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Title: Proposal to encode 11 cossic characters

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1. Background

Our proposal for encoding of 228 historic scientific characters (N5277 / L-24-02n), forwarded on February 19, 2024, has been discussed at the WG2-#71 meeting (June 10–14, 2024) in Prague. The discussion led to the idea to forward the several character groups seperately, in order to ease the approval process. Hence we intend to submit these character sets in a number of new proposals, of which this document is the 1st.

The background of this proposal is the collaboration of two European institutions: the Leibniz-Archiv: Forschungsstelle der Leibniz-Edition (a department of the Gottfried Wilhelm Leibniz Bibliothek (Hanover, Germany), supervised by the Göttingen Academy of Science and Humanities in Lower Saxony; and the *Philiumm* research group of CNRS (UMR 7219, laboratoire SPHERE) / Université de Paris VII (France), in the Philiumm Project (2021–2026), funded by the European Research Council (N° ADG-101020985). The characters proposed appear in the works of Gottfried Wilhelm Leibniz (1646–1716) and his contemporaries.

For more general information about the *Philiumm* project and our research work, please see the doc. N5277.

2. About Coss or cossic characters

"Coss" (or "Cofs", historic) is a German term for written or printed treatises about Algebra. It derives from Italian *cosa* ("thing") which was used to denote variables in calculations.

The first printed "Coss" was a book by German mathematician Christoff Rudolff (ca. 1500 – before 1543): *Behend und hübfch Rechnung durch die kunftreichen regeln Algebre, so gemeinicklich die Cofs genent werden.* ("Handy and neat calculation by the artful Algebre rules, commonly so called the Coss.") The work was based on older algebra manuscripts which the author studied in Vienna. The book was released in Straßburg 1525 and was out of stock shortly thereafter. Because it was such a desired title, Michael Stifel edited a new and extended version of Rudolff's *Coss* in 1553.

In the 1525 edition the character " $\sqrt{}$ " was used the first time for *radix* in print. For the expression of powers (up to ninth) Rudolff used a set of special abbreviation characters. Some of them were common in writing at the time (and used for different purposes), some were rather special additions. Since this set of cossic characters appears explicitly for a longer time in mathematical literature, we see a need to have them encoded as a whole, in order to enable precise content encoding in facsimile transcriptions of the historic sources.

Title page of Rudolff's *Coss*, edited in Straßburg 1525. Source: Münchner Digitalisierungszentrum

Title page of Stifel's new edition of Rudolff's *Coss*, printed in Königsberg 1553. Source: ETH Zurich





2

We see a case for encoding this whole set of characters in its particular form and determined by its special meaning and function. For editions of historic sources in facsimile mode it is neccessary to encode these symbols accurately and unambiguously.

3. Characters

The cossic characters set consists of two sub-groups. If this proposal gets accepted, the following new characters will exist.

Group 1 is a range of 8 Latin abbreviation characters, derivates from Latin letters c, d, r, f and z. They represent the initials of the names of roots or powers. These characters are comparable to other already encoded abbreviation characters, like fb (*libra*, 2114), ϕ (*per*, 214C), δ (*denarius/ penny*, 20B0), ϕ (*prae-*, A755) or ψ (*-rum*, A75D) which show a combination of a modified basic shape with some sort of graphic attachment, like scriptive loops directly connected to or crossing the base glyph.

We prefer to encode them as *mathematical symbols*, rather than as *Latin letters*. The aspect of case pairing is not relevant in all of the cases since no capital variants of these characters have ever been used anywhere. "Lowercase" in the proposed character names is merely to indicate the proper 'parent' characters. The cossic characters do not occur as abbreviations in general Latin writing but exclusively in calculation contexts. Hence their specific shapes in combination with very specific meaning should justify their encoding, even if an apparent close optical 'neighbourhood' to existing characters can be observed.

$oldsymbol{\mathcal{C}}$ LOWERCASE C WITH SMALL SLASH

= cubus

• denotes cube of the unknown

CC LOWERCASE C WITH RIGHT LOOP

- = cubus
- denotes cube of the unknown
- ç

LOWERCASE C WITH DESCENDER

- = census
- denotes square of the unknown
- ð

LOWERCASE D ROTUNDA WITH CROSSING LOOP

- = dragma
- denotes numerus / constant
- ightarrow 1E9F δ latin small letter delta
- ightarrow A77A ${\mathfrak d}$ latin small letter insular d
- \rightarrow 20B0 & german penny sign

$2\!\mathcal{Q}$ lowercase r rotunda with loop

- = res, radix
- denotes the unknown
- → A75D 2 latin small letter r rotunda
- \rightarrow A75D μ latin small letter rum rotunda
- \rightarrow A776 \mathbf{R} latin letter small capital rum
- \rightarrow 221A $\sqrt{}$ square root



LOWERCASE DOUBLE S ABBREVIATION SIGN

- = sursolidum
- denotes fifth power of the unknown
- also used as abbreviation for solidus, semis
- \rightarrow 017F f latin small letter long s
- ightarrow 0073 m s latin small letter s
- \rightarrow 00DF β latin small letter sharp s
- ightarrow A7D7 m I latin small letter middle scots s

LOWERCASE LONG S WITH TOP LOOP

- = sursolidum
- denotes fifth power of the unknown
- \rightarrow 017F f latin small letter long s
- → 1E9C & latin small letter long s with diagonal stroke
- ightarrow 1E9D ${
 m f}$ latin small letter long s with high stroke
- ¥

 \mathcal{S}

LOWERCASE KURRENT Z SIGN

- = zensus
- denotes square of the unknown
- \rightarrow 0292 z latin small letter ezh

Group 2 is a set of *root* or *radix* symbols, their shapes beeing related to $\sqrt{(221A)}$.



RADIX SIGN 1

= fourth root \rightarrow 221A $\sqrt{}$ square root



RADIX SIGN 2

= eighth root \rightarrow 221A $\sqrt{}$ square root



RADIX SIGN 3

= sixteenth root \rightarrow 221A $\sqrt{}$ square root

In group 1 there are two different characters for "cubus": ζ and ζ ?; two different characters for "census/zensus": ζ and χ ; and two different characters for "sursolidum": β and β ". Although the meaning is the same in either pairing, the actual glyphs differ considerably (most obvious with "census/zensus") and these typographic differences are strongly tied to certain writing or publishing traditions. In an edition of sources it would not be tolerable to encode e.g. β instead of β ". Therefore we propose to encode all the characters, thus being in line with a principle which has been followed in e.g. the alchemical characters block, where also (in some cases) two or three different characters bear (basically) the same meaning.

Because the small capital R with stroke R_k (A776) does also belong to the set of cossic characters, we additionally propose a new anotation to this character in the standard:

A776 R LATIN LETTER SMALL CAPITAL RUM

- cossic sign for res, radix
- \rightarrow XXXX 22 lowercase r rotunda with loop
- ightarrow A75D arphi latin small letter rum rotunda

4. Figures and explanations

The *Coss* characters became a widely adopted set of characters for denoting powers and roots, in the 16th and 17th century. We show a couple of instances from printed sources and also a piece of manuscript evidence by Leibniz. See page 17 for a synopsis of all characters belonging to the first group.

25 bargmifche/bie negft aber ein quadratie . Jtem bie iffradir 3 / mußder sens 9 fein / bañ 3 mal 3 pringt vierd sal ein cubic/darnach alweg nach sweien bar swifchen widerumb cin cubice? (wie dan Eucli:in T Eubus ift ein corperlich sal/gleich preit/ lang of ber 8 vnd o pro: des neunden buchs anseigt) haben nach ernftlichem vleis erfunden die cofs/das ift/die bid /entfpringt wann ich den zens multiplicir mitt feine radir/als 2 mal 4 thut 8/3 mal 9 macht 27 te. rechnung von einem bing/ vn die zalen nachnatür Benfdegens die vierd in der ordnung/ ift ein quas brat/erwachfen von einem quadrat in fich felbfi ges multiplteirt/dañ die wurst folher sal/ift aliweg ein licher ordnung genent/wie bernachuolgt.dragma/ radir/ senfus/ cubus/senfidesens/furfolidum/sene quadrat.ale 4 mal 4 pringt ic.ite 9 mal 9 thut 81. ficubus/biffurfolidum/senfenfdesens/ cubus de cu bo. Saben auch je eine von fürs wegen mit einem ic cin vngefchictte sal / hat wider radicem quad:as tam noch cubicam / würt von Boecio su latein ges character : genomen von anfang des worts oder na mens:alfo verzeichnet dragma oder numerus nennt altera parte longioz. 9 Benficubus/darumbalfogefprochen/ das fie hat radir 22 zenfus cubus radicem quadratam onnd auch cubicam/als 64 ift 3 cin senficubus/darauf radir quad:ata ift 8. ond ra dir cubica/4. gDiffurfolidum/die acht in der ordnung/auch al 3cnfdegens 38 furfolidum ß weg vngefchieft / hat weder radicem quadratam noch cubicam. . senficubus bs biffurfolidum nody cuorcam. C Senfsenfoesens/alfo genent/ds fie erwechft von eunem senfoesens in fich quadrate gemultiplicitt/ als 256 entipeingt von 16 mal 16. C Die letif in den obemelten salen ift eubus de eu-bo/alfo gefproch? / das fie erwechft von einem eubo in fich eubice gemultiplicitt/alf 5 12 erwechft von 8 mals 3th acht malen. Dolgt bernach ein tafl/hat beietermol/das erft in proportione duvid / wirt ide 388 senfsenfocsens cce cubus de cubo Dagma oder numerus würt hie genom? gleich fam 1. ift fein sal funder gibt andern salen ir wefen Tadir ift die feiten oder wurst eins quadtats. Benfus:die britt in der ordnüg: ift allweg ein qua brat/entfpringt auß multiplicirüg des radir in fich ander brei erempl/ das erft in proportione dupla/witt ide felbft. Darumb wan radir 2 bedeut/ift 4 fein sens. 28. Bå probirn bas achter erempl / fen ich bas ber rabir muß folche gefchehen durch das seichen - Alsich will fubtrahirn 5 9 von 622/Steet alfo 622-will dich auch albie in funderbeit vermant ha 2 bedeute. Steet alfo 36 56 auff ju mercten/wañ beid zalen mit vil quantitetn gefdziben fein/ bere cin/jwo oder mer gefchen wer Reft 28 den in der obern zal von welcher du fubrrahuff/ die da fein gleich im nam habe. fcheib fie onter die ges zogen linie mit irem zeichen / fian fie in der ontern ØJultiplicirn. In difer übung ift erftlich von noten/ju wiffen ben nam cins products fo auf der multiplication erwar chfen wärt. dañ fo ich multiplicit ze mit ze fompt z. at / fchicib fie binab mitt irem gegen zeichen / als Flartich erfcheint in nachuolgenden erempin 2e mit &/fompt c. & in fich felbft/ fompt im product 38 :? wie die nachgefchribne multiplicir tafl flar 22+49 -18 68+422+69 4 22 + 39 22 lichaufweift. Steft. 3 20 + 19 - 18 Steft. 28 + 6 20 + 6 9 9 22 8 ct 38 B 3ct bB 338 cct 9 22 8 ct 38 B 3ct bB 338 cct 22 8 ct 38 B 3ct bB 338 cct item 8 + >ce item 1220+69 9 722-29 8+30-100 Reft. 4 8 + 4 ce + 10 9 Reft. 5 22 + 8 9 - 3 8 T Droba. Refoluir die obern swo salen/ jende ein refoluten von der andern/ pleibe dan die refolution 22 2 2 2 3 cc 38 p yer b 388 cc 3 3 cc 38 B yer b 388 cc cc cc 38 B yer b 388 cc B 3 yc b 388 cc B 3 yc b 398 cc B 3 yc b 398 cc Cc 4 38 B ycc b 3 388 cc Cc 4 38 B ycc b 3 388 cc Cc 4 38 B ycc b 3 388 cc Cc 4 38 B ycc b 3 388 cc Cc 4 38 B ycc b 3 388 cc Cc 4 38 B ycc b 3 388 cc Cc 4 38 B ycc Cc 4 3 ber onteriften sal fo haftu recht fubtrabirt. Nim ber bitteritett jar fo bala rege fubriagite. Stim son bith das vierb erempl/fes ze fei 3/dennad mae den 9 ze / 27 / dauon fubrahit 5 pleibt zz/ bie rejos lusen der erften sal. Beiter 5 ze machen 15 /nim da uon 7/reftn 8 die refolusen der andern / nun fubra bf bf 333 coe | Die ander in der oberften tigen 338 338 cce | den seilen das in gemeinem wincht bir 8 von 22 reftat 14 . fouil pringt auch die onterift cee |cee | gefunden würt / seigt ben nam bes pros bucte fo auf dem multiplicim erwachfen if. 2Bar lich die tafel ift fchwer ine hirn an bring? noch fch-werer au behalten. darumb wil ich dich ein andern al/bañ 4 2e mache 12 baju thu ich 2/werde auch 14 922-59. 22 5 20. Steffat 4 2 + 2 9. 14 wegleiten alfo . Ses bie quantitet nacheinander!

Christoff Rudolff: Behend und hübsch Rechnung durch die kunstreichen regeln Algebre, so gemeinicklich die Coss genennt werden. Straßburg 1525. fol. 24v-25r, 27v-28r.

5

refolution der onteriften sal/ fo haffu recht gemuß tiplicirt. Als ich wil probirn by drit er empl/fese ben merdt radicis y . bemnach würt die erft ber obern: nemlich 6 1e+89:refoluirt in 38. die ander in 18/ multiplicit 38 mit 18 fomen 684.fouil bedeut auch Das facit/ dafi 30 & machen >50/ dauon fubtrabir 10/als ben werdt 220/mer fubtrahir 56/pleiben684 habich wellen probiren.

Diuidirn.

Bañ du haft diuidirt die groffer quantitet durch die fleiner/wilt wiffen den nam des quocients/Gee in die nachuolged tafl/ fuch die groffer quantitet in ber obern/ die fleiner in der untern überect hengen? den jeilen fo wurt dir in gemeinem windt der nam des quocients angezeigt.

	9	20;	8	R	38	ß	300	68	888	cre
9	9	20	8	1 ce	38	ß	302	bß	338	cce
100	28	9	22	8	ce	38	1B	see	bB	333
		8	9	20	8	R	38	IB	1300	68
	32	100	æ	9	22	18	R	188	ß	zre
		5.00		38	9	22	18	æ	88	ß
	1.54		Diar	1-1700	ß	9	20	8	æ	138
	100			1	100	1800	9	22	8	æ
ų,				1		192	bß	9	22	*
1	1	ほかい		1			1254	338	9	22
24	19-0-1	d Trees	C. Salar	Sind!			1	and the	200	9

DBaft ein quantitet wirt geteilt durch ein andere in im namen gleich/fompt alweg g im quocient.würt cin quantitet burch & geteilt/ fo fompt fold quantis tet im quocient. Dan g verandert feine quantitet wi ber im multiplicirn nach diuidirn.

30

g Ein ander weiß/ben nam des quocients ju fuch? wandie groffer geteilt wärt burch ein fleinere ober gleiche quantitet.

Schreib die quantitet nacheinander bit verseiche fie mit der sal natürlicher ordnung/ wie du im mut tiplicirn gelernt haftalfo.



o 1 2 3 4 5 6 > 8 9 9 22 8 ce 38 ß zee bß 238 cee Subtrahir die zalder fleinern von der zalder gröf fern quantitet / durch da übrig würt fundt ber nam Des quocients. Als ich diuidir f durch e. / fubtrahir bes quocients. Als ich diuidir b durch et / jubrahir 3 bon 5 reften 2 / jeigt das der quocient fei y. Jiem ich diuidir zee durch / fubrahir 5 von 6 reftat 1 / seigt im quocient ze. Jiem ich diuidir ce durch ee/ fubrahir 3 von 3 reftat 0 / jeigt g. Des ju mererm verftandt nim dife erempl. Jch diuidir 6 y durch z ze Steet alfo. 6 y (fa:3 ze. Jtem 5 ce (fa:2-1-y. Jtem 12) (fa:49

220

220 220 38 TD:oba. Acfoluir peide salen. Diuidir ein refolus Ben durch die ander/das auß folcher teilung fomen würdt / müß gleich fein des quocients refolusen. Bu einer prob nim das erft erempel / fet den werde

1	and the second	5. H
	binibirt werd? burd 3. Darumb las dich albie nit	Dieteiler
	irren / mas oben im fünfften capitl des erften tepls	28 , 89
	ben ber division acfaatift.	3 66 12 12
	T Dis and any ation about al hou cafe	4 88 10 8
	Sole etfe equation over tegi ver colos	5 ß Geingleich 20 ce fa: 122.29
	23an zwo quantitein naturlicher oronung einans	6 gre 24 38
	Dergleich werden / diuidir die fleiner in die groffer	7 bß 28 ß
	quantitet / ber quocient feigt an ben werdt 12e. 416	8 888 32 80C
	in difen erempin.	9 cce 36 bß
	Dieteiler	T.Die dritt equation.
	3 20 6 9	DBan zwo quantitein einander gleich werden/jwi
	48 84	fchen welche zwo andere : naturlicher ordnug nady
	2 cc 10 8	begriffen:gefchwige fein. Diuidir die fleiner in die
	6 38 12 02	groffer quatitet / radir cubica des quociets seigt an
	7 B Seingleich 14 33 factt 120.29	Die wiler (den werde ine. Als
	8 yre 10 p	2 R 16 g
	9 bß 18 gre	3 88 24 20
	10383 20 bk	4 \$ 32 8
	11 506 22 388	5 zre Geingleich 40 re fa: 12e. 22e3
	T. Die ander equation.	6 b/s 48 33
	Dan zwo quantitetn einander gleich werden/ zwi	2 888 20 1
	fchen welchen eine : natürlicher ordnung nach bes	s cre 04 sre
55	griffen:gefchwigen ift . Diuidier die fleiner in die	Die vierd equation
2	groffer quantitet /radir quadrata des quociets jeigt	25an zwo quantitein einander gleich werden zwis
	an den werdt 12e. 216	fchen welche / drey andere natürlicher ordnug nach
	And a first and a second of the second of th	begriffen/geldwige fein. Diutdir die fleiner in die
	And the second se	groffer quantitet/ Nadir quadrata von radice quas
	and the second	Diata Desquocients/zeigt an Den werdt me. Als
	Within & South Landson - Southern and south theme	that is a site .
-	the second s	

Christoff Rudolff: Behend und hübsch Rechnung durch die kunstreichen regeln Algebre, so gemeinicklich die Coss genennt werden. Straßburg 1525. fol. 29v-30r, 53v-54r.

6



Christoff Rudolff: *Behend und hübſch Rechnung* ... Straßburg 1525, part of fol. 24v. In this chapter Rudolff introduces the set of root and power symbols by samples and explanations. We can see: χ LOWERCASE KURRENT Z SIGN, § LOWERCASE D ROTUNDA WITH CROSSING LOOP, 2ϱ LOWERCASE R ROTUNDA WITH LOOP, $c\ell$ LOWERCASE C WITH RIGHT LOOP and β LOWERCASE DOUBLE S ABBREVIATION SIGN.

This print demonstrates the deliberate distinction between the cossic character χ and the normal fraktur z (see at \vdots). Whereas in other scenarios this two shapes could be seen as 'just' glyph variants without semantic distinction, in this case the form difference is clearly an indicator for a specific meaning. The character χ LOWERCASE KURRENT Z SIGN is denoting *zensus*. It is semantically determined by this one unambiguous meaning, and graphically characterized by a) a round-shaped upper part (mostly), and b) a prominent loop descender which crosses upwards. The origin of its shape is neither *Fraktur* type nor Latin script style but the German *Kurrent* writing style. Therefore the character is neither to be unified with *ezh* (0292) nor with any of the mathematical alphanumeric characters 1D4B5 etc^a, in order to secure its specific semantic content.

The character β should not be unified with LATIN SMALL LETTER SHARP S (00DF, its somewhat obscure origin going back to medieval long-s abbreviation characters and later becoming typographically a ligature of long s and z in blackletter styles). Wheras the β character is clearly and unambiguously based on the ligation of **f** and **s** in order to facilitate a crisp abbreviation sign for frequently occuring words like *femis*, *folidus* or *furfolidus*. Since the German **B** appears in various shapes nowadays in typefaces (e.g. in Times – like seen here – it is definitely not a f-s ligature), it would be misleading to assign 00DF to the special usage shown in these examples.

an femper fequirar 138.1 numerus zenfizenficus, quiuidelis cer numerum quadra um habeat pro fua radice quadrata. Numerum zensizensicum semper sequitur 1 B,idest, numerus furdefolidus. Numerum talem femper fequitur nu.nerus zenficubicus, qui in coffica progreffione fic figuratur 12ce. Erlic deinceps in infinitum. Hæceft igitur progreffio coffica, ferens denominationes numerori cofficorum 1. 1 20. 13. 100. 133. 18. 1300. 1bb. 1338. 1000. 12 B. 10B. 13200. ids. 12bs. 1008. 13222. Et fic deinceps in infinitum. Nulla autement progressio Ceometrica, quain ista Coffica" progressio coprehendat, cum nullus sit numerus qui non possit repræfentari per 12e. Et nullus fit numerus quadratus, qui non reprælentetor fub ifto termino eins 13. Atcgrailes fit numerus cubicus, g no copreheñas lit hoc teratino eiu si ce. l'e fic de alis. Sicut autem denominationes uulgares, non feium unitates recipium, fed nullum excludent; fic denominationes illa coffi cæ,quosliber numeros patiunf, ut 420. 10%. 50re. Et fic de alis. Dicuntur autem Coffici numeri, proportionaliter effe deno

Stifel 1544 (after Cajori). This sample shows γ LOWERCASE KURRENT Z SIGN, 2ϱ LOWERCASE R ROTUNDA WITH LOOP, ce LOWERCASE C WITH RIGHT LOOP and β LOWERCASE DOUBLE S ABBREVIATION SIGN.

euel multiplicar heziste :y afsi mesmo senalados co 1, 2,3, &c. Y encima del 8, vn zero, alsi. 0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 8. 22. 3. re. 33. B. zre. bf. 333. cre. Y afsi como en el multiplicar fummas las quantidades q

Aurel 1552, fol. 73B (after Cajori). This sample shows γ LOWERCASE KURRENT Z SIGN (2., 4., 6., 8.), § LOWERCASE D ROTUNDA WITH CROSSING LOOP (0.), 2ρ LOWERCASE R ROTUNDA WITH LOOP (1.), $c\rho$ LOWERCASE C WITH RIGHT LOOP 3., 6., 9.), and β LOWERCASE DOUBLE S ABBREVIATION SIGN (7.).

These samples also show how those characters were used in combination to express the powers 4th and so on.

PREMIER LIVRE nous fournit de termes consecutiz, pour expofer les nombres Radicaus e leurs Sines:comme vous voyez par la Table ici mife. 0, 1, 2, 3, 4 5, 6, 7, 8, 9, 10, I, B4, &, d, &&, B, &d, bB, &&, dd, &B, 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 11, 12, 13, 14, 15, 16. cs, ççç, ds, çbs, cs, çççç 2048, 4096, 8192, 16384, 32768, 65536. н, L'ordre des Expofans composez. 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, &c. L'ordre des Sines composez. çç, çq, ççç, qq, çß, ççq, çbß. &c. La ou vous noterez, que le Ganlique ét touljours participant, ou le Cube redouble. L'ordre des Exposans incomposez. Example de la Diuision. Ie veu diuiser 30ç m. 58k, p. 24, par 5k m.3, La posicion sera comme vous voyez, 40 38 gm. 88 P. 24 8 B2 m. 3. 3.0 g m. 4.8 B2. Ie di donq einsi : 5 an 30 sont com-

Three extracts from Peletier 1554: c_{ℓ} LOWERCASE C WITH DESCENDER, c_{ℓ}^{o} LOWERCASE C WITH RIGHT LOOP and β LOWERCASE DOUBLE S ABBREVIATION SIGN. These samples also demonstrate the usage of R_{ℓ} (A776) as part of the cossic set, as well as the use

These samples also demonstrate the usage of R_{k} (A776) as part of the cossic set, as well as the use of slashed figures (on which we elaborate in another proposal).

uoide the tediouse repetition of these woozdes: is e= qualle to: I will sette as I doe often in woozke ble, a paire of paralleles, oz Geniowe lines of one lengthe, thus:=_____, bicause noc. 2. thyinges, can be moare equalle. And now marke these nombers.

1.
$$14.22.4-1.15.9=-71.9.$$

2. $20.22.-..18.9=-.102.9.$
3. $26.3.-1-1022=-9.3.-1022-1.213.9.$
4. $19.22-1-192.9=-103-1089-1922$
5. $18.22-1-24.9.=-8.3.-1-2.22.$
6. $343.--1222-4022-1-4(09-9.3.1)$
1. In the first there appeareth. 2. nombers, that is

14.20.



Two extracts from Recorde 1557 (after Cajori): cc LOWERCASE C WITH RIGHT LOOP, § LOWERCASE D ROTUNDA WITH CROSSING LOOP, 2c LOWERCASE R ROTUNDA WITH LOOP and γ LOWERCASE KURRENT Z SIGN.

Р

nis, a diuerfe Arithmetike from the other. Practife bryngeth in, here, diuerfe compoundyng of Numbers: as fome tyme, two, three, foure (or more) Radicall nubers, diuerfly knit, by fignes, of More & Leffe: as thus $\sqrt{3}$ 12 + \sqrt{C} 15. Or thus $\sqrt{3}$ 3 19 + \sqrt{C} 12 - $\sqrt{3}$ 2. & c. And fome tyme with whole numbers, or fractions of whole Number, amog them: as 20 + $\sqrt{3}$ 24. \sqrt{C} 16 + 33 - $\sqrt{3}$ 10. $\sqrt{3}$ $\sqrt{3}$ 44 + 12 $\frac{1}{2}$ + \sqrt{C} 9. And fo infinitely, may hap the varietie. After this : Both the one and the other.

Example from Dee 1570 (after Cajori): ce LOWERCASE C WITH RIGHT LOOP and γ LOWER-CASE KURRENT Z SIGN.

0,1,2, 3,4, 5,6,7,8, 1, R, ç, q, çç, ß, çq, bß, ççç, qq, çß, 1,2,4,8,16,32,64,128,256,512,1024 11, 12, 13, 14, 15, 16 $c\beta$, gcq, $d\beta$, $gb\beta$, $q\beta$, 2048,4096,8192,16384,32768,65536

From Peletier 1620.

C A P. XXVIII. 159 Sie rurfus Binomium primum 72 7 J8 28 10. Maius nomen 72. fecabitur in duas partes producentes 720. 9' artam partem quadrati 2880. maioris nominis, hac ratione. Semiflis maioris nominis 72. ell 36. a cuius quadrato 1296. detracta quarta pars prædicta 720. relinquit 576. cu-ius radix 24. addita ad femiflem no-minatam 36. & derracta h eadem, fa-18 60 + 18 12 18 60 + 18 11 +18.720 . 60 + 18 720 cit partes quafir 15 60. & 12. Irgo ra-dix Binomij eft 13 60 + 13 12. quod hic probatum eft per multiplicationem radicis in fe quadrate. 72 + 18 2680 Sit quoque elicienda radix ex hoc refiduo fexto 18 60 - 18 12. Maius nomen J& 60. diffribuetur in duas partes producetes 3. quartam partem quadrat: 12. minoris nominis, hoc pacto. Semifis maioris nominis $J_{\mathcal{X}}$ 60. elt $J_{\mathcal{X}}$ 15. a cuius quadrato 15. detracta nomi-nata pars quarta 3. relinquit 12. cuius radix $J_{\mathcal{X}}$ 12. addita ad fe-millem $J_{\mathcal{X}}$ 15. prædictam, & ab eadem fublata facit partes $J_{\mathcal{X}}$ 15 + $J_{\mathcal{X}}$ 12. & $J_{\mathcal{X}}$ 15 — $J_{\mathcal{X}}$ 12. Ergo radix dicti Refidui fexti elt $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 15 + $J_{\mathcal{X}}$ 12) — $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 25 – $J_{\mathcal{X}}$ 12 – $J_{\mathcal{X}}$ 12 – $J_{\mathcal{X}}$ 12 – $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 25 – $J_{\mathcal{X}}$ 12 – $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 27 – $J_{\mathcal{X}}$ 12 – $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 27 – $J_{\mathcal{X}}$ 12 – $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 27 – $J_{\mathcal{X}}$ 27 – $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 27 – $J_{\mathcal{X}}$ 12 – $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 27 – $J_{\mathcal{X}}$ 12 – $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 27 – $J_{\mathcal{X}}$ 27 – $J_{\mathcal{X}}$ ($J_{\mathcal{X}}$ 27 – J_{\mathcal $\frac{18}{18} (18 12 + 18 15) - 18 (18 12 - 18 15) \\ 18 (18 12 + 18 15) - 18 (18 12 - 18 15) \\ 18 (18 12 + 18 15) - 18 (18 12 - 18 15)$ Quadrata partium. 18 15 + 18 12 & 18 15 - 18 12 - 18 3 18 3 18 6a - JE 12 Summa .

Clavius 1608 (after Cajori): χ LOWERCASE KURRENT Z SIGN. In this setting of Roman type style the common z character will have the usual Greek-Latin 'Zeta' shape, z, whereas the symbol for *zensus* retains not only the z initial (in this Latin treatise one may expect census instead), but also the specific *kurrent* script form of the letter.

	72	De Notati	one Alge	brica.		CAI
	Nomina.		[CI	aracteres.		Pote
20 36 P	Radix Quadratum Gubus Quad. quadratum Surdefolidum Quad.Cubi. 2 ^m Surdefolidum. Quad. quad.quad. Cubi cubus Quad. Surdefol.	29 23 23 23 23 23 24 23 24 25 25 25 25 25 25 25 25 25 25 25 25 25	R Q C Q S Q S Q S Q C Q S	A Aq Ac Aqq Aqc Aqc Aqqc Aqqc Aqcc Aqqc Aqcc	4 aa aaa 4444 8kc.	a a a a a a a a a a a a a a a a a a a
	3 th Surdelolidum Quad. quad. cubi 4 th Surdefolidum Quad. 2 ⁱ Surdefol. Cubus Surdefol. Quad.quad.quad.quad.qua &c.	2,2,2,2 Djø 2,Bjø ejø ad. 2,2,2,2,2	2 2 2 2 2 5 2 5 2 5 5 2 5 5 5 5 5 5 5 5	Aqcee Accee Aqqeee Aqeeee Accee Accee		812 a 13 a 14 a 15 a 26

From Wallis, Operum mathematicorum, 1657 (after Cajori); shows the use of f^o LOWERCASE LONG S WITH TOP LOOP for "sursolidum".

The γ LOWERCASE KURRENT Z SIGN has been given a sort of 'Latinization treatment' here, based rather on the Greek/Roman zeta shape. We regard this as a glyph variant with no distinctive meaning.

Go. 30

Ms. LH 4 I 4b 1v., Leibniz 1676, shows a frequent use of cossic signs: c LOWERCASE C WITH SMALL SLASH for *cubus*, 2c LOWERCASE R ROTUNDA WITH LOOP for *radix* and χ LOWERCASE KURRENT Z SIGN for *zensus*.

The use of the simplier ς instead of cc for *cubus* is believed to originate from writings of Descartes, from who Leibniz (and other authors) made text copies.

ØSultiplicirn.

Dultiplicir einen cubic mit dem andern/ auf dem Das bo fomen würt ertrahir radicem cubicam/fol de radir seigt an bas product fo erwachfen ift auf multiplicirung einer cubic wurst mitt der andern. Bit erempl du folt -/ 27 multipliciren mitt -/ 8 multiplicir27 mit 8 /entfpringt 216 / daraufradir cubica thut 6. Souil erwechft manich - 27 muls tiplicir mit w/ S

> Erempl von communicanten 54 mit w/ 16 facit w/ 864 Bon iracionaln

DBann ein zal denominier ift / die ander nit/fo muß das abfolut vorhin auch su gleich denominire werden . Gefchicht alfo . multiplicir das abfolut in fich felbft cubice/fes vor das product difen character

20 mut 2 Steet alfo und 20 mitt und 8 fa: und 160 12 mit w 5 fteet alfo w 1728 mit w 5 fa:w 8640 w 6 mit 2 1/2 fteet alfo w 1728 mit w 5 fa:w 8640 w 6 mit 2 1/2 fteet alfo w 6 mit w 13/8 fa:w 93 1/2 Zuß dem würt verstanden das duptirn in difem al gorithmo ift mitt 8 multiplicirn. Zriplirn mitt 27. Suadruplirn mit 64 multiplicirn/ vnd widerumb medijrn durch 8 diuidirn :?

Diuidirn.

Diuidir eine cubic durch den andern/ radir cubica Des

16200000000 facit 5451 600000000 facit 1817 Olimdyfleiner vögröffern. Neft: 363 4taufentett

Das neund Lavitl. Lernt eine algorithmum su latein genent de furdis quadratorum de quadratis. Derd das quadratum

de quadrato ift oben im fünfften capiti / genent moz Den senf Desens von földen salen ift der gegenwer

Die wursel oder radir von genfdegens wart albie.

Als J 16 bedeut radicistadicem / dasift : radicem quadiatam auf der genierten murst von 16. Abbern

Racional / ertrahir die wurßin . Addier

Tracional / 210dier burch bas seichen +

Lomunicantn/ Reducir fie in die fleinft proporse ons fie rational werde /darnach thù ein wurst sur andern. ds collect mul

tiplicir in fich felbft quadrate / das darauf

fompt multiplicir auch quadrate. Da letft

quadrat gemultiplicirt mit der gemeinen

menfur/gibt cine senf dezens/auf welche

em ertrabier radicis radice. die letft radir

befchleuft peibe murgin ber erften salen.

vermercht durch folchen character -

eine jur andern

Dergleichen probir auch die andern fpecies.

Radir fa: 3634

800000000

tig algorithmus.

Befib

feindie

acnfde.

ins

bis quocients bericht bich wie offrein wurst die an ber inhelt.

Erempl von racionaln. /64 burch ... / 6 fa:2 it? ... / 125 burch ... / 27 fa:-5 Don communicanten

/54durch 16fa: 1 it. - / 375durch / Sifa: 1 27 Durch of facit w/ 3

Dan cin sal denominirt ift / Die ander nit / fo muß Das abfolut auch vorhin denominirt werde: wie du im multiplitin verfianden haft. 2lls du wilt dini dirn 1 36 durch 3. Steet alfo - 36 durch 127 facit 1 1- Jeem ich wild undirn 6 durch 12. Steet alfo. 126 durch - 4 facit - 54.

Addirn.

Lernt swo cubic wurfin in ein fumma pring? alfo. Defich / fein Die cubic salen racional / ertrahir die wursin/abbir eine zur andern. 2110- 8 ju - 64/ thut 6. Sein fie inacional/addirein wurst sur and bern durch da seiche +. 2115 - 6 30 - 12 facit - 1 12 + - 6. Sein fie aber communicantn/reducier fie in die fleinft proportion ons fieracional werde/ barnach abdir ein wurst sur andern/bg collect mut tiplicir in fich felbft cubice /ben cub multiplicir weis ter mit der gröften menfur dardurch die communis eanten fein fleiner gemacht / radir cubtea des lerft? products / seigt an Die fumma peider wurpin. 216

42

39.

Eineremploon racionaln J 16 ju S1. Summa facits Bon irracionaln 18 11 12 5: Summa facit ~ 25+ 18 23 ju J 162. Summa facit / 1250

Bubtrabirn.

Befich/fein die senf desens rational . Ertrabir bie wursin ond fubtrabir die fleiner von der gröffern. Gein fie iracional/ fubtrabir durch das zeichen -Bein fie aber communicanten / mach fie durch die reduction zu rationaln / Subtrahier Darnach ein murst von der andern/Dit dem reft procedir gleich wie im abbirn mit dem collect suthun gelernt haft/ foiftsgemacht

Einerempl von racionaln 16 von 2 625. Steftant 3. Don irracionaln ... 28 von - 36. Steft:- 36.

Bon communicanten w 32 bon w 1250. Reft: w 162

Dultiplicirn.

Multiplicir eine senfbesens mit dem andern. Rat bir quadrata von radice quadrata foldes products/ ift da/fo anf multiplicirung der wursin erwachfen thut. Bu erempl in rationaln. Jeh wil multiplicirn f uu

M RADIX SIGN 1, M RADIX SIGN 2

Christoff Rudolff: Behend und hübsch Rechnung durch die kunstreichen regeln Algebre, so gemeinicklich die Coss genennt werden. Straßburg 1525. fol. 38v-39r., 41v-42r

1 () sec () Produict d'une prime quantité par une prime quantité secondement posee. 5 (ter Produict de cincq quartes quantitez par une seconde quantité tiercement posee. Les characteres fignifians racines de quels l'explication se trouve à la 29 & 30 definition sont tels : N Racine de quarre. W Racine de racine de quarré. W Racine de racine de racine de quarré. +w Racine de racine de racine de racine de quarré. V (3) Racine de cube. W (3) Racine de racine de cube. N @ Racine de quarte quantité. W @ Racine de racine de quarte quantité, &cc. Le charactere fignifiant la separation entre le signe de racine & la quantité, duquel l'explication fe trouve à la 34. definition, cst tel. χ , Comme $\sqrt{3}\chi$ (2) n'est pas le mesme que $\sqrt{3}$ (2), comme dict eft à ladicte 34. definition. Les characteres signifians plus & moins, comme à la 36 definition, sont tels : + Plus. - Moins. Et pour expliquer la racine d'un multinomie (qu'aucuns appellent racine universelle) nous userons le vocable du multinomie, comme: N bino 2 + N 3, c'est à dire racine quarree de binomie, ou de la fomme de 2 & 1/3. N trino N 3 + N 2 - N 5, c'est à dire racine quarrée de trinomie, ou de la somme de N 3 & V 2 & bino N 2'+ N 3, c'eft à dire racine cubique de

 \mathcal{M} RADIX SIGN 1, \mathcal{M} RADIX SIGN 2, \mathcal{M} RADIX SIGN 3 These characters can be seen related to the established radix symbol $\sqrt{(221A)}$. Simon Stevin, L'arithmétique in Œuvres mathématiques, 1634 (after Cajori)

see also next page

Les characteres fignifians racines de quels l'explication se trouve à la 29 & 30 definition sont tels : Racine de quarré.
 Racine de racine de quarré. W Racine de racine de racine de quarré. +w Racine de racine de racine de racine de quarré. ✔ ③ Racine de cube. W (3) Racine de racine de cube. N @ Racine de quarte quantité. W @Racine de racine de quarte quantité,&c Le charactere fignifiant la separation entre le si-

Simon Stevin, L'arithmétique in Œvres mathématiques, 1634 (after Cajori)

The number of ascending lines indicates how often an operation of root determination is performed on an expression. In the Stevin example the combination with an encircled number indicates, which type of root is meant. If there is no such number, the square root is to be considered. For example, the combinations denote the following:

- \mathcal{N} square root of square root, which corresponds to the forth root;
- square root of square root, which corresponds to the eighth root;
- square root of square root of square root of square root, which corresponds to the sixteenth root;
- \mathcal{M} (3) cubic root of cubic root, which corresponds to the ninth root;
- \mathcal{N} (4) forth root of forth root, which corresponds to the sixteenth root.

Para tratar de tales numeros, y otros semejantes, seria cofa larga, y no galana, poner los tales nobres a la larga : mas desseando huyr efto, y cuitar toda prolixidad, procure poner aigunos, que para en esta arte eran necessarios. Y fon V. w. w. v. v. w. v. w. v. +. -. Delos quales el p°, fignifica, y quiere dezir ravz quadrada: el 2º, rayz quadrada de rayz quas drada, o rayz de rayz: el 3°, rayz cubica: el 4°, rayz vniuerfal: el 5°, rayz de rayz vniuerfal:el 6°, rayz cubica vniuerfal:cl 7°, mas: y cl 8°, menos. Exeplo, V 4, quiere dezir rayz que da de 4, que es 2. V5, quiere dezir rayz de 5. &c. W 20 + wV 1 quiere dezir, rayz de rayz de 20, y mas rayz cubica de > -V3, quiere dezir, rayz quadrada de todo efto: q es 3 - V

M RADIX SIGN 1, M RADIX SIGN 2, M RADIX SIGN 3 Marco Aurel, Arithmetica algebratica, 1552 (after Cajori)

5. Synopsis (Group 1)

	Glyph	§	26	¥	ç	Ç	ce	ß	۶ م
	Character	LOWERCASE D ROTUNDA WITH CROSS- ING LOOP	LOWERCASE R ROTUNDA WITH LOOP	LOWERCASE KURRENT Z SIGN	LOWERCASE C WITH DESCENDER	LOWERCASE C WITH SMALL SLASH	LOWERCASE C WITH RIGHT LOOP	LOWERCASE DOUBLE S ABBREVIA- TION SIGN	LOWERCASE LONG S WITH TOP LOOP
	Meaning	dragma	radix	zensus	census	cubus	cubus	solidus sursolidum semis	sursolidum
1	Rudolf 1525	9	28	¥			r,	ß	
2	Stifel 1544		22.	18.			cre,	18.1	
3	Aurel 1552	8,	22.	 <i>8</i> .			P.	. ß.	
4	Peletier 1554				S		q	ß	
5	Recorde 1557	2.9.	».ze	03-			.e.		
6	Dee 1570			18.8			1æu		
7	Peletier 1620				2,8,1		, ¢,	çß,	
8	Clavius 1608/12		22.	8.			ce.	ß.	
9	Beeckmann 1628		¥	des.		ç			
10	Wallis 1657		29	28			r		2
11	Leibniz MS 1676		-29.	-3+		- 5+			
12	MS Leiden 17. c.		29	26		4			
13	MS Ham- burg 17. c.		¥	8					

Comparative survey of Coss characters in various sources, 1525 to 1676.

6. Unicode Character Properties

```
xi01;LOWERCASE C WITH SMALL SLASH;Sm;0;ON;;;;N;;;;
xi02;LOWERCASE C WITH DESCENDER;Sm;0;ON;;;;N;;;;
xi03;LOWERCASE C WITH RIGHT LOOP;Sm;0;ON;;;;N;;;;
xi04;LOWERCASE D ROTUNDA WITH CROSSING LOOP;Sm;0;ON;;;;N;;;;
xi05;LOWERCASE R ROTUNDA WITH LOOP;Sm;0;ON;;;;N;;;;
xi06;LOWERCASE DOUBLE S ABBREVIATION SIGN;Sm;0;ON;;;;N;;;;
xi07;LOWERCASE LONG S WITH TOP LOOP;Sm;0;ON;;;;N;;;;
xi08;LOWERCASE KURRENT Z SIGN;Sm;0;ON;;;;N;;;;
xi09;RADIX SIGN 1;Sm;0;ON;;;;N;;;;
xi10;RADIX SIGN 2;Sm;0;ON;;;;N;;;;
xi11;RADIX SIGN 3;Sm;0;ON;;;;N;;;;
```

"x" stands for *unspecified codespace*. "i" refers to our internal characters classification, see N5277.

7. Bibliography

LAA - refers to: Leibniz, Gottfried Wilhelm: Sämtliche Schriften und Briefe. ('Leibniz-Akademie-Ausgabe', many volumes) LBr - refers to: Leibniz's original correspondence papers, GWLB Hanover LH - refers to: Leibniz's original manuscripts, GWLB Hanover Aurel, Marco: Arithmetica algebratica, Valencia 1552 Bombelli, Rafael: L'Algebra. Bologna 1579 —: L'Algebra. Milan 1966 Cajori, Florian: A history of mathematical notations. Chicago 1928 Cardano, Gerolamo: Opera omnia. Lyon 1663 Clavius, Christophorus: Algebra. Rome 1608 Dee, John: [preface] in: Euclid: The elements. Henry Billingsley (ed.), London 1570 Descartes, René: La Géométrie. Leiden 1637 Dulaurens, François: Specimina Mathematica. Paris 1667 Ghaligai, Francesco: Pratica d'Arithmetica, Florence 1552 Peletier, Jaques: L'Algèbre. Lyon 1554 Probst, Siegmund: Édition des symboles de Leibniz. PDF, Hanover 2023 (presentation Paris 2023) Rudolff, Christoff: Behend und hübsch Rechnung durch die kunstreichen regeln Algebre, so gemeinicklich die Coß genennt werden. Straßburg 1525 Stevin, Simon: Œvres mathématiques. Leiden 1634 Stifel, Michael: Arithmetica integra. Nürnberg 1544 Wallis, John: De sectionibus conicis nova methodo expositis tractatus. Oxford 1655 - : Operum mathematicorum, Oxford 1657 - : Treatise of Algebra. London 1685

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 <u>http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html</u> for guidelines and details before filling this form. Please ensure you are using the latest Form from <u>http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html</u> . See also <u>http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html</u> .							
A. Administrative							
1. Title: Product of the second s	oposal to add 11 cossic characters to the UCS und Probst, David Rabouin, Elisabeth Rinner, Andreas Stötzner, clotte Wahl ividual contribution): Individual (work group) 2024-09.17.						
 6. Choose one of the following: This is a complete proposal: (cr) Mars information will be provided 	LUCP L-2438						
(or) More information will be provided							
B. Technical – General 1. Choose one of the following: a. This proposal is for a new script (set Proposed name of script:	of characters): No						
b. The proposed name of script: b. The proposal is for addition of chara Name of the existing block:	cter(s) to an existing block: Yes since no space is available in the various Math symbols blocks, we propose a new block Miscellaneous Mathematical Symbols-C or similar. This new block can also accomodate other related new character sets we will propose (see N5277)						
2. Number of characters in proposal:	11						
 Proposed category (select one from below A-Contemporary B.1-Specialized C-Major extinct D-Attested extin F-Archaic Hieroglyphic or Ideographic Is a repertoire including character names in a. If YES, are the names in accordance in Annex L of P&P document? 	r - see section 2.2 of P&P document): (small collection) Yes B.2-Specialized (large collection) ct E-Minor extinct G-Obscure or questionable usage symbols provided? Yes e with the "character naming guidelines"						
b. Are the character shapes attached in	n 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? 							
b. Identify the party granting a license f Andreas Stötzner Gestaltung, Kla	Andreas Stötzner or use of the font by the editors (include address, e-mail, ftp-site, etc.): uflügelweg 21, 88400 Biberach/R., Germany, as@signographie.de						
 6. References: a. Are references (to other character set b. Are published examples of use (such of proposed characters attached? 	ets, dictionaries, descriptive texts etc.) provided? Yes h as samples from newspapers, magazines, or other sources) Yes						
 Special encoding issues: Does the proposal address other aspective presentation, sorting, searching, indexi 	cts of character data processing (if applicable) such as input, ng, transliteration etc. (if yes please enclose information)? <u>No</u>						
8. Additional Information: Submitters are invited to provide any addition that will assist in correct understanding of an Examples of such properties are: Casing info information such as line breaks, widths etc., Collation behaviour, relevance in Mark Up co information. See the Unicode standard at <u>ht</u> Unicode Character Database (<u>http://www.ur</u> information needed for consideration by the U	hal information about Properties of the proposed Character(s) or Script d correct linguistic processing of the proposed character(s) or script. formation, Numeric information, Currency information, Display behaviour Combining behaviour, Spacing behaviour, Directional behaviour, Default ontexts, Compatibility equivalence and other Unicode normalization related ttp://www.unicode.org. for such information on other scripts. Also see <u>nicode.org/reports/tr44/</u>) and associated Unicode Technical Reports for Unicode Technical Committee for inclusion in the Unicode Standard.						

¹ Form number: N4502-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 c	haracter(s) been submitted before?	Yes					
If YES explain	<i>see</i> N5277 / L-24-02n						
2. Has contact been made to member user groups of the script or characteristics	ers of the user community (for example: National Body, aracters, other experts, etc.)?	Yes					
If YES, with whom?	Leibniz-Archiv, Forschungsstelle der Leibniz-Edit	tion,					
	Niedersächsische Landesbibliothek (GWLB), Hand	over,					
	Göttingen Academy of Science and Humanities in Lower S	Saxony (DE),					
	Philiumm research group of CNRS (UMR 7219, laboratoir	e SPHERE) /					
	Université de Paris VII;						
	general: scholars, researchers, authors and editors working	in the field of					
	science history and upon editions of historic text corpora (e.g. of G. W.					
If VEC, evolution releva	Leibniz, but also many others)						
II FES, available releva	the documents. L-2409, L-2410						
size demographics information	y for the proposed characters (for example, on technology use, or publishing use) is included?	Vec					
Reference:		105					
4. The context of use for the propose	ed characters (type of use; common or rare)	Common					
Reference:	mainly specialist usage, scholarly, worldwide	Common					
5. Are the proposed characters in cu	irrent use by the user community?	Yes					
If YES, where? Reference:	mainly Europe. Americas: other countries	105					
6. After giving due considerations to	the principles in the P&P document must the proposed character	ers be entirely					
in the BMP?		No					
If YES, is a rationale	provided?						
If YES, reference							
7. Should the proposed characters b	e kept together in a contiguous range (rather than being scatter	ed)? Yes					
8. Can any of the proposed character character or character sequen	ers be considered a presentation form of an existing ce?	No					
If YES, is a rationale	for its inclusion provided?						
9. Can any of the proposed character	ers be encoded using a composed character sequence of either						
existing characters or other pro-	oposed characters?	No					
If YES, is a rationale	for its inclusion provided?						
If YES, reference): ter(a) he considered to be similar (in appearance or function)						
to or could be confused with	an existing character?	No					
If YES, is a rationale	for its inclusion provided?	NO					
If YES, reference							
11. Does the proposal include use o	f combining characters and/or use of composite sequences?	No					
If YES, is a rationale for such u	use provided?						
If YES, reference	: and their corresponding glyph images (graphic symbols) prov	idod2 N					
	s and their corresponding gryph images (graphic symbols) prov	NO NO					
12. Does the proposal contain chara	cters with any special properties such as						
control function or similar sem	antics?	No					
If YES, describe in de	etail (include attachment if necessary)						
13 Does the proposal contain any l	leographic compatibility characters?	N					
If VES are the equivalent corr	esponding unified ideographic characters identified?	No					
If YES, reference:	esponding unined ideographic characters identified :						