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, LICR[1] macro, Latin transliteration).

The document is compiled with pdfTeX, 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 LGR 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 + transliteration

5. accent character + transliteration

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	ͺ ͺ ͺ	ͺ ͺ ͺ	ͺ ͺ ͺ
x037E	; ; ;	; ; ;	; ; ;
x0384	´ ´ ´ ´ ´	´	´ ´ ´ ´ ´
x0385	΅ ΅ ΅ ΅	··· ··· ,	΅ ΅ ΅ ΅
x0386	Ά Ά Ά Ά Ά	Α Α Α Α Α	ά ά ά ά ά

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[1]LaTeX internal character representation

x0387	· · · · ·	· · · · ·	· · · · ·
x0388	Έ Έ Έ Έ Έ	E E E E E	έ έ έ έ έ
x0389	Ή Ή Ή Ή Ή	Ή H H H H	ή ή ή ή ή
x038A	Ί Ί Ί Ί Ί	I I I I I	ί ί ί ί ί
x038C	Ό Ό Ό Ό Ό	O O O O O	ό ό ό ό ό
x038E	Ύ Ύ Ύ Ύ Ύ	Υ Υ Υ Υ Υ	ύ ύ ύ ύ ύ
x038F	Ώ Ώ Ώ Ώ Ώ	Ω Ω Ω Ω Ω	ώ ώ ώ ώ ώ
x0390	ΐ ΐ ΐ ΐ ΐ ΐ ΐ ΐ	Ϊ Ϊ Ϊ Ϊ Ϊ Ϊ Ϊ Ϊ	ΐ ΐ ΐ ΐ ΐ ΐ ΐ ΐ [2]
x0391	A A A	A A A	α α α
x0392	B B B	B B B	β β β
x0393	Γ Γ Γ	Γ Γ Γ	γ γ γ
x0394	Δ Δ Δ	Δ Δ Δ	δ δ δ
x0395	E E E	E E E	ε ε ε
x0396	Z Z Z	Z Z Z	ζ ζ ζ
x0397	H H H	H H H	η η η
x0398	Θ Θ Θ Θ	Θ Θ Θ Θ	ϑ ϑ ϑ ϑ
x0399	I I I	I I I	ι ι ι
x039A	K K K	K K K	κ κ κ
x039B	Λ Λ Λ	Λ Λ Λ	λ λ λ
x039C	M M M	M M M	μ μ μ
x039D	N N N	N N N	ν ν ν
x039E	Ξ Ξ Ξ	Ξ Ξ Ξ	ξ ξ ξ
x039F	O O O	O O O	o o o
0x3A0	Π Π Π	Π Π Π	π π π
0x3A1	P P P	P P P	ρ ρ ρ
0x3A3	Σ Σ Σ	Σ Σ Σ	ς ς ς cf. section **??**
0x3A4	T T T	T T T	τ τ τ
0x3A5	Υ Υ Υ	Υ Υ Υ	υ υ υ
0x3A6	Φ Φ Φ	Φ Φ Φ	φ φ φ
0x3A7	X X X	X X X	χ χ χ
0x3A8	Ψ Ψ Ψ	Ψ Ψ Ψ	ψ ψ ψ
0x3A9	Ω Ω Ω	Ω Ω Ω	ω ω ω
0x3AA	Ϊ Ϊ Ϊ Ϊ	Ϊ Ϊ Ϊ Ϊ	ϊ ϊ ϊ ϊ
0x3AB	Ϋ Ϋ Ϋ Ϋ Ϋ	Ϋ Ϋ Ϋ Ϋ Ϋ	ϋ ϋ ϋ ϋ ϋ
0x3AC	ά ά ά ά	A A A A	ά ά ά ά
0x3AD	έ έ έ έ έ	E E E E E	έ έ έ έ έ
0x3AE	ή ή ή ή ή	Ή H H H H	ή ή ή ή ή
0x3AF	ί ί ί ί ί	I I I I I	ί ί ί ί ί
x03B0	ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ	Ϋ Ϋ Ϋ Ϋ Ϋ Ϋ Ϋ Ϋ	ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ
x03B1	α α α	A A A	α α α
x03B2	β β β	B B B	β β β
x03B3	γ γ γ	Γ Γ Γ	γ γ γ
x03B4	δ δ δ	Δ Δ Δ	δ δ δ
x03B5	ε ε ε ε	E E E E	ε ε ε ε
x03B6	ζ ζ ζ	Z Z Z	ζ ζ ζ
x03B7	η η η	H H H	η η η
x03B8	ϑ ϑ ϑ	Θ Θ Θ	ϑ ϑ ϑ
x03B9	ι ι ι	I I I	ι ι ι

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[2] With the pre-2022 \MakeUppercase and literal input, the order of combined accents involving the dialytika is important, e.g., "'i results in ΐ → Ϊ.

x03BA	ϰ ϰ ϰ	K K K	ϰ ϰ ϰ
x03BB	λ λ λ	Λ Λ Λ	λ λ λ
x03BC	μ μ μ	M M M	μ μ μ
x03BD	ν ν ν	N N N	ν ν ν
x03BE	ξ ξ ξ	Ξ Ξ Ξ	ξ ξ ξ
x03BF	o o o	O O O	o o o
x03C0	π π π	Π Π Π	π π π
x03C1	ρ ρ ρ	P P P	ρ ρ ρ
x03C2	ς ς ς ς	Σ Σ Σ Σ	ς ς ς ς
x03C3	σ σ σ σ σ	Σ Σ Σ Σ Σ˘	σ σ σ σ σ sic![3]
x03C4	τ τ τ	T T T	τ τ τ
x03C5	υ υ υ	Υ Υ Υ	υ υ υ
x03C6	φ φ φ φ	Φ Φ Φ Φ	φ φ φ φ
x03C7	χ χ χ	X X X	χ χ χ
x03C8	ψ ψ ψ	Ψ Ψ Ψ	ψ ψ ψ
x03C9	ω ω ω	Ω Ω Ω	ω ω ω
x03CA	ϊ ϊ ϊ ϊ ϊ	Ϊ Ϊ Ϊ Ϊ	ϊ ϊ ϊ ϊ ϊ
x03CB	ϋ ϋ ϋ ϋ ϋ	Ϋ Ϋ Ϋ Ϋ Ϋ	ϋ ϋ ϋ ϋ ϋ
x03CC	ό ό ό ό ό	O O O O O	ό ό ό ό ό
x03CD	ύ ύ ύ ύ ύ	Υ Υ Υ Υ Υ	ύ ύ ύ ύ ύ
x03CE	ώ ώ ώ ώ ώ	Ω Ω Ω Ω Ω	ώ ώ ώ ώ ώ
x03D0	β β β	B B B	β β β
x03D1	ϑ ϑ ϑ	Θ Θ Θ	ϑ ϑ ϑ
x03D5	φ φ	Φ Φ	φ φ
x03D6	π π π	Π Π Π	π π π
x03D8	Ϙ Ϙ	Ϙ Ϙ	Ϙ Ϙ
x03D9	ϙ ϙ	ϙ ϙ	ϙ ϙ
x03DA	Ϛ Ϛ	Ϛ Ϛ	ϛ ϛ
x03DB	ϛ ϛ	Ϛ Ϛ	ϛ ϛ
x03DC	Ϝ Ϝ	Ϝ Ϝ	Ϝ Ϝ
x03DD	ϝ ϝ	Ϝ Ϝ	ϝ ϝ
x03DE	Ϟ Ϟ	Ϟ Ϟ	Ϟ Ϟ
x03DF	ϟ ϟ	ϟ ϟ	ϟ ϟ
x03E0	Ϡ Ϡ	Ϡ Ϡ	ϡ ϡ
x03E1	ϡ ϡ	Ϡ Ϡ	ϡ ϡ
x03F0	ϰ ϰ ϰ	K K K	ϰ ϰ ϰ
x03F1	ρ ρ ρ	P P P	ρ ρ ρ
x03F4	Θ Θ	Θ Θ	ϑ ϑ
x03F5	ε ε	E E	ε ε

3 Greek extended

x1F00	ἀ ἀ ἀ ἀ ἀ	A A A A A	ἀ ἀ ἀ ἀ ἀ
x1F01	ἁ ἁ ἁ ἁ ἁ	A A A A A	ἁ ἁ ἁ ἁ ἁ
x1F02	ἂ ἂ ἂ ἂ ἂ ἂ ἂ ἂ ἂ	A A A A A A A A A	ἂ ἂ ἂ ἂ ἂ ἂ ἂ ἂ ἂ

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[3]transliteration `sv` fails in uppercase

Code			
x1F03	ἃ ἃ ἃ ἃ ἃ ἃ ἃ ἃ	A A A A A A A A	ἃ ἃ ἃ ἃ ἃ ἃ ἃ
x1F04	ἄ ἄ ἄ ἄ ἄ ἄ ἄ ἄ	A A A A A A A A	ἄ ἄ ἄ ἄ ἄ ἄ ἄ ἄ
x1F05	ἅ ἅ ἅ ἅ ἅ ἅ ἅ ἅ	A A A A A A A A	ἅ ἅ ἅ ἅ ἅ ἅ ἅ ἅ
x1F06	ἆ ἆ ἆ ἆ ἆ ἆ ἆ ἆ	A A A A A A A A	ἆ ἆ ἆ ἆ ἆ ἆ ἆ ἆ
x1F07	ἇ ἇ ἇ ἇ ἇ ἇ ἇ ἇ	A A A A A A A A	ἇ ἇ ἇ ἇ ἇ ἇ ἇ ἇ
x1F08	Ἀ Ἀ Ἀ Ἀ Ἀ	A A A A A	ἀ ἀ ἀ ἀ ἀ
x1F09	Ἁ Ἁ Ἁ Ἁ Ἁ	A A A A A	ἁ ἁ ἁ ἁ ἁ
x1F0A	Ἂ Ἂ Ἂ Ἂ Ἂ Ἂ Ἂ Ἂ Ἂ	A A A A A A A A	ἂ ἂ ἂ ἂ ἂ ἂ ἂ ἂ ἂ
x1F0B	Ἃ Ἃ Ἃ Ἃ Ἃ Ἃ Ἃ Ἃ Ἃ	A A A A A A A A	ἃ ἃ ἃ ἃ ἃ ἃ ἃ ἃ
x1F0C	Ἄ Ἄ Ἄ Ἄ Ἄ Ἄ Ἄ Ἄ Ἄ	A A A A A A A A	ἄ ἄ ἄ ἄ ἄ ἄ ἄ ἄ
x1F0D	Ἅ Ἅ Ἅ Ἅ Ἅ Ἅ Ἅ Ἅ Ἅ	A A A A A A A A	ἅ ἅ ἅ ἅ ἅ ἅ ἅ ἅ
x1F0E	Ἆ Ἆ Ἆ Ἆ Ἆ Ἆ Ἆ Ἆ Ἆ	A A A A A A A A	ἆ ἆ ἆ ἆ ἆ ἆ ἆ ἆ
x1F0F	Ἇ Ἇ Ἇ Ἇ Ἇ Ἇ Ἇ Ἇ Ἇ	A A A A A A A A	ἇ ἇ ἇ ἇ ἇ ἇ ἇ ἇ
x1F10	ἐ ἐ ἐ ἐ	E E E E	ἐ ἐ ἐ ἐ
x1F11	ἑ ἑ ἑ ἑ	E E E E	ἑ ἑ ἑ ἑ
x1F12	ἒ ἒ ἒ ἒ ἒ	E E E E E	ἒ ἒ ἒ ἒ ἒ
x1F13	ἓ ἓ ἓ ἓ ἓ	E E E E E	ἓ ἓ ἓ ἓ ἓ
x1F14	ἔ ἔ ἔ ἔ ἔ	E E E E E	ἔ ἔ ἔ ἔ ἔ
x1F15	ἕ ἕ ἕ ἕ ἕ	E E E E E	ἕ ἕ ἕ ἕ ἕ
x1F18	Ἐ Ἐ Ἐ Ἐ Ἐ	E E E E E	ἐ ἐ ἐ ἐ ἐ
x1F19	Ἑ Ἑ Ἑ Ἑ Ἑ	E E E E E	ἑ ἑ ἑ ἑ ἑ
x1F1A	Ἒ Ἒ Ἒ Ἒ Ἒ	E E E E E	ἒ ἒ ἒ ἒ ἒ
x1F1B	Ἓ Ἓ Ἓ Ἓ Ἓ	E E E E E	ἓ ἓ ἓ ἓ ἓ
x1F1C	Ἔ Ἔ Ἔ Ἔ Ἔ	E E E E E	ἔ ἔ ἔ ἔ ἔ
x1F1D	Ἕ Ἕ Ἕ Ἕ Ἕ	E E E E E	ἕ ἕ ἕ ἕ ἕ
x1F20	ἠ ἠ ἠ ἠ ἠ	H H H H H	ἠ ἠ ἠ ἠ ἠ
x1F21	ἡ ἡ ἡ ἡ ἡ	H H H H H	ἡ ἡ ἡ ἡ ἡ
x1F22	ἢ ἢ ἢ ἢ ἢ	Ἢ H H H H	ἢ ἢ ἢ ἢ ἢ
x1F23	ἣ ἣ ἣ ἣ ἣ	H H H H H	ἣ ἣ ἣ ἣ ἣ
x1F24	ἤ ἤ ἤ ἤ ἤ	H H H H H	ἤ ἤ ἤ ἤ ἤ
x1F25	ἥ ἥ ἥ ἥ ἥ	H H H H H	ἥ ἥ ἥ ἥ ἥ
x1F26	ἦ ἦ ἦ ἦ ἦ	H H H H H	ἦ ἦ ἦ ἦ ἦ
x1F27	ἧ ἧ ἧ ἧ ἧ	H H H H H	ἧ ἧ ἧ ἧ ἧ
x1F28	Ἠ Ἠ Ἠ Ἠ Ἠ	H H H H H	ἠ ἠ ἠ ἠ ἠ
x1F29	Ἡ Ἡ Ἡ Ἡ Ἡ	H H H H H	ἡ ἡ ἡ ἡ ἡ
x1F2A	Ἢ Ἢ Ἢ Ἢ Ἢ	Ἢ H H H H	ἢ ἢ ἢ ἢ ἢ
x1F2B	Ἣ Ἣ Ἣ Ἣ Ἣ	H H H H H	ἣ ἣ ἣ ἣ ἣ
x1F2C	Ἤ Ἤ Ἤ Ἤ Ἤ	H H H H H	ἤ ἤ ἤ ἤ ἤ
x1F2D	Ἥ Ἥ Ἥ Ἥ Ἥ	H H H H H	ἥ ἥ ἥ ἥ ἥ
x1F2E	Ἦ Ἦ Ἦ Ἦ Ἦ	H H H H H	ἦ ἦ ἦ ἦ ἦ
x1F2F	Ἧ Ἧ Ἧ Ἧ Ἧ	H H H H H	ἧ ἧ ἧ ἧ ἧ
x1F30	ἰ ἰ ἰ ἰ ἰ	I I I I I	ἰ ἰ ἰ ἰ ἰ
x1F31	ἱ ἱ ἱ ἱ ἱ	I I I I I	ἱ ἱ ἱ ἱ ἱ
x1F32	ἲ ἲ ἲ ἲ ἲ	I I I I I	ἲ ἲ ἲ ἲ ἲ
x1F33	ἳ ἳ ἳ ἳ ἳ	I I I I I	ἳ ἳ ἳ ἳ ἳ
x1F34	ἴ ἴ ἴ ἴ ἴ	I I I I I	ἴ ἴ ἴ ἴ ἴ
x1F35	ἵ ἵ ἵ ἵ ἵ	I I I I I	ἵ ἵ ἵ ἵ ἵ
x1F36	ἶ ἶ ἶ ἶ ἶ	I I I I I	ἶ ἶ ἶ ἶ ἶ
x1F37	ἷ ἷ ἷ ἷ ἷ	I I I I I	ἷ ἷ ἷ ἷ ἷ
x1F38	Ἰ Ἰ Ἰ Ἰ Ἰ	I I I I I	ἰ ἰ ἰ ἰ ἰ

x1F39	Ἰ Ἰ Ἰ Ἰ Ἰ	Ι Ι Ι Ι Ι	ἰ ἰ ἰ ἰ ἰ
x1F3A	Ἲ Ἲ Ἲ Ἲ Ἲ	Ι Ι Ι Ι Ι	ἲ ἲ ἲ ἲ ἲ
x1F3B	Ἳ Ἳ Ἳ Ἳ Ἳ	Ι Ι Ι Ι Ι	ἳ ἳ ἳ ἳ ἳ
x1F3C	Ἴ Ἴ Ἴ Ἴ Ἴ	Ι Ι Ι Ι Ι	ἴ ἴ ἴ ἴ ἴ
x1F3D	Ἵ Ἵ Ἵ Ἵ Ἵ	Ι Ι Ι Ι Ι	ἵ ἵ ἵ ἵ ἵ
x1F3E	Ἶ Ἶ Ἶ Ἶ Ἶ	Ι Ι Ι Ι Ι	ἶ ἶ ἶ ἶ ἶ
x1F3F	Ἷ Ἷ Ἷ Ἷ Ἷ	Ι Ι Ι Ι Ι	ἷ ἷ ἷ ἷ ἷ
x1F40	ὀ ὀ ὀ ὀ ὀ	Ο Ο Ο Ο Ο	ὀ ὀ ὀ ὀ ὀ
x1F41	ὁ ὁ ὁ ὁ ὁ	Ο Ο Ο Ο Ο	ὁ ὁ ὁ ὁ ὁ
x1F42	ὂ ὂ ὂ ὂ ὂ	Ο Ο Ο Ο Ο	ὂ ὂ ὂ ὂ ὂ
x1F43	ὃ ὃ ὃ ὃ ὃ	Ο Ο Ο Ο Ο	ὃ ὃ ὃ ὃ ὃ
x1F44	ὄ ὄ ὄ ὄ ὄ	Ο Ο Ο Ο Ο	ὄ ὄ ὄ ὄ ὄ
x1F45	ὅ ὅ ὅ ὅ ὅ	Ο Ο Ο Ο Ο	ὅ ὅ ὅ ὅ ὅ
x1F48	Ὀ Ὀ Ὀ Ὀ Ὀ	Ο Ο Ο Ο Ο	ὀ ὀ ὀ ὀ ὀ
x1F49	Ὁ Ὁ Ὁ Ὁ Ὁ	Ο Ο Ο Ο Ο	ὁ ὁ ὁ ὁ ὁ
x1F4A	Ὂ Ὂ Ὂ Ὂ Ὂ	Ο Ο Ο Ο Ο	ὂ ὂ ὂ ὂ ὂ
x1F4B	Ὃ Ὃ Ὃ Ὃ Ὃ	Ο Ο Ο Ο Ο	ὃ ὃ ὃ ὃ ὃ
x1F4C	Ὄ Ὄ Ὄ Ὄ Ὄ	Ο Ο Ο Ο Ο	ὄ ὄ ὄ ὄ ὄ
x1F4D	Ὅ Ὅ Ὅ Ὅ Ὅ	Ο Ο Ο Ο Ο	ὅ ὅ ὅ ὅ ὅ
x1F50	ὐ ὐ ὐ ὐ ὐ	Υ Υ Υ Υ Υ	ὐ ὐ ὐ ὐ ὐ
x1F51	ὑ ὑ ὑ ὑ ὑ	Υ Υ Υ Υ Υ	ὑ ὑ ὑ ὑ ὑ
x1F52	ὒ ὒ ὒ ὒ ὒ	Υ Υ Υ Υ Υ	ὒ ὒ ὒ ὒ ὒ
x1F53	ὓ ὓ ὓ ὓ ὓ	Υ Υ Υ Υ Υ	ὓ ὓ ὓ ὓ ὓ
x1F54	ὔ ὔ ὔ ὔ ὔ	Υ Υ Υ Υ Υ	ὔ ὔ ὔ ὔ ὔ
x1F55	ὕ ὕ ὕ ὕ ὕ	Υ Υ Υ Υ Υ	ὕ ὕ ὕ ὕ ὕ
x1F56	ὖ ὖ ὖ ὖ ὖ	Υ Υ Υ Υ Υ	ὖ ὖ ὖ ὖ ὖ
x1F57	ὗ ὗ ὗ ὗ ὗ	Υ Υ Υ Υ Υ	ὗ ὗ ὗ ὗ ὗ
x1F59	Ὑ Ὑ Ὑ Ὑ Ὑ	Υ Υ Υ Υ Υ	ὑ ὑ ὑ ὑ ὑ
x1F5B	Ὓ Ὓ Ὓ Ὓ Ὓ	Υ Υ Υ Υ Υ	ὓ ὓ ὓ ὓ ὓ
x1F5D	Ὕ Ὕ Ὕ Ὕ Ὕ	Υ Υ Υ Υ Υ	ὕ ὕ ὕ ὕ ὕ
x1F5F	Ὗ Ὗ Ὗ Ὗ Ὗ	Υ Υ Υ Υ Υ	ὗ ὗ ὗ ὗ ὗ
x1F60	ὠ ὠ ὠ ὠ ὠ	Ω Ω Ω Ω Ω	ὠ ὠ ὠ ὠ ὠ
x1F61	ὡ ὡ ὡ ὡ ὡ	Ω Ω Ω Ω Ω	ὡ ὡ ὡ ὡ ὡ
x1F62	ὢ ὢ ὢ ὢ ὢ	Ω Ω Ω Ω Ω	ὢ ὢ ὢ ὢ ὢ
x1F63	ὣ ὣ ὣ ὣ ὣ	Ω Ω Ω Ω Ω	ὣ ὣ ὣ ὣ ὣ
x1F64	ὤ ὤ ὤ ὤ ὤ	Ω Ω Ω Ω Ω	ὤ ὤ ὤ ὤ ὤ
x1F65	ὥ ὥ ὥ ὥ ὥ	Ω Ω Ω Ω Ω	ὥ ὥ ὥ ὥ ὥ
x1F66	ὦ ὦ ὦ ὦ ὦ	Ω Ω Ω Ω Ω	ὦ ὦ ὦ ὦ ὦ
x1F67	ὧ ὧ ὧ ὧ ὧ	Ω Ω Ω Ω Ω	ὧ ὧ ὧ ὧ ὧ
x1F68	Ὠ Ὠ Ὠ Ὠ Ὠ	Ω Ω Ω Ω Ω	ὠ ὠ ὠ ὠ ὠ
x1F69	Ὡ Ὡ Ὡ Ὡ Ὡ	Ω Ω Ω Ω Ω	ὡ ὡ ὡ ὡ ὡ
x1F6A	Ὢ Ὢ Ὢ Ὢ Ὢ	Ω Ω Ω Ω Ω	ὢ ὢ ὢ ὢ ὢ
x1F6B	Ὣ Ὣ Ὣ Ὣ Ὣ	Ω Ω Ω Ω Ω	ὣ ὣ ὣ ὣ ὣ
x1F6C	Ὤ Ὤ Ὤ Ὤ Ὤ	Ω Ω Ω Ω Ω	ὤ ὤ ὤ ὤ ὤ
x1F6D	Ὥ Ὥ Ὥ Ὥ Ὥ	Ω Ω Ω Ω Ω	ὥ ὥ ὥ ὥ ὥ
x1F6E	Ὦ Ὦ Ὦ Ὦ Ὦ	Ω Ω Ω Ω Ω	ὦ ὦ ὦ ὦ ὦ
x1F6F	Ὧ Ὧ Ὧ Ὧ Ὧ	Ω Ω Ω Ω Ω	ὧ ὧ ὧ ὧ ὧ
x1F70	ὰ ὰ ὰ ὰ ὰ	A A A A A	ὰ ὰ ὰ ὰ ὰ
x1F71	ά ά ά ά ά	A A A A A	ά ά ά ά ά

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x1F72	ὲ ὲ ὲ ὲ	E E E E	ὲ ὲ ὲ ὲ
x1F73	έ έ έ έ έ	E E E E	έ έ έ έ
x1F74	ὴ ὴ ὴ ὴ ὴ	H H H H	ὴ ὴ ὴ ὴ ὴ
x1F75	ή ή ή ή ή	H H H H	ή ή ή ή ή
x1F76	ὶ ὶ ὶ ὶ ὶ	I I I I	ὶ ὶ ὶ ὶ ὶ
x1F77	ί ί ί ί ί	I I I I	ί ί ί ί ί
x1F78	ὸ ὸ ὸ ὸ ὸ	O O O O O	ὸ ὸ ὸ ὸ ὸ
x1F79	ό ό ό ό ό	O O O O O	ό ό ό ό ό
x1F7A	ὺ ὺ ὺ ὺ ὺ	Υ Υ Υ Υ Υ	ὺ ὺ ὺ ὺ ὺ
x1F7B	ύ ύ ύ ύ ύ	Υ Υ Υ Υ Υ	ύ ύ ύ ύ ύ
x1F7C	ὼ ὼ ὼ ὼ ὼ	Ω Ω Ω Ω Ω	ὼ ὼ ὼ ὼ ὼ
x1F7D	ώ ώ ώ ώ ώ	Ω Ω Ω Ω Ω	ώ ώ ώ ώ ώ
x1F80	ᾀ ᾀ ᾀ ᾀ ᾀ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾀ ᾀ ᾀ ᾀ ᾀ
x1F81	ᾁ ᾁ ᾁ ᾁ ᾁ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾁ ᾁ ᾁ ᾁ ᾁ
x1F82	ᾂ ᾂ ᾂ ᾂ ᾂ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾂ ᾂ ᾂ ᾂ ᾂ
x1F83	ᾃ ᾃ ᾃ ᾃ ᾃ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾃ ᾃ ᾃ ᾃ ᾃ
x1F84	ᾄ ᾄ ᾄ ᾄ ᾄ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾄ ᾄ ᾄ ᾄ ᾄ
x1F85	ᾅ ᾅ ᾅ ᾅ ᾅ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾅ ᾅ ᾅ ᾅ ᾅ
x1F86	ᾆ ᾆ ᾆ ᾆ ᾆ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾆ ᾆ ᾆ ᾆ ᾆ
x1F87	ᾇ ᾇ ᾇ ᾇ ᾇ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾇ ᾇ ᾇ ᾇ ᾇ
x1F88	ᾈ ᾈ ᾈ ᾈ ᾈ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾀ ᾀ ᾀ ᾀ ᾀ
x1F89	ᾉ ᾉ ᾉ ᾉ ᾉ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾁ ᾁ ᾁ ᾁ ᾁ
x1F8A	ᾊ ᾊ ᾊ ᾊ ᾊ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾂ ᾂ ᾂ ᾂ ᾂ
x1F8B	ᾋ ᾋ ᾋ ᾋ ᾋ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾃ ᾃ ᾃ ᾃ ᾃ
x1F8C	ᾌ ᾌ ᾌ ᾌ ᾌ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾄ ᾄ ᾄ ᾄ ᾄ
x1F8D	ᾍ ᾍ ᾍ ᾍ ᾍ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾅ ᾅ ᾅ ᾅ ᾅ
x1F8E	ᾎ ᾎ ᾎ ᾎ ᾎ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾆ ᾆ ᾆ ᾆ ᾆ
x1F8F	ᾏ ᾏ ᾏ ᾏ ᾏ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾇ ᾇ ᾇ ᾇ ᾇ
x1F90	ᾐ ᾐ ᾐ ᾐ ᾐ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾐ ᾐ ᾐ ᾐ ᾐ
x1F91	ᾑ ᾑ ᾑ ᾑ ᾑ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾑ ᾑ ᾑ ᾑ ᾑ
x1F92	ᾒ ᾒ ᾒ ᾒ ᾒ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾒ ᾒ ᾒ ᾒ ᾒ
x1F93	ᾓ ᾓ ᾓ ᾓ ᾓ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾓ ᾓ ᾓ ᾓ ᾓ
x1F94	ᾔ ᾔ ᾔ ᾔ ᾔ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾔ ᾔ ᾔ ᾔ ᾔ
x1F95	ᾕ ᾕ ᾕ ᾕ ᾕ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾕ ᾕ ᾕ ᾕ ᾕ
x1F96	ᾖ ᾖ ᾖ ᾖ ᾖ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾖ ᾖ ᾖ ᾖ ᾖ
x1F97	ᾗ ᾗ ᾗ ᾗ ᾗ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾗ ᾗ ᾗ ᾗ ᾗ
x1F98	ᾘ ᾘ ᾘ ᾘ ᾘ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾐ ᾐ ᾐ ᾐ ᾐ
x1F99	ᾙ ᾙ ᾙ ᾙ ᾙ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾑ ᾑ ᾑ ᾑ ᾑ
x1F9A	ᾚ ᾚ ᾚ ᾚ ᾚ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾒ ᾒ ᾒ ᾒ ᾒ
x1F9B	ᾛ ᾛ ᾛ ᾛ ᾛ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾓ ᾓ ᾓ ᾓ ᾓ
x1F9C	ᾜ ᾜ ᾜ ᾜ ᾜ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾔ ᾔ ᾔ ᾔ ᾔ
x1F9D	ᾝ ᾝ ᾝ ᾝ ᾝ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾕ ᾕ ᾕ ᾕ ᾕ
x1F9E	ᾞ ᾞ ᾞ ᾞ ᾞ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾖ ᾖ ᾖ ᾖ ᾖ
x1F9F	ᾟ ᾟ ᾟ ᾟ ᾟ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ᾗ ᾗ ᾗ ᾗ ᾗ
x1FA0	ᾠ ᾠ ᾠ ᾠ ᾠ	Ωᵢ Ωᵢ Ωᵢ Ωᵢ Ωᵢ	ᾠ ᾠ ᾠ ᾠ ᾠ
x1FA1	ᾡ ᾡ ᾡ ᾡ ᾡ	Ωᵢ Ωᵢ Ωᵢ Ωᵢ Ωᵢ	ᾡ ᾡ ᾡ ᾡ ᾡ
x1FA2	ᾢ ᾢ ᾢ ᾢ ᾢ	Ωᵢ Ωᵢ Ωᵢ Ωᵢ Ωᵢ	ᾢ ᾢ ᾢ ᾢ ᾢ
x1FA3	ᾣ ᾣ ᾣ ᾣ ᾣ	Ωᵢ Ωᵢ Ωᵢ Ωᵢ Ωᵢ	ᾣ ᾣ ᾣ ᾣ ᾣ
x1FA4	ᾤ ᾤ ᾤ ᾤ ᾤ	Ωᵢ Ωᵢ Ωᵢ Ωᵢ Ωᵢ	ᾤ ᾤ ᾤ ᾤ ᾤ
x1FA5	ᾥ ᾥ ᾥ ᾥ ᾥ	Ωᵢ Ωᵢ Ωᵢ Ωᵢ Ωᵢ	ᾥ ᾥ ᾥ ᾥ ᾥ

x1FA6	ᾦ ᾦ ᾦ ᾦ ᾦ	ῼ ῼ ῼ ῼ ῼ	ᾦ ᾦ ᾦ ᾦ ᾦ
x1FA7	ᾧ ᾧ ᾧ ᾧ ᾧ	ῼ ῼ ῼ ῼ ῼ	ᾧ ᾧ ᾧ ᾧ ᾧ
x1FA8	ᾨ ᾨ ᾨ ᾨ ᾨ	ῼ ῼ ῼ ῼ ῼ	ᾠ ᾠ ᾠ ᾠ ᾠ
x1FA9	ᾩ ᾩ ᾩ ᾩ ᾩ	ῼ ῼ ῼ ῼ ῼ	ᾡ ᾡ ᾡ ᾡ ᾡ
x1FAA	ᾪ ᾪ ᾪ ᾪ ᾪ	ῼ ῼ ῼ ῼ ῼ	ᾢ ᾢ ᾢ ᾢ ᾢ
x1FAB	ᾫ ᾫ ᾫ ᾫ ᾫ	ῼ ῼ ῼ ῼ ῼ	ᾣ ᾣ ᾣ ᾣ ᾣ
x1FAC	ᾬ ᾬ ᾬ ᾬ ᾬ	ῼ ῼ ῼ ῼ ῼ	ᾤ ᾤ ᾤ ᾤ ᾤ
x1FAD	ᾭ ᾭ ᾭ ᾭ ᾭ	ῼ ῼ ῼ ῼ ῼ	ᾥ ᾥ ᾥ ᾥ ᾥ
x1FAE	ᾮ ᾮ ᾮ ᾮ ᾮ	ῼ ῼ ῼ ῼ ῼ	ᾦ ᾦ ᾦ ᾦ ᾦ
x1FAF	ᾯ ᾯ ᾯ ᾯ ᾯ	ῼ ῼ ῼ ῼ ῼ	ᾧ ᾧ ᾧ ᾧ ᾧ
x1FB0	ᾰ ᾰ ᾰ ᾰ ᾰ	Ᾰ Ᾰ Ᾰ Ᾰ Ᾰ	ᾰ ᾰ ᾰ ᾰ ᾰ
x1FB1	ᾱ ᾱ ᾱ ᾱ ᾱ	Ᾱ Ᾱ Ᾱ Ᾱ Ᾱ	ᾱ ᾱ ᾱ ᾱ ᾱ
x1FB2	ᾲ ᾲ ᾲ ᾲ ᾲ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾲ ᾲ ᾲ ᾲ ᾲ
x1FB3	ᾳ ᾳ ᾳ ᾳ ᾳ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾳ ᾳ ᾳ ᾳ ᾳ
x1FB4	ᾴ ᾴ ᾴ ᾴ ᾴ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾴ ᾴ ᾴ ᾴ ᾴ
x1FB6	ᾶ ᾶ ᾶ ᾶ ᾶ	A A A A A	ᾶ ᾶ ᾶ ᾶ ᾶ
x1FB7	ᾷ ᾷ ᾷ ᾷ ᾷ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾷ ᾷ ᾷ ᾷ ᾷ
x1FB8	Ᾰ Ᾰ Ᾰ Ᾰ Ᾰ	Ᾰ Ᾰ Ᾰ Ᾰ Ᾰ	ᾰ ᾰ ᾰ ᾰ ᾰ
x1FB9	Ᾱ Ᾱ Ᾱ Ᾱ Ᾱ	Ᾱ Ᾱ Ᾱ Ᾱ Ᾱ	ᾱ ᾱ ᾱ ᾱ ᾱ
x1FBA	Ὰ Ὰ Ὰ Ὰ Ὰ	A A A A A	ὰ ὰ ὰ ὰ ὰ
x1FBB	Ά Ά Ά Ά Ά	A A A A A	ά ά ά ά ά
x1FBC	ᾼ ᾼ ᾼ ᾼ ᾼ	Aᵢ Aᵢ Aᵢ Aᵢ Aᵢ	ᾳ ᾳ ᾳ ᾳ ᾳ
x1FBD	᾽ ᾽ ᾽ ᾽ ᾽	᾽	᾽ ᾽ ᾽ ᾽ ᾽
x1FBE	ι ι ι ..	I ι ι ..	ι ....
x1FBF	᾿ ᾿ ᾿ ᾿ ᾿	᾿	᾿ ᾿ ᾿ ᾿ ᾿
x1FC0	῀ ῀ ῀ ῀	῀	῀ ῀ ῀ ῀
x1FC1	῁ ῁ ῁ ῁ ῁	῁ ..... ᾿	῁ ῁ ῁ ῁ ῁
x1FC2	ὴ ὴ ὴ ὴ ὴ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ὴ ὴ ὴ ὴ ὴ
x1FC3	ῃ ῃ ῃ ῃ ῃ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ῃ ῃ ῃ ῃ ῃ
x1FC4	ῄ ῄ ῄ ῄ ῄ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ῄ ῄ ῄ ῄ ῄ
x1FC6	ῆ ῆ ῆ ῆ ῆ	H H H H	ῆ ῆ ῆ ῆ ῆ
x1FC7	ῇ ῇ ῇ ῇ ῇ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ῇ ῇ ῇ ῇ ῇ
x1FC8	Ὲ Ὲ Ὲ Ὲ Ὲ	E E E E	ὲ ὲ ὲ ὲ
x1FC9	Έ Έ Έ Έ Έ	E E E E	έ έ έ έ
x1FCA	Ὴ Ὴ Ὴ Ὴ Ὴ	H H H H	ὴ ὴ ὴ ὴ ὴ
x1FCB	Ή Ή Ή Ή Ή	H H H H	ή ή ή ή ή
x1FCC	ῌ ῌ ῌ ῌ ῌ	Hᵢ Hᵢ Hᵢ Hᵢ Hᵢ	ῃ ῃ ῃ ῃ ῃ
x1FCD	῍ ῍ ῍ ῍ ῍	῍	῍ ῍ ῍ ῍ ῍
x1FCE	῎ ῎ ῎ ῎ ῎	῎	῎ ῎ ῎ ῎ ῎
x1FCF	῏ ῏ ῏ ῏ ῏	῏	῏ ῏ ῏ ῏ ῏
x1FD0	ῐ ῐ ῐ ῐ ῐ	Ῐ Ῐ Ῐ Ῐ	ῐ ῐ ῐ ῐ ῐ
x1FD1	ῑ ῑ ῑ ῑ ῑ	Ῑ Ῑ Ῑ Ῑ	ῑ ῑ ῑ ῑ ῑ
x1FD2	ῒ ῒ ῒ ῒ ῒ ῒ ῒ	Ῐ Ῐ Ῐ Ῐ Ῐ Ῐ Ῐ	ῒ ῒ ῒ ῒ ῒ ῒ ῒ
x1FD3	ῗ ῗ ῗ ῗ ῗ ῗ ῗ	Ῐ Ῐ Ῐ Ῐ Ῐ Ῐ Ῐ	ῗ ῗ ῗ ῗ ῗ ῗ ῗ
x1FD6	ῖ ῖ ῖ ῖ ῖ	I I I I I	ῖ ῖ ῖ ῖ ῖ
x1FD7	ῗ ῗ ῗ ῗ ῗ ῗ ῗ	Ῐ Ῐ Ῐ Ῐ Ῐ Ῐ Ῐ	ῗ ῗ ῗ ῗ ῗ ῗ ῗ
x1FD8	Ῐ Ῐ Ῐ Ῐ Ῐ	Ῐ Ῐ Ῐ Ῐ	ῐ ῐ ῐ ῐ ῐ
x1FD9	Ῑ Ῑ Ῑ Ῑ Ῑ	Ῑ Ῑ Ῑ Ῑ	ῑ ῑ ῑ ῑ ῑ
x1FDA	Ὶ Ὶ Ὶ Ὶ Ὶ	I I I I I	ὶ ὶ ὶ ὶ ὶ
x1FDB	Ί Ί Ί Ί Ί	I I I I I	ί ί ί ί ί

Code			
x1FDD	῾ ῾ ῾ ῾	῾	῾ ῾ ῾ ῾
x1FDE	῞ ῞ ῞ ῞	῞	῞ ῞ ῞ ῞
x1FDF	῟ ῟ ῟ ῟	῟	῟ ῟ ῟ ῟
x1FE0	ῠ ῠ ῠ ῠ	Ῠ Ῠ Ῠ Ῠ	ῠ ῠ ῠ ῠ
x1FE1	ῡ ῡ ῡ ῡ	Ῡ Ῡ Ῡ Ῡ	ῡ ῡ ῡ ῡ
x1FE2	ῢ ῢ ῢ ῢ ῢ ῢ ῢ ῢ ῢ ῢ ῢ	Ῠ Ῠ Ῠ Ῠ Ῠ Ῠ Ῠ Ῠ Ῠ Ῠ Ῠ	ῢ ῢ ῢ ῢ ῢ ῢ ῢ ῢ ῢ ῢ ῢ
x1FE3	ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ	Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ	ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ ΰ
x1FE4	ῤ ῤ ῤ ῤ ῤ	P P P P P	ῤ ῤ ῤ ῤ ῤ
x1FE5	ῥ ῥ ῥ ῥ ῥ	P P P P P	ῥ ῥ ῥ ῥ ῥ
x1FE6	ῦ ῦ ῦ ῦ ῦ	Υ Υ Υ Υ Υ	ῦ ῦ ῦ ῦ ῦ
x1FE7	ῧ ῧ ῧ ῧ ῧ ῧ ῧ ῧ ῧ ῧ ῧ	Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ Ῡ	ῧ ῧ ῧ ῧ ῧ ῧ ῧ ῧ ῧ ῧ ῧ
x1FE8	Ῠ Ῠ Ῠ Ῠ Ῠ	Ῠ Ῠ Ῠ Ῠ	ῠ ῠ ῠ ῠ ῠ
x1FE9	Ῡ Ῡ Ῡ Ῡ Ῡ	Ῡ Ῡ Ῡ Ῡ	ῡ ῡ ῡ ῡ ῡ
x1FEA	Ὺ Ὺ Ὺ Ὺ Ὺ	Υ Υ Υ Υ	ῢ ῢ ῢ ῢ ῢ
x1FEB	Ύ Ύ Ύ Ύ Ύ	Υ Υ Υ Υ	ΰ ΰ ΰ ΰ ΰ
x1FEC	Ῥ Ῥ Ῥ Ῥ Ῥ	P P P P P	ῥ ῥ ῥ ῥ ῥ
x1FED	῭ ῭ ῭ ῭ ῭	῭ ... ... ;	῭ ῭ ῭ ῭ ῭
x1FEE	΅ ΅ ΅ ΅ ΅	΅ ... ... ;	΅ ΅ ΅ ΅ ΅
x1FEF	` ` ` ` `	`	` ` ` ` `
x1FE3	ῷ ῷ ῷ ῷ ῷ	Ωῌ Ωῌ Ωῌ Ωῌ Ωῌ	ῷ ῷ ῷ ῷ ῷ
x1FE4	ῳ ῳ ῳ ῳ ῳ	Ωῌ Ωῌ Ωῌ Ωῌ Ωῌ	ῳ ῳ ῳ ῳ ῳ
x1FE5	ῴ ῴ ῴ ῴ ῴ	Ωῌ Ωῌ Ωῌ Ωῌ Ωῌ	ῴ ῴ ῴ ῴ ῴ
x1FE6	ῶ ῶ ῶ ῶ ῶ	Ω Ω Ω Ω Ω	ῶ ῶ ῶ ῶ ῶ
x1FE7	ῷ ῷ ῷ ῷ ῷ	Ωῌ Ωῌ Ωῌ Ωῌ Ωῌ	ῷ ῷ ῷ ῷ ῷ
x1FE8	Ὸ Ὸ Ὸ Ὸ Ὸ	O O O O O	ὸ ὸ ὸ ὸ ὸ
x1FE9	Ό Ό Ό Ό Ό	O O O O O	ό ό ό ό ό
x1FEA	Ὼ Ὼ Ὼ Ὼ Ὼ	Ω Ω Ω Ω Ω	ὼ ὼ ὼ ὼ ὼ
x1FEB	Ώ Ώ Ώ Ώ Ώ	Ω Ω Ω Ω Ω	ώ ώ ώ ώ ώ
x1FEC	ῼ ῼ ῼ ῼ ῼ	Ωῌ Ωῌ Ωῌ Ωῌ Ωῌ	ῳ ῳ ῳ ῳ ῳ
x1FED	´ ´ ´ ´ ´	´	´ ´ ´ ´ ´
x1FEE	῾ ῾ ῾ ῾ ῾	῾	῾ ῾ ῾ ῾ ῾

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, most[4] diacritics are dropped in UPPERCASE. Up to 2022, `\MakeUppercase` dropped diacritics from Greek letters in any locale (except for standard accent macros).

For *literal characters*, the new `\MakeUppercase` implementation follows the Unicode standard, where dropping diacritics is a feature of the Greek locale ("el"). However, *accent macros* behave according to Greek typesetting rules in *all* locales (standard accent macros only in documents that declare the Greek language with Babel).

Since version 1.14, babel-greek maps standard accent macros to "capital" versions to fix uppercasing accented Greek letters with the new `\MakeUppercase`. The default expansion ensures that accents are kept on Latin letters: á è ï õ ú → Á È Ï Õ Ú. It also works if the Language is set to Greek: á è ï õ ú → Á È Ï Õ Ú. (Mind, that with 8-bit TeX Latin letters are interpreted as transliteration input and converted to Greek if not wrapped in `\ensureascii`: ά ὲ ϊ õ ύ → A E Ϊ O Υ.)

4.2.2 Sigma, final sigma, and "autosigma"

There are two variants of the small letter *sigma*.

Lowercasing a capital Σ at the end of a word should print a final sigma. This works as expected with 8-bit TeX and, since 2022, also with Xe/LuaTeX and a literal Sigma: ΣΣ → σς. However, it fails with the `\textSigma` macro and Unicode fonts: ΣΣ → σς.

With 8-bit TeX, you can add a ZWNJ or use the `\noboundary` macro to prevent the conversion to a final sigma: σσ.

4.2.3 The one-letter word *ἤ* (or)

For disambiguation, the Greek word *or* (ή / ἤ) keeps diacritics in UPPERCASE. The 2022 MakeUppercase handles this for literal input.

ή Ή ἤ Ἤ ἤ Ἤ → Ή Ή Ή Ή Η Η .[5]

Currently, this feature is not supported with other input methods.

Diacritics are dropped from eta if it is part of a word: ήτοι, Ήτοι, επιταγή ήτοι, Ἤτοι → ΗΤΟΙ, ΗΤΟΙ, ΕΠΙΤΑΓΗ ΗΤΟΙ, ΗΤΟΙ.[6]

4.2.4 Case conversion if the locale is *not* Greek

Since 2022, `\MakeUppercase` keeps diacritics on Greek letters and uses combining diacritical characters for characters that have no pre-composed uppercase equivalent.

With Xe/LuaTeX, the result may be illegible due to overlapping diacritics. With pdfTeX, this led to compiling errors. This is fixed in *greek-fontenc* 2.3. by mapping the affected characters to macro representations before case conversions (requires the 2023 LaTeX release). Consequently, with pdfTeX, diacritics are dropped from literal characters without pre-composed uppercase equivalent also if the text language is *not* Greek.

ϊ ὺ ὺ ὒ ὒ ᾷ ῆ ῇ ῒ ῗ ὸ ῤ ῠ ῦ ῳ ῷ → ΪΫ ΥΥΥΥΑΑᾼΗῌΪΙͅΪΫ ΫΡΥΫΩῼ

---

[4]Exceptions are the diaeresis, the sub-iota, and the length markers macron (¯) 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.

[5]TODO: The polytonic variant ETA WITH DASIA AND OXIA used in ἤ … ἤ (*either … or*) drops diacritics! By mistake, omission, or intent?

[6]TODO: It seems the test is only for whitespace on both sides: ή, Ή. ἤ· Ἤ → H, H. H· H

4.2.5 PDF strings

MakeUppercase in PDF strings led to compiling errors until 2022.

Check the table of contents in the side-bar of a PDF viewer.

4.2.6 ί ΐ ΐΐΐΐ ί ί ί ί ί → Ϊ Ϊ ΪΪΪΪ Ϊ Ϊ Ϊ Ϊ Ϊ

4.2.7 ύ ΰ ΰΰΰΰ ύ ύ ύ ύ ύ → Ϋ Ϋ ΫΫΫΫ Ϋ Ϋ Ϋ Ϋ Ϋ

4.2.8 ΐ ΐ ΐΐΐΐ ΐ ΐ ΐ ΐ ΐ → Ϊ Ϊ ΪΪΪΪ Ϊ Ϊ Ϊ Ϊ Ϊ

4.2.9 ΰ ΰ ΰΰΰΰ ΰ ΰ ΰ ΰ ΰ → Ϋ Ϋ ΫΫΫΫ Ϋ Ϋ Ϋ Ϋ Ϋ

4.2.10 ἤ ἤ ἤ ἤ ἤ ἤ Ἤ Ἡ Ἧ Ἣ → Ἤ Η Η Η Η Η Η Η Η Ἤ Η

Transliteration input stays Latin in PDF strings.

Diacritics are not dropped from literal characters in text, ToC but not PDF sidebar ToC, if the language switch is inside the `\section` command. (It works if the language is switched before the 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

βββββ εεεεε ϑϑϑϑϑ ΘΘΘΘΘ ϰϰϰϰϰ πππππ ϱϱϱϱϱ φφφφφ

MakeUppercase selects the matching capital letter:

ΒΒΒΒΒ ΕΕΕΕΕ ΘΘΘΘΘ ΘΘΘΘΘ ΚΚΚΚΚ ΠΠΠΠΠ ΡΡΡΡΡ ΦΦΦΦΦ

MakeLowercase selects the lowercase letter (not the symbol):

ββ εε ϑϑ ϑϑϑ 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`(ϛ).

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 ἄι ἄυ ἔι ἀυ → ΑΪ ΑΫ ΕΪ ΑΪ ΑΫ ΕΪ ΑΫ (literal)
άι άυ έι ἄι ἄυ ἔι ἀυ → ΑΪ ΑΫ ΕΪ ΑΪ ΑΫ ΕΪ ΑΫ (named+LICR)
άι άυ έι ἄι ἄυ ἔι ἀυ → ΑΪ ΑΫ ΕΪ ΑΪ ΑΫ ΕΪ ΑΫ (short+LICR)
άι άυ έι ἄι ἄυ ἔι ἀυ → ΑΪ ΑΫ ΕΪ ΑΪ ΑΫ ΕΪ ΑΫ (short+transliteration)
ἄι ἄυ ἔι → ΑΪ ΑΫ ΕΪ (short+transliteration, 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 (ἀυπνία → ΑῨΠΝΙΑ).

Test the auto-hiatus feature for side-effects:

A B (must keep space after A).

Kerning (compare with source):

```
  ΑΟ ΑΨ ΑΙ ΑΥ ΡΑ ΟΑ ΥΑ ΔΥ [
᾿ ΑΟ ΑΨ ΑΙ ΑΥ ΡΑ ΟΑ ΥΑ ΔΥ [
᾿ ΑΟ ΑΨ ΑΪ ΑῨ ΡΑ ΟΑ ΥΑ ΔΥ [
῀ ΑΟ ΑΨ ΑΪ ΑῨ ΡΑ ΟΑ ΥΑ ΔΥ [
´ ΑΟ ΑΨ ΑΪ ΑῨ ΡΑ ΟΑ ΥΑ ΔΥ [
῀ ΑΟ ΑΨ ΑΪ ΑῨ ΡΑ ΟΑ ΥΑ ΔΥ [
῀ ΑΟ ΑΨ ΑΙ ΑΥ ΡΑ ΟΑ ΥΑ ΔΥ [
` ΑΟ ΑΨ ΑΙ ΑΥ ΡΑ ΟΑ ΥΑ ΔΥ [
῀ ΑΟ ΑΨ ΑΙ ΑΥ ΡΑ ΟΑ ΥΑ ΔΥ [
˜ ΑΟ ΑΨ ΑΙ ΑΥ ΡΑ ΟΑ ΥΑ ΔΥ [
῀ ΑΟ ΑΨ ΑΙ ΑΥ ΡΑ ΟΑ ΥΑ ΔΥ [
῀ ΑΟ ΑΨ ΑΙ ΑΥ ΡΑ ΟΑ ΥΑ ΔΥ [
῀ ΑΟ ΑΨ ΑΙ ΑΥ ΡΑ ΟΑ ΥΑ ΔΥ [
¨ ΑΟ ΑΨ ΑΪ ΑῨ ΡΑ ΟΑ ῩΑ ΔΥ [
```

Rows 3 ... 7: Look-ahead (to check for a hiatus) breaks kerning before 'A' with tonos or psili.

Lowercasing should keep diacritics (of course, it cannot regenerate "manually" dropped ones): Ά Ϊ Ϋ͂ ᾍ ↦ ά ϊ ΰ ᾅ.

4.5   Problems with the Latin transliteration

- With monotonic Greek or if `\greekfontencoding` is not LGR, the tilde ~ keeps its default expansion as no-break space (NBSP) and transliterations involving ~ fail. If the `greek` language is loaded with Babel, the tilde accent `\~` as well as combined accents involving the tilde work in all language variants.

- In order to drop accents from input using the Latin transliteration, the characters ', `, ~, <, and > are suppressed in uppercase. This affects other uses of these characters:

  « ` ´ ˜ ῾ ᾿ » → «   »   'ξ' → Ξ

  Workaround: use literal typographical quote characters or "french" quotes:

  'ξ' → 'Ξ'   «ξ» → «Ξ»

  To keep side-effects to a minimum, breathings, combined accents and varia are dropped only with the language variants *polutoniko* or *ancient* as they are not required with monotonic Greek (the current language variant is polutoniko).

- The uppercase of spacing composite diacritics including a dialytika "~ "` "' appears as apostrophe, as a single " stands for an apostrophe in the LGR transliteration if followed by a space or empty character.