Title
Proposal for three Greek papyrological characters

Authors
Sosin, Joshua
Heilporn, Paul
Hoogendijk, Cisca
et al.

Publication Date
2012-03-23

Peer reviewed

JTC 1/SC2 / WG2 N4194
L2/12-034

TO: The Unicode Technical Committee and JTC1/SC2 WG2
FROM: Joshua Sosin (Dept. of Classical Studies, Duke University), Paul Heilporn (Prof. of Papyrology, University of Strasbourg), Cisca Hoogendijk (SMES Papyrological Institute, Leiden University), Donald Mastronarde (Dept. of Classics, UC Berkeley), Todd Hickey (Center for the Tebtunis Papyri, UC Berkeley), and Deborah Anderson (SEI, UC Berkeley)
RE: Proposal for three Greek papyrological characters
DATE: 23 January 2012

Members of the Integrating Digital Papyrology (IDP) project[1] have identified three characters that appear in papyri, but are not yet in Unicode. In order to digitize Greek papyrus materials, the following three characters are needed:

- 𐅵 GREEK ONE QUARTER SIGN
- ϛ GREEK SINUSOID SIGN
- ⲧ GREEK SYMBOL TAU RHO

1. Proposed Characters

a. 𐅵 GREEK ONE QUARTER SIGN

The GREEK ONE QUARTER SIGN likely derives from Ptolemaic Greek delta (Δ′), according Paul Heilporn of the University de Strasbourg, although it superficially resembles lower case Latin *d*. The character appears on listings of common papyrological abbreviations (see figure 2 [Gonis 2009: 176], Thompson 1912: 81).

The character has a variant glyph shape with a bar through the vertical (see figures 1 and 2). An example of the character on a papyrus is shown in figure 3.

b. ϛ GREEK SINUSOID SIGN

The GREEK SINUSOID SIGN is used to designate 'year'. Unlike U+10179 GREEK YEAR SIGN, which was in use from 3c BCE until 4c CE (and afterwards only in a restricted context), the SINUSOID SIGN was a common abbreviation used from the Roman period on (30 BCE-).

[1] IDP is a collaboration between projects at various institutions whose goal is to bring together digital resources for the study and publication of ancient documents preserved on papyrus. Collaborating projects include the Duke Data Bank of Documentary Papyri, the Heidelberger Gesamtverzeichnis der griechischen Papyrusurken Ägyptens, The Advanced Papyrological Information System as well as leading research institutions. See http://idp.atlantides.org/trac/idp/wiki/.

The GREEK SINUSOID SIGN likely derives from the L-shaped symbol used for 'year', but the two symbols are used in different contexts. According to Paul Heilporn, the ς-sign more often appears in mid-sentence ("poll tax of the Xth year"), though both "L" and "ς" can be found in such a position, and hence is not predictable in this position. However, the SINUSOID SIGN appears only after the year number, usually regnal, indictional, and consular iteration years (Gonis 2009:175, 177) and the "L" is found when a date is in a separate sentence ("Year X of Imp. Caes. XXX") (Heilporn, p.c.). The two 'year' symbols can co-occur in the same document (figure 4).

Note: The SINUSOID SIGN was not proposed or noted in the final TLG proposal N2612-2 = L2/03=158.[2] As was true for GREEK YEAR SIGN, the SINUSOID SIGN can have a variety of other meanings, including the *drachma* and fraction for '1/2', as well as other meanings (see Gonis 2009: 177).

c. ⲧ GREEK SYMBOL TAU RHO

This sign is made up of the Greek letters *tau* and *rho*. According to Larry Hurtado, who has extensively studied the history of the symbol[3], GREEK SYMBOL TAU RHO appeared on Herodian coins of 1c BCE (see figure 6) and inscriptions, where the symbol is an abbreviation for '3' or '30' (*tria* or *triakonta*) (see figure 7).

The symbol appears also in literary papyri, but with a different use.[4]

In Christian usage, it appears in two main contexts[5]:

(1) as a free-standing character, appearing in Christian inscriptions or other items, such a lamps, signaling "Christian" and/or as a symbol for Christ. The symbol hence differs from the most well-known Christogram, the *chi rho* symbol (U+2627 ☧ CHI RHO), whose first two letters are those found in the Greek name for 'Christ'. (Figure 8 shows common Christograms. For examples of the free-standing use, see figures 9 and 10.)

(2) as part of the special abbreviation form of the Greek words *stauros* (cross) and/or *stauroo* (crucify), hence the name "staurogram". This latter use is the earliest known Christian usage, dating to ca. 200 CE in New Testament manuscripts, such as P45 and

---

[2] The sinusoid form, or something similar to it, appeared in an earlier version of the TLG proposal (L2/03-075), but was removed in the final version.

[3] Hurtado 2006a and 2006b, both with extensive bibliographies.

[4] The TAU RHO in documentary papyri should be differentiated from its use in literary papyri. According to K. McNamee, the *rho* with the horizontal stroke in literary papyri had the same function as chi rho, and was used as an acronym for χρηστόν (*chreston*) vel sim., and meant 'useful'. It appeared in the margin of literary commentaries beside passages in which (one assumes) the annotator wanted to mark it so that he could find them again. The symbol appeared in texts dating mostly to 2c CE, but likely was in use earlier. (For examples, see *Abbreviations in Greek Literary Papyri and Ostraca*, Chico, Calif., 1981.)

[5] Hurtado, p.c.

P75. In this usage, it does not appear on its own, but as part of words in which it appears. (See figure 11.)

The symbol was later adopted into the Coptic script and into Latin, but not before 4c CE. According to Prof. Terry Wilfong, University of Michigan, the COPTIC TAU RO character, which is encoded in Unicode at U+2CE8, is also used for the numeral for 900, which is not a use shared by Greek.

The character is clearly a Greek compendium and, as such, should be separately encoded. As a free-standing character, it has special semantic meaning. Also, the representative glyph ⲧ̀ does not have the typical Coptic ends, cf. the appearance of the COPTIC TAU RO in the Antinoou font, ⲧ̀ .[6]

To reflect other names used for this character, we recommend an annotation "also known as rho-cross or staurogram."

2. Proposed Location

The proposed location for GREEK ONE QUARTER SIGN and GREEK SINUSOID SIGN is in the Ancient Greek Numbers block, at the next two available code points, U+1018B and U+1018C. (These would conveniently fall under the current heading, "Ancient Greek papyrological numbers," which already includes characters for '1/2', '2/3', as well as for GREEK YEAR SIGN.)

The proposed location for GREEK SYMBOL TAU RHO is in the Ancient Symbols block, at U+101A0, which is the start of a new column (and thereby leaves space for additional Roman symbols to fill in the preceding column, U+10190..U+1019F). The GREEK SYMBOL TAU RHO should cross-reference U+2627 CHI RHO and U+2CE8 COPTIC TAU RO.

3. Character Properties

1018B;GREEK ONE QUARTER SIGN;No;0;ON;;;;1/4;N;;;;;
1018C;GREEK SINUSOID SIGN;So;0;ON;;;;;N;;;;;
101A0;GREEK SYMBOL TAU RHO;So;0;ON;;;;;N;;;;;

4. Collation

GREEK ONE QUARTER SIGN should sort just before 10175 GREEK ONE HALF SIGN.
GREEK SINUSOID SIGN should be interpolated next to 10179 GREEK YEAR SIGN.
GREEK SYMBOL TAU RHO can default to code point order.

5. References

Gonis, Nikolaos. 2009. "Abbreviations and Symbols" in *The Oxford Handbook of Papyrology*, ed. Roger S. Bagnall. OUP: Oxford. Pp. 170-178.

[6] http://www.evertype.com/fonts/coptic/.

Hurtado, Larry. 2006a. *The Earliest Christian Artifacts: Manuscripts and Christian Origins*, Eerdmans: Grand Rapids, Cambridge U.K.

Hurtado, Larry. 2006b. "The Staurogram in Early Christian Manuscripts: The Earliest Visual Reference to the Crucified Jesus?" in New Testament Manuscripts: Their Text and Their World, ed. Thomas J. Kraus and Tobias Nicklas. "Texts and Editions for New Testament Study," 2. Leiden: Brill 2006. Pp. 207-26. Available at: larryhurtado.files.wordpress.com/2010/07/staurogram1.doc

Thompson, Edward Maunde. *An Introduction to Greek and Latin Palaeography*. Oxford: Clarendon, 1912.

ACKNOWLEDGEMENTS

This work was made possible in part by a grant from the United States National Endowment for the Humanities, which funded the Universal Scripts Project (part of the Script Encoding Initiative at the University of California, Berkeley). Any views, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect those of the National Endowment for the Humanities.

Thanks are also due to Larry Hurtado, Gabby Bodard, Roger Bagnall, Rodney Ast, Terry Wolfong, Malcolm Choat, Maria Pantelia, Joel Kalvesmaki, and John Hudson, who also provided feedback.

FIGURES

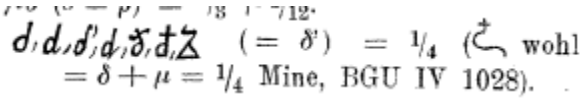

Figure 1. Entry under the headword "Siglae" in *Paulys Real-Encyclopädie* (Stuttgart, 1923: 2307). This snippet shows the various forms of the GREEK ONE QUARTER SIGN.

176 THE OXFORD HANDBOOK OF PAPYROLOGY

SOME COMMON ABBREVIATIONS AND SYMBOLS

	ἄρουρα
	ἀρτάβη
	χοῖνιξ
	λίτρα
	οὐγκία
	τάλαντον
	δραχμή
	ὀβολός
	διώβολον
	τριώβολον
	τετρώβολον
	πεντώβολον
	ἡμιωβέλιον
	δηνάριος
	μυριάς
	νόμισμα
	κεράτιον
	1/2
	1/4
	3/4 (Rom.)
	200 (Byz.)
	900 (Byz.)
	0 (Isl.)
	αὐτός
	γίνεται
	ἔτους

Figure 2. Common abbreviations and symbols found in papyrology (Gonis 2009: 176). This table shows the shapes for GREEK ONE QUARTER SIGN and GREEK SINUSOID SIGN (last entry, *etous*, 'year'). It also shows the symbol for GREEK SINUSOID SIGN under '1/2' and *drachma*.

Figure 3a. Close-up of SB 12 10897, a papyrus from Thebes, dating to 126 CE, showing GREEK ONE QUARTER SIGN.

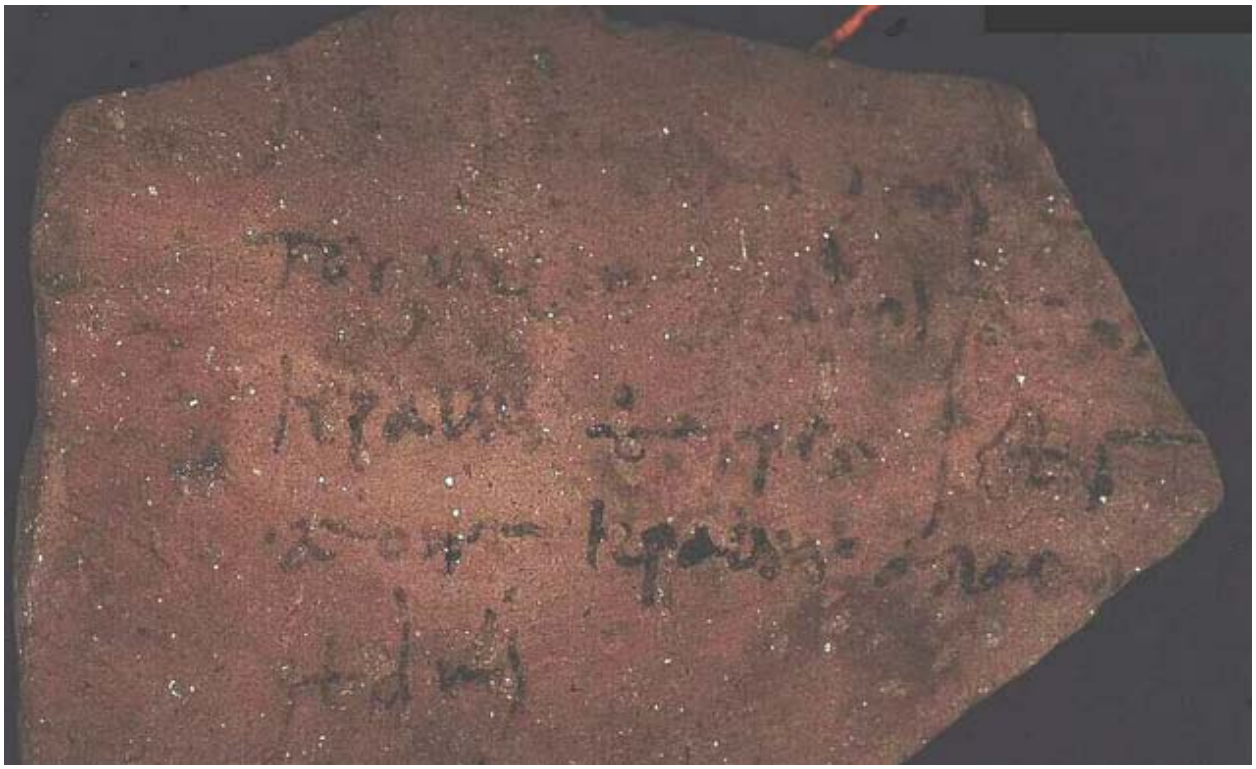

Figure 3b. Full image of text showing SB 12 10897.
(Source: http://bibd.uni-giessen.de/ostr/images/ostrgiss-inv043.jpg)

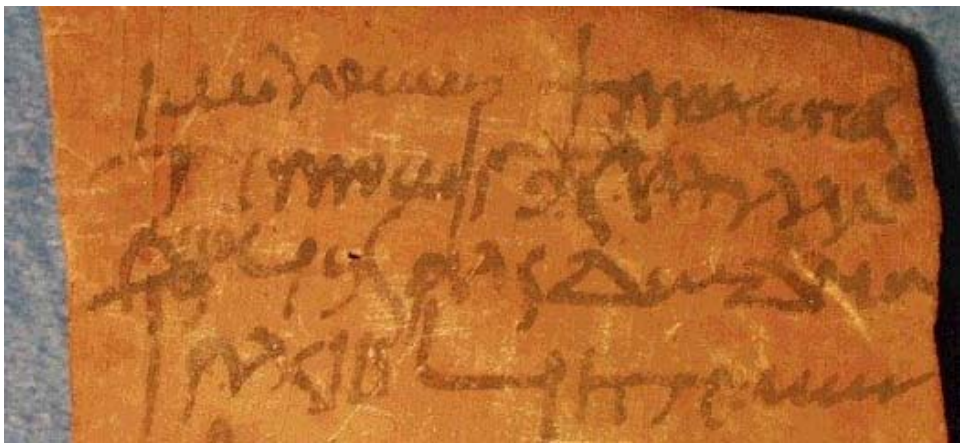

Figure 4. Image of O. Brux. 3, an ostracon from Thebes, dating to 114 CE (Roman period – Trajan), showing SINUSOID SIGN in the third line and the L-shaped 'year' sign in the fourth line. (Source: http://www.globalegyptianmuseum.org/large.aspx?img=images/KMKG-MRAH/BrE.0385%282%29.jpg)

ἴσον ἐπ[ιστ]έλλεταί σοι, ὅπως [τὸν περὶ τούτων]
καταχωρισμὸν ποιήσῃ[ς. v a c a t]
(ἔτους) ιη̸ʹ ιϛ̸ʹ η̸ʹ. Μεσ[ορὴ].

". . . I, Kephalon, have submitted [- - -]. 5th. To Heraklas, bibliophylax of public records. An exemplar of the petition submitted to me by the herein named person is forwarded to you, so that you may carry out the registration in this matter. Year 18-16-8, Mesore ."

Figure 5. Example in print showing the SINUSOID SIGN (in the last line). (Source: Bagnall, R.S., and K.A. Worp, "Three Notes on Byzantine Documents," *Zeitschrift für Papyrologie und Epigraphik* , Bd. 101, 1994: 98; http://www.jstor.org/stable/20189086)

Figure 6. This Herodian coin shows the TAU RHO to the right of the central image (TAU RHO being used as a monogram for *trito*, the 'third year'). On the left of the image is the date LΓ (= year 3). (Source: Ariel, D.T. "The Coins of Herod the Great in the Context of the Augustan Empire," in D.M. Jacobson and N. Kokkinos eds. *Herod and Augustus: Papers Presented at the IJS Conference, 21st–23rd June 2005,* IJS Studies in Judaica 6, Leiden-Boston: Brill, 2009: 425).

τριακάς ⲣ IG XII 1, 4.

Figure 7. Entry under the headword "Siglae" in *Paulys Real-Encyclopädie* (Stuttgart, 1923: 2287). This snippet shows the TAU RHO for *triakas* 'thirty', which is found in Greek inscriptions. ("IG XII" = Inscriptiones Graecae XII, Berlin 1895.)

Early Christograms

☧ = ΧΡΙΣΤΟΣ

⁜ = ΙΗΣΟΥΣ ΧΡΙΣΤΟΣ

ΙΗ = ΙΗΣΟΥΣ

ⲣ = In NT manuscripts (𝔓75, 𝔓66, 𝔓45), in abbreviated forms of σταυροω and σταυρος, e.g., σⲣος

Figure 8. Examples of Christograms (Source: Hurtado 2006a: 154)

Figure 9. Examples of TAU RHO as the first sign in lines 1-7 from the papyrus P.Leid. inv. 514. (Source: http://www.hum.leidenuniv.nl/papyrologisch-instituut/collectie/papyruscollectie.html)

DDbDP transcription: p.brux.bawit.43 [xml]

ϯ ἐν ὀνόματ[ι] τ[–ca.?–] ὁμοουσίου
ἐν μονάτι(*) τριάτ[ος](*)[–ca.?–]

Figure 10. Example of TAU RHO appearing in a transcription by the Duke Databank of Documentary Papyri. The papyri text is a Christian invocation from Bawit (Hermopolites), and dates to 6-7c CE. (Source: http://www.papyri.info/ddbdp/p.brux.bawit;;43)

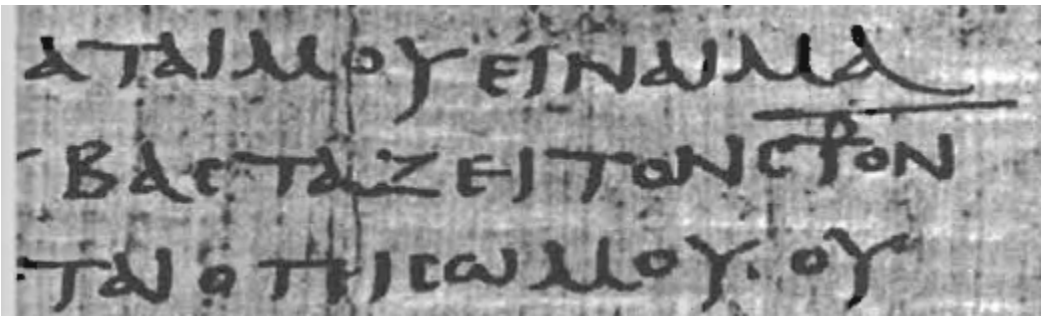

Figure 11. Close-up of P. Bodmer XIV, P75 (Luke 14:27). This figure shows TAU RHO (staurogram) in abbreviated form of *stauron*, line 2 above. (Source: Hurtado 2006a: 237)

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from http://www.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://www.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html**.**
See also http://www.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** *Proposal for three Greek papyrological characters*
2. Requester's name: *Joshua Sosin (Dept. of Classical Studies, Duke University), Paul Heilporn (Prof. of Papyrology, University of Strasbourg), Cisca Hoogendijk (SMES Papyrological Institute, Leiden University), Donald Mastronarde (Dept. of Classics, UC Berkeley), Todd Hickey (Center for the Tebtunis Papyri, UC Berkeley), and Deborah Anderson (SEI, UC Berkeley)*
3. Requester type (Member body/Liaison/Individual contribution): *Liaison member (SEI, UC Berkeley)*
4. Submission date: *27 January 2012*
5. Requester's reference (if applicable):
6. Choose one of the following:
   This is a complete proposal: *yes*
   (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters): *no*
      Proposed name of script:
   b. The proposal is for addition of character(s) to an existing block: *yes*
      Name of the existing block: *Ancient Greek Numbers, Ancient Symbols*
2. Number of characters in proposal: *3*
3. Proposed category (select one from below - see section 2.2 of P&P document):
   A-Contemporary ___ B.1-Specialized (small collection) x B.2-Specialized (large collection) ___
   C-Major extinct ___ D-Attested extinct ___ E-Minor extinct ___
   F-Archaic Hieroglyphic or Ideographic ___ G-Obscure or questionable usage symbols ___
4. Is a repertoire including character names provided? *yes*
   a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document? *yes*
   b. Are the character shapes attached in a legible form suitable for review? *yes*
5. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?
   Donald Mastronarde
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):
   Prof. Donald Mastronarde, Dept. of Classics, UC Berkeley
6. References:
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *yes*
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? *yes*
7. Special encoding issues:
   Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? *yes*

8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

[1] Form number: N4102-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? *no*
   If YES explain
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? *yes*
   If YES, with whom? *Users and experts, including Larry Hurtado, Gabby Bodard, Roger Bagnall, Rodney Ast, Terry Wolfong, Malcolm Choat, Maria Pantelia, Joel Kalvesmaki, and John Hudson*
   If YES, available relevant documents:
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? *yes*
   Reference: *(see proposal, characters are used by scholars and students working with Greek papyri)*
4. The context of use for the proposed characters (type of use; common or rare) *rare*
   Reference:
5. Are the proposed characters in current use by the user community? *yes*
   If YES, where? Reference: *(see proposal, in papyrological texts and materials discussing such texts)*
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? *no*
   If YES, is a rationale provided?
   If YES, reference:
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)? *see prop.*
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? *no*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters?
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character? *possibly*
    If YES, is a rationale for its inclusion provided? *yes*
    If YES, reference: *(see proposal)*
11. Does the proposal include use of combining characters and/or use of composite sequences? *no*
    If YES, is a rationale for such use provided?
    If YES, reference:
    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?
    If YES, reference:
12. Does the proposal contain characters with any special properties such as control function or similar semantics? *no*
    If YES, describe in detail (include attachment if necessary)
13. Does the proposal contain any Ideographic compatibility characters? *no*
    If YES, are the equivalent corresponding unified ideographic characters identified?
    If YES, reference: