

The HEP-MATH-FONT package*

Extended Greek and sans-serif math

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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 in this case 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>` class option sets the family of the symbol fonts. `symbols=ams` loads the two $\mathcal{A}\mathcal{M}\mathcal{S}$ 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 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{\langle text \rangle}` 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

*This document corresponds to HEP-MATH-FONT v1.2.

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serif if the main text is sans-serif, i.e. ($Ab\Gamma\delta\mathbf{Ab}\Gamma\delta$). 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. ($\mathbf{A}\mathbf{\Gamma}\mathbf{A}\mathbf{\Gamma}$).

`\mathfrak` Finally, the `\mathfrak` font is also available i.e. ($\mathfrak{A}\mathfrak{B}\mathfrak{1}\mathfrak{2}$).

Details about the font handling in \TeX can be found in reference [9].

2 Math alphabet allocation

Of the 16 available math alphabets, \TeX loads four by default

- 0) **OT1** Text (latin, upper case greek, numerals, text symbols)

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`.

- 1) **OML** Math Italic (latin, greek, numerals, text symbols)

The italic math font 1) of CM is `cmi10 \OML/cmm/m/it/10`, and is replaced by LM to be `lmm10 \OML/lmm/m/it/10`, the `sansserif` options uses `cmssmi10 \OML/cmssrm/m/it/10` from the `SANSMATHFONTS` package [10].

- 2) **OMS** Symbol (`\mathcal`, operators)

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].

- 3) **OMX** Math Extension (big operators, delimiters)

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)

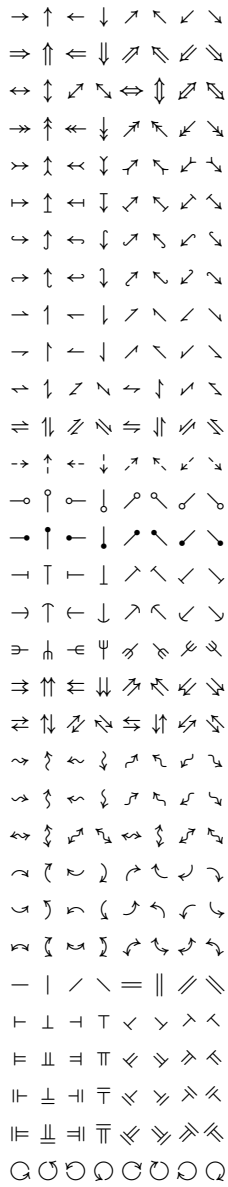
The `sansserif` option replaces them with `ssmsam10 \U/ssmsa/m/n/10` and `ssmsbm10 \U/ssmsb/m/n/10` from the `SANSMATHFONTS` package [10], respectively.

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)

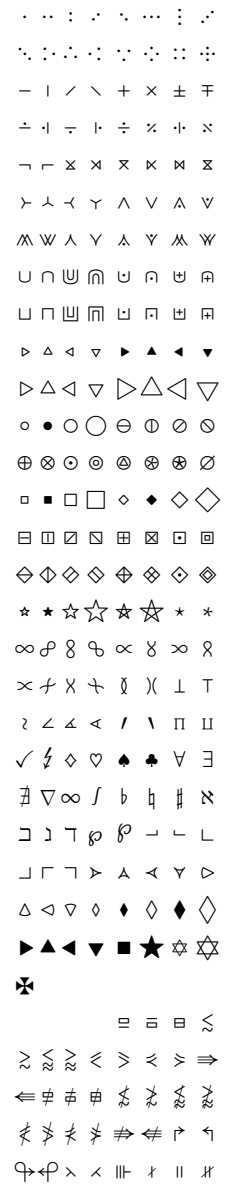
The `\mathbb` macro loads the double stroke font from the `DSFONT` package [4], this can be prevented with the `symbols=ams` option.



(a) Mn Symbol A



(b) Mn Symbol B



(c) Mn Symbol C



(d) Mn Symbol D

Figure 3: Minion symbol fonts

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{\bmmmax}{o}` 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 `LuaATEX` or `XYATEX`.

```
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 using the `PDFTEXCMDS` package [17].

```
15 \RequirePackage{pdftexcmds}
16 \newif\ifhepmathfont@symbols
17 \ifnum
18   \pdf@strcmp{\hepmathfont@symbols}{false}=0
19 \else
20   \hepmathfont@symbolstrue
21 \fi
22 \newif\ifhep@ams
```

```

23 \ifnum\pdf@strcmp{\hepmathfont@symbols}{ams}=0 \hep@amstrue\fi
24 \newif\ifhep@minion
25 \ifnum\pdf@strcmp{\hepmathfont@symbols}{minion}=0 \hep@miniontrue\fi

```

A.1 Sans serif

Check if document is set to sans-serif using the XSTRING package [18].

```

26 \newif\ifhepmathfont@serif
27 \RequirePackage{xstring}
28 \IfStrEq{\familydefault}{\sfdefault}{%
29   \hepmathfont@seriffalse}{\hepmathfont@seriftrue%
30 }

```

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

```

31 \ifhepmathfont@serif

```

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

```

32 \newcommand\hep@font@sf{cmssm}
33 \DeclareMathAlphabet{\mathsf}{OML}{\hep@font@sf}{m}{it}
34 \SetMathAlphabet{\mathsf}{bold}{OML}{\hep@font@sf}{b}{it}
35 \newcommand\hep@textfont@sf{lms}
36 \DeclareMathAlphabet{\mathsftext}{OT1}{\hep@textfont@sf}{m}{n}
37 \SetMathAlphabet{\mathsftext}{bold}{OT1}{\hep@textfont@sf}{bx}{n}

```

Define fonts for sans-serif documents.

```

38 \else
39 \newcommand\hep@font@sf{lmr}
40 \newcommand\hep@font@text{lms}
41 \newcommand\hep@font@math{cmssm}
42 \newcommand\hep@font@symbol{cmssy}
43 \newcommand\hep@font@extra{cmssex}

```

Declare font substitutions.

```

44 \DeclareFontSubstitution{OML}{\hep@font@math}{m}{it}
45 \ifhepmathfont@symbols\ifhep@minion\else
46   \DeclareFontSubstitution{OMS}{\hep@font@symbol}{m}{n}
47   \DeclareFontSubstitution{OMX}{\hep@font@extra}{m}{n}
48 \fi\fi

```

Declare the symbol fonts.

```

49 \DeclareSymbolFont{operators}{OT1}{\hep@font@text}{m}{n}
50 \DeclareSymbolFont{letters}{OML}{\hep@font@math}{m}{it}
51 \ifhepmathfont@symbols\ifhep@minion\else
52   \DeclareSymbolFont{symbols}{OMS}{\hep@font@symbol}{m}{n}
53   \DeclareSymbolFont{largesymbols}{OMX}{\hep@font@extra}{m}{n}
54 \fi\fi

```

Set bold symbol fonts.

```
55 \SetSymbolFont{operators}{bold}{OT1}{\hep@font@text}{b}{n}
56 \SetSymbolFont{letters}{bold}{OML}{\hep@font@math}{b}{it}
57 \ifhep@font@symbols\ifhep@minion\else
58   \SetSymbolFont{symbols}{bold}{OMS}{\hep@font@symbol}{b}{n}
59 \fi\fi
```

Adjust the fonts loaded by the AMSFONTS [3] and ESINT [19] packages.

```
60 \ifhep@font@symbols\ifhep@minion\else
61   \DeclareSymbolFont{AMSA}{U}{ssmsa}{m}{n}
62   \DeclareSymbolFont{AMSb}{U}{ssmsb}{m}{n}
63 \fi\fi
64 \AtBeginDocument{%
65   \ifpackage@loaded{esint}{%
66     \DeclareSymbolFont{largesymbolsA}{U}{ssesint}{m}{n}
67   }{}
68 }
```

`\mathrm` Declare the symbol font alphabets.

```
\mathnormal
\mathcal 69 \DeclareSymbolFontAlphabet{\mathrm}{operators}
70 \DeclareSymbolFontAlphabet{\mathnormal}{letters}
71 \ifhep@minion\else
72   \DeclareSymbolFontAlphabet{\mathcal}{symbols}
73 \fi
```

`\mathit` Declare `\mathit`.

```
74 \DeclareMathAlphabet{\mathit}{OML}{\hep@font@text}{m}{it}
75 \SetMathAlphabet\mathit{bold}{OML}{\hep@font@text}{bx}{it}
```

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

```
76 \DeclareMathAlphabet{\mathsf}{OML}{\hep@font@sf}{m}{it}
77 \SetMathAlphabet{\mathsf}{bold}{OML}{\hep@font@sf}{bx}{it}
```

End of sansserif.

```
78 \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 using the AMSSYMB [12] and AMSTEXT [6] packages.

```
79 \ifhep@font@symbols
80   \RequirePackage{amssymb}
81   \RequirePackage{amstext}
82   \RequirePackage{fixmath}
```



```

83 \RequirePackage{textalpha}
84 \def\hep@Greek#1#2#3{
85   \protected\def#1{\TextOrMath{#3}{\ifnum\fam=0 \text{#3}\else#2\fi}}%
86 }
87 \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.

```

88 \providecommand*\Alpha{\textAlpha}
89 \providecommand*\Beta{\textBeta}
90 \hep@greek\Gamma\mathGamma\textGamma
91 \hep@greek\Delta\mathDelta\textDelta
92 \providecommand*\Epsilon{\textEpsilon}
93 \providecommand*\Zeta{\textZeta}
94 \providecommand*\Eta{\textEta}
95 \hep@greek\Theta\mathTheta\textTheta
96 \providecommand*\Iota{\textIota}
97 \providecommand*\Kappa{\textKappa}
98 \hep@greek\Lambda\mathLambda\textLambda
99 \providecommand*\Mu{\textMu}
100 \providecommand*\Nu{\textNu}
101 \hep@greek\Xi\mathXi\textXi
102 \providecommand*\Omicron{\textOmicron}
103 \hep@greek\Pi\mathPi\textPi
104 \providecommand*\Rho{\textRho}
105 \hep@greek\Sigma\mathSigma\textSigma
106 \providecommand*\Tau{\textTau}
107 \hep@greek\Upsilon\mathUpsilon\textUpsilon
108 \hep@greek\Phi\mathPhi\textPhi
109 \providecommand*\Chi{\textChi}
110 \hep@greek\Psi\mathPsi\textPsi
111 \hep@greek\Omega\mathOmega\textOmega

```

Apply to minuscule Greek letters.

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

Archaic letters

```
138 \hepgreek\digamma\mathdigamma\textdigamma
139 \providecommand*\Digamma{\textDigamma}
140 \providecommand*\stigma{\textstigma}
141 \providecommand*\varstigma{\textvarstigma}
142 \providecommand*\koppa{\textkoppa}
143 \providecommand*\Koppa{\textKoppa}
144 \providecommand*\qoppa{\textqoppa}
145 \providecommand*\Qoppa{\textQoppa}
146 \providecommand*\Stigma{\textStigma}
147 \providecommand*\Sampi{\textSampi}
148 \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...

```
149 \hepgreek\varpi\mathvarpi\textpisymbol
150 \providecommand*\pisymbol{\varpi}
151 \hepgreek\varrho\mathvarrho\textrhosymbol
152 \hepgreek\rhosymbol\mathvarrho\textrhosymbol
153 \hepgreek\vartheta\mathvartheta\textthetasymbol
154 \providecommand*\thetasymbol{\vartheta}
```

...symbol != var...

```
155 \hepgreek\varepsilon\mathvarepsilon\textepsilon
156 \hepgreek\epsilonsymbol\mathepsilon\textepsilonsymbol
157 \hepgreek\varphi\mathvarphi\textphisymbol
158 \hepgreek\phisymbol\mathphi\textphisymbol
```

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

```
159 \ifdefined\varbeta
160   \hepgreek\varbeta\mathvarbeta\textbetasymbol
161 \else
162   \providecommand*\varbeta{\textbetasymbol}
163 \fi
164 \providecommand*\betasymbol{\varbeta}
165 \ifdefined\varkappa
166   \hepgreek\varkappa\mathvarkappa\textkappasymbol
167 \else
168   \providecommand*\varkappa{\textkappasymbol}
169 \fi
170 \providecommand*\kappasymbol{\varkappa}
```

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

```
171 \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).

```
172 \@ifl@aded{def}{tuenc-greek}{\input{alphabet-tuenc.def}}{}
173 \@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.

```
174 \ifdefined\DeclareUnicodeCharacter
```

```

175 \DeclareUnicodeCharacter{0393}{\Gamma}
176 \DeclareUnicodeCharacter{0394}{\Delta}
177 \DeclareUnicodeCharacter{0398}{\Theta}
178 \DeclareUnicodeCharacter{039B}{\Lambda}
179 \DeclareUnicodeCharacter{039E}{\Xi}
180 \DeclareUnicodeCharacter{03A0}{\Pi}
181 \DeclareUnicodeCharacter{03A3}{\Sigma}
182 \DeclareUnicodeCharacter{03A5}{\Upsilon}
183 \DeclareUnicodeCharacter{03A6}{\Phi}
184 \DeclareUnicodeCharacter{03A8}{\Psi}
185 \DeclareUnicodeCharacter{03A9}{\Omega}
186 \DeclareUnicodeCharacter{03B1}{\alpha}
187 \DeclareUnicodeCharacter{03B2}{\beta}
188 \DeclareUnicodeCharacter{03B3}{\gamma}
189 \DeclareUnicodeCharacter{03B4}{\delta}
190 \DeclareUnicodeCharacter{03B5}{\varepsilon}
191 \DeclareUnicodeCharacter{03B6}{\zeta}
192 \DeclareUnicodeCharacter{03B7}{\eta}
193 \DeclareUnicodeCharacter{03B8}{\theta}
194 \DeclareUnicodeCharacter{03B9}{\iota}
195 \DeclareUnicodeCharacter{03BA}{\kappa}
196 \DeclareUnicodeCharacter{03BB}{\lambda}
197 \DeclareUnicodeCharacter{03BC}{\mu}
198 \DeclareUnicodeCharacter{03BD}{\nu}
199 \DeclareUnicodeCharacter{03BE}{\xi}
200 \DeclareUnicodeCharacter{03C0}{\pi}
201 \DeclareUnicodeCharacter{03C1}{\rho}
202 \DeclareUnicodeCharacter{03C2}{\varsigma}
203 \DeclareUnicodeCharacter{03C3}{\sigma}
204 \DeclareUnicodeCharacter{03C4}{\tau}
205 \DeclareUnicodeCharacter{03C5}{\upsilon}
206 \DeclareUnicodeCharacter{03C6}{\varphi}
207 \DeclareUnicodeCharacter{03C7}{\chi}
208 \DeclareUnicodeCharacter{03C8}{\psi}
209 \DeclareUnicodeCharacter{03C9}{\omega}
210 \DeclareUnicodeCharacter{03D1}{\thetasymbol}
211 \DeclareUnicodeCharacter{03D5}{\phisymbol}
212 \DeclareUnicodeCharacter{03D6}{\pisymbol}
213 \DeclareUnicodeCharacter{03DD}{\digamma}
214 \DeclareUnicodeCharacter{03F1}{\rhosymbol}
215 \DeclareUnicodeCharacter{03F5}{\epsilonsymbol}
216 \fi

```

Ensure that this works also after loading other fonts packages such as CFR-LM using `SUBSTITUTE-FONT [20]`.

```

217 \ifxetexorluatex
218 % missing code
219 \else
220 \RequirePackage{substitutefont}
221 \substitutefont{LGR}{\rmdefault}{lmr}

```

```

222 \DeclareFontFamily{LGR}{\rmdefault}{}
223 \DeclareFontShape{LGR}{\rmdefault}{b}{n}{<->ssub*lmr/bx/n}{}
224 \DeclareFontShape{LGR}{\rmdefault}{b}{sc}{<->ssub*lmr/bx/sc}{}
225 \substitutefont{LGR}{\ttdefault}{lmtt}
226 \DeclareFontFamily{LGR}{\ttdefault}{}
227 \DeclareFontShape{LGR}{\ttdefault}{b}{n}{<->ssub*lmtt/bx/n}{}
228 \substitutefont{LGR}{\sfdefault}{lmss}
229 \DeclareFontFamily{LGR}{\sfdefault}{}
230 \DeclareFontShape{LGR}{\sfdefault}{b}{n}{<->ssub*lmss/bx/n}{}
231 \DeclareFontShape{LGR}{\sfdefault}{b}{sc}{<->ssub*lmss/bx/sc}{}
232 \fi

```

A.3 Additional math fonts

Either load the MNSYMBOL package [5] or the the EXSCALE package [11] 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].

```

233 \ifhep@minion
234 \RequirePackage{MnSymbol}
235 \else
236 \RequirePackage{exscale}
237 \RequirePackage{amssymb}
238 \fi

```

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

```

239 \RequirePackage{bm}
240 \AtBeginDocument{\let\mathbf\bm}
241 \g@addto@macro\bfseries{\boldmath}

```

`\mathtt` Typewriter math font

```

242 \DeclareMathAlphabet{\mathtt}{OT1}{lmtt}{m}{n}
243 \SetMathAlphabet{\mathtt}{bold}{OT1}{lmtt}{bx}{n}

```

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

```

244 \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].

```

245 \ifhep@minion
246 \DeclareMathAlphabet{\mathbb}{U}{%
247 \ifhepmathfont@serif dsrom\else dsss\fi%
248 }{m}{n}
249 \else
250 \ifhep@ams\else
251 \SetMathAlphabet{\mathbb}{normal}{U}{%
252 \ifhepmathfont@serif dsrom\else dsss\fi%

```

```

253     }{m}{n}
254   \fi
255 \fi

```

End of symbols conditional.

```
256 \fi
```

```
</package>
```

B Tests

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

```

257 \documentclass{article}
258
259 %<testsans>\renewcommand{\familydefault}{\sfdefault}
260 \usepackage[oldstyle]{hep-font}
261 \usepackage{hep-math-font}
262
263 \usepackage{fancyvrb}\DefineShortVerb{||}
264 \newenvironment{vrb}{\begin{tabular}{@{}p{6cm}l@{}}{\end{tabular}}
265
266 \begin{document}
267
268 \begin{vrb}
269 || & $\Ab\Gamma\delta_{123}$ \\
270 | \mathbf | & $\mathbf{Ab\Gamma\delta_{123}}$ \\
271 | \mathrm | & $\mathrm{Ab\Gamma\delta_{123}}$ \\
272 | \mathbf | & $\mathbf{\mathrm{Ab\Gamma\delta_{123}}}$ !! \\
273 | \text | & $\text{Ab\Gamma\delta_{123}}$ \\
274 | \textbf | & $\textbf{\text{Ab\Gamma\delta_{123}}}$ \\
275 | \mathsf | & $\mathsf{Ab\Gamma\delta_{123}}$ \\
276 | \mathbf | & $\mathbf{\mathsf{Ab\Gamma\delta_{123}}}$ \\
277 | \mathtt | & $\mathtt{Ab\Gamma\delta_{123}}$ \\
278 | \mathbf | & $\mathbf{\mathtt{Ab\Gamma\delta_{123}}}$ \\
279 | \mathcal | & $\mathcal{ABC}$ \\
280 | \mathscr | & $\mathscr{ABC123}$ \\
281 | \mathbb | & $\mathbb{ABC1}$ \\
282 | \mathfrak | & $\mathfrak{ABC123}$ \\
283 \end{vrb}
284
285 $\Gamma\Delta\Lambda\Phi\Pi\Psi\Sigma\Theta\Upsilon\Xi\Omega$
286
287 $\rm\Gamma\Delta\Lambda\Phi\Pi\Psi\Sigma\Theta\Upsilon\Xi\Omega$
288
289 \Gamma\Delta\Lambda\Phi\Pi\Psi\Sigma\Theta\Upsilon\Xi\Omega
290
291 $\alpha\beta\gamma\delta\epsilon\zeta\eta\theta\iota\kappa\lambda\mu$
292 $\nu\xi\pi\rho\sigma\varsigma\tau\upsilon\phi\chi\psi\omega$
293

```

```

294 $\rm\alpha\beta\gamma\delta\epsilon\zeta\eta\theta\iota\kappa\lambda\lambdaambda
295 \mu\nu\xi\pi\rho\sigma\varsigma\tau\upsilon\phi\chi\psi\omega$
296
297 \alpha\beta\gamma\delta\epsilon\zeta\eta\theta\iota\kappa\lambda\lambdaambda
298 \mu\nu\xi\pi\rho\sigma\varsigma\tau\upsilon\phi\chi\psi\omega$
299
300 \end{document}
</testserif|testsans>

```

C Readme

```
<*readme>
```

```

301 # The ‘hep-math-font’ package
302
303 Extended Greek and sans-serif math
304
305 ## Introduction
306
307 The ‘hep-math-font’ package adjust the math fonts to be sans-serif if the
308 document is sans-serif. Additionally Greek letters are redefined to be
309 always italic and upright in math and text mode respectively. Some math
310 font macros are adjusted to give more consistently the naively expected
311 results.
312
313 The package is loaded using ‘\usepackage{hep-math-font}’.
314
315 ## Author
316
317 Jan Hajer
318
319 ## License
320
321 This file may be distributed and/or modified under the conditions of the
322 ‘LaTeX’ Project Public License, either version 1.3c of this license or
323 (at your option) any later version. The latest version of this license is
324 in ‘http://www.latex-project.org/lppl.txt’ and version 1.3c or later is
325 part of all distributions of LaTeX version 2005/12/01 or later.
</readme>

```

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