

# The **mathspec** package

*Font selection for mathematics with X<sub>Ǝ</sub>L<sup>A</sup>T<sub>E</sub>X*

version 0.2b

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## 1 PREAMBLE

This document describes the mathspec package, a package that provides an interface to select ordinary text fonts for typesetting mathematics with X<sub>Ǝ</sub>L<sup>A</sup>T<sub>E</sub>X. It relies on fontspec to work and familiarity with fontspec is advised. I thank Will Robertson for his useful advice and suggestions!

The package is developmental and later versions might to be incompatible with this version. This version is incompatible with earlier versions. The package requires at least version 0.9995 of X<sub>Ǝ</sub>L<sup>A</sup>T<sub>E</sub>X.

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<sup>\*</sup>vo.2b update by Will Robertson ([will.robertson@latex-project.org](mailto:will.robertson@latex-project.org)).

Should you be using this package? If you are using another L<sup>A</sup>T<sub>E</sub>X package for some mathematics font, then you should not (unless you know what you are doing). If you want to use Asana Math or Cambria Math (or the final release version of the `stix` fonts) then you should be using `unicode-math`.

Some paragraphs in this document are marked **ADVANCED**. Such paragraphs may be safely ignored by basic users.

## 2 INTRODUCTION

Since Jonathan Kew released X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, an extension to T<sub>E</sub>X that permits the inclusion of system wide Unicode fonts and modern font technologies in T<sub>E</sub>X documents, users have been able to easily typeset documents using readily available fonts such as Hoefler Text and Times New Roman (This document is typeset using Sabon L<sup>T</sup> Std). Will Robertson's X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X package `fontspec` provides an automatic font selection process for such fonts. Still, mathematics typesetting has not benefited from this development to the same extent as text typesetting, which is not surprising given the font requirements that are demanded.

Will Robertson has in development a package `unicode-math` that is used to typeset mathematics using some font that has an OpenType mathematics table. Currently, the only two that are available are Cambria Math, a new design, by Microsoft and Asana Math, ultimately based on Hermann Zapf's Palatino, by Apostolos Syropoulos. It is expected that the `stix` fonts, based on Times, may also be used.

Thus, it is evident that a book designer is confronted with such narrow variety in mathematics typefaces, even considering already established L<sup>A</sup>T<sub>E</sub>X fonts such as AMS Euler (and Computer Modern, of course!) that are dedicated to providing mathematics typefaces; and the book designer is challenged to find a suitable pair of matching typefaces for mathematics and body text.

This package provides mathematics alphabets in any of the same typefaces that are available to X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X, using `fontspec` as a back end. Other mathematics symbols such as arrows and operators, whose designs are largely independent of an alphabetic typeface, can be taken from collections like MnSymbol or Computer Modern and are not covered by the scope of this package.

## 3 IMPLEMENTATION

```
\usepackage[mathspec and fontspec options]{mathspec}
```

To use the package, put `\usepackage{mathspec}` in the preamble of the document. It is not necessary to put `\usepackage{fontspec}` because `mathspec` will ensure that `fontspec`

is loaded anyway. To load fontspec with some options, parse them through mathspec, for example, `\usepackage[quiet]{fontspec}` is equivalent to:

```
\usepackage[quiet]{fontspec}
\usepackage{mathspec}
```

Actually, mathspec ordinarily loads fontspec with the no-math option. To cancel this, explicitly use the math option: e.g. `\usepackage[math]{mathspec}`.

## 4 SETTING FONTS

### 4.1 Letters and Digits

```
\setmathfont(<sets>)[<shapes, font features>]{<font name>}
\setmathfont(<sets>)[<shapes, font features>]{<font name>}
```

This single command is used to entirely describe the desired font for some use. For each character set (Digits, Latin, Greek), there is a (possibly shared) `\setmathfont` command. The command can be used only in the preamble. Then, there can be only one typeface for each character set in a single document.

For basic use, `(<sets>)` is mandatory. `[<shapes, font features>]` is optional and may be omitted.

`<sets>` A comma separated value list of any of the following: Digits, Latin, Greek.

**ADVANCED** `<sets>` may also take the value `Special`. `(<sets>)` is actually optional and if it is omitted, then `(Special)` is assumed. For basic use, it is safe to ignore `Special`, so `(<sets>)` would effectively be a mandatory argument.

If the value of `<sets>` is `Special`, then `\eu@ScopeSet@Special[<font features>]{<font name>}` is executed, but this command is provided by `mathspec` to gobble its arguments (that is, it does nothing). The command `\eu@ScopeSet@Special` maybe predefined before `mathspec` is loaded (or redefined after `mathspec` is loaded) to cause the command to do something else. This effectively means that `\setmathfont(<sets>)[<font features>]{<font name>}` is a `mathspec` command, but `\setmathfont[<font features>]{<font name>}` is an external command which another package might use.

`<shapes>` A comma separated value list of keys and their values. The permitted keys and their values are:

`Uppercase`=Regular, Italic, Plain

`Lowercase`=Regular, Italic, Plain

`Arabic`=Regular, Italic, Plain

To set the symbols in an upright font, choose Regular. To set the symbols in an italic font, choose Italic. Choose Plain to indicate that no font is assignment is to be performed

**TABLE 1** The default shapes for the symbol sets.

Set	Key	Default value
Digits	Arabic	Regular
Latin	Uppercase	Italic
Latin	Lowercase	Italic
Greek	Uppercase	Regular
Greek	Lowercase	Italic

by `mathspec`, so that the symbols will remain with their default font (usually Computer Modern). If a value's key is omitted, its default value, which depends on the  $\langle set \rangle$ , as shown in table 1 is chosen.

The default values are very good and you would be wise not to change the shapes for the Latin and Digit sets. The Greek shapes may be changed, if needed, to adhere to some particular style, for example all Italic or all Regular.

$\langle font\ features \rangle$   $\langle font\ features \rangle$  and  $\langle font\ name \rangle$  follow directly from `fontspec` to select the font and its features. See `fontspec`'s documentation for details.

Note that if  $\langle sets \rangle$  contains multiple sets, the command is iterated over each set. Each of these iterations share the same  $\langle shapes\ and\ font\ features \rangle$  and  $\langle font\ name \rangle$ . If you require that the different sets have individual options and font names, they must be specified in separate commands. However, if a value's key is omitted, the individual default values are still applied.

These same command options follow through to the other commands of this package.

## 4.2 Symbols

There is currently no way to set the font for general mathematical symbols such as:

$$=, \times, \mapsto, \partial, \emptyset, \in, \int, \subset$$

You can try the package `MnSymbol`, which has greater (and more uniform) coverage, with the package option `MnSymbol`, e.g. `\usepackage[MnSymbol]{mathspec}`. Note that `MnSymbol` is a third party package by Achim Blumensath, which can only be used if additionally installed.

## 4.3 Examples

The following command:

```
\setmathsfont(Digits, Latin, Greek)
  [Numbers={Lining, Proportional}]{Minion Pro}
```

is equivalent to:

```
\setmathsfont(Digits)[Numbers={Lining, Proportional}]{Minion Pro}
\setmathsfont(Latin)[Numbers={Lining, Proportional}]{Minion Pro}
\setmathsfont(Greek)[Numbers={Lining, Proportional}]{Minion Pro}
```

and indicates that all digits, Latin and Greek characters are to be set in Minion Pro with lining, proportional digits, with digits and uppercase Greek in regular and Latin and lowercase Greek in italic, which are the default shapes.

The following command:

```
\setmathsfont(Digits, Greek)
  [Uppercase=Plain, Lowercase=Regular, Scale=MatchLowercase]
  {GFS Porson}
```

is equivalent to:

```
\setmathsfont(Digits)
  [Uppercase=Plain, Lowercase=Regular, Scale=MatchLowercase]{GFS Porson}
\setmathsfont(Greek)
  [Uppercase=Plain, Lowercase=Regular, Scale=MatchLowercase]{GFS Porson}
```

and indicates that all digits and lowercase Greek characters are to be set in GFS Porson, scaled so that its x-height matches the main font's, in regular. Uppercase Greek characters remain unchanged (probably from Computer Modern).

#### 4.4 Declaring alphabets

The mathematics alphabets like `\mathrm` and `\mathcal` can be set using these commands.

```
\setmathrm[⟨font features⟩]{⟨font name⟩}
```

This command defines `\mathrm`, `\mathit`, `\mathbf` and the font for operators like `\sin` and `\log`.

```
\setmathsf[⟨font features⟩]{⟨font name⟩}
```

This command defines `\mathsf`.

`\setmathtt[⟨font features⟩]{⟨font name⟩}`

This command defines `\mathtt`.

`\setmathcal[⟨font features⟩]{⟨font name⟩}`

This command defines `\mathcal`.

`\setmathbb[⟨font features⟩]{⟨font name⟩}`

This command defines `\mathbb`.

`\setmathfrak[⟨font features⟩]{⟨font name⟩}`

This command defines `\mathfrak`.

#### 4.5 *Shorthands*

These commands are useful to save typing the same information multiple times, if the same font is used for different purposes.

`\setallmainfonts(⟨sets⟩)[⟨shapes, font features⟩]{⟨font name⟩}`

This command is equivalent to:

```
\setmainfont[⟨font features⟩]{⟨font name⟩}
\setmathsf(⟨sets⟩)[⟨shapes, font features⟩]{⟨font name⟩}
\setmathrm[⟨font features⟩]{⟨font name⟩}
```

If `(⟨sets⟩)` is omitted, then `(Digits, Latin, Greek)` is assumed.

`\setprimaryfont[⟨shapes, font features⟩]{⟨font name⟩}`

This command is equivalent to:

```
\setallmainfonts(Digits, Latin)[⟨shapes, font features⟩]{⟨font name⟩}
```

`\setallsansfonts[⟨font features⟩]{⟨font name⟩}`

This command is equivalent to:

```
\setsansfont[⟨font features⟩]{⟨font name⟩}
\setmathsf[⟨font features⟩]{⟨font name⟩}
```

`\setallmonofonts[⟨font features⟩]{⟨font name⟩}`

This command is equivalent to:

```
\setmonofont[⟨font features⟩]{⟨font name⟩}
\setmathtt[⟨font features⟩]{⟨font name⟩}
```

#### 4.6 A further example

This document used to be typeset with the following:

```
\setmainfont[Numbers=OldStyle]{Sabon LT Std}
\setallsansfont[Numbers={OldStyle,Proportional},Scale=MatchLowercase]{Candara}
\setallmonofont[Numbers=OldStyle,Scale=MatchLowercase]{Consolas}
\setmathsfont(Digits,Latin)[Scale=MatchLowercase]{Bembo MT}
\setmathsfont(Greek)[Scale=MatchLowercase]{STIXGeneral}
\setmathrm{Sabon LT Std}
\exchangeforms{phi}
\setminwhitespace[750]
```

The main text font is Sabon LT Std with old style figures. The sans serif font is Candara with old style, proportional figures and the monospaced font is Consolas with old style figures, both scaled to match Sabon LT Std in x-height.

The mathematics font for digits and Latin symbols is Bembo MT and for Greek symbols STIXGeneral, both scaled to match Sabon LT Std in x-height.

The `\mathrm`, `\mathit` and `\mathbf` alphabets are set in Sabon LT Std.

Finally, the normal and variant forms of Greek lowercase phi are exchanged, see section 5 Greek symbols, and the minimum white space on each side of a spaced character is 750 mmu, see section 6 Glyph bounds.

## 5 GREEK SYMBOLS

For reference, the Greek alphabet and variant letter forms are given in table 2. Despite its name, `\varsigma`  $\zeta$  is not a variant form of `\sigma`  $\sigma$ , it is the final form. Digamma  $\varphi$  is an obsolete letter of the alphabet, originally placed between epsilon  $\epsilon$  and zeta  $\zeta$ .

**ADVANCED** Initially, `mathspec` defines control sequences for the Greek characters that are absent in Computer Modern, because they are similar in form to Latin characters, from ASCII, thus control sequences like `\Alpha` and `\omicron` are defined. Any variant forms that are absent become equivalent to the normal forms. The meanings of these control sequences are preserved by other control sequences of the same names prefixed with `eu@cm@` (e.g. `\eu@cm@alpha`), which may be recalled after the Greek mathematics font is changed.

`\exchangeforms{⟨list⟩}`

**TABLE 2** The Greek alphabet and variant letter forms with control sequences.

Uppercase		Lowercase		Uppercase		Lowercase	
A	\Alpha	$\alpha$	\alpha	Ξ	\Xi	$\xi$	\xi
B	\Beta	$\beta$	\beta	Ο	\Omicron	$ο$	\omicron
Γ	\Gamma	$\gamma$	\gamma	Π	\Pi	$\pi$	\pi
Δ	\Delta	$\delta$	\delta	Ρ	\Rho	$\rho$	\rho
Ε	\Epsilon	$\epsilon$	\epsilon	Σ	\Sigma	$\varsigma$	\varsigma
Ζ	\Zeta	$\zeta$	\zeta			$\sigma$	\sigma
Η	\Eta	$\eta$	\eta	Τ	\Tau	$\tau$	\tau
Θ	\Theta	$\theta$	\theta	Υ	\Upsilon	$\upsilon$	\upsilon
Ι	\Iota	$\iota$	\iota	Φ	\Phi	$\phi$	\phi
Κ	\Kappa	$\kappa$	\kappa	Χ	\Chi	$\chi$	\chi
Λ	\Lambda	$\lambda$	\lambda	Ψ	\Psi	$\psi$	\psi
Μ	\Mu	$\mu$	\mu	Ω	\Omega	$\omega$	\omega
Ν	\Nu	$\nu$	\nu	Ϝ	\Digamma	$\varphi$	\digamma
Normal form	Variant form						
$\beta$	$\beta$	$\pi$	$\varpi$	$\pi$	$\varpi$	$\pi$	$\varpi$
$\epsilon$	$\epsilon$	$\rho$	$\varrho$	$\rho$	$\varrho$	$\rho$	$\varrho$
$\theta$	$\theta$	$\phi$	$\varphi$	$\phi$	$\varphi$	$\phi$	$\varphi$
$\kappa$	$\kappa$	Θ	Θ	Θ	Θ	Θ	Θ

*<list>* A comma separated value list of any of the names for the Greek symbols which have variant forms: beta, epsilon, theta, kappa, pi, rho, phi, Theta.

Some authors might prefer the normal and variant forms of a symbol to be exchanged. For example, I prefer `\phi` to print the orthotic phi ‘ $\phi$ ’ and `\varphi` the cursive phi ‘ $\varphi$ ’, contrary to many text fonts. To exchange the forms of any symbol, include its name in the list.

`\normalisevarforms[<list>]`

`\normalizevarforms[<list>]`

*<list>* As above, a comma separated value list of any of the names for the Greek symbols which have variant forms: beta, epsilon, theta, kappa, pi, rho, phi, Theta.

If [*<list>*] is omitted, then [beta, epsilon, theta, kappa, pi, rho, phi, Theta], that is every such symbol, is assumed.

Since not all fonts contain all variant forms, there might be the odd variant letter that remains in Computer Modern while other Greek letters have changed font. For these characters, the command `\normalisevarforms` (or `\normalizevarforms`) will cause the listed symbols that are absent from the font to be equivalent to their corresponding normal forms. If a symbol is listed which is included in the font, then it is ignored.

Note that this command only adjusts the characters that are absent in the font. Of course, this might mean that, for example, `\vartheta` and `\theta` would print the same glyph, which would be dubious if they are to be used in the same document, with different meanings.

It should be noted that `\epsilon` prints the lunate epsilon ‘ $\epsilon$ ’ and `\varpepsilon` prints the usual (double loop) epsilon ‘ $\varepsilon$ ’ in Plain  $\TeX$  and  $\LaTeX$ . This is in contrast to Unicode text fonts, which contain the lunate style epsilon separately from the Greek alphabet among variant letter forms and symbols (where Unicode assigns ‘Greek Lunate Epsilon Symbol’). The definition of `\LaTeXe`, which prints ‘ $\LaTeX_2\epsilon$ ’ uses `\varepsilon` and care should be taken to ensure that `\LaTeXe` still uses the usual epsilon either by using one of the methods that were presented in this section or by redefining `\LaTeXe` (possibly using my `metalogo` package), because ‘ $\LaTeX_2\epsilon$ ’ is not as good as ‘ $\LaTeX_2\varepsilon$ ’.

## 6 GLYPH BOUNDS

In using this package to set text fonts for mathematics, there are issues with glyph bounds (similar to italic correction), as illustrated in the equations:

```
\begin{align}
f(x) &= \sum_{n = -\infty}^{\infty} c_n e^{jnx} && \\\
c_n &= \frac{1}{2\pi} \int_{-\pi}^{\pi} f(x) e^{-jnx} dx, \mathrm{mathrm} dx \\
\end{align}
```

$$f(x) = \sum_{n=-\infty}^{\infty} c_n e^{jnx} \quad (1)$$

$$c_n = \frac{1}{2\pi} \int_{-\pi}^{\pi} f(x) e^{-jnx} dx \quad (2)$$

where the function  $f$  is too close to the parenthesis ( and the exponent  $jnx$  is too close to its base  $e$  that there is in fact a collision. The reason is that the font has metrics that are suitable for use in text, but not for mathematics.

Comparing the alphabets typeset in Computer Modern italic, in table 3, it is shown that many characters have greater space around them in the mathematics version, which does not exist in the text version.

**TABLE 3** Computer Modern Italic in text and mathematics.

Text	<i>abcdefghijklmnopqrstvwxyz</i>
Mathematics	<i>abcdefghijklmnopqrstvwxyz</i>

**TABLE 4** All valid characters for use with " and \"...\".

0123456789
ABCDEFGHIJKLMN OPQRSTUVWXYZ
<i>abcdefghijklmnopqrstvwxyz</i>
ΑΒΓΔΕΖΗΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩϜ
<i>αβγδεζηθικλμνξοπρςστυφχψωϝ</i>
ϐϑϕϗκρϵΘ

"*<character>*

It is necessary to indicate exactly where additional space needs to be inserted. By putting " before a character, the character will be typeset with additional space inserted on both sides of it.

\ "*<string>*"

For multiple adjacent characters, each need not have a " in front of it, but if the characters may be surrounded by \ " before and " after. That is, for example \ "abcde" is equivalent to "a"b"c"d"e.

Note that *<character>* must be one of the symbols that are listed in table 4. *<string>* must one or more such characters adjacent to each other. So \ "xyz" and \sin"x is okay, but \ "\sin x" is not because \sin is not a valid character. Also note that with Greek symbols, they can only be used if typed literally, not via control sequences, so \cos" is okay but \cos"\theta is not. Use of control sequences for Greek symbols is still perfectly acceptable because the spacings are built into the definitions of each (for example \alpha is defined to expand to { " } automatically).

Use of " and \ " in mathematics mode does not interfere with their use in text mode for quotation marks and umlauts or diæreses: "" coöperates, even with "Mapping=tex-text".

\setminwhitespace[*<number>*]

Use this command to change the minimum allowed white space around such a spaced character. The unit of *<number>* is millimu (mmu), that is  $\frac{1}{1000}$  mu. Recall 18 mu = 1 em.

**TABLE 5** Libre Baskerville in text and spaced mathematics.

Text	<i>abcdefghijklmnopqrstvwxyz</i>
Mathematics	<i>abcdefghijklmnopqrstvwxyz</i>

The default  $\langle number \rangle$  is 500 which corresponds to  $500 \text{ mmu} = \frac{500}{1000} \text{ mu} = 0.5 \text{ mu} = \frac{1}{36} \text{ em}$ .

Note that this value corresponds to the inserted spaces on both sides for each spaced character. If two adjacent characters are spaced, then the total minimum white space between the two characters is twice this value. The effect is shown in table 5.

Now, the spacing in equations (1, 2) are improved by:

```
\begin{align}
"f\left("x\right) &= \sum_{n = -\infty}^{\infty} c_n e^{jn x} \\
"c_n &= \frac{1}{2\pi} \int_{-\pi}^{\pi} f(\bigl(x\bigr) e^{-jn x} dx
\end{align}
```

$$f(x) = \sum_{n=-\infty}^{\infty} c_n e^{jn x} \tag{3}$$

$$c_n = \frac{1}{2\pi} \int_{-\pi}^{\pi} f(x) e^{-jn x} dx \tag{4}$$

Also note that the spacing is improved by replacing  $(x)$  with  $\bigl(x\bigr)$  (which you should be doing anyway).

## 7 COMPATABILITY

If `amsmath` is required, it must be loaded earlier than `mathspec`.

## 8 THE PACKAGE

The package style file is printed in this section.

```
1 \NeedsTeXFormat{LaTeX2e}[2005/12/01]
2 \ProvidesPackage{mathspec}
3 [2016/12/22 v0.2b LaTeX Package (Mathematics font selection for XeLaTeX)]
4
5 %% Requirements:
6 \RequirePackage{etoolbox}
7 \RequirePackage{amstext}
8
9 \RequirePackage{ifxetex}
10 \RequireXeTeX
11 \ifcsundef{XeTeXglyphbounds}
12   {\PackageError{mathspec}
13     {mathspec requires a more recent version of XeTeX}
14     {Your current vesion of XeTeX is \theXeTeXversion\XeTeXrevision.\MessageBreak
15       Update your version of XeTeX to at least 0.9995.}}
16   {\relax}
17
18 %% Booleans are created automatically on demand.
19 \newcommand\eu@booltrue[1]{\providebool{#1}\booltrue{#1}}
20 \newcommand\eu@gbooltrue[1]{\providebool{#1}\global\booltrue{#1}}
21 \newcommand\eu@boolfalse[1]{\providebool{#1}\boolfalse{#1}}
22 \newcommand\eu@ifbool[1]{\providebool{#1}\ifbool{#1}}
23
24 %% Some extras:
25 %% \eu@ifbooltrue{<bool>}{<true>}
26 %% \eu@ifboolfalse{<bool>}{<false>}
27 %% \eu@ifsomebooltrue{<bool_1>, ..., <bool_n>}{<true>}
28 %% (if <bool_i> is true for some i)
29 %% \eu@ifnumis{x}{x_1, ..., x_n}{<true>}{<false>} (if x = x_i for some i)
30 %% \eu@ifnumin{x}{a, b}{<true>}{<false>} (if a x b)
31 \newcommand\eu@ifbooltrue[2]{\eu@ifbool{#1}{#2}\relax}
32 \newcommand\eu@ifboolfalse[2]{\eu@ifbool{#1}{\relax}{#2}}
33 \newcommand\eu@ifsomebooltrue[1]{%
34   \eu@boolfalse{temp}%
35   \def\do##1{\eu@ifbooltrue{##1}{\eu@booltrue{temp}}}%
36   \docsvlist{#1}%
37   \eu@ifbooltrue{temp}}
38 \newcommand\eu@ifnumis[2]{%
39   \providebool{temp}%
40   \boolfalse{temp}%
41   \def\do##1{\ifnumcomp{#1}{=}{##1}{\booltrue{temp}}{\relax}}%
42   \docsvlist{#2}%
43   \ifbool{temp}}
44 \newcommand\eu@ifnumin[2]{\eu@ifnumin{#1}{#2}\nil}
45 \def\eu@ifnumin #1#2, #3\nil{%
```

```

46 \providebool{temp}%
47 \booltrue{temp}%
48 \ifnumcomp{#1}{<}{#2}{\boolfalse{temp}}{\relax}%
49 \ifnumcomp{#3}{<}{#1}{\boolfalse{temp}}{\relax}%
50 \ifbool{temp}}
51
52 %% Options:
53 \DeclareOption{normalskips}
54   {\PackageWarning{mathspec}
55     {Package option `normalskips' is deprecated}}
56 \def\eu@zf@math{no-math}
57 \DeclareOption{math}{\def\eu@zf@math{math}}
58 \DeclareOption{no-math}{\relax}
59 \DeclareOption{MnSymbol}{\eu@booltrue{MnSymbol}}
60 \DeclareOption*{\PassOptionsToPackage{\CurrentOption}{fontspec}}
61 \ProcessOptions\relax
62
63 %% Requires packages:
64 %% fontspec, xkeyval, mathstyle, etoolbox and maybe MnSymbol
65 \RequirePackage[\eu@zf@math]{fontspec}[2008/08/09]
66 \RequirePackage{xkeyval}
67 \eu@ifbooltrue{MnSymbol}{\RequirePackage{MnSymbol}}
68
69 \providecommand\currentmathstyle{\relax}
70
71 %% @-namespace fontspec variable:
72 \ExplSyntaxOn
73 \def\eu@enc{\g_fontspec_encoding_tl}
74 \ExplSyntaxOff
75 %% This is needed to transition to the TU encoding instead of EU1 (WSPR)
76
77 %% Deprecated commands in fontspec:
78 \ExplSyntaxOn
79 \tl_set:Nn \zf@enc { \g_fontspec_encoding_tl }
80 \cs_set:Npn \zf@fontspec #1 #2
81   {
82     \fontspec_select:nn {#1} {#2}
83     \tl_set:Nn \zf@family { \l_fontspec_family_tl }
84     \tl_set:Nn \zf@basefont { \l_fontspec_font }
85   }
86 \ExplSyntaxOff
87 %% These are still defined in fontspec at time of writing but maybe be removed in the future. (WSPR)
88
89 %% Define the undefined Greek letters. Include all variant forms (same as normal
90 %% forms if variant forms are unavailable). Latin F for digamma is better than
91 %% nothing. If Digamma is available, then Capital and Lowercase the are same.
92 \DeclareMathSymbol{\Alpha}{\mathalpha}{operators}"41}
93 \DeclareMathSymbol{\Beta}{\mathalpha}{operators}"42}
94 \DeclareMathSymbol{\Epsilon}{\mathalpha}{operators}"45}

```

```

95 \DeclareMathSymbol{\Zeta}{\mathalpha}{operators}{"5A}
96 \DeclareMathSymbol{\Eta}{\mathalpha}{operators}{"48}
97 \DeclareMathSymbol{\Iota}{\mathalpha}{operators}{"49}
98 \DeclareMathSymbol{\Kappa}{\mathalpha}{operators}{"4B}
99 \DeclareMathSymbol{\Mu}{\mathalpha}{operators}{"4D}
100 \DeclareMathSymbol{\Nu}{\mathalpha}{operators}{"4E}
101 \DeclareMathSymbol{\Omicron}{\mathalpha}{operators}{"4F}
102 \DeclareMathSymbol{\Rho}{\mathalpha}{operators}{"50}
103 \DeclareMathSymbol{\Tau}{\mathalpha}{operators}{"54}
104 \DeclareMathSymbol{\Chi}{\mathalpha}{operators}{"58}
105 \DeclareMathSymbol{\omicron}{\mathord}{letters}{"6F}
106 \let\varbeta\beta
107 \ifdef{\varkappa}{\relax}
108     {\let\varkappa\kappa}
109 \ifdef{\varTheta}{\let\eu@cm@varTheta\varTheta}
110     {\relax}
111 \let\varTheta\Theta
112 \ifdef{\digamma}{\let\Digamma\digamma}
113     {\DeclareMathSymbol{\Digamma}{\mathalpha}{operators}{"46}
114     \DeclareMathSymbol{\digamma}{\mathord}{letters}{"46}}
115
116 %% Preserve old definitions of all Greek letters. \eu@cm@alpha etc.
117 \def\do#1{\csletcs{eu@cm@#1}{#1}}
118 \docsvlist{
119     Alpha,Beta,Gamma,Delta,Epsilon,Zeta,Eta,Theta,Iota,Kappa,Lambda,Mu,Nu,
120     Xi,Omicron,Pi,Rho,Sigma,Tau,Upsilon,Phi,Chi,Psi,Omega,Digamma,alpha,
121     beta,gamma,delta,epsilon,zeta,eta,theta,iota,kappa,lambda,mu,nu,xi,
122     omicron,pi,rho,varsigma,sigma,tau,upsilon,phi,chi,psi,omega,digamma,
123     varTheta,varbeta,varepsilon,vartheta,varkappa,varpi,varrho,varphi}
124 %% varTheta is done separately because amsmath defines it differently.
125
126 %% Can define/redefine any command using the syntax of
127 %% \newcommand/\renewcommand without error. Some helpers.
128 \newcommand\ernewcommand[1]{\ifdef{#1}{\renewcommand{#1}}{\newcommand{#1}}}
129 \providecommand\expanded[1]{\edef\@tempa{#1}\@tempa}
130 \newcommand\eu@setkeys[3][]{
131     \ifblank{#1}{\relax}{\presetkeys[eu]{#2}{#1}{}}
132     \expanded{\noexpand\setkeys*[eu]{#2}{\expandonce#3@empty}}}
133 \newcommand\eu@fontspec[2]{
134     \expanded{\noexpand\zf@fontspec{\expandonce#1@empty}{\expandonce#2@empty}}}
135
136 %% Deprecated commands.
137 %% \+: Use \"... " or " instead.
138 %% \plaindigits: Digits are no longer selected automatically from either
139 %% the Latin or the Greek mathematics font. Instead, they
140 %% must explicitly be stated. If you want plain digits, just
141 %% don't say you want digits.
142 %%5 \normalvarforms: Now called \normalisevarforms
143 %% \varforms: Now called \exchangeforms

```

```

144 %% Eventually, documents that use these will compile with error.
145 \newcommand\+{
146   \PackageWarning{mathspec}
147     {\protect+\space is deprecated, recommend to use\MessageBreak\protect"..."}
148     or "}
149   \eu@plus}
150 \newcommand\setsansfonts{
151   \PackageWarning{mathspec}
152     {\protect\setsansfonts\space is deprecated, recommend to use \protect
153     \setallsansfonts.}
154   \setallsansfonts}
155 \@onlypreamble\setsansfonts
156 \newcommand\setmonofonts{
157   \PackageWarning{mathspec}
158     {\protect\setmonofonts\space is deprecated, recommend to use \protect
159     \setallmonofonts.}
160   \setallsansfonts}
161 \@onlypreamble\setmonofonts
162 \newcommand\plaindigits{
163   \PackageWarning{mathspec}{\protect\plaindigits\space is deprecated}}
164 \@onlypreamble\plaindigits
165 \newcommand\normalvarforms{
166   \PackageWarning{mathspec}
167     {\protect\normalvarforms\space is deprecated, recommend to use
168     \protect\normalisevarforms\space or \protect\normalizevarforms}
169   \normalisevarforms}
170 \@onlypreamble\normalvarforms
171 \newcommand\varforms{
172   \PackageWarning{mathspec}
173     {\protect\varforms\space is deprecated, recommend to use
174     \protect\exchangeforms}
175   \exchangeforms}
176 \@onlypreamble\varforms
177
178 %% I don't want this clogging up my sty file. It will be gone eventually.
179 \def@ifnext#1#2#3{%
180   \let\@tempd=#1%
181   \def\@tempa{#2}%
182   \def\@tempb{#3}%
183   \futurelet\@tempc@ifnexta}
184 \def@ifnexta{%
185   \ifx\@tempc\@tempd%
186     \let\@tempb\@tempa%
187     \fi\@tempb}
188 \def\eu@DeclareRobustCommand{\@star@or@long\eu@declare@robustcommand}
189 \def\eu@declare@robustcommand#1{%
190   \ifx#1\undefined\else\ifx#1\relax\else
191     \latex@info{Redefining \string#1}%
192   \fi\fi

```

```

193 \edef\reserved@a{\string#1}%
194 \def\reserved@b{#1}%
195 \edef\reserved@b{\expandafter\strip@prefix\meaning\reserved@b}%
196 \edef#1{%
197   \ifx\reserved@a\reserved@b
198     \noexpand\x@protect
199     \noexpand#1%
200   \fi
201   \noexpand\protect
202   \expandafter\noexpand\csname\expandafter@gobble\string#1\endcsname}%
203 \let\ifdefinable\erc@ifdefinable
204 \expandafter\eu@new@command\csname\expandafter@gobble\string#1\endcsname}
205 \def\eu@new@command#1{\eu@testopt{\eu@newcommand#1}0}
206 \def\eu@@newcommand#1[#2]{\ifnext[{\@xargdef#1[#2]}{\@argdef#1[#2]}}
207 \long\def\eu@testopt#1#2{\ifnext[#{1}{#1[#2]}}
208 \eu@DeclareRobustCommand\eu@plus[1][{}
209
210 %% The main user command (comes in two spellings)
211 %% \setmathfont(<sets>)[<shapes, font features>]{<font name>}
212 %% \setmathfont(<sets>)[<shapes, font features>]{<font name>}
213 %%
214 %% <set> is a CSV list of any of: Special, Latin, Greek, Digits, Symbols. If
215 %% (<set>) is omitted, then (Special) is assumed. Special is provided to
216 %% hook to some external code (e.g. potentially unicode-math). That is,
217 %% for mathspec purposes, (<sets>) is mandatory. Omit it so that it
218 %% behaves like a different command. See below.
219 %% <shapes> is the keyval list of font shapes for the subset of <set>.
220 %% Valid keys are: Uppercase, Lowercase, Arabic.
221 %% Valid values are: Regular, Italic, Plain.
222 %% <font features>, <font name> follow directly from fontspec.
223 \providecommand\setmathfont{\eu@setmathfont}
224 \let\setmathfont\setmathfont
225 \newcommand\eu@setmathfont{
226   \ifnextchar(
227     {\eu@setmathfont}
228     {\eu@setmathfont(Special)}}
229 \def\eu@setmathfont(#1){
230   \edef\eu@setmathfont@Set{#1}
231   \@eu@setmathfont}
232 \newcommand\@eu@setmathfont[2][{}{
233   \@for\i@for:=\eu@setmathfont@Set\do
234     {\csname eu@ScopeSet@\i@for\endcsname[#1]{#2}}}
235
236 %% The FIRST branch \setmathfont(Special)
237 %% Predefine this command before mathspec is loaded (or redefine it) to get
238 %%
239 %% \setmathfont[<font features>]{<font name>}
240 %%
241 %% to do something else.

```

```

242 %%
243 %% Essentially, \setmathsfont(<sets>)[<font features>]{<font name>} is a mathspec
244 %% command, but \setmathsfont[<font features>]{<font name>} is an external
245 %% command.
246 \providecommand\eu@ScopeSet@Special[2][\relax]
247
248 %% The SECOND branch \setmathsfont(Digits)
249 \newcommand\eu@ScopeSet@Digits[2][\{
250   \eu@setkeys[Arabic=Regular]{Digits}{#1}
251   \eu@fontspec{\XKV@rm}{#2}
252   \ifcase\eu@DigitsArabic@@value %% If Digits Regular
253     \ernewcommand\eu@DigitsArabic@symfont{Digits:m:n}
254     \let\eu@Digitsmathsfont\zf@family
255     \eu@booltrue{Digits}
256   \or %% If Digits Italic
257     \ernewcommand\eu@DigitsArabic@symfont{Digits:m:it}
258     \let\eu@Digitsmathsfont\zf@family
259     \eu@booltrue{Digits}
260   \or %% If Digits Plain
261     \eu@boolfalse{Digits}
262   \fi
263   \eu@ifsomebooltrue{Digits}
264     {\DeclareSymbolFont{Digits:m:n}{\eu@enc}{\eu@Digitsmathsfont}{m}{n}}
265   \eu@ifbooltrue{Digits}
266     {\fontfamily\eu@Digitsmathsfont\selectfont
267     \DeclareMathSymbol{0}{\mathord}{\eu@DigitsArabic@symfont}{`0}
268     \DeclareMathSymbol{1}{\mathord}{\eu@DigitsArabic@symfont}{`1}
269     \DeclareMathSymbol{2}{\mathord}{\eu@DigitsArabic@symfont}{`2}
270     \DeclareMathSymbol{3}{\mathord}{\eu@DigitsArabic@symfont}{`3}
271     \DeclareMathSymbol{4}{\mathord}{\eu@DigitsArabic@symfont}{`4}
272     \DeclareMathSymbol{5}{\mathord}{\eu@DigitsArabic@symfont}{`5}
273     \DeclareMathSymbol{6}{\mathord}{\eu@DigitsArabic@symfont}{`6}
274     \DeclareMathSymbol{7}{\mathord}{\eu@DigitsArabic@symfont}{`7}
275     \DeclareMathSymbol{8}{\mathord}{\eu@DigitsArabic@symfont}{`8}
276     \DeclareMathSymbol{9}{\mathord}{\eu@DigitsArabic@symfont}{`9}}
277
278 %% The THIRD branch \setmathsfont(Latin)
279 \newcommand\eu@ScopeSet@Latin[2][\{
280   \eu@setkeys[Uppercase=Italic,Lowercase=Italic]{Latin}{#1}
281   \eu@fontspec{\XKV@rm}{#2}
282   \ifcase\eu@LatinUppercase@@value %% If Latin Uppercase Regular
283     \ernewcommand\eu@LatinUppercase@symfont{Latin:m:n}
284     \let\eu@Latinmathsfont\zf@family
285     \eu@booltrue{LatinUppercase}
286   \or %% If Latin Uppercase Italic
287     \ernewcommand\eu@LatinUppercase@symfont{Latin:m:it}
288     \let\eu@Latinmathsfont\zf@family
289     \eu@booltrue{LatinUppercase}
290   \or %% If Latin Uppercase Plain

```

```

291 \eu@boolfalse{LatinUppercase}
292 \fi
293 \ifcase\eu@LatinLowercase@@value %% If Latin Lowercase Regular
294 \ernewcommand\eu@LatinLowercase@symfont{Latin:m:n}
295 \let\eu@Latinmathsfont\zf@family
296 \eu@booltrue{LatinLowercase}
297 \or %% If Latin Lowercase Italic
298 \ernewcommand\eu@LatinLowercase@symfont{Latin:m:it}
299 \let\eu@Latinmathsfont\zf@family
300 \eu@booltrue{LatinLowercase}
301 \or %% If Latin Lowercase Plain
302 \eu@boolfalse{LatinLowercase}
303 \fi
304 \eu@ifsomebooltrue{LatinUppercase,LatinLowercase}
305 {\DeclareSymbolFont{Latin:m:n}{\eu@enc}{\eu@Latinmathsfont}{m}{n}
306 \DeclareSymbolFont{Latin:m:it}{\eu@enc}{\eu@Latinmathsfont}{m}{it}}
307 \eu@ifbooltrue{LatinUppercase}
308 {\fontfamily\eu@Latinmathsfont\selectfont
309 \DeclareMathSymbol{A}{\mathalpha}{\eu@LatinUppercase@symfont}`A}
310 \DeclareMathSymbol{B}{\mathalpha}{\eu@LatinUppercase@symfont}`B}
311 \DeclareMathSymbol{C}{\mathalpha}{\eu@LatinUppercase@symfont}`C}
312 \DeclareMathSymbol{D}{\mathalpha}{\eu@LatinUppercase@symfont}`D}
313 \DeclareMathSymbol{E}{\mathalpha}{\eu@LatinUppercase@symfont}`E}
314 \DeclareMathSymbol{F}{\mathalpha}{\eu@LatinUppercase@symfont}`F}
315 \DeclareMathSymbol{G}{\mathalpha}{\eu@LatinUppercase@symfont}`G}
316 \DeclareMathSymbol{H}{\mathalpha}{\eu@LatinUppercase@symfont}`H}
317 \DeclareMathSymbol{I}{\mathalpha}{\eu@LatinUppercase@symfont}`I}
318 \DeclareMathSymbol{J}{\mathalpha}{\eu@LatinUppercase@symfont}`J}
319 \DeclareMathSymbol{K}{\mathalpha}{\eu@LatinUppercase@symfont}`K}
320 \DeclareMathSymbol{L}{\mathalpha}{\eu@LatinUppercase@symfont}`L}
321 \DeclareMathSymbol{M}{\mathalpha}{\eu@LatinUppercase@symfont}`M}
322 \DeclareMathSymbol{N}{\mathalpha}{\eu@LatinUppercase@symfont}`N}
323 \DeclareMathSymbol{O}{\mathalpha}{\eu@LatinUppercase@symfont}`O}
324 \DeclareMathSymbol{P}{\mathalpha}{\eu@LatinUppercase@symfont}`P}
325 \DeclareMathSymbol{Q}{\mathalpha}{\eu@LatinUppercase@symfont}`Q}
326 \DeclareMathSymbol{R}{\mathalpha}{\eu@LatinUppercase@symfont}`R}
327 \DeclareMathSymbol{S}{\mathalpha}{\eu@LatinUppercase@symfont}`S}
328 \DeclareMathSymbol{T}{\mathalpha}{\eu@LatinUppercase@symfont}`T}
329 \DeclareMathSymbol{U}{\mathalpha}{\eu@LatinUppercase@symfont}`U}
330 \DeclareMathSymbol{V}{\mathalpha}{\eu@LatinUppercase@symfont}`V}
331 \DeclareMathSymbol{W}{\mathalpha}{\eu@LatinUppercase@symfont}`W}
332 \DeclareMathSymbol{X}{\mathalpha}{\eu@LatinUppercase@symfont}`X}
333 \DeclareMathSymbol{Y}{\mathalpha}{\eu@LatinUppercase@symfont}`Y}
334 \DeclareMathSymbol{Z}{\mathalpha}{\eu@LatinUppercase@symfont}`Z}}
335 \eu@ifbooltrue{LatinLowercase}
336 {\fontfamily\eu@Latinmathsfont\selectfont
337 \DeclareMathSymbol{a}{\mathalpha}{\eu@LatinLowercase@symfont}`a}
338 \DeclareMathSymbol{b}{\mathalpha}{\eu@LatinLowercase@symfont}`b}
339 \DeclareMathSymbol{c}{\mathalpha}{\eu@LatinLowercase@symfont}`c}

```

```

340 \DeclareMathSymbol{d}{\mathalpha}{\eu@LatinLowercase@symfont}{`d}
341 \DeclareMathSymbol{e}{\mathalpha}{\eu@LatinLowercase@symfont}{`e}
342 \DeclareMathSymbol{f}{\mathalpha}{\eu@LatinLowercase@symfont}{`f}
343 \DeclareMathSymbol{g}{\mathalpha}{\eu@LatinLowercase@symfont}{`g}
344 \DeclareMathSymbol{h}{\mathalpha}{\eu@LatinLowercase@symfont}{`h}
345 \DeclareMathSymbol{i}{\mathalpha}{\eu@LatinLowercase@symfont}{`i}
346 \DeclareMathSymbol{j}{\mathalpha}{\eu@LatinLowercase@symfont}{`j}
347 \DeclareMathSymbol{k}{\mathalpha}{\eu@LatinLowercase@symfont}{`k}
348 \DeclareMathSymbol{l}{\mathalpha}{\eu@LatinLowercase@symfont}{`l}
349 \DeclareMathSymbol{m}{\mathalpha}{\eu@LatinLowercase@symfont}{`m}
350 \DeclareMathSymbol{n}{\mathalpha}{\eu@LatinLowercase@symfont}{`n}
351 \DeclareMathSymbol{o}{\mathalpha}{\eu@LatinLowercase@symfont}{`o}
352 \DeclareMathSymbol{p}{\mathalpha}{\eu@LatinLowercase@symfont}{`p}
353 \DeclareMathSymbol{q}{\mathalpha}{\eu@LatinLowercase@symfont}{`q}
354 \DeclareMathSymbol{r}{\mathalpha}{\eu@LatinLowercase@symfont}{`r}
355 \DeclareMathSymbol{s}{\mathalpha}{\eu@LatinLowercase@symfont}{`s}
356 \DeclareMathSymbol{t}{\mathalpha}{\eu@LatinLowercase@symfont}{`t}
357 \DeclareMathSymbol{u}{\mathalpha}{\eu@LatinLowercase@symfont}{`u}
358 \DeclareMathSymbol{v}{\mathalpha}{\eu@LatinLowercase@symfont}{`v}
359 \DeclareMathSymbol{w}{\mathalpha}{\eu@LatinLowercase@symfont}{`w}
360 \DeclareMathSymbol{x}{\mathalpha}{\eu@LatinLowercase@symfont}{`x}
361 \DeclareMathSymbol{y}{\mathalpha}{\eu@LatinLowercase@symfont}{`y}
362 \DeclareMathSymbol{z}{\mathalpha}{\eu@LatinLowercase@symfont}{`z}}
363
364 %% The FOURTH branch \setmathsfnt(Greek)
365 \newcommand\eu@ScopeSet@Greek[2][]{
366   \eu@setkeys[Uppercase=Regular,Lowercase=Italic]{Greek}{#1}
367   \eu@fontspec{\XKV@rm}{#2}
368   \ifcase\eu@GreekUppercase@@value %% If Greek Uppercase Regular
369     \ernewcommand\eu@GreekUppercase@symfont{Greek:m:n}
370     \let\eu@Greekmathsfnt\zf@family
371     \eu@booltrue{GreekUppercase}
372   \or %% If Greek Uppercase Italic
373     \ernewcommand\eu@GreekUppercase@symfont{Greek:m:it}
374     \let\eu@Greekmathsfnt\zf@family
375     \eu@booltrue{GreekUppercase}
376   \or %% If Greek Uppercase Plain
377     \eu@boolfalse{GreekUppercase}
378   \fi
379   \ifcase\eu@GreekLowercase@@value %% If Greek Lowercase Regular
380     \ernewcommand\eu@GreekLowercase@symfont{Greek:m:n}
381     \let\eu@Greekmathsfnt\zf@family
382     \eu@booltrue{GreekLowercase}
383   \or %% If Greek Lowercase Italic
384     \ernewcommand\eu@GreekLowercase@symfont{Greek:m:it}
385     \let\eu@Greekmathsfnt\zf@family
386     \eu@booltrue{GreekLowercase}
387   \or %% If Greek Lowercase Plain
388     \eu@boolfalse{GreekLowercase}

```

```

389 \fi
390 \eu@ifsomebooltrue{GreekUppercase,GreekLowercase}
391   {\DeclareSymbolFont{Greek:m:n}{\eu@enc}{\eu@Greekmathsfnt}{m}{n}
392   \DeclareSymbolFont{Greek:m:it}{\eu@enc}{\eu@Greekmathsfnt}{m}{it}}
393 \eu@ifbooltrue{GreekUppercase}
394   {\fontfamily\eu@Greekmathsfnt\selectfont
395   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Alpha]
396   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Beta]
397   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Gamma]
398   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Delta]
399   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Epsilon]
400   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Zeta]
401   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Eta]
402   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Theta]
403   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Iota]
404   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Kappa]
405   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Lambda]
406   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Mu]
407   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Nu]
408   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Xi]
409   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Omicron]
410   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Pi]
411   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Rho]
412   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Sigma]
413   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Tau]
414   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Upsilon]
415   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Phi]
416   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Chi]
417   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Psi]
418   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Omega]
419   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\Digamma]
420   \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{' }[\varTheta]
421   \eu@fixgreekcs {}{Alpha}
422   \eu@fixgreekcs {}{Beta}
423   \eu@fixgreekcs {}{Gamma}
424   \eu@fixgreekcs {}{Delta}
425   \eu@fixgreekcs {}{Epsilon}
426   \eu@fixgreekcs {}{Zeta}
427   \eu@fixgreekcs {}{Eta}
428   \eu@fixgreekcs {}{Theta}
429   \eu@fixgreekcs {}{Iota}
430   \eu@fixgreekcs {}{Kappa}
431   \eu@fixgreekcs {}{Lambda}
432   \eu@fixgreekcs {}{Mu}
433   \eu@fixgreekcs {}{Nu}
434   \eu@fixgreekcs {}{Xi}
435   \eu@fixgreekcs {}{Omicron}
436   \eu@fixgreekcs {}{Pi}
437   \eu@fixgreekcs {}{Rho}

```

```

438 \eu@fixgreekcs {}{\Sigma}
439 \eu@fixgreekcs {}{\Tau}
440 \eu@fixgreekcs {}{\Upsilon}
441 \eu@fixgreekcs {}{\Phi}
442 \eu@fixgreekcs {}{\Chi}
443 \eu@fixgreekcs {}{\Psi}
444 \eu@fixgreekcs {}{\Omega}
445 \eu@fixgreekcs {}{\Digamma}
446 \eu@fixgreekcs {}{\varTheta}
447 \eu@ifbooltrue{GreekLowercase}
448 {\fontfamily\eu@Greekmathsfnt\selectfont
449 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\alpha]
450 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\beta]
451 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\gamma]
452 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\delta]
453 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\epsilon]
454 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\eta]
455 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\theta]
456 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\iota]
457 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\kappa]
458 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\lambda]
459 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\mu]
460 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\nu]
461 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\xi]
462 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\omicron]
463 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\pi]
464 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\rho]
465 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\varsigma]
466 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\sigma]
467 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\tau]
468 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\upsilon]
469 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\phi]
470 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\chi]
471 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\psi]
472 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\omega]
473 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\digamma]
474 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\varbeta]
475 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\varepsilon]
476 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\vartheta]
477 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\varkappa]
478 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\varpi]
479 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\varrho]
480 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\varphi]
481 \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{' }[\varphi]
482 \eu@fixgreekcs {}{\alpha}
483 \eu@fixgreekcs {}{\beta}
484 \eu@fixgreekcs {}{\gamma}
485 \eu@fixgreekcs {}{\delta}
486 \eu@fixgreekcs {}{\epsilon}

```

```

487 \eu@fixgreekcs {}{zeta}
488 \eu@fixgreekcs {}{eta}
489 \eu@fixgreekcs {}{theta}
490 \eu@fixgreekcs {}{iota}
491 \eu@fixgreekcs {}{kappa}
492 \eu@fixgreekcs {}{lambda}
493 \eu@fixgreekcs {}{mu}
494 \eu@fixgreekcs {}{nu}
495 \eu@fixgreekcs {}{xi}
496 \eu@fixgreekcs {}{omicron}
497 \eu@fixgreekcs {}{pi}
498 \eu@fixgreekcs {}{rho}
499 \eu@fixgreekcs {}{varsigma}
500 \eu@fixgreekcs {}{sigma}
501 \eu@fixgreekcs {}{tau}
502 \eu@fixgreekcs {}{upsilon}
503 \eu@fixgreekcs {}{phi}
504 \eu@fixgreekcs {}{chi}
505 \eu@fixgreekcs {}{psi}
506 \eu@fixgreekcs {}{omega}
507 \eu@fixgreekcs {}{digamma}
508 \eu@fixgreekcs {}{varbeta}
509 \eu@fixgreekcs {}{varepsilon}
510 \eu@fixgreekcs {}{vartheta}
511 \eu@fixgreekcs {}{varkappa}
512 \eu@fixgreekcs {}{varpi}
513 \eu@fixgreekcs {}{varrho}
514 \eu@fixgreekcs {}{varphi}}
515 \newcommand\eu@fixgreekcs[2]{
516 \ifcsequal{#2}{eu@cm#2}
517 {\relax}
518 {\expandafter\def\csname #2\endcsname{"#1"}}}
519
520 %% The FIFTH branch \setmathsf(Symbols)
521 %% The symbols are not for now.
522 %% \newcommand\eu@ScopeSet@Symbols[2][]{
523 %% \eu@fontspec{#1}{#2}
524 %% \def\eu@Symbols@symfont{Symbols:m:n}
525 %% \let\eu@Symbols@mathsf\zf@family
526 %% \eu@booltrue{Symbols}}
527 %%
528 %% The FIFTH branch (REDEFINED) \setmathsf(Symbols)
529 \newcommand\eu@ScopeSet@Symbols[2][]{\eu@boolfalse{Symbols}}
530
531 %% Just so we know, by "all variant forms" I mean:
532 %% varbeta varpi cursive beta "omega" style pi
533 %% varepsilon varrho lunate epsilon rho with tail hooked under
534 %% vartheta varphi cursive theta cursive phi (or orthotic phi)
535 %% varkappa varTheta cursive kappa Theta with horizontal bar connected

```

```

536 %%
537 %% Note that varsigma is not included in this list (varsigma is not a variant
538 %% form, it is a final form).
539
540 %% Some authors might prefer the normal and variant forms to be exchanged. For
541 %% example, I prefer \phi to print the orthotic phi and \varphi the cursive phi,
542 %% contrary to many text fonts.
543 %%
544 %% \exchangeforms{<list>}
545 %% <list> is a CSV list of any of:
546 %% beta, epsilon, theta, kappa, pi, rho, phi, Theta
547 \newcommand\exchangeforms[1]{
548   \AtBeginDocument{
549     \@for\i@for:=#1\do{\eu@booltrue{exchange\i@for forms}}
550     \eu@ifbooltrue{GreekLowercase}
551       {\eu@ifbooltrue{exchangebetaforms}
552         {\XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\beta]
553         \XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\varbeta]}
554     \eu@ifbooltrue{exchangeepsilonforms}
555       {\XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\epsilon]
556       \XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\varepsilon]}
557     \eu@ifbooltrue{exchangethetaforms}
558       {\XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\theta]
559       \XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\vartheta]}
560     \eu@ifbooltrue{exchangekappaforms}
561       {\XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\kappa]
562       \XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\varkappa]}
563     \eu@ifbooltrue{exchangepiforms}
564       {\XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\pi]
565       \XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\varpi]}
566     \eu@ifbooltrue{exchangerhoforms}
567       {\XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\rho]
568       \XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\varrho]}
569     \eu@ifbooltrue{exchangephiforms}
570       {\XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\phi]
571       \XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekLowercase@symfont }{'}\[\varphi]}
572     \eu@ifbooltrue{GreekUppercase}
573       {\eu@ifbooltrue{exchangeThetaforms}
574         {\XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekUppercase@symfont }{'}\[\Theta]
575         \XeTeXDeclareMathSymbol }{\mathalpha}{\eu@GreekUppercase@symfont }{'}\[\varTheta]}}
576 \@onlypreamble\exchangeforms
577
578 %% Some text fonts do not contain all variant forms. For those that don't,
579 %% after defining the Greek mathematics font, the 'absent variant forms will
580 %% still be typeset in Computer Modern (usually).
581 %%
582 %% \normalisevarforms{<list>}
583 %% \normalizevarforms{<list>}
584 %% <list> is a CSV list of any of:

```

```

585 %%      beta, epsilon, theta, kappa, pi, rho, phi, Theta
586 %%
587 %% This command makes the listed variant forms of Greek symbols equivalent to
588 %% their normal forms, but only if they do not already exist in the font. For
589 %% example, if \varbeta and \eu@cm@varbeta are equivalent, then
590 %% \XeTeXDeclareMathSymbol failed to assign \varbeta to  because  does not
591 %% exist in the font.
592 \newcommand\normalisevarforms[1][beta,epsilon,theta,kappa,pi,rho,phi,Theta]{
593   \AtBeginDocument{
594     \@for\i@for:=#1\do{\eu@booltrue{normalisevar\i@for}}
595     \eu@ifbooltrue{GreekLowercase}
596       {\eu@ifbooltrue{normalisevarbeta}
597         {\ifx\varbeta\eu@cm@varbeta
598           \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{'}}
599           \let\varbeta\beta
600           \fi}
601     \eu@ifbooltrue{normalisevarepsilon}
602       {\ifx\varepsilon\eu@cm@varepsilon
603         \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{'}}
604         \let\varepsilon\epsilon
605         \fi}
606     \eu@ifbooltrue{normalisevartheta}
607       {\ifx\vartheta\eu@cm@vartheta
608         \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{'}}
609         \let\vartheta\theta
610         \fi}
611     \eu@ifbooltrue{normalisevarkappa}
612       {\ifx\varkappa\eu@cm@varkappa
613         \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{'}}
614         \let\varkappa\kappa
615         \fi}
616     \eu@ifbooltrue{normalisevarpi}
617       {\ifx\varpi\eu@cm@varpi
618         \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{'}}
619         \let\varpi\pi
620         \fi}
621     \eu@ifbooltrue{normalisevarrho}
622       {\ifx\varrho\eu@cm@varrho
623         \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{'}}
624         \let\varrho\rho
625         \fi}
626     \eu@ifbooltrue{normalisevarphi}
627       {\ifx\varphi\eu@cm@varphi
628         \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekLowercase@symfont }{'}}
629         \let\varphi\phi
630         \fi}}
631     \eu@ifbooltrue{GreekUppercase}{
632       \eu@ifbooltrue{normalisevarTheta}
633         {\ifx\varTheta\eu@cm@varTheta

```

```

634      \XeTeXDeclareMathSymbol {}{\mathalpha}{\eu@GreekUppercase@symfont }{'}
635      \let\varTheta\Theta
636      \fi}}}}
637 \onlypreamble\normalisevarforms
638 \let\normalizevarforms\normalisevarforms
639 \onlypreamble\normalizevarforms
640
641 %% xkeyval things
642 \define@choicekey[eu]
643   {Digits}{Arabic}[\eu@DigitsArabic@value\eu@DigitsArabic@value]
644   {Regular,Italic,Plain}[Regular]{\relax}
645 \define@choicekey[eu]
646   {Latin}{Uppercase}[\eu@LatinUppercase@value\eu@LatinUppercase@@value]
647   {Regular,Italic,Plain}[Italic]{\relax}
648 \define@choicekey[eu]
649   {Latin}{Lowercase}[\eu@LatinLowercase@value\eu@LatinLowercase@@value]
650   {Regular,Italic,Plain}[Italic]{\relax}
651 \define@choicekey[eu]
652   {Greek}{Uppercase}[\eu@GreekUppercase@value\eu@GreekUppercase@@value]
653   {Regular,Italic,Plain}[Regular]{\relax}
654 \define@choicekey[eu]
655   {Greek}{Lowercase}[\eu@GreekLowercase@value\eu@GreekLowercase@@value]
656   {Regular,Italic,Plain}[Italic]{\relax}
657
658 %% Also say Digits has Uppercase and Lowercase keys, and Latin and Greek both
659 %% have Arabic key. So that if a superfluous key is accidently sent through the
660 %% wrong command (possible with \setallmainfonts), then it doesn't blow up.
661 \define@key[eu]{Digits}{Uppercase}{\relax}
662 \define@key[eu]{Digits}{Lowercase}{\relax}
663 \define@key[eu]{Latin}{Arabic}{\relax}
664 \define@key[eu]{Greek}{Arabic}{\relax}
665
666 %% I hope Will doesn't mind if I patch fontspec. Why? Because these keys are
667 %% accidently sent through fontspec (e.g. \setallmainfonts does \setmainfont,
668 %% which is a fontspec command). So I allow fontspec to understand them, but do
669 %% nothing.
670 \define@key[zf]{options}{Arabic}{\relax}
671 \define@key[zf]{options}{Uppercase}{\relax}
672 \define@key[zf]{options}{Lowercase}{\relax}
673
674 %% Fonts have metrics suitable for text, not for mathematics. Need to kern each
675 %% letter individually. Previous version took a trial and error approach with
676 %% \+ [<size>] where <size> was determined by trial and error. Now, there is a
677 %% XeTeX primitive \XeTeXglyphbounds which is used to automatically calculate
678 %% the required mkern.
679 %%
680 %% Some register definitions. \three@digits takes a number and, if it is less
681 %% than 100, inserts leading zeroes so that it has three digits.
682 \muskipdef\muskip@z@

```

```

683 \muskipdef\muskip@i\@ne
684 \dimendef\dimen@iv 4\relax
685 \newcounter{eu@}
686 \newcounter{eu@i}
687 \providecommand\threedigits[1]{\ifnum#1<100 0\ifnum#1<10 0\fi\fi\number#1}
688
689 %% \setminwhitespace{<number>}
690 %%   Sets the minimum gap between adjacent characters in mathematics.
691 %%   <number> is in units of mmu (1/1000 mu). So 1 em = 18000 mmu.
692 %% \eu@minwhitespace is the minimum white space. It's default value is 500
693 %% which corresponds to 0.5 mu or 1/36 em.
694 \newcommand\setminwhitespace[1][500]{\def\eu@minwhitespace{#1}}
695 \setminwhitespace
696
697 %% \eu@mkern operates over some adjacent character tokens
698 %% \@eu@mkern operates over individual character tokens
699 %%
700 %% Unless I've missed something, it is really, really hard to get information
701 %% about the font that a mathematics symbol is typeset in, so I devised a series
702 %% of tests in text mode (\text!) (otherwise the received information will be
703 %% rubbish, related to the text font outside the mathematics). It would be
704 %% neater if I do it inside a box that's not printed, instead of an empty
705 %% \text. The \@eu@mkern algorithm to calculate the mkern might be neater if I
706 %% use e-TeX's \numexpr and \glueexpr. Maybe \gluetomu might be useful? What I
707 %% have here already ought to be sufficient but perhaps inefficient. I think
708 %% optical sizes follow through automatically because \text inherits the
709 %% surrounding size, is that right?
710 \newcommand\eu@mkern[1]{%
711   \@tfor\i@tfor:=#1\do{\expandafter\@eu@mkern\i@tfor}}
712 \def\eu@get@familyseriesshape#1:#2:#3\@nil{%
713   \expandafter\fontfamily\csname eu@#1mathsfnt\endcsname\selectfont
714   \ifstrequal{#2}{m}{\mdseries}{\relax}%
715   \ifstrequal{#2}{bx}{\bfseries}{\relax}%
716   \ifstrequal{#3}{n}{\upshape}{\relax}%
717   \ifstrequal{#3}{it}{\itshape}{\relax}}
718 \def\eu@get@familyseriesshape#1:#2:#3\@nil{%
719   \def\eu@family{#1}%
720   \def\eu@series{#2}%
721   \def\eu@shape{#3}}
722 \newcounter{mkern}
723 \newcommand\@eu@mkern[1]{%
724   \setcounter{mkern}{-1}%
725   \eu@boolfalse{domkern}%
726   \eu@ifnumin{`#1}{`0,`9}{\setcounter{mkern}{0}}{\relax}%
727   \eu@ifnumin{`#1}{`A,`Z}{\setcounter{mkern}{1}}{\relax}%
728   \eu@ifnumin{`#1}{`a,`z}{\setcounter{mkern}{2}}{\relax}%
729   \eu@ifnumin {`#1}{`,`}{\setcounter{mkern}{3}}{\relax}%
730   \eu@ifnumin {`#1}{`,`}{\setcounter{mkern}{4}}{\relax}%
731   \eu@ifnumis {`#1}{`,`}{\setcounter{mkern}{3}}{\relax}%

```

```

732 \eu@ifnumis      {\#1}{\setcounter{mkern}{4}}{\relax}%
733 \text{%
734   \ifnum\the\c@mkern>\m@ne
735     \eu@gbooltrue{domkern}%
736   \fi
737   \ifcase\the\c@mkern\relax % If Digits (0)
738     \ifdef{\eu@DigitsArabic@symfont}%
739       {\expandafter\eu@get@familyseriesshape\eu@DigitsArabic@symfont\@nil}%
740       {\global\boolfalse{domkern}}%
741     \or % If Latin Uppercase (1)
742       \ifdef{\eu@LatinUppercase@symfont}%
743         {\expandafter\eu@get@familyseriesshape\eu@LatinUppercase@symfont\@nil}%
744         {\global\boolfalse{domkern}}%
745     \or % If Latin Lowercase (2)
746       \ifdef{\eu@LatinLowercase@symfont}%
747         {\expandafter\eu@get@familyseriesshape\eu@LatinLowercase@symfont\@nil}%
748         {\global\boolfalse{domkern}}%
749     \or % If Greek Uppercase (3)
750       \ifdef{\eu@GreekUppercase@symfont}%
751         {\expandafter\eu@get@familyseriesshape\eu@GreekUppercase@symfont\@nil}%
752         {\global\boolfalse{domkern}}%
753     \or % If Greek Lowercase (4)
754       \ifdef{\eu@GreekLowercase@symfont}%
755         {\expandafter\eu@get@familyseriesshape\eu@GreekLowercase@symfont\@nil}%
756         {\global\boolfalse{domkern}}%
757   \fi
758   \ifdef{\eu@family}%
759     {\expandafter\fontfamily\c@name eu\eu@family mathsf\endcsname\selectfont}%
760     {\relax}%
761   \ifdef{\eu@series}%
762     {\expandafter\ifstrequal\expandafter{\eu@series}{m}%
763      {\mdseries}%
764      {\relax}%
765      \expandafter\ifstrequal\expandafter{\eu@series}{bx}%
766      {\bfseries}%
767      {\relax}}%
768     {\relax}%
769   \ifdef{\eu@shape}%
770     {\expandafter\ifstrequal\expandafter{\eu@shape}{n}%
771      {\upshape}%
772      {\relax}%
773      \expandafter\ifstrequal\expandafter{\eu@shape}{it}%
774      {\itshape}%
775      {\relax}}%
776     {\relax}%
777   \global\dimen@XeTeXglyphbounds\@ne\theXeTeXcharglyph`#1\relax
778   \global\dimen@ivXeTeXglyphbounds\thr@theXeTeXcharglyph`#1}
779 \dimen@ii 1em
780 \c@eu@dimen@

```

```

781 \c@eu@i\dimen@ii
782 \multiply\c@eu@ 3000\relax
783 \divide\c@eu@i 6\relax
784 \divide\c@eu@\c@eu@i
785 \c@eu@i\c@eu@
786 \ifnum\number\c@eu@ <\eu@minwhitespace
787 \c@eu@\eu@minwhitespace
788 \fi
789 \advance\c@eu@ -\c@eu@i
790 \c@eu@i\c@eu@
791 \divide\c@eu@i\@m
792 \edef\eu@mkern@left{\number\c@eu@i}
793 \multiply\c@eu@i\@m
794 \advance\c@eu@ -\c@eu@i
795 \edef\eu@mkern@left{\eu@mkern@left.\three@digits{\number\c@eu@}\mu}
796 \dimen@i\dimen@iv
797 \dimen@ii 1em
798 \c@eu@\dimen@
799 \c@eu@i\dimen@ii
800 \multiply\c@eu@ 3000\relax
801 \divide\c@eu@i 6\relax
802 \divide\c@eu@\c@eu@i
803 \c@eu@i\c@eu@
804 \ifnum\number\c@eu@ <\eu@minwhitespace
805 \c@eu@\eu@minwhitespace
806 \fi
807 \advance\c@eu@ -\c@eu@i
808 \c@eu@i\c@eu@
809 \divide\c@eu@i\@m
810 \edef\eu@mkern@right{\number\c@eu@i}
811 \multiply\c@eu@i\@m
812 \advance\c@eu@ -\c@eu@i
813 \edef\eu@mkern@right{\eu@mkern@right.\three@digits{\number\c@eu@}\mu}
814 \eu@ifbool{domkern}
815 {\mkern\eu@mkern@left#1\mkern\eu@mkern@right}
816 {#1}}
817
818 %% Redefine \" and " in maths mode only. Umlaut and quote definitions remain
819 %% in effect in text mode.
820 %%
821 %% " put the " before a character, e.g "$f$, and the character is
822 %% printed with kerns on either side.
823 %% \"..." Surround a series of adjacent characters, e.g. "$"abcde"$ is
824 %% equivalent to "$"a"b"c"d"e$.
825 %% Note that the tokens that " and \" operate on MUST be characters because
826 %% they are sent through the XeTeX primitive \XeTeXcharglyph as in:
827 %%
828 %% \XeTeXglyphbounds n \the\XeTeXcharglyph`#1
829 %%

```

```

830 %% where n = 1,2,3,4 and #1 is the character (If #1 is not a character, then
831 %% \XeTeXcharglyph'#1 doesn't make sense). Higher level tests are needed to
832 %% avoid this problem.
833 \let\eu@original@quote="
834 \let\eu@original@csquote=\
835 \mathcode`\\"="8000
836 \newcommand\eu@active@quote{%
837   \ifmmode
838     \expandafter\eu@new@quote
839   \else
840     \expandafter\eu@original@quote
841   \fi}
842 \newcommand\eu@active@csquote{%
843   \ifmmode
844     \expandafter\eu@new@csquote
845   \else
846     \expandafter\eu@original@csquote
847   \fi}
848 \begingroup
849   \catcode`\\"=\active
850   \global\let\"=\eu@active@quote
851 \endgroup
852 \let\"=\eu@active@csquote
853 \newcommand\eu@new@quote[1]{\eu@mkern{#1}}
854 \def\eu@new@csquote#1"{\eu@mkern{#1}}
855
856 %% Redefine LaTeX 2e kernel macros to do Unicode characters too. Add optional
857 %% fifth argument. This is a list of control sequences which will be let equal
858 %% to the symbol if the symbol exists in the font. If the symbol does not exist
859 %% in the font, then the fifth argument is ignored.
860 %%
861 %% e.g. \XeTeXDeclareMathSymbol {}{\mathrel}{font}{"2260}[\neq\ne]
862 \def\XeTeXDeclareMathSymbol#1#2#3#4{%
863   \expandafter\in@\csname sym#3\expandafter\endcsname
864   \expandafter{\group@list}%
865   \ifin@
866     \begingroup
867       \if\relax\noexpand#1% is command?
868         \edef\reserved@a{\noexpand\in@{\string\mathchar}{\meaning#1}}%
869         \reserved@a
870       \ifin@
871         \expandafter\XeTeXset@mathsymbol
872         \csname sym#3\endcsname#1#2{#4}%
873         \@font@info{Redeclaring math symbol \string#1}%
874       \else
875         \expandafter\ifx
876         \csname\expandafter@gobble\string#1\endcsname
877         \relax
878         \expandafter\XeTeXset@mathsymbol

```

```

879         \csname sym#3\endcsname#1#2{#4}%
880     \else
881         \@latex@error{Command '\string#1' already defined}\@eha
882     \fi
883     \fi
884     \else
885         \expandafter\XeTeXset@mathchar
886         \csname sym#3\endcsname#1#2{#4}%
887     \fi
888     \endgroup
889     \def\XeTeXDeclareMathSymbol@symbol{#1}%
890     \def\XeTeXDeclareMathSymbol@slot{#4}%
891     \expandafter\XeTeXDeclareMathSymbol@option
892     \else
893         \@latex@error{Symbol font `#3' is not defined}\@eha
894         \expandafter\@gobbleoarg
895     \fi}
896 \@onlypreamble\XeTeXDeclareMathSymbol
897 \def\XeTeXset@mathchar#1#2#3#4{%
898     \global\XeTeXmathcode`#2="\mathchar@type#3#1#4\relax}
899 \@onlypreamble\XeTeXset@mathchar
900 \def\XeTeXset@mathsymbol#1#2#3#4{%
901     \global\XeTeXmathchardef#2"\mathchar@type#3#1#4\relax}
902 \@onlypreamble\XeTeXset@mathsymbol
903 \newcommand\@gobbleoarg[1][{}]{
904 \newcommand\XeTeXDeclareMathSymbol@option[1][{}]{%
905     \ifnum\the\XeTeXcharglyph\XeTeXDeclareMathSymbol@slot\z@
906         \etfor\ietfor #1:=\do%
907         {\expandafter\edef\ietfor{\expandonce\XeTeXDeclareMathSymbol@symbol}}%
908     \fi}
909
910 %% Some shorthands, so the same information isn't typed out more than once
911 %%
912 %% \setallmainfonts(<sets>)[<shapes, font features>]{<font name>}
913 %% \setprimaryfont[<shapes, font features>]{<font name>}
914 %% \setallsansfonts[<shapes, font features>]{<font name>}
915 %% \setallmonofonts[<shapes, font features>]{<font name>}
916 \newcommand\setallmainfonts{
917     \@ifnextchar(
918         {\eu@setallmainfonts}
919         {\eu@setallmainfonts(Digits,Latin,Greek)}}
920 \def\eu@setallmainfonts(#1){
921     \edef\eu@setmathsfont@Set{#1}
922     \eu@setallmainfonts}
923 \newcommand\eu@setallmainfonts[2][{}]{
924     \setmainfont[#1]{#2}
925     \setmathsfont(\eu@setmathsfont@Set)[#1]{#2}
926     \setmathrm[#1]{#2}}
927 \newcommand\setprimaryfont{\setallmainfonts(Digits,Latin)}

```

```

928 \newcommand\setallsansfonts[2][]{
929   \setsansfont[#1]{#2}
930   \setmathsf[#1]{#2}}
931 \newcommand\setallmonofonts[2][]{
932   \setmonofont[#1]{#2}
933   \setmathtt[#1]{#2}}
934
935 %% Set the particular mathematics alphabets
936 \vernewcommand\setmathrm[2][]{
937   \zf@fontspec{#1}{#2}
938   \let\eu@mathrm\zf@family
939   \DeclareMathAlphabet{\mathrm}{\eu@enc}{\eu@mathrm}{m}{n}
940   \SetMathAlphabet{\mathrm}{bold}{\eu@enc}{\eu@mathrm}{bx}{n}
941   \DeclareMathAlphabet{\mathit}{\eu@enc}{\eu@mathrm}{m}{it}
942   \DeclareMathAlphabet{\mathbf}{\eu@enc}{\eu@mathrm}{bx}{n}
943   \SetMathAlphabet{\mathit}{bold}{\eu@enc}{\eu@mathrm}{bx}{it}
944   \DeclareSymbolFont{Operators:m:n}{\eu@enc}{\eu@mathrm}{m}{n}
945   \def\operator@font{\expandafter\mathgroup\csname symOperators:m:n\endcsname}}
946 \vernewcommand\setmathcal[2][]{
947   \zf@fontspec{#1}{#2}
948   \let\eu@mathcal\zf@family
949   \DeclareMathAlphabet{\mathcal}{\eu@enc}{\eu@mathcal}{m}{n}}
950 \vernewcommand\setmathsf[2][]{
951   \zf@fontspec{#1}{#2}
952   \let\eu@mathsf\zf@family
953   \DeclareMathAlphabet{\mathsf}{\eu@enc}{\eu@mathsf}{m}{n}
954   \SetMathAlphabet{\mathsf}{bold}{\eu@enc}{\eu@mathsf}{bx}{n}}
955 \vernewcommand\setmathtt[2][]{
956   \zf@fontspec{#1}{#2}
957   \let\eu@mathtt\zf@family
958   \DeclareMathAlphabet{\mathtt}{\eu@enc}{\eu@mathtt}{m}{n}}
959 \vernewcommand\setmathfrak[2][]{
960   \zf@fontspec{#1}{#2}
961   \let\eu@mathfrak\zf@family
962   \DeclareMathAlphabet{\mathfrak}{\eu@enc}{\eu@mathfrak}{m}{n}}
963 \vernewcommand\setmathbb[2][]{
964   \zf@fontspec{#1}{#2}
965   \let\eu@mathbb\zf@family
966   \DeclareMathAlphabet{\mathbb}{\eu@enc}{\eu@mathbb}{m}{n}}
967
968 %% If amsmath is loaded, it must be loaded before mathspec. Checking for its
969 %% existence \AtBeginDocument is too late because the damage is already done
970 %% (It attempted to define \varTheta when mathspec already defined it). Or
971 %% should I delay the definition of \varTheta until \AtBeginDocument?
972 \let\original@RequirePackage\RequirePackage
973 \renewcommand\RequirePackage[2][]{
974   \ifstrequal{#2}{amsmath}
975     {\PackageError{mathspec}
976       {'amsmath' must be loaded earlier than 'mathspec'}}

```

```

977         {Edit the document so that 'amsmath' is required earlier than 'mathspec'.}}
978     {\relax}
979     \original@RequirePackage[#1]{#2}}
980 \onlypreamble\RequirePackage
981 \let\usepackage\RequirePackage
982 \onlypreamble\usepackage
983
984 %% Any font changes that mathspec has done are reset by LaTeX 2 at
985 %% \begin{document} using \process@table.
986
987 \endinput
988
989 %% © Andrew Gilbert Moschou 2009
990 %%
991 %% This work may be distributed and/or modified under the
992 %% conditions of the LaTeX Project Public License, either version 1.3c
993 %% of this license or (at your option) any later version.
994 %% The latest version of this license is in:
995 %% http://www.latex-project.org/lppl.txt
996 %% and version 1.3c or later is part of all recent distributions of LaTeX.
997 %%
998 %% This work has the LPPL maintenance status ''maintained.
999 %% The Current Maintainer of this work is Andrew Gilbert Moschou.
1000 %% This work consists of the files mathspec.sty and mathspec.tex.

```

Exactly 1000 lines! How about that?

## 9 LICENSE

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<http://www.latex-project.org/lppl.txt>

and version 1.3c or later is part of all recent distributions of L<sup>A</sup>T<sub>E</sub>X.

This work has the LPPL maintenance status ‘maintained’.

The Current Maintainer of this work is Andrew Gilbert Moschou.

This work consists of the files `mathspec.sty` and `mathspec.tex`.