

The HEP-MATH-FONT package*

Extended Greek and sans-serif math

Jan Hajer†

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Abstract

The HEP-MATH-FONT package adjust the math fonts to be italic sans-serif if the document is sans-serif. Additionally Greek letters are redefined to be always italic and upright in math and text mode, respectively. Some math font macros are adjusted to give more consistently the naively expected results.

The package is loaded using `\usepackage{hep-math-font}`.

warning If the document `\familydefault` font is switched to the sansserif `\sfdefault` font the math font is adjusted accordingly using fonts compatible to latin modern (LM) and computer modern (CM). In order to be able to easily switch large chunks of math from serif to sans-serif documents the meaning of `\mathrm` and `\mathsf` is adjusted so that the first generates upright sans-serif math and the second serif math. This is is neither the literal meaning of the macros nor the best behaviour if a single large document is written in sans-serif. However, it simplifies working in an environment where one copies pieces of math between serif and sans-serif documents *e.g.* publications *vs.* talks and funding applications.

Using the `FIXMATH` [1] and `TEXTALPHA` [2] packages Greek letter are adjusted so that they are always italic and upright in math and text mode, respectively. Greek letters can be written by using their unicode characters.

symbols The `symbols=<family>` sets the family of the symbol fonts. `symbols=ams` loads the two \mathcal{AMS} fonts [3] and the BM bold fonts. The default `symbols=true` replaces additionally the blackboard font with the `DSFONT` [4]. `symbols=minion` switches the symbol fonts to the Adobe MinionPro companion font from the `MNSYMBOL` package [5]. `symbols=false` deactivates loading any additional symbol fonts, effectively restricting the package to only switch the math font according to the sans-serif property of the main text.

1 Macros

`\text` The `\mathrm{\langle math \rangle}` macro and the `\text{\langle text \rangle}` macro from `AMSTEXT` [6] are

`\mathrm` *This document corresponds to HEP-MATH-FONT v1.0.
†jan.hajer@unibas.ch

adjusted to produce upright Greek letters, *i.e.* ($\text{Ab}\Gamma\delta\mathbf{Ab}\Gamma\delta$), by adjusting the code from the ALPHABETA [7] package.

- `\mathbf` Bold math, via `\mathbf` is improved with the `BM` package [8], *i.e.* ($\text{Ab}\Gamma\delta\mathbf{Ab}\Gamma\delta$). Macros switching to `bfseries` such as `\section{<text>}` are ensured to also typeset math in bold.
- `\mathsf` The math sans-serif alphabet is redefined to be italic sans-serif if the main text is serif and italic serif if the main text is sans-serif, *i.e.* ($\text{Ab}\Gamma\delta\mathbf{Ab}\Gamma\delta$). Ensuring that the distinction between these fonts is also kept if the (sans-)serif option of the document is switched.
- `\mathscr` The `\mathcal` font *i.e.* ($\mathcal{A}\mathcal{B}\mathcal{C}\mathcal{D}$) is accompanied by the `\mathscr` font *i.e.* ($\mathscr{A}\mathscr{B}\mathscr{C}\mathscr{D}$).
- `\mathbb` The `\mathbb` font is improved by the `DOUBLESTROKE` package [4] and adjusted depending on the (sans-)serif option of the document *i.e.* ($\mathbb{A}\mathbb{h}\mathbb{1}$).
- `\mathtt` The `\mathtt` macro switches to LM typewriter font *i.e.* ($\mathbf{Ab}\Gamma\mathbf{Ab}\Gamma$).
- `\mathfrak` Finally, the `\mathfrak` font is also available *i.e.* ($\mathfrak{A}\mathfrak{B}\mathfrak{1}\mathfrak{2}$).

Details about the font handling in $\text{T}_{\text{E}}\text{X}$ can be found in reference [9].

2 Math alphabet allocation

Of the 16 available math alphabets, $\text{T}_{\text{E}}\text{X}$ loads four by default

- 0) **OT1** Text (latin, upper case greek, numerals, text symbols)
- 1) **OML** Math Italic (latin, greek, numerals, text symbols)
- 2) **OMS** Symbol (`\mathcal`, operators)
- 3) **OMX** Math Extension (big operators, delimiters)

The text font 0) of CM is `cmr10 \OT1/cmr/m/n/10`, which is replaced by LM to be `rm-lmr10 \OT1/lmr/m/n/10`, the `sansserif` option uses `rm-lmss10 \OT1/lmss/m/n/10`. The italic math font 1) of CM is `cmmi10 \OML/cmm/m/it/10`, and is replaced by LM to be `lmmi10 \OML/lmm/m/it/10`, the `sansserif` options uses `cmssmi10 \OML/cmssrm/m/it/10` from the `SANSMATHFONTS` package [10]. The symbol font 2) of CM is `cmsy10 \OMS/cmsy/m/n/10`, and is replaced by LM to be `lmsy10 \OMS/lmsy/m/n/10`, the `sansserif` options uses `cmsssy10 \OMS/cmsssy/m/n/10` from the `SANSMATHFONTS` package [10]. The extension font 3) of CM is `cmex10 \OMX/cmex/m/n/5`, and is replaced by the `EXSCALE` package [11] to be `cmex10 \OMX/cmex/m/n/10`, the `sansserif` option loads `cmssex10 \OMX/cmssex/m/n/10`. The `AMSSYMB` (`AMSFONTS`) packages [12] load two more symbol fonts

- 4) **msam10** `\U/msa/m/n/10` AMS symbol font A (special math operators)
- 5) **msbm10** `\U/msb/m/n/10` AMS symbol font B (`\mathbb`, negated operators)

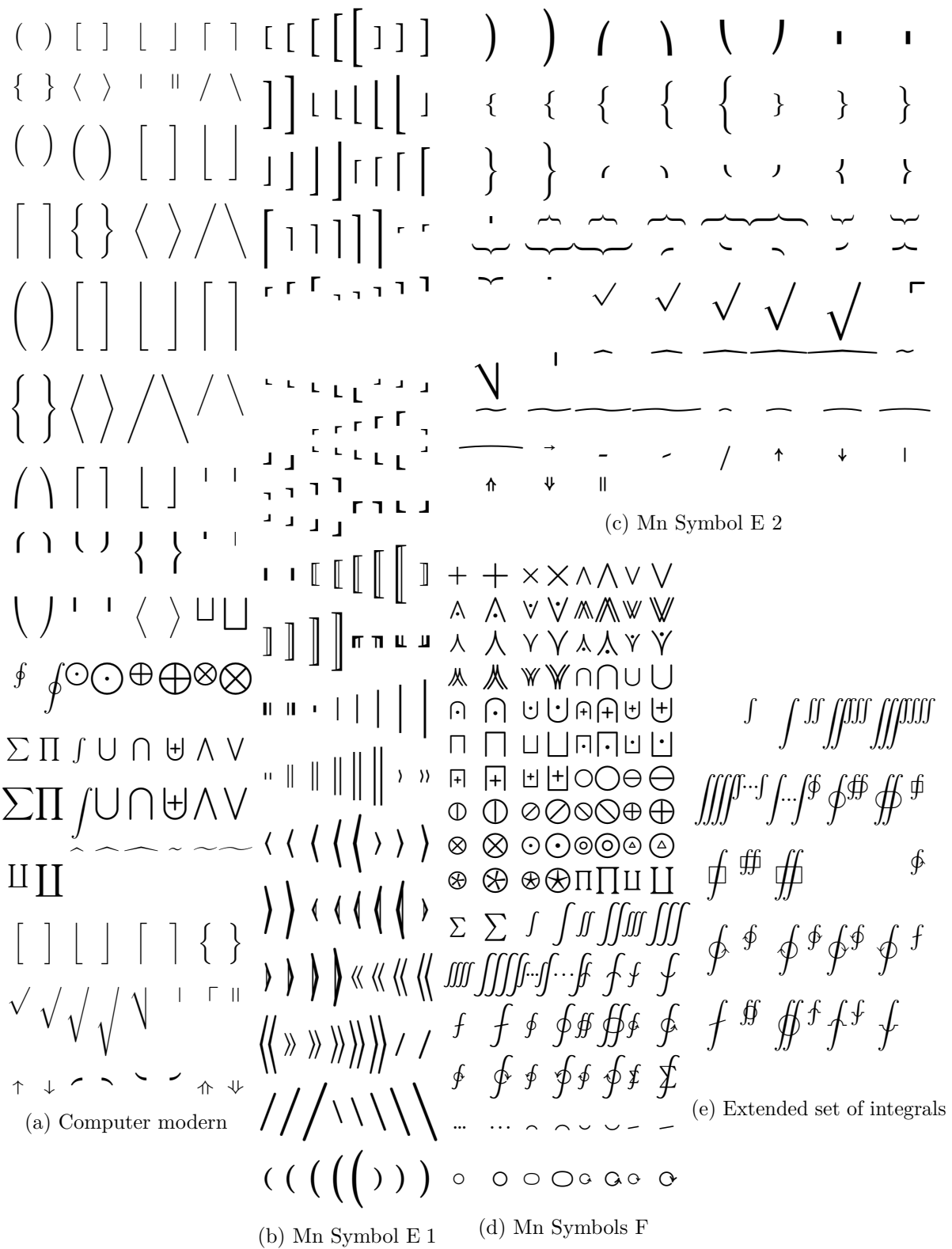


Figure 2: Math extension fonts

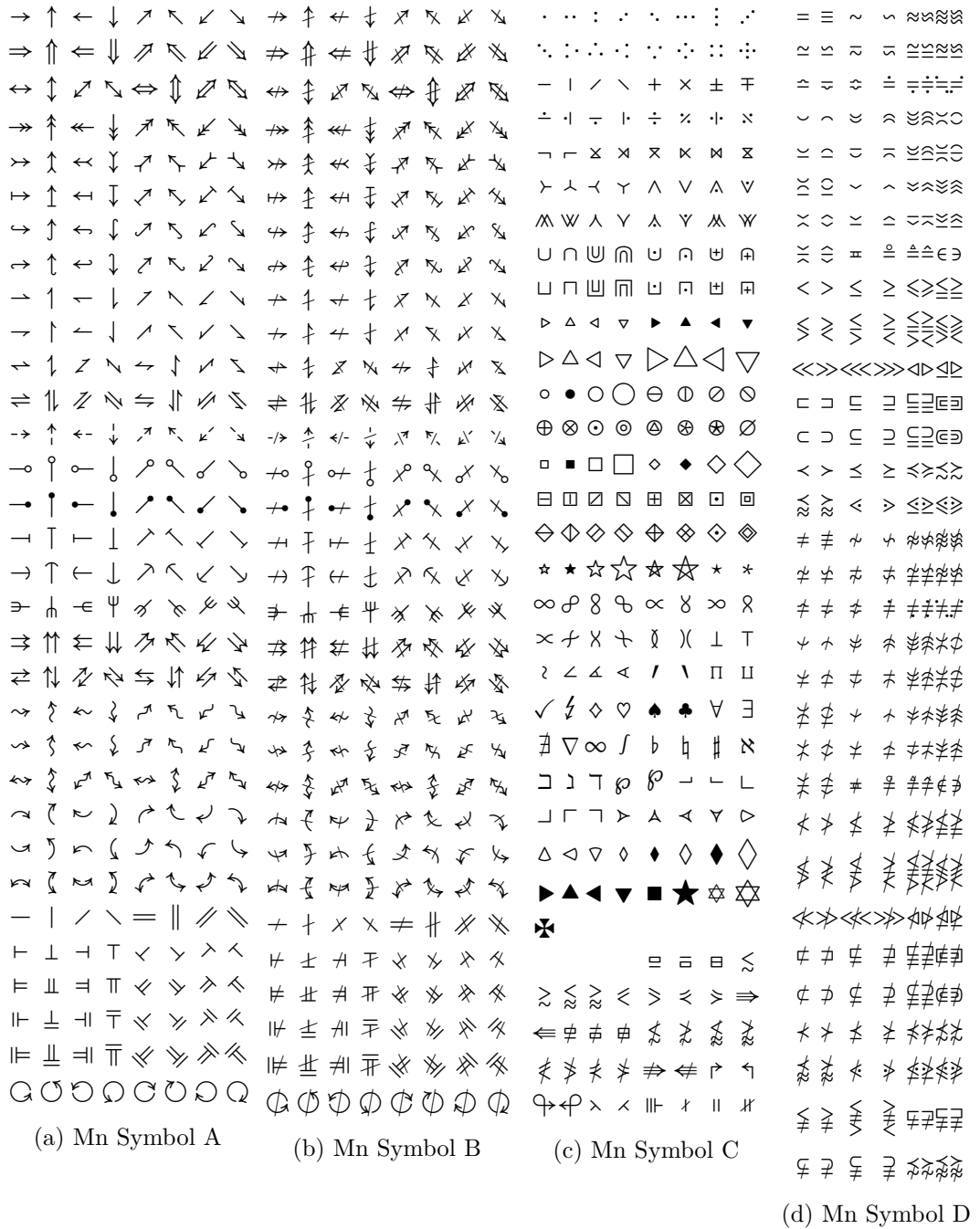


Figure 3: Minion symbol fonts

The `sansserif` option replaces them with `ssmsam10 \U/ssmsa/m/n/10` and `ssmsbm10 \U/ssmsb/m/n/10` from the `SANSMATHFONTS` package [10], respectively. The `BM` package [8] loads the bold version for the fonts 0) to 2).

Other math alphabets are only loaded on demand, *e.g.* `\mathsf` uses a sans-serif font and `\mathbf` without the `BM` package uses a bold font. The `\mathscr` macro uses the script font from the `MATHRSFS` package [13]

9) `rsfs10 \U/rsfs/m/n/10` Math script font (capital letters)

The `\mathbb` macro loads the double stroke font from the `DSFONT` package [4], this can be prevented with the `symbols=ams` option.

10) `dsrom10 \U/dsrom/m/n/10` Double stroke font

The `\mathfrak` macro loads the fractur font from the `AMSSYMB` package [12]

11) `eufm10 \U/euf/m/n/10` Math fraktur (Basic Latin)

The `HEP-MATH-FONT` package uses nine of the available 16 math alphabets. This number can be reduced by three using `\newcommand{\bmmax}{0}` from the `BM` package [8] and brought down to the default of four with the option `symbols=false`.

The `symbols=minion` options replaces the fonts 2) to 5) with corresponding fonts from the `MNSYMBOL` package [5]. Additionally, two more symbol alphabets are allocated, the `BM` package [8] loads one more font and now `\mathcal` triggers the use of one additional alphabet. Hence, the `minion` option uses three to four more math alphabets than a usual setup.

A Implementation

<*package>

Use the `KVOPTIONS` package [14].

```

1 \RequirePackage{kvoptions}
2 \SetupKeyvalOptions{
3   family=hepmathfont,
4   prefix=hepmathfont@
5 }

```

`symbols` Provide the `symbols` option allowing to switch the symbol font.

```

6 \DeclareStringOption[true]{symbols}
7 \ProcessKeyvalOptions*

```

`\ifxetexorluatex` Load the `IFLUATEX` [15] and `IFXETEX` [16] packages. Define the `\ifxetexorluatex` conditional checking if the package is executed by `LuaLATEX` or `XqLATEX`.

```

8 \RequirePackage{ifluatex}

```

```

9 \RequirePackage{ifxetex}
10 \newif\ifxetexorluatex
11 \ifxetex\xetexorluatextrue
12 \else\ifluatex\xetexorluatextrue
13 \else\xetexorluatexfalse\fi
14 \fi

```

Define conditionals based on the symbols package option.

```

15 \RequirePackage{pdftexcmds}
16 \newif\ifhepmathfont@symbols
17 \ifnum\pdf@stricmp{\hepmathfont@symbols}{false}=0\else\hepmathfont@symbolstrue\fi
18 \newif\ifhep@ams
19 \ifnum\pdf@stricmp{\hepmathfont@symbols}{ams}=0 \hep@amstrue\fi
20 \newif\ifhep@minion
21 \ifnum\pdf@stricmp{\hepmathfont@symbols}{minion}=0 \hep@miniontrue\fi

```

A.1 Sans serif

Check if document is set to sans-serif using the XSTRING package [17].

```

22 \newif\ifhepmathfont@serif
23 \RequirePackage{xstring}
24 \IfStrEq{\familydefault}{\sfdefault}{%
25 \hepmathfont@seriffalse}{\hepmathfont@seriftrue%
26 }

```

If the `sansserif` package option is active use code adjusted from the `SANSMATH-FONTS` package [10]. Ensure that `\mathsf` is italic as well as sans-serif and sans for sans and sans-serif documents, respectively.

```

27 \ifhepmathfont@serif

```

`\mathsf` Declare `\mathsf` for serif documents.

```

28 \newcommand\hep@font@sf{cmssm}
29 \DeclareMathAlphabet{\mathsf}{OML}{\hep@font@sf}{m}{it}
30 \SetMathAlphabet{\mathsf}{bold}{OML}{\hep@font@sf}{b}{it}

```

Define fonts for sans-serif documents.

```

31 \else
32 \newcommand\hep@font@sf{lmr}
33 \newcommand\hep@font@text{lms}
34 \newcommand\hep@font@math{cmssm}
35 \newcommand\hep@font@symbol{cmssy}
36 \newcommand\hep@font@extra{cmssex}

```

Declare font substitutions.

```

37 \DeclareFontSubstitution{OML}{\hep@font@math}{m}{it}

```

```

38 \ifhepmathfont@symbols\ifhep@minion\else
39   \DeclareFontSubstitution{OMS}{\hep@font@symbol}{m}{n}
40   \DeclareFontSubstitution{OMX}{\hep@font@extra}{m}{n}
41 \fi\fi

```

Declare the symbol fonts.

```

42 \DeclareSymbolFont{operators}{OT1}{\hep@font@text}{m}{n}
43 \DeclareSymbolFont{letters}{OML}{\hep@font@math}{m}{it}
44 \ifhepmathfont@symbols\ifhep@minion\else
45   \DeclareSymbolFont{symbols}{OMS}{\hep@font@symbol}{m}{n}
46   \DeclareSymbolFont{largesymbols}{OMX}{\hep@font@extra}{m}{n}
47 \fi\fi

```

Set bold symbol fonts.

```

48 \SetSymbolFont{operators}{bold}{OT1}{\hep@font@text}{b}{n}
49 \SetSymbolFont{letters}{bold}{OML}{\hep@font@math}{b}{it}
50 \ifhepmathfont@symbols\ifhep@minion\else
51   \SetSymbolFont{symbols}{bold}{OMS}{\hep@font@symbol}{b}{n}
52 \fi\fi

```

Adjust the fonts loaded by the AMSFONTS [3] and ESINT [18] packages.

```

53 \ifhepmathfont@symbols\ifhep@minion\else
54   \DeclareSymbolFont{AMSA}{U}{ssmsa}{m}{n}
55   \DeclareSymbolFont{AMSb}{U}{ssmsb}{m}{n}
56 \fi\fi
57 \AtBeginDocument{%
58   \@ifpackageloaded{esint}{%
59     \DeclareSymbolFont{largesymbolsA}{U}{ssesint}{m}{n}
60   }{}
61 }

```

`\mathrm` Declare the symbol font alphabets.

```

\mathnormal
\mathcal
62 \DeclareSymbolFontAlphabet{\mathrm}{operators}
63 \DeclareSymbolFontAlphabet{\mathnormal}{letters}
64 \ifhep@minion\else
65   \DeclareSymbolFontAlphabet{\mathcal}{symbols}
66 \fi

```

`\mathit` Declare `\mathit`.

```

67 \DeclareMathAlphabet{\mathit}{OML}{\hep@font@text}{m}{it}
68 \SetMathAlphabet\mathit{bold}{OML}{\hep@font@text}{bx}{it}

```

`\mathsf` Declare `\mathsf` for sans-serif documents to produce serif.

```

69 \DeclareMathAlphabet{\mathsf}{OML}{\hep@font@sf}{m}{it}
70 \SetMathAlphabet{\mathsf}{bold}{OML}{\hep@font@sf}{bx}{it}

```


End of `sansserif`.

```
71 \fi
```

A.2 Greek letters

Load the `FIXMATH` [1] and `TEXTALPHA` [2] packages ensuring that upper Greek letters in math mode are italic and providing upright Greek letters in text mode, respectively. Define the `hep@greek` macro ensuring that both `\text` and `\mathrm` produce upright Greek letters.

```
72 \ifhepmathfont@symbols
73   \RequirePackage{amssymb}
74   \RequirePackage{amstext}
75   \RequirePackage{fixmath}
76   \RequirePackage{textalpha}
77   \def\hep@GreeK#1#2#3{
78     \def#1{\TextOrMath{#3}{\ifnum\fam=0 \text{#3}\else#2\fi}}%
79   }
80   \def\hep@greek#1#2#3{\let#2=#1\hep@GreeK#1#2#3}
```

The following code follows closely the `ALPHABETA` package [7].

A.2.1 Commands to access Greek letters by name

For letters defined in math mode, the commands work in both, text and math. Some Greek letters look identical to Latin letters and can therefore not be used as variable symbols in math formulas. These letters are not defined in TeX's math mode, we provide an alias to the corresponding `\text...` command.

Mathematical notation distinguishes ‘variant shape symbols’ for pi, phi, rho, theta (small and capital), beta, and kappa (characters for the latter three symbols are not included in TeX's math fonts). These variations have no syntactic meaning in Greek text and are not given code-points in the LGR encoding while Unicode defines separate code points for the symbol variants.

A.2.2 Greek Alphabet

Macros keep their meaning in mathematical mode (*i.e.* use the same shape as without this package) and refer to **greek letter ...** in text. For `\epsilon` and `\phi`, this means that the selected symbol variant differs in text *vs.* math mode. Use `\varepsilon` and `\varphi` (see section ‘variant shape symbols’ below) to select the **greek letter ...** in both, text and math mode.

```
81 \providecommand*\Alpha{\textAlpha}
82 \providecommand*\Beta{\textBeta}
83 \hep@greek\Gamma\mathGamma\textGamma
84 \hep@greek\Delta\mathDelta\textDelta
85 \providecommand*\Epsilon{\textEpsilon}
```

```

86 \providecommand*\Zeta{\textZeta}
87 \providecommand*\Eta{\textEta}
88 \hepgreek\Theta\mathTheta\textTheta
89 \providecommand*\Iota{\textIota}
90 \providecommand*\Kappa{\textKappa}
91 \hepgreek\Lambda\mathLambda\textLambda
92 \providecommand*\Mu{\textMu}
93 \providecommand*\Nu{\textNu}
94 \hepgreek\Xi\mathXi\textXi
95 \providecommand*\Omicron{\textOmicron}
96 \hepgreek\Pi\mathPi\textPi
97 \providecommand*\Rho{\textRho}
98 \hepgreek\Sigma\mathSigma\textSigma
99 \providecommand*\Tau{\textTau}
100 \hepgreek\Upsilon\mathUpsilon\textUpsilon
101 \hepgreek\Phi\mathPhi\textPhi
102 \providecommand*\Chi{\textChi}
103 \hepgreek\Psi\mathPsi\textPsi
104 \hepgreek\Omega\mathOmega\textOmega

```

Apply to minuscule Greek letters.

```

105 \hepgreek\alpha\mathalpha\textalpha
106 \hepgreek\beta\mathbeta\textbeta
107 \hepgreek\gamma\mathgamma\textgamma
108 \hepgreek\delta\mathdelta\textdelta
109 \hepgreek\epsilon\mathepsilon\textepsilon
110 \hepgreek\zeta\mathzeta\textzeta
111 \hepgreek\eta\matheta\texteta
112 \hepgreek\theta\maththeta\texttheta
113 \hepgreek\iota\mathiota\textiota
114 \hepgreek\kappa\mathkappa\textkappa
115 \hepgreek\lambda\mathlambda\textlambda
116 \hepgreek\mu\mathmu\textmu
117 \hepgreek\nu\mathnu\textnu
118 \hepgreek\xi\mathxi\textxi
119 \providecommand*\omicron{\textomicron}
120 \hepgreek\pi\mathpi\textpi
121 \hepgreek\rho\mathrho\textrho
122 \hepgreek\sigma\mathsigma\textsigma
123 \hepgreek\varsigma\mathvarsigma\textvarsigma
124 \providecommand*\finalsigma{\finalsigma}
125 \hepgreek\tau\mathtau\texttau
126 \hepgreek\upsilon\mathupsilon\textupsilon
127 \hepgreek\phi\mathphi\textphi
128 \hepgreek\chi\mathchi\textchi
129 \hepgreek\psi\mathpsi\textpsi
130 \hepgreek\omega\mathomega\textomega

```

Archaic letters

```

131 \hepgreek\digamma\mathdigamma\textdigamma
132 \providecommand*\Digamma{\textDigamma}
133 \providecommand*\stigma{\textstigma}
134 \providecommand*\varstigma{\textvarstigma}
135 \providecommand*\koppa{\textkoppa}
136 \providecommand*\Koppa{\textKoppa}
137 \providecommand*\qoppa{\textqoppa}
138 \providecommand*\Qoppa{\textQoppa}
139 \providecommand*\Stigma{\textStigma}
140 \providecommand*\Sampi{\textSampi}
141 \providecommand*\sampi{\textsampi}

```

A.2.3 Variant shape symbols

TeX’s concept of “standard” *vs.* “variant” math symbols does not map to the distinction between greek letter ... *vs.* greek ... symbol in the Unicode standard (see `test-tuenc-greek.pdf`).

The `\...symbol` macros select the greek ... symbol in both, text and math mode. For `\epsilonsymbol` and `\phisymbol` this is the default shape in math mode. The `\var...` macros select the shape used by TeX math (or, if not supported, the `symbol` shape)

`...symbol == var...`

```

142 \hepgreek\varpi\mathvarpi\textpisymbol
143 \providecommand*\pisymbol{\varpi}
144 \hepgreek\varrho\mathvarrho\textrhosymbol
145 \hepgreek\rhosymbol\mathvarrho\textrhosymbol
146 \hepgreek\vartheta\mathvartheta\textthetasymbol
147 \providecommand*\thetasymbol{\vartheta}

```

`...symbol != var...`

```

148 \hepgreek\varepsilon\mathvarepsilon\textepsilon
149 \hepgreek\epsilonsymbol\mathepsilon\textepsilonsymbol
150 \hepgreek\varphi\mathvarphi\textphi
151 \hepgreek\phisymbol\mathphi\textphisymbol

```

only text (in standard 8-bit TeX, may be defined with additional packages):

```

152 \ifdefined\varbeta
153   \hepgreek\varbeta\mathvarbeta\textbetasymbol
154 \else
155   \providecommand*\varbeta{\textbetasymbol}
156 \fi
157 \providecommand*\betasymbol{\varbeta}
158 \ifdefined\varkappa
159   \hepgreek\varkappa\mathvarkappa\textkappasymbol
160 \else
161   \providecommand*\varkappa{\textkappasymbol}
162 \fi

```

```
163 \providecommand*\kappasymbol{\varkappa}
```

`\Theta/\varTheta` are not a symbol variants but upright/italic shape of Theta

```
164 \providecommand*\Thetasymbol{\textThetasymbol}
```

A.2.4 TextCompositeCommands for the generic macros

The NFSS TextComposite mechanism looks for the next token without expanding it. In order to let compositions like `\ensuregreek{\'\Alpha}` or `\ensuregreek{\>''\alpha}` work as expected we define TextComposites with the ‘letter name commands’. (Composition only works if the active font encoding is LGR).

```
165 \ifl@aded{def}{tuenc-greek}{\input{alphabet-tuenc.def}}{}
```

```
166 \ifl@aded{def}{lgrenc}{\input{alphabet-lgr.def}}{}
```

A.2.5 Re-definition for Greek Unicode input in math mode

Check with `\ifdefined` for the definition of `\DeclareUnicodeCharacter`. In contrast to `\@ifdefined`, this works without side-effects. It makes the package dependent on the ε -TeX extensions but these are standard in all current TeX distributions anyway. Map Greek characters that are also defined in math mode to the generic macros.

```
167 \ifdefined\DeclareUnicodeCharacter
168   \DeclareUnicodeCharacter{0393}{\Gamma}
169   \DeclareUnicodeCharacter{0394}{\Delta}
170   \DeclareUnicodeCharacter{0398}{\Theta}
171   \DeclareUnicodeCharacter{039B}{\Lambda}
172   \DeclareUnicodeCharacter{039E}{\Xi}
173   \DeclareUnicodeCharacter{03A0}{\Pi}
174   \DeclareUnicodeCharacter{03A3}{\Sigma}
175   \DeclareUnicodeCharacter{03A5}{\Upsilon}
176   \DeclareUnicodeCharacter{03A6}{\Phi}
177   \DeclareUnicodeCharacter{03A8}{\Psi}
178   \DeclareUnicodeCharacter{03A9}{\Omega}
179   \DeclareUnicodeCharacter{03B1}{\alpha}
180   \DeclareUnicodeCharacter{03B2}{\beta}
181   \DeclareUnicodeCharacter{03B3}{\gamma}
182   \DeclareUnicodeCharacter{03B4}{\delta}
183   \DeclareUnicodeCharacter{03B5}{\varepsilon}
184   \DeclareUnicodeCharacter{03B6}{\zeta}
185   \DeclareUnicodeCharacter{03B7}{\eta}
186   \DeclareUnicodeCharacter{03B8}{\theta}
187   \DeclareUnicodeCharacter{03B9}{\iota}
188   \DeclareUnicodeCharacter{03BA}{\kappa}
189   \DeclareUnicodeCharacter{03BB}{\lambda}
190   \DeclareUnicodeCharacter{03BC}{\mu}
191   \DeclareUnicodeCharacter{03BD}{\nu}
192   \DeclareUnicodeCharacter{03BE}{\xi}
193   \DeclareUnicodeCharacter{03C0}{\pi}
```

```

194 \DeclareUnicodeCharacter{03C1}{\rho}
195 \DeclareUnicodeCharacter{03C2}{\varsigma}
196 \DeclareUnicodeCharacter{03C3}{\sigma}
197 \DeclareUnicodeCharacter{03C4}{\tau}
198 \DeclareUnicodeCharacter{03C5}{\upsilon}
199 \DeclareUnicodeCharacter{03C6}{\varphi}
200 \DeclareUnicodeCharacter{03C7}{\chi}
201 \DeclareUnicodeCharacter{03C8}{\psi}
202 \DeclareUnicodeCharacter{03C9}{\omega}
203 \DeclareUnicodeCharacter{03D1}{\thetasymbol}
204 \DeclareUnicodeCharacter{03D5}{\phisymbol}
205 \DeclareUnicodeCharacter{03D6}{\pisymbol}
206 \DeclareUnicodeCharacter{03DD}{\digamma}
207 \DeclareUnicodeCharacter{03F1}{\rhosymbol}
208 \DeclareUnicodeCharacter{03F5}{\epsilonsymbol}
209 \fi

```

Ensure that this works also after loading other fonts packages such as CFR-LM using SUBSTITUTEFONT [19].

```

210 \ifxetexorluatex
211 % missing code
212 \else
213 \RequirePackage{substitutefont}
214 \substitutefont{LGR}{\rmdefault}{lmr}
215 \DeclareFontFamily{LGR}{\rmdefault}{}
216 \DeclareFontShape{LGR}{\rmdefault}{b}{n}{<->ssub*lmr/bx/n}{}
217 \DeclareFontShape{LGR}{\rmdefault}{b}{sc}{<->ssub*lmr/bx/sc}{}
218 \substitutefont{LGR}{\ttdefault}{lmtt}
219 \DeclareFontFamily{LGR}{\ttdefault}{}
220 \DeclareFontShape{LGR}{\ttdefault}{b}{n}{<->ssub*lmtt/bx/n}{}
221 \substitutefont{LGR}{\sfdefault}{lmss}
222 \DeclareFontFamily{LGR}{\sfdefault}{}
223 \DeclareFontShape{LGR}{\sfdefault}{b}{n}{<->ssub*lmss/bx/n}{}
224 \DeclareFontShape{LGR}{\sfdefault}{b}{sc}{<->ssub*lmss/bx/sc}{}
225 \fi

```

A.3 Additional math fonts

Either load the MNSYMBOL package [5] or the the EXSCALE package in order to fix Latin Modern `lmex` fonts. Additionally, load the AMSSYMB package [3] which provides further math symbols and also loads the AMSFONTS package [3].

```

226 \ifhep@minion
227 \RequirePackage{MnSymbol}
228 \else
229 \RequirePackage{exscale}
230 \RequirePackage{amssymb}
231 \fi

```

`\mathbf` Load the BM package [8] for superior boldmath. Make math symbols bold whenever they appear in bold macros such as `\section{<text>}`.

```
232 \RequirePackage{bm}
233 \AtBeginDocument{\let\mathbf\bm}
234 \g@addto@macro\bfseries{\boldmath}
```

`\mathtt` Typewriter math font

```
235 \DeclareMathAlphabet{\mathtt}{OT1}{lmtt}{m}{n}
236 \SetMathAlphabet{\mathtt}{bold}{OT1}{lmtt}{bx}{n}
```

`\mathscr` Provid the `\mathscr` math script font from the MATHRSFS package [13].

```
237 \DeclareMathAlphabet{\mathscr}{U}{rsfs}{m}{n}
```

`\mathbb` Redefine the the `\mathbb` math blackboard style font according to the (sans-)serif option with the font from the DSFONT package [4].

```
238 \ifhep@minion
239   \DeclareMathAlphabet{\mathbb}{U}{%
240     \ifhepmathfont@serif dsrom\else dsss\fi%
241   }{m}{n}
242 \else
243   \ifhep@ams\else
244     \SetMathAlphabet{\mathbb}{normal}{U}{%
245       \ifhepmathfont@serif dsrom\else dsss\fi%
246     }{m}{n}
247   \fi
248 \fi
```

End of symbols conditional.

```
249 \fi
```

```
</package>
```

B Tests

```
<*testserif|testsans>
```

```
250 \documentclass{article}
251
252 %<testsans>\renewcommand{\familydefault}{\sfdefault}
253 \usepackage[oldstyle]{hep-font}
254 \usepackage{hep-math-font}
255
256 \usepackage{fancyvrb}\DefineShortVerb{\|}
257 \newenvironment{vrb}{\begin{tabular}{@{}p{6cm}l@{}}{\end{tabular}}
258
```

```

259 \begin{document}
260
261 \begin{vrb}
262 || & $\Ab\Gamma\delta_{123}$ \\
263 |\mathbf | & $\mathbf{Ab\Gamma\delta_{123}}$ \\
264 |\mathrm | & $\mathrm{Ab\Gamma\delta_{123}}$ \\
265 | \mathbf | & $\mathbf{\mathrm{Ab\Gamma\delta_{123}}}$ !! \\
266 |\text | & $\text{Ab\Gamma\delta_{123}}$ \\
267 | \textbf | & $\textbf{\text{Ab\Gamma\delta_{123}}}$ \\
268 |\mathsf | & $\mathsf{Ab\Gamma\delta_{123}}$ \\
269 | \mathbf | & $\mathbf{\mathsf{Ab\Gamma\delta_{123}}}$ \\
270 |\mathtt | & $\mathtt{Ab\Gamma_{123}}$ \\
271 | \mathbf | & $\mathbf{\mathtt{Ab\Gamma_{123}}}$ \\
272 |\mathcal | & $\mathcal{ABC}$ \\
273 |\mathscr | & $\mathscr{ABC_{123}}$ \\
274 |\mathbb | & $\mathbb{ABC_1}$ \\
275 |\mathfrak | & $\mathfrak{ABC_{123}}$ \\
276 \end{vrb}
277
278 $\Gamma\Delta\Lambda\Phi\Pi\Psi\Sigma\Theta\Upsilon\Xi\Omega$
279
280 $\rm\Gamma\Delta\Lambda\Phi\Pi\Psi\Sigma\Theta\Upsilon\Xi\Omega$
281
282 \Gamma\Delta\Lambda\Phi\Pi\Psi\Sigma\Theta\Upsilon\Xi\Omega
283
284 $\alpha\beta\gamma\delta\epsilon\zeta\eta\theta\iota\kappa\lambda\mu\nu\xi\pi\rho\sigma\varsigma\tau\upsilon\phi\chi\psi\omega$
285 \mu\nu\xi\pi\rho\sigma\varsigma\tau\upsilon\phi\chi\psi\omega$
286
287 $\rm\alpha\beta\gamma\delta\epsilon\zeta\eta\theta\iota\kappa\lambda\mu\nu\xi\pi\rho\sigma\varsigma\tau\upsilon\phi\chi\psi\omega$
288 \mu\nu\xi\pi\rho\sigma\varsigma\tau\upsilon\phi\chi\psi\omega$
289
290 \alpha\beta\gamma\delta\epsilon\zeta\eta\theta\iota\kappa\lambda\mu\nu\xi\pi\rho\sigma\varsigma\tau\upsilon\phi\chi\psi\omega
291 \mu\nu\xi\pi\rho\sigma\varsigma\tau\upsilon\phi\chi\psi\omega
292
293 \end{document}

```

</testserif|testsans>

C Readme

<*readme>

294 # The ‘hep-math-font’ package

295

296 Extended Greek and sans-serif math

297

298 ## Introduction

299

300 The ‘hep-math-font’ package adjust the math fonts to be sans-serif if the document is sa

301 Additionally Greek letters are redefined to be always italic and upright in math and tex

302 Some math font macros are adjusted to give more consistently the naively expected result
303
304 The package is loaded using ‘\usepackage{hep-math-font}’.
305
306 ## Author
307
308 Jan Hajer
309
310 ## License
311
312 This file may be distributed and/or modified under the conditions of the ‘LaTeX’ Project
313 The latest version of this license is in ‘http://www.latex-project.org/lppl.txt’ and ver
</readme>

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