

Greek characters supported by *greek-fontenc*

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Abstract

This document lists all Greek characters that are supported by *greek-fontenc* and tests the outcome of `\MakeUppercase` and `\MakeLowercase` for different input variants (literal input, LICR¹ macro, Latin transliteration).

The document is compiled with LuaTeX, format version 2023-06-01 patch-level 1, and the L3 programming layer from 2023-08-29.

The *babel-greek* version is “2023/08/18 1.14 Greek support for the babel system”.

The `\greekfontencoding` is TU and the current language variant is *polutoniko*.

Contents

1 Input Variants

The columns represent the following input variants:

1. literal character
2. named accent macro + LICR
3. short accent macro + LICR
4. short accent macro + literal character
5. short accent macro (reversed order) + literal character

For composite diacritics, there are additional columns for short macros in reversed order and with the second diacritic as accent macro.

2 Greek and Coptic

Characters from the Greek and Coptic Unicode block that are supported by *greek-fontenc* and *greek-inputenc*:

x0374	''	''	''
x0375	''	''	''
x037A	''	''	''
x037E	;;	;;	;;
x0384	''	''	''
x0385	''	''	''

¹LaTeX internal character representation

x0386	Α Α Α Α	Α Α Α Α	ά ά ά ά
x0387	· · ·	· · ·	· · ·
x0388	Έ Έ Έ Έ	Ε Ε Ε Ε	έ έ έ έ
x0389	Ή Ή Ή Ή	Η Η Η Η	ή ή ή ή
x038A	Ί Ί Ί Ί	Ι Ι Ι Ι	ί ί ί ί
x038C	Ό Ό Ό Ό	Ο Ο Ο Ο	ό ό ό ό
x038E	Υ Υ Υ Υ	Υ Υ Υ Υ	ύ ύ ύ ύ
x038F	Ω Ω Ω Ω	Ω Ω Ω Ω	ώ ώ ώ ώ

x0390	ί ί ί ί ί ί	ϊ ι ι ι ι ι	ί ί ί ί ί ί
x0391	Α Α	Α Α	α α
x0392	Β Β	Β Β	β β
x0393	Γ Γ	Γ Γ	γ γ
x0394	Δ Δ	Δ Δ	δ δ
x0395	Ε Ε	Ε Ε	ε ε
x0396	Ζ Ζ	Ζ Ζ	ζ ζ
x0397	Η Η	Η Η	η η
x0398	Θ Θ Θ	Θ Θ Θ	θ θ θ
x0399	Ι Ι	Ι Ι	ι ι
x039A	Κ Κ	Κ Κ	κ κ
x039B	Λ Λ	Λ Λ	λ λ
x039C	Μ Μ	Μ Μ	μ μ
x039D	Ν Ν	Ν Ν	ν ν
x039E	Ξ Ξ	Ξ Ξ	ξ ξ
x039F	Ο Ο	Ο Ο	ο ο

0x3A0	Π Π	Π Π	π π
0x3A1	Ρ Ρ	Ρ Ρ	ρ ρ
0x3A3	Σ Σ	Σ Σ	ς σ cf. section ??
0x3A4	Τ Τ	Τ Τ	τ τ
0x3A5	Υ Υ	Υ Υ	υ υ
0x3A6	Φ Φ	Φ Φ	φ φ
0x3A7	Χ Χ	Χ Χ	χ χ
0x3A8	Ψ Ψ	Ψ Ψ	ψ ψ
0x3A9	Ω Ω	Ω Ω	ω ω
0x3AA	Ϊ Ϊ Ϊ Ϊ	ϊ ι ι ι	ι ι ι ι
0x3AB	Ϋ Ϋ Ϋ Ϋ	ϋ ϋ ϋ ϋ	ϋ ϋ ϋ ϋ
0x3AC	ά ά ά ά	Α Α Α Α	ά ά ά ά
0x3AD	έ έ έ έ	Ε Ε Ε Ε	έ έ έ έ
0x3AE	ή ή ή ή	Η Η Η Η	ή ή ή ή
0x3AF	ί ί ί ί	Ι Ι Ι Ι	ί ί ί ί

x03B0	ύ ύ ύ ύ ύ ύ	ϋ ϋ ϋ ϋ ϋ ϋ	ύ ύ ύ ύ ύ ύ
x03B1	α α	Α Α	α α
x03B2	β β	Β Β	β β
x03B3	γ γ	Γ Γ	γ γ
x03B4	δ δ	Δ Δ	δ δ
x03B5	ε ε ε	Ε Ε Ε	ε ε ε
x03B6	ζ ζ	Ζ Ζ	ζ ζ
x03B7	η η	Η Η	η η
x03B8	θ θ	Θ Θ	θ θ
x03B9	ι ι	Ι Ι	ι ι
x03BA	κ κ	Κ Κ	κ κ

x03BB	λ λ	Λ Λ	λ λ
x03BC	μ μ	Μ Μ	μ μ
x03BD	ν ν	Ν Ν	ν ν
x03BE	ξ ξ	Ξ Ξ	ξ ξ
x03BF	ο ο	Ο Ο	ο ο
x03C0	π π	Π Π	π π
x03C1	ρ ρ	Ρ Ρ	ρ ρ
x03C2	ς ς ς	Σ Σ Σ	ς ς ς
x03C3	σ σ σ	Σ Σ Σ	σ σ σ
x03C4	τ τ	Τ Τ	τ τ
x03C5	υ υ	Υ Υ	υ υ
x03C6	φ φ φ	Φ Φ Φ	φ φ φ
x03C7	χ χ	Χ Χ	χ χ
x03C8	ψ ψ	Ψ Ψ	ψ ψ
x03C9	ω ω	Ω Ω	ω ω
x03CA	ϊ ι ι ι	Ϊ Ϊ Ϊ Ϊ	ϊ ι ι ι
x03CB	ϋ ϋ ϋ ϋ	Ϋ Ϋ Ϋ Ϋ	ϋ ϋ ϋ ϋ
x03CC	ό ό ό ό	Ο Ο Ο Ο	ό ό ό ό
x03CD	ύ ύ ύ ύ	Υ Υ Υ Υ	ύ ύ ύ ύ
x03CE	ώ ώ ώ ώ	Ω Ω Ω Ω	ώ ώ ώ ώ
x03D0	Ϳ Ϳ Ϳ	Β Β Β	Ϳ Ϳ Ϳ
x03D1	Ϳ Ϳ Ϳ	Θ Θ Θ	Ϳ Ϳ Ϳ
x03D5	ϕ ϕ	Φ Φ	ϕ ϕ
x03D6	Ϙ Ϙ Ϙ	Π Π Π	Ϙ Ϙ Ϙ
x03D8	ϙ ϙ	ϙ ϙ	ϙ ϙ
x03D9	Ϛ Ϛ	ϙ ϙ	ϙ ϙ
x03DA	ϛ ϛ	ϙ ϙ	ς ς
x03DB	ς ς	ϙ ϙ	ς ς
x03DC	ƒ ƒ	ƒ ƒ	ƒ ƒ
x03DD	ƒ ƒ	ƒ ƒ	ƒ ƒ
x03DE	℥ ℥	℥ ℥	℥ ℥
x03DF	℥ ℥	℥ ℥	℥ ℥
x03E0	Λ Λ	Λ Λ	λ λ
x03E1	λ λ	Λ Λ	λ λ
x03F0	κ κ κ	Κ Κ Κ	κ κ κ
x03F1	ρ ρ ρ	Ρ Ρ Ρ	ρ ρ ρ
x03F4	Θ Θ	Θ Θ	θ θ
x03F5	€ €	Ε Ε	€ €

3 Greek extended

x1F00	ἄ ἄ ἄ ἄ	Α Α Α Α	ἄ ἄ ἄ ἄ
x1F01	ᾀ ᾀ ᾀ ᾀ	Α Α Α Α	ᾀ ᾀ ᾀ ᾀ
x1F02	ἄ ἄ ἄ ἄ ἄ ἄ ἄ ἄ	Α Α Α Α Α Α Α Α	ἄ ἄ ἄ ἄ ἄ ἄ ἄ ἄ
x1F03	ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ	Α Α Α Α Α Α Α Α	ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ
x1F04	ἄ ἄ ἄ ἄ ἄ ἄ ἄ ἄ	Α Α Α Α Α Α Α Α	ἄ ἄ ἄ ἄ ἄ ἄ ἄ ἄ
x1F05	ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ	Α Α Α Α Α Α Α Α	ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ ᾀ
x1F06	ἄ ἄ ἄ ἄ ἄ ἄ ἄ ἄ	Α Α Α Α Α Α Α Α	ἄ ἄ ἄ ἄ ἄ ἄ ἄ ἄ

x1F07	ǎǎǎǎǎǎ	A A A A A A	ǎǎǎǎǎǎ
x1F08	ǎǎǎǎ	A A A A	ǎǎǎǎ
x1F09	ǎǎǎǎ	A A A A	ǎǎǎǎ
x1F0A	ǎǎǎǎǎǎǎǎ	A A A A A A	ǎǎǎǎǎǎǎǎ
x1F0B	ǎǎǎǎǎǎǎǎ	A A A A A A	ǎǎǎǎǎǎǎǎ
x1F0C	ǎǎǎǎǎǎǎǎ	A A A A A A	ǎǎǎǎǎǎǎǎ
x1F0D	ǎǎǎǎǎǎǎǎ	A A A A A A	ǎǎǎǎǎǎǎǎ
x1F0E	ǎǎǎǎǎǎǎǎ	A A A A A A	ǎǎǎǎǎǎǎǎ
x1F0F	ǎǎǎǎǎǎǎǎ	A A A A A A	ǎǎǎǎǎǎǎǎ
x1F10	éééé	E E E E	éééé
x1F11	éééé	E E E E	éééé
x1F12	ěěěěěěěě	E E E E E E	ěěěěěěěě
x1F13	ěěěěěěěě	E E E E E E	ěěěěěěěě
x1F14	ěěěěěěěě	E E E E E E	ěěěěěěěě
x1F15	ěěěěěěěě	E E E E E E	ěěěěěěěě
x1F18	’E’E’E’E	E E E E	éééé
x1F19	’E’E’E’E	E E E E	éééé
x1F1A	”E”E”E”E”E”E”E	E E E E E E	ěěěěěěěě
x1F1B	”E”E”E”E”E”E”E	E E E E E E	ěěěěěěěě
x1F1C	”E”E”E”E”E”E”E	E E E E E E	ěěěěěěěě
x1F1D	”E”E”E”E”E”E”E	E E E E E E	ěěěěěěěě
x1F20	ǵǵǵǵ	H H H H	ǵǵǵǵ
x1F21	ǵǵǵǵ	H H H H	ǵǵǵǵ
x1F22	ǵǵǵǵǵǵǵǵ	’H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F23	ǵǵǵǵǵǵǵǵ	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F24	ǵǵǵǵǵǵǵǵ	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F25	ǵǵǵǵǵǵǵǵ	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F26	ǵǵǵǵǵǵǵǵ	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F27	ǵǵǵǵǵǵǵǵ	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F28	’H’H’H’H	H H H H	ǵǵǵǵ
x1F29	’H’H’H’H	H H H H	ǵǵǵǵ
x1F2A	”H”H”H”H”H”H”H	’H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F2B	”H”H”H”H”H”H”H	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F2C	”H”H”H”H”H”H”H	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F2D	”H”H”H”H”H”H”H	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F2E	”H”H”H”H”H”H”H	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F2F	”H”H”H”H”H”H”H	H H H H H H H H	ǵǵǵǵǵǵǵǵ
x1F30	ìììì	I I I I	ìììì
x1F31	ìììì	I I I I	ìììì
x1F32	ììììì	I I I I I	ììììì
x1F33	ììììì	I I I I I	ììììì
x1F34	ììììì	I I I I I	ììììì
x1F35	ììììì	I I I I I	ììììì
x1F36	ììììì	I I I I I	ììììì
x1F37	ììììì	I I I I I	ììììì
x1F38	’I’I’I’I	I I I I	ìììì
x1F39	’I’I’I’I	I I I I	ìììì
x1F3A	”I”I”I”I”I”I”I	I I I I I	ììììì
x1F3B	”I”I”I”I”I”I”I	I I I I I	ììììì
x1F3C	”I”I”I”I”I”I”I	I I I I I	ììììì

x1F3D	ᳵᳵᳵᳵᳵᳵ	IIIII	ᳵᳵᳵᳵ
x1F3E	ᳶᳶᳶᳶᳶᳶ	IIIII	ᳶᳶᳶᳶ
x1F3F	᳷᳷᳷᳷᳷᳷	IIIII	᳷᳷᳷᳷
x1F40	᳸᳸᳸᳸	OOOO	᳸᳸᳸᳸
x1F41	᳹᳹᳹᳹	OOOO	᳹᳹᳹᳹
x1F42	ᳺᳺᳺᳺᳺᳺ	OOOOO	ᳺᳺᳺᳺᳺᳺ
x1F43	᳻᳻᳻᳻᳻᳻	OOOOO	᳻᳻᳻᳻᳻᳻
x1F44	᳼᳼᳼᳼᳼᳼	OOOOO	᳼᳼᳼᳼᳼᳼
x1F45	᳽᳽᳽᳽᳽᳽	OOOOO	᳽᳽᳽᳽᳽᳽
x1F48	᳾᳾᳾᳾᳾᳾	OOOO	᳾᳾᳾᳾
x1F49	᳿᳿᳿᳿᳿᳿	OOOO	᳿᳿᳿᳿
x1F4A	᳠᳠᳠᳠᳠᳠᳠᳠	OOOOO	᳠᳠᳠᳠᳠᳠
x1F4B	᳡᳡᳡᳡᳡᳡᳡᳡	OOOOO	᳡᳡᳡᳡᳡᳡
x1F4C	᳢᳢᳢᳢᳢᳢᳢᳢	OOOOO	᳢᳢᳢᳢᳢᳢
x1F4D	᳣᳣᳣᳣᳣᳣᳣᳣	OOOOO	᳣᳣᳣᳣᳣᳣
x1F50	ᳵᳵᳵᳵᳵᳵ	YYYY	ᳵᳵᳵᳵᳵᳵ
x1F51	ᳶᳶᳶᳶᳶᳶ	YYYY	ᳶᳶᳶᳶᳶᳶ
x1F52	᳷᳷᳷᳷᳷᳷᳷᳷	YYYY	᳷᳷᳷᳷᳷᳷᳷᳷
x1F53	᳸᳸᳸᳸᳸᳸᳸᳸	YYYY	᳸᳸᳸᳸᳸᳸᳸᳸
x1F54	᳹᳹᳹᳹᳹᳹᳹᳹	YYYY	᳹᳹᳹᳹᳹᳹᳹᳹
x1F55	ᳺᳺᳺᳺᳺᳺᳺᳺ	YYYY	ᳺᳺᳺᳺᳺᳺᳺᳺ
x1F56	᳻᳻᳻᳻᳻᳻᳻᳻	YYYY	᳻᳻᳻᳻᳻᳻᳻᳻
x1F57	᳼᳼᳼᳼᳼᳼᳼᳼	YYYY	᳼᳼᳼᳼᳼᳼᳼᳼
x1F59	᳽᳽᳽᳽᳽᳽᳽᳽	YYYY	᳽᳽᳽᳽᳽᳽᳽᳽
x1F5B	᳾᳾᳾᳾᳾᳾᳾᳾᳾	YYYY	᳾᳾᳾᳾᳾᳾᳾᳾᳾
x1F5D	᳿᳿᳿᳿᳿᳿᳿᳿᳿	YYYY	᳿᳿᳿᳿᳿᳿᳿᳿᳿
x1F5F	᳠᳠᳠᳠᳠᳠᳠᳠᳠	YYYY	᳠᳠᳠᳠᳠᳠᳠᳠᳠
x1F60	᳡᳡᳡᳡᳡᳡᳡᳡᳡	ΩΩΩΩ	᳡᳡᳡᳡᳡᳡᳡᳡᳡
x1F61	᳢᳢᳢᳢᳢᳢᳢᳢᳢	ΩΩΩΩ	᳢᳢᳢᳢᳢᳢᳢᳢᳢
x1F62	᳣᳣᳣᳣᳣᳣᳣᳣᳣	ΩΩΩΩΩ	᳣᳣᳣᳣᳣᳣᳣᳣᳣
x1F63	ᳵᳵᳵᳵᳵᳵᳵᳵᳵ	ΩΩΩΩΩ	ᳵᳵᳵᳵᳵᳵᳵᳵᳵ
x1F64	ᳶᳶᳶᳶᳶᳶᳶᳶᳶ	ΩΩΩΩΩ	ᳶᳶᳶᳶᳶᳶᳶᳶᳶ
x1F65	᳷᳷᳷᳷᳷᳷᳷᳷᳷	ΩΩΩΩΩ	᳷᳷᳷᳷᳷᳷᳷᳷᳷
x1F66	᳸᳸᳸᳸᳸᳸᳸᳸᳸	ΩΩΩΩΩ	᳸᳸᳸᳸᳸᳸᳸᳸᳸
x1F67	᳹᳹᳹᳹᳹᳹᳹᳹᳹	ΩΩΩΩΩ	᳹᳹᳹᳹᳹᳹᳹᳹᳹
x1F68	ᳺᳺᳺᳺᳺᳺᳺᳺᳺ	ΩΩΩΩ	ᳺᳺᳺᳺᳺᳺᳺᳺᳺ
x1F69	᳻᳻᳻᳻᳻᳻᳻᳻᳻	ΩΩΩΩ	᳻᳻᳻᳻᳻᳻᳻᳻᳻
x1F6A	᳼᳼᳼᳼᳼᳼᳼᳼᳼᳼	ΩΩΩΩΩ	᳼᳼᳼᳼᳼᳼᳼᳼᳼᳼
x1F6B	᳽᳽᳽᳽᳽᳽᳽᳽᳽᳽	ΩΩΩΩΩ	᳽᳽᳽᳽᳽᳽᳽᳽᳽᳽
x1F6C	᳾᳾᳾᳾᳾᳾᳾᳾᳾᳾	ΩΩΩΩΩ	᳾᳾᳾᳾᳾᳾᳾᳾᳾᳾
x1F6D	᳿᳿᳿᳿᳿᳿᳿᳿᳿᳿	ΩΩΩΩΩ	᳿᳿᳿᳿᳿᳿᳿᳿᳿᳿
x1F6E	᳠᳠᳠᳠᳠᳠᳠᳠᳠᳠	ΩΩΩΩΩ	᳠᳠᳠᳠᳠᳠᳠᳠᳠᳠
x1F6F	᳡᳡᳡᳡᳡᳡᳡᳡᳡᳡	ΩΩΩΩΩ	᳡᳡᳡᳡᳡᳡᳡᳡᳡᳡
x1F70	᳢᳢᳢᳢᳢᳢᳢᳢᳢᳢	AAAA	᳢᳢᳢᳢᳢᳢᳢᳢᳢᳢
x1F71	᳣᳣᳣᳣᳣᳣᳣᳣᳣᳣	AAAA	᳣᳣᳣᳣᳣᳣᳣᳣᳣᳣
x1F72	ᳵᳵᳵᳵᳵᳵᳵᳵᳵᳵ	EEEE	ᳵᳵᳵᳵᳵᳵᳵᳵᳵᳵ
x1F73	ᳶᳶᳶᳶᳶᳶᳶᳶᳶᳶ	EEEE	ᳶᳶᳶᳶᳶᳶᳶᳶᳶᳶ
x1F74	᳷᳷᳷᳷᳷᳷᳷᳷᳷᳷	HHHH	᳷᳷᳷᳷᳷᳷᳷᳷᳷᳷
x1F75	᳸᳸᳸᳸᳸᳸᳸᳸᳸᳸	HHHH	᳸᳸᳸᳸᳸᳸᳸᳸᳸᳸

x1F76	ìììì	IIII	ìììì
x1F77	íííí	IIII	íííí
x1F78	òòòò	O O O O	òòòò
x1F79	óóóó	O O O O	óóóó
x1F7A	ùùùù	ΥΥΥΥ	ùùùù
x1F7B	úúúú	ΥΥΥΥ	úúúú
x1F7C	òòòò	ΩΩΩΩ	òòòò
x1F7D	óóóó	ΩΩΩΩ	óóóó
x1F80	ǎǎǎǎ	A. A. A. A.	ǎǎǎǎ
x1F81	ǎǎǎǎ	A. A. A. A.	ǎǎǎǎ
x1F82	ǎǎǎǎ	A. A. A. A.	ǎǎǎǎ
x1F83	ǎǎǎǎ	A. A. A. A.	ǎǎǎǎ
x1F84	ǎǎǎǎ	A. A. A. A.	ǎǎǎǎ
x1F85	ǎǎǎǎ	A. A. A. A.	ǎǎǎǎ
x1F86	ǎǎǎǎ	A. A. A. A.	ǎǎǎǎ
x1F87	ǎǎǎǎ	A. A. A. A.	ǎǎǎǎ
x1F88	ǎ. ǎ. ǎ. ǎ.	A. A. A. A.	ǎ. ǎ. ǎ. ǎ.
x1F89	ǎ. ǎ. ǎ. ǎ.	A. A. A. A.	ǎ. ǎ. ǎ. ǎ.
x1F8A	ǎ. ǎ. ǎ. ǎ.	A. A. A. A.	ǎ. ǎ. ǎ. ǎ.
x1F8B	ǎ. ǎ. ǎ. ǎ.	A. A. A. A.	ǎ. ǎ. ǎ. ǎ.
x1F8C	ǎ. ǎ. ǎ. ǎ.	A. A. A. A.	ǎ. ǎ. ǎ. ǎ.
x1F8D	ǎ. ǎ. ǎ. ǎ.	A. A. A. A.	ǎ. ǎ. ǎ. ǎ.
x1F8E	ǎ. ǎ. ǎ. ǎ.	A. A. A. A.	ǎ. ǎ. ǎ. ǎ.
x1F8F	ǎ. ǎ. ǎ. ǎ.	A. A. A. A.	ǎ. ǎ. ǎ. ǎ.
x1F90	ǎǎǎǎ	H. H. H. H.	ǎǎǎǎ
x1F91	ǎǎǎǎ	H. H. H. H.	ǎǎǎǎ
x1F92	ǎǎǎǎ	H. H. H. H.	ǎǎǎǎ
x1F93	ǎǎǎǎ	H. H. H. H.	ǎǎǎǎ
x1F94	ǎǎǎǎ	H. H. H. H.	ǎǎǎǎ
x1F95	ǎǎǎǎ	H. H. H. H.	ǎǎǎǎ
x1F96	ǎǎǎǎ	H. H. H. H.	ǎǎǎǎ
x1F97	ǎǎǎǎ	H. H. H. H.	ǎǎǎǎ
x1F98	ǎ. ǎ. ǎ. ǎ.	H. H. H. H.	ǎ. ǎ. ǎ. ǎ.
x1F99	ǎ. ǎ. ǎ. ǎ.	H. H. H. H.	ǎ. ǎ. ǎ. ǎ.
x1F9A	ǎ. ǎ. ǎ. ǎ.	H. H. H. H.	ǎ. ǎ. ǎ. ǎ.
x1F9B	ǎ. ǎ. ǎ. ǎ.	H. H. H. H.	ǎ. ǎ. ǎ. ǎ.
x1F9C	ǎ. ǎ. ǎ. ǎ.	H. H. H. H.	ǎ. ǎ. ǎ. ǎ.
x1F9D	ǎ. ǎ. ǎ. ǎ.	H. H. H. H.	ǎ. ǎ. ǎ. ǎ.
x1F9E	ǎ. ǎ. ǎ. ǎ.	H. H. H. H.	ǎ. ǎ. ǎ. ǎ.
x1F9F	ǎ. ǎ. ǎ. ǎ.	H. H. H. H.	ǎ. ǎ. ǎ. ǎ.
x1FA0	ǎǎǎǎ	Ω. Ω. Ω. Ω.	ǎǎǎǎ
x1FA1	ǎǎǎǎ	Ω. Ω. Ω. Ω.	ǎǎǎǎ
x1FA2	ǎǎǎǎ	Ω. Ω. Ω. Ω.	ǎǎǎǎ
x1FA3	ǎǎǎǎ	Ω. Ω. Ω. Ω.	ǎǎǎǎ
x1FA4	ǎǎǎǎ	Ω. Ω. Ω. Ω.	ǎǎǎǎ
x1FA5	ǎǎǎǎ	Ω. Ω. Ω. Ω.	ǎǎǎǎ
x1FA6	ǎǎǎǎ	Ω. Ω. Ω. Ω.	ǎǎǎǎ
x1FA7	ǎǎǎǎ	Ω. Ω. Ω. Ω.	ǎǎǎǎ
x1FA8	ǎ. ǎ. ǎ. ǎ.	Ω. Ω. Ω. Ω.	ǎ. ǎ. ǎ. ǎ.
x1FA9	ǎ. ǎ. ǎ. ǎ.	Ω. Ω. Ω. Ω.	ǎ. ǎ. ǎ. ǎ.

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x1FE0	ϣ ϣ ϣ ϣ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FE1	ϣ ϣ ϣ ϣ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FE2	ϣ ϣ ϣ ϣ ϣ ϣ ϣ ϣ	Υ Υ Υ Υ Υ Υ Υ Υ	ϣ ϣ ϣ ϣ ϣ ϣ ϣ ϣ
x1FE3	ϣ ϣ ϣ ϣ ϣ ϣ ϣ ϣ	Υ Υ Υ Υ Υ Υ Υ Υ	ϣ ϣ ϣ ϣ ϣ ϣ ϣ ϣ
x1FE4	ρ ρ ρ ρ	P P P P	ρ ρ ρ ρ
x1FE5	ρ ρ ρ ρ	P P P P	ρ ρ ρ ρ
x1FE6	ϣ ϣ ϣ ϣ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FE7	ϣ ϣ ϣ ϣ ϣ ϣ ϣ ϣ	Υ Υ Υ Υ Υ Υ Υ Υ	ϣ ϣ ϣ ϣ ϣ ϣ ϣ ϣ
x1FE8	Υ Υ Υ Υ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FE9	Υ Υ Υ Υ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FEA	Υ Υ Υ Υ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FEB	Υ Υ Υ Υ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FEC	Υ Υ Υ Υ	P P P P	ρ ρ ρ ρ
x1FED	Υ Υ Υ Υ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FEE	Υ Υ Υ Υ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FEF	Υ Υ Υ Υ	Υ Υ Υ Υ	ϣ ϣ ϣ ϣ
x1FE3	ϣ ϣ ϣ ϣ	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FE4	ϣ ϣ ϣ ϣ	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FE5	ϣ ϣ ϣ ϣ	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FE6	ϣ ϣ ϣ ϣ	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FE7	ϣ ϣ ϣ ϣ	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FE8	Ω Ω Ω Ω	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FE9	Ω Ω Ω Ω	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FEA	Ω Ω Ω Ω	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FEB	Ω Ω Ω Ω	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FEC	Ω Ω Ω Ω	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FED	Ω Ω Ω Ω	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ
x1FEE	Ω Ω Ω Ω	Ω Ω Ω Ω	ϣ ϣ ϣ ϣ

4 Discussion

4.1 Pre-composed vs. combining characters

Under pdfTeX and XeTeX, all input variants select pre-composed characters if possible (using the NFC [Unicode normalization](#) with XeTeX and ligature definitions in LGR fonts under pdfTeX).

The default LuaTeX renderer does no NFC normalization. This leads to sub-optimal placement of diacritics with many fonts, often resulting in illegible output. NFC normalization for LuaTeX is provided by the [uninormalize](#) package and, alternatively, by the *Harfbuzz* renderer that can be selected with the `[Renderer=Harfbuzz]` option of the [fontspec](#) font selection commands. This document uses the Harfbuzz renderer with LuaTeX.

4.2 Case changing

4.2.1 Diacritics

According to Greek typographical conventions, most² diacritics are dropped in UPPERCASE. Up to 2022, `\MakeUppercase` dropped diacritics from Greek letters in any locale (except for standard accent macros).

²Exceptions are the diaeresis, the sub-iota, and the length markers macron (ˉ) and breve (˘). The length markers are used in dictionaries and textbooks but not part of the Greek orthography. There is no established practice regarding their handling in uppercase. LaTeX keeps them but the [Unicode reference implementation](#) drops them.

Since version 1.14, babel-greek maps standard accent macros to “capital” versions to fix upper-casing accented Greek letters with the new `\MakeUppercase`. The default expansion ensures that accents are kept on Latin letters: $\acute{\alpha} \grave{\epsilon} \tilde{\imath} \tilde{\omicron} \acute{\upsilon} \rightarrow \acute{A} \grave{E} \tilde{I} \tilde{O} \acute{U}$. It also works if the Language is set to Greek: $\acute{\alpha} \grave{\epsilon} \tilde{\imath} \tilde{\omicron} \acute{\upsilon} \rightarrow \acute{A} \grave{E} \tilde{I} \tilde{O} \acute{U}$.

section command.)

See [hyperref-with-greek.pdf](#) for a comprehensive test.

4.3 Symbol variants

For several Greek letters, there are alternative glyphs which may have a different semantic in a mathematical context. Unicode reserves code points for the alternative glyphs (naming them SYMBOL as opposed to LETTER). Some of these symbols are available as `\var<name>` macros in TeX’s mathematical mode.

In text, the alternative glyphs are considered typographical variants without special meaning. The 8-bit LGR font encoding does not allocate code points for them. *Babel-greek* and the *textalpha* package provide the `normalize-symbols` option (ignored with Xe/LuaTeX) that is also used in this test document.

Test the handling of symbol variants in text

literal letter, LICR, `\var<name>`, `\<name>symbol`, literal symbol:

No case change

ββββ εεεε θθθθ ΘΘΘΘ κκκκ ππππ ρρρρ φφφφ

MakeUppercase selects the matching capital letter:

BBBBB EEEEE ΘΘΘΘ ΘΘΘΘ ΚΚΚΚΚ ΠΠΠΠ ΠΡΡΡΡ ΦΦΦΦ

MakeLowercase selects the lowercase letter (not the symbol):

ββ εε θθ θθ κκ ππ ρρ φφ.

LGR provides two lowercase variants of the archaic letter *stigma*. Both map to GREEK LETTER STIGMA Ϛ.

The lowercase of Ϛ is ϛ (`\textstigma`), not `\textvarstigma`.

4.4 Hiatus

Tonos and psili mark a *hiatus* (break-up) if placed on the first of two vowels that would otherwise form a diphthong. A dialytika must be placed on the second vowel if they are dropped:

άι άυ έι άυ έι άυ → Αϊ Αΰ Εϊ Αϊ Αΰ Εϊ Αΰ (literal)

άι άυ έι άυ έι άυ → Αϊ Αΰ Εϊ Αϊ Αΰ Εϊ Αΰ (named+LICR)

άι άυ έι άυ έι άυ → Αϊ Αΰ Εϊ Αϊ Αΰ Εϊ Αΰ (short+LICR)

άι άυ έι άυ έι άυ → Αϊ Αΰ Εϊ Αϊ Αΰ Εϊ Αΰ (short+literal)

ΐι ΐυ ΐι → Αϊ Αΰ Εϊ (short+literal, reversed)

The “hiatus feature” does not work with the LGR “input ligatures”. Support for monotonic literal characters came with the 2022 `\MakeUppercase` implementation changes. Since 2023 it also works with polytonic literals (άυπνία → ΑΰΠΝΙΑ).