndOfPackage{\AtBeginDocument{\ifmst@subdued\else\mst@nonsubduedmathaccents\fi}}%
```

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 LaTeX 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[1]. Due to the reassignements 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 LuaLaTeX 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 modifiying 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.

```
\ifmst@subdued
\AtBeginDocument{%
  \def\mst@reserved#1\getanddefine@fonts\symletters#2#3\@nil{%
        \def\mst@normalmv@letter{#2}}%
  \expandafter\mst@reserved\mv@normal\@nil
  \def\mst@reserved#1\getanddefine@fonts\symletters#2#3\@nil{%
        \def\mst@boldmv@letter{#2}}%
  \expandafter\mst@reserved\mv@bold\@nil
  \def\mst@reserved#1\getanddefine@fonts\symoperators#2#3\@nil{%
        \def\mst@normalmv@operator{#2}}%
  \expandafter\mst@reserved\mv@normal\@nil
  \def\mst@reserved#1\getanddefine@fonts\symoperators#2#3\@nil{%
        \def\mst@boldmv@operator{#2}}%
  \expandafter\mst@reserved\mv@bold\@nil
  \edef\mst@tmp@enc{\mst@encoding@normal}%
  \def\mst@reserved#1/#2/#3/#4/{\gdef\mst@debut{#1}\gdef\mst@reste{#2/#3/#4}}%
  \begingroup\escapechar\m@ne
      \xdef\mst@funnyoti{\expandafter\string\csname OT1\endcsname}%
      \expandafter\expandafter\expandafter
          \mst@reserved\expandafter\string\mst@normalmv@operator/%
  \endgroup
```

```
\ifx\mst@debut\mst@funnyoti\ifx\mst@tmp@enc\mst@oti\def\mst@tmp@enc{T1}\fi\fi
\edef\mst@normalmv@operator{\expandafter\noexpand\csname
     \if1\mst@OneifUniEnc
       \ifx\mst@debut\mst@funnyoti T1\else\mst@debut\fi
     \else
       \mst@tmp@enc
     \fi/\mst@reste\endcsname}%
\edef\mst@tmp@enc{\mst@encoding@bold}%
\begingroup\escapechar\m@ne
    \expandafter\expandafter\expandafter
        \mst@reserved\expandafter\string\mst@boldmv@operator/%
\endgroup
\ifx\mst@debut\mst@funnyoti\ifx\mst@tmp@enc\mst@oti\def\mst@tmp@enc{T1}\fi\fi
\edef\mst@boldmv@operator{\expandafter\noexpand\csname
     \if1\mst@OneifUniEnc
       \ifx\mst@debut\mst@funnyoti T1\else\mst@debut\fi
     \else
       \mst@tmp@enc
     \fi/\mst@reste\endcsname}%
\typeout{** ...entering subdued mode...}%
\expandafter\SetSymbolFont@ \expandafter\mv@normal\mst@normalmv@letter\symmtletterfont
\expandafter\SetSymbolFont@ \expandafter\mv@bold\mst@boldmv@letter\symmtletterfont
\expandafter\SetSymbolFont@ \expandafter\mv@normal\mst@normalmv@operator\symmtoperatorfon
\expandafter\SetSymbolFont@ \expandafter\mv@bold\mst@boldmv@operator\symmtoperatorfont
\typeout{** ...done.}%
}% \AtBeginDocument
\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.

```
\expandafter \gdef \expandafter \@preamblecmds \expandafter {\@preamblecmds
\do\MTitgreek
\do\MTupgreek
\do\MTitGreek
\do\MTitGreek
\do\Mathastextitgreek
\do\Mathastextupgreek
\do\MathastextitGreek
\do\MathastextitGreek
\do\MTgreekfont
\do\Mathastextgreekfont
\do\MTgreekupdefault
\do\MTgreekitdefault
\do\MTDeclareVersion
\do\MathastextDeclareVersion
\do\MTWillUse
```

```
\do\MathastextWillUse
\do\Mathastextwilluse
\do\Mathastext
\do\mathastext
}
\endinput
```