

Guided Tour

ChantDigger is a program that gives basic material for the analysis of plain chant. The database contains about 2200 chants being the repertory of proprium chants in the Gregorian, Old Roman and Milanese (Ambrosian) repertory. The data are taken from (in bold are given the abbreviations used in the program):

AntMed: Gregorio Maria Suñol (Hrsg.), *Antiphonale missarum juxta ritum sanctae ecclesiae Mediolanensis*, Rom 1935;

GrTr: *Graduale triplex seu Graduale Romanum Pauli PP. VI cura recognitum & rhythmicis signis a Solesmensibus Monachis ornatum, Neumis Laudunensibus (Cod. 239) et Sangallensibus (Codicum Sangallensis 359 et Einsidlensis 121) nunc auctum* (1979);

OffTr: *Offertoriale triplex cum versiculis*, [hrsg. v. Rupert Fischer], 1985;

MM: *Graduale Vat 5319*, herausgegeben von Stäblein/Melnicki (*Die Gesänge des altrömischen Graduale Vat. lat. 5319*, Einführung von Bruno Stäblein; Notenteil, kritischer Bericht und Verzeichnisse von Margareta Landwehr-Melnicki, Kassel: Bärenreiter, 1970 [*Monumenta monodica medii aevi* II]).

I inserted the data myself without correction help. That's why I assume that there are mistakes. I'm sure you will find them.

Be cautious: *ChantDigger* helps. But it never gives solutions which could be results in current research. Every „result“ needs scholarly interpretation!

ChantDigger is free. It seems that all major browsers give a comfortable workspace: Chrome, Firefox, Opera and Safari. I had no chance myself to test InternetExplorer.

Let's start: a first tour

When you choose *ChantDigger* in the internet start with pressing the red load button: *Load the data*. You should see something like (see next page).

Your first selections can be managed with the following buttons:



- When you press *Without notes*, you change the colour of the button as well as the text. The effect will be that you get always above the first line of any graphic representation a one liner summary of the action. Useful when you work some hours and when you make during this time a little collection of photographs.
- *All word forms* may be useful when you look for text items.

- In the beginning you will start with the button *Contents* (the contents of the database or the contents directed by you choice with corpus and genre). Or you enter a word – e.g. *summo* – after the button *Word in title* and you get all relevant chants.

The screenshot shows the ChantDigger web interface. At the top, a status bar indicates the version (alpha 0.6), publication date (31.10.2014), and the number of chants in the database (2195). Below this is a 'Loaded' button and a large empty rectangular area. The main control panel includes several buttons and input fields: 'Without notes' and 'All word forms' (highlighted in orange); 'Corpus + genre:' with two dropdown menus set to 'all'; 'Contents' and 'Word in title' buttons; a 'Page: 1' indicator; 'Presentation of SM 1:' with a dropdown set to 'normal' and a 'SM 1: Chant' button; a 'Delete number(s):' input field; and a 'Find axis' button. Below these are 'SM 2: Syllable segment', 'SM 3: Sequences', 'SM 4: BNA', and 'SM 5: Syllables' buttons. At the bottom, there is a 'to the right' button and a 'Photograph' button. A horizontal timeline at the bottom is marked from 0 to 850 in increments of 50. Two arrows originate from the 'Text' label below the screenshot: one points to the large empty area, and the other points to the timeline. A 'Graphics' label above the screenshot has an arrow pointing to the 'Find axis' button.

Text

Let's say your choice was GR for the corpus and Graduale for the genre.

From the list

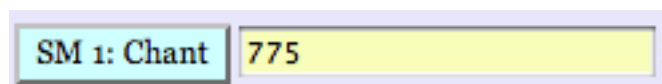
A domino factum est (GR GradualeV GrTr 45) 921
 A summo caelo (GR GradualeR GrTr 27) 775
 Ab occultis meis (GR GradualeR GrTr 101) 779
 Accedite ad eum (GR GradualeV OffTr 103) 2131
 Ad annuntiandum (GR GradualeV GrTr 327) 2140
 Ad annuntiandum (GR GradualeV GrTr 510) 2174
 Ad dominum dum tribularer (GR GradualeR GrTr 282) 780
 Ad te domine clamavi (GR GradualeV GrTr 312) 2136
 Ad te domine clamavi (GR GradualeV GrTr 355) 2147
 Adiutor in opportunitatibus (GR GradualeR GrTr 69) 781

you select the line

A summo caelo (GR GradualeR GrTr 27) 775

The line contains five informations: The *title* (A summo caelo), the *corpus* (Gregorian), the *genre* (graduale responsorium), the *source* (Graduale triplex) and the current number of the chant in the database (which will never change).

To see the chant you enter its number



and press the button *SM 1: Chant*. You get a picture which is partly reproduced here:

SM 1 Num. 775 | 1.11.2014 6:35:15 pm

775 A summo caelo
GR
GradualeR
GrTr 27

A	sum-mo	cae-	lo	e-	gres-	si-	o	e-	ius:	
0	1	2	3	4	5	6	7	8	9	10
11	2	20	3415	20	20	3416	407	886	1696	3417
971	5222	5528	11	5528	5528	13	376	66	54	15

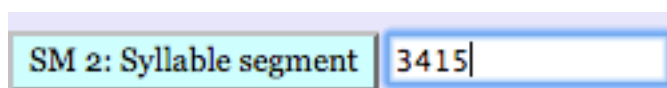
The neumatic content is reduced: there are normal notes, liquescentes and oriscus – not more. Please note that the option *With notes* is selected. That's why you see the one liner

SM 1 Num. 775 | 1.11.2014 8:01:24 pm

above the first line. By the way: I speak of *search modes* and use for it the abbreviation *SM*.

The representation contains three lines of numbers below the syllables: the number of the syllable (zero based); the number of the syllable segment („Silbenstrecke“) and the number of occurrences of this segment. A segment (in the sense of Silbenstrecke) consists of the tones above *one* syllable. Segment Nr. 3415 starts with *c'* and ends with *b* (before the *a* above [cae-] lo).

If you would like to see the segment you enter the number in the field for *SM 3*:



Now press this button:

SM 2 | Segment(s): 3415 | Page: 1 alle alle o | 1.11.2014 8:10:07 pm

1
775 A summo caelo
GR
GradualeR
GrTr 27

A sum-mo cae- lo e- gres- si- o e- ius:
 0 1 2 3 4 5 6 7 8 9 10
 11 2 20 3415 20 20 3416 407 886 1696 3417
 971 5222 5528 11 5528 5528 13 376 66 54 15

2
779 Ab occultis meis
GR
GradualeR
GrTr 101

Ab oc- cul- tis me- is mun- da me Do- mi- ne:
 0 1 2 3 4 5 6 7 8 9 10 11
 11 11 2 20 3415 20 3416 407 886 1696 21 3417
 971 971 5222 5528 11 5528 13 376 66 54 215 15

3
784 Angelis suis
GR
GradualeR
GrTr 72

An- ge- lis su- is man- da- vit de te, ut
 0 1 2 3 4 5 6 7 8 9 10
 108 20 20 3415 20 20 3416 3467 2 3468 29
 58 5528 5528 11 5528 5528 13 3 5222 2 542

4
808 Dispersit dedit
GR
GradualeR
GrTr 520

Di- sper-sit, de- dit pau- pe- ri- bus: iu- sti- ti- a e-
 0 1 2 3 4 5 6 7 8 9 10 11 12 13
 11 2 20 3415 20 20 3416 407 886 2 1696 20 20 3620
 971 5222 5528 11 5528 5528 13 376 66 5222 54 5528 5528 1

5
809 Domine deus virtutum,
GR
GradualeR
GrTr 32

Do- mi- ne De- us vir- tu- tum, con- ver- te nos: et o-
 0 1 2 3 4 5 6 7 8 9 10 11 12 13
 108 20 20 20 20 20 3415 20 20 3416 3467 3468 29 8
 58 5528 5528 5528 5528 11 5528 5528 13 3 2 542 45

You see a synoptic presentation of segment 3415.

If ever you would like to see a sequence of segments you could enter 3415, 3416 886, 1696, 3417 and you would see (only first two lines of five):

SM 2 | Segment(s): 3415 3416 407 886 1696 3417 | Page: 1 alle alle o | 1.11.2014 8:12:42 pm

1
775 A summo caelo
GR
GradualeR
GrTr 27

A sum-mo cae- lo e- gres- si- o e- ius:
 0 1 2 3 4 5 6 7 8 9 10
 11 2 20 3415 20 20 3416 407 886 1696 3417
 971 5222 5528 11 5528 5528 13 376 66 54 15

2
779 Ab occultis meis
GR
GradualeR
GrTr 101

Ab oc- cul- tis me- is mun- da me Do- mi- ne:
 0 1 2 3 4 5 6 7 8 9 10 11
 11 11 2 20 3415 20 3416 407 886 1696 21 3417
 971 971 5222 5528 11 5528 13 376 66 54 215 15

What we did with these segments is a very limited business. It's evident that we must know the sequences and that we look only for syllable segments. It should be possible to give a more sleek formulation of a search. Let's try it.

In *SM 3* – you remember: *SM* is *search mode* – you give the definition of a sequence and a search width. This means: you give a sequence of tones and define within how many tones the sequence should be found. A valid expression could be

SM 3: Sequences d f a c' a g 10

Please note that ChantDigger is written by a Swiss. That means: there's no b (B, b' etc.), but only h (H, h' etc.).

Thus: d f a c' a g 10 means, that the sequence d f a c' a g must occur within 10 tones. The result is (as always I give only the first lines of 82 lines):

SM 3 | Search: d f a c' a g 10 | Page: 1 alle alle | 1.11.2014 8:22:38 pm

1
7 Caritas dei diffusa est
GR
Introitus
GrTr 248
Caritas Dei diffusa est in cordibus vestris, alleluia: per inhabitantem Spi-

ri-	tum e-	ius in no-	bis, al-	le-	lu-	ia, al-	le-	lu-	ia.
26	27 28	29 30 31	32 33 34	35	36 37 38	39	40		
47	4 125	2 4 128	129 4 130	5	11 2 131	13	14		
1458	4380 348	5222 4380 12	348 4380 4	502	971 5222 3	132	801		

2
52 Exaudivit de templo
GR
Introitus
GrTr 239
Exaudivit de templo sancto suo vocem meam, alleluia: et clamor meus in conspectu eius introi-

vit	in au-	res e-	ius, al-	le-	lu-	ia, al-	le-	lu-	ia.
33	34 35	36 37	38 39 40	41	42 43 44	45	46		
292	4 169	47 452	129 4 130	5	11 2 131	13	14		
20	4380 47	1458 5	348 4380 4	502	971 5222 3	132	801		

3
56 Exsurge quare obdormis
GR
Introitus
GrTr 91
Exsurge, quare obdormis Domine? exsurge, et ne repellas in finem: qua-

re fa-	ci-em tu-	am a-	ver-tis, o-	bli-vi-	sce-	ris tri-	bu-la-	ti-o-	
23 24	25 26 27 28	29 30 31 32 33 34	35 36 37 38 39 40 41						
2 16	4 101 4 79	101 110 4 4 2 465	16 20 20 25 16 16 1						
5222 1425	4380 2653 4380 90	2653 921 4380 4380 5222 30	1425 5528 5528 857 1425 1425 395						

BTW: There are 82 matches but ChantDigger gives always not more than 20 lines a page. What to do? Use the page option. Page 2 = lines 21-40, page 3 lines 41-60 etc.

Let's go back to the syllable segments. For three segments in line I use the abbreviation *BNA* = *B*[efore], *N*[ucleus], *A*[fter]. The case of finding the Nucleus is given by *SM 2*, as we have seen. Very interesting could be the case of *B_A*, meaning: a *B* and a *A* and – marked with *_* as a variable – a Nucleus as the bridge between a certain *B* and a certain *A*. One could find with this formalism the occurrence of *1_949*:

SM 4 | BNA: 1 949 | Page: 1 alle alle | 1.11.2014 8:32:22 pm

1
1481 Avertantur retrorsum
AR
OffertoriumV
MM 348
A-

ver-	tan-	tur	re-	tror-
1	2	3	4	5
1	5477	949	4	630
395	1	125	4380	35

2
1508 Confiteantur tibi
AR
OffertoriumV
MM 357
Confi-

te-	an-	tur	ti-	bi
2	3	4	5	6
1	5581	949	20	1407
395	1	125	5528	44

3
1510 Confitebor tibi domine
AR
OffertoriumV
MM 356
Con-

fi-	te-	bor	ti-	bi
1	2	3	4	5
1	5587	949	20	1407
395	1	125	5528	44

4
1577 Exspectans exspectavi dominum
AR
OffertoriumV
MM 348

Ex-	pec-	tans	ex-	pec-	ta
0	1	2	3	4	5
1	5831	949	2	20	22
395	1	125	5222	5528	14

5
1651 Miserere mihi infirmus
AR
OffertoriumV
MM 349
Mi-

se-	re-	re	mi-	chi	do-
1	2	3	4	5	6
1	6110	949	20	1407	25
395	1	125	5528	44	857

When you experiment with 1_949 you see a different picture. Why? With the help of the button to the right I shifted the chant indications to the right. That's why I have the indications and the interesting parts of the melodies together. Try it yourself!

The bridge between the segments 1 and 949 is a very long melisma which is extremely interesting. It occurs in several shapes but never in a verbatim copy. As Leo Treitler has pointed out a long time ago this could be a symptom of an oral tradition.

Last and not least let's have a look at *SM 5*. It may occur that chants have the same number of syllables. Is this by chance or have they the same model in common? Select a corpus and a genre (e.g. GR and Offertorium) and you get by pressing the button

SM 5: Syllables

in the text field chants with the same number of syllables.

Let's have a look at those with 24 syllables. We enter the number

SM 5: Syllables 24

SM 6 GR Graduale | Length of segment: 24 | 1.11.2014 8:37:50 pm

1
775 A summo caelo
GR
GradualeR
GrTr: 27

A sum- mo cae- lo e- gres- si- o e- ius: et oc- cur- sus e- ius us- que ad sum- mum e- ius.
o 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
11 2 20 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
971 5222 5528 3415 5528 3415 407 376

2
779 Ab oculis meis
GR
GradualeR
GrTr: 201

Ab oc- cul- tis me- is mun- da-
o 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
11 11 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
971 971 5222 3415 5528 3415 407 376

3
784 Angelis suis
GR
GradualeR
GrTr: 72

An- ge- lis is man- da- vit
o 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
108 20 20 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
58 5528 5528 3415 5528 3415 407 376

4
792 Benedictus es domine
GR
GradualeR
GrTr: 272

Be- ne- dic- tus es, Do- mi- ne, qui in- tu- e- ris a- bys- sos, et se- des su- per Che- ru- bim.
o 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
101 124 159 20 3415 352 20 5528 1223 3325 2
253 307 28 5528 32 5528 1223 3325 2

5
802 Deus exaudi
GR
GradualeR
GrTr: 107

De- us ex- au- di o- ra- ti- o- nem me- am: au- ri- bus per- ci- pe ver- ba o- ris me- i.
o 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
103 2 199 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
68 5222 73 3589 3511 68 5222 5222

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
A	sum-	mo	cae-	lo	e-	gres-	si-	o	e-	ius:	et	oc-	cur-	sus	e-	ius	us-	que	ad	sum-	mum	e-	ius.
Ab	oc-	cul-	tis	me-	is	mun-	da-	o	e-	Do-	mi-	ne:	et	ab-	a-	li-	e-	nis	par-	ce	ser-	vo	tu-
An-	ge-	lis	su-	is	man-	da-	vit	de	te,	ut	cu-	sto-	di-	ant	te	in	o-	mni-	bus	vi-	is	tu-	is.
Be-	ne-	dic-	tus	es,	Do-	mi-	ne,	qui	in-	tu-	e-	ris	a-	bys-	sos,	et	se-	des	su-	per	Che-	ru-	bim.
De-	us	ex-	au-	di	o-	ra-	ti-	o-	nem	me-	am:	au-	ri-	bus	per-	ci-	pe	ver-	ba	o-	ris	me-	i.
Di-	ri-	ga-	tur	o-	ra-	ti-	o	me-	a	si-	cut	in-	cen-	sus	in	con-	spec-	tu	tu-	o,	Do-	mi-	ne.
Di-	sper-	sit,	de-	dit	pau-	pe-	ri-	bus:	iu-	sti-	ti-	a	e-	ius	ma-	net	in	sae-	cu-	lum	se-	cu-	li.
Do-	mi-	ne,	re-	fu-	gi-	um	fa-	ctus	es	no-	bis,	a	ge-	ne-	ra-	ti-	o-	ne	et	pro-	ge-	ni-	e.
Pos-	su-	i-	sti,	Do-	mi-	ne,	su-	per	ca-	put	e-	ius	co-	ro-	nam	de	la-	pi-	dem	pre-	ti-	o-	so.
Re-	qui-	em	ae-	ter-	nam	do-	na	e-	is	Do-	mi-	ne:	et	lux	per-	pe-	tu-	a	lu-	ce-	at	e-	is.
Ti-	me-	bunt	gen-	tes	no-	men	tu-	um,	Do-	mi-	ne,	et	om-	nes	re-	ges	ter-	rae	glo-	ri-	am	tu-	am.
U-	nam	pe-	ti-	i	a	Do-	mi-	no,	hanc	re-	qui-	ram,	ut	in-	ha-	bi-	tem	in	do-	mo	Do-	mi-	ni.
De-	us	me-	us,	po-	ne	il-	los	ut	ro-	tam,	et	sic-	ut	sti-	pu-	lam	an-	te	fa-	ci-	em	ven-	ti.
Con-	fun-	dantur	et	re-	ve-	re-	an-	tur	i-	ni-	mi-	ci	me-	i,	qui	quae-	runt	a-	ni-	mam	me-	am.	
Con-	tur-	ba-	ta	sunt	o-	mni-	a	os-	sa	me-	a:	et	a-	ni-	ma	me-	a	tur-	ba-	ta	est	val-	de.
Li-	be-	ra-	sti	in	bra-	chi-	o	tu-	o	po-	pu-	lum	tu-	um,	fi-	li-	os	Is-	ra-	el	et	Io-	seph.
Do-	mi-	ne	re-	fu-	gi-	um	fa-	ctus	es	no-	bis,	a	ge-	ne-	ra-	ti-	o-	ne	et	pro-	ge-	ni-	e.
In	Do-	mi-	no	lau-	da-	bi-	tur	a-	ni-	ma	me-	a:	au-	di-	ant	man-	su-	e-	ti	et	lae-	ten-	tur.
Be-	ne-	dic-	tus	es	Do-	mi-	ne,	in	fir-	ma-	men-	to	cae-	li,	et	lau-	da-	bi-	lis	in	sae-	cu-	la.
Pot-	ens	in	ter-	ra	e-	rit	se-	men	e-	ius:	ge-	ne-	ra-	ti-	o	re-	cto-	rum	be-	ne-	di-	ce-	tur.

and we get a presentation with syllables:


Let's go on: a second tour with more details

It's obvious that the shown possibilities have serious drawbacks. We must always know something. The sequence of segments for SM2 – 3415 3416 407 887 1696 3417 – is known to those who are acquainted with the so called *Justus ut palma*-type of gradualia. But not everybody knows this type. And what's worse: we don't know much about types at all. Thus it could be comfortable that ChantDigger teaches us a bit more. Let's see!

I repeat the walk from SM1 to SM5 and show you the details not mentioned until now.

Chants only


SM1: Our example, the graduale *A summo caelo*, can be displayed in different ways. Choose with the option after the label

Presentation of SM 1: 

By displaying only the first (or the last or the first and the last) notes you get an insight in the structure of the melody (as I hope – but this is not more than a working hypothesis). You can do more. When you enter the number and after a space the letter „x“ you get the melody. The tones which occur most are signed with red noted or hollow notes:

SM 1 Num. 775 x | 1.11.2014 8:59:59 pm

775 A summo caelo
GR
GradualeR
GrTr 27



A	sum-mo	cae-		lo	e-	gres-	si-	o	e-	ius:
0	1	2	3	4	5	6	7	8	9	10
11	2	20	3415	20	20	3416	407	886	1696	3417
971	5222	5528	11	5528	5528	13	376	66	54	15

There may be occasions when you want to see more chants the same time. You can either enter several chant numbers or a word from the text. Or you mix the two possibilities. What you see is one chant after the other with no correspondence between the segments of the syllables.

Segments

SM2: How can we get informations about sequences of segments? Select a corpus and a genre (I select GR and graduale) and then let's enter something like

SM 2: Syllable segment

In the text field you find sequences of segments, e.g.


```


0 2855 2856 1898 2857(4)
1 3416 886 1696 3417 3420 (8)
2 3416 886 1696 3417 1898 1343 3420 (4)
3 3415 1898 1343 3420 (4)
4 3415 3416 1696 3417 3420 (6)
5 1696 3417 1898 3420 (6)
6 3416 1696 3417 1898 1343 3420 (5)
7 3415 3416 886 1696 3417 1343 3420 (4)
8 886 1696 3417 308 3419 1343 3420 (5)
9 3415 3416 886 1696 1343 3420 (5)
10 3415 3416 1343 3420 (4)
11 3416 886 1696 3417 3438 2856 3420 (5)
12 3438 2856 1343 3420(9)
13 3415 886 1696 3417 1343 3420 (5)
14 3415 3416 1696 3417 3438 2856 3420 (4)
15 1696 3417 3438 2856 1898 3420 (4)
16 886 1696 3417 3438 2856 1343 3420 (4)

```

Every line gives three informations: line number, the sequence of syllable segments and the number of occurrences. If you select line 0 and enter 2855 2856 1898 2857 then you get (with help of the button *to the right*)


SM 2 | Segment(s): 2855 2856 1898 2857 | Page: 1 GR Graduale 0 | 1.11.2014 9:06:43 pm

1
627 Beatus qui intelligit
GR
GradualeV
GrTr: 279




Beatus qui intelligit	ma-	la	li-	be-	ra-	bit	e-	um	Do-	mi-	nus.
super egenum et pauperem	20	21	22	23	24	25	26	27	28	29	30
in die	2855	2856	4	16	20	20	1898	16	36	41	2857
	10	28	4380	1425	5528	5528	31	1425	144	980	18

2
891 Si mei non fuerint
GR
GradualeV
GrTr: 102




Si mei non fuerint dominati, tunc immaculatus ero: et emun-	n-da-	bor	a	de-	lic-	to	ma-	xi-	mo.
	22	23	24	25	26	27	28	29	30
	2855	2856	4	16	1898	16	36	41	2857
	10	28	4380	1425	31	1425	144	980	18

3
2145 Priusquam fierent montes
GR
GradualeV
GrTr: 348



Priusquam montes fierent aut formaretur terra et orbis a	se-	cu-	lo	et	in	se-	cu-	lum	tu	es	De-	us.
	19	20	21	22	23	24	25	26	27	28	29	30
	2855	20	2856	4	4	1	20	1898	2	20	1343	2857
	10	5528	28	4380	4380	395	5528	31	5222	5528	79	18

4
2160 Cantate Domino
GR
GradualeV
GrTr: 456

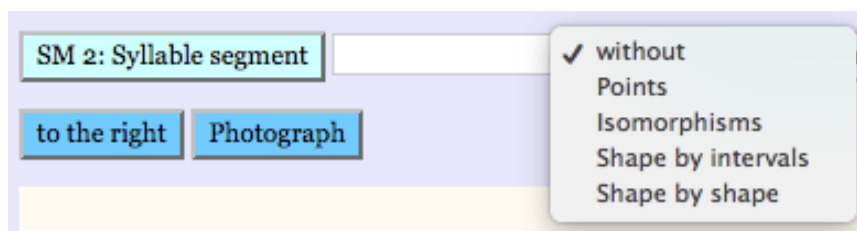


Cantate Domino canticum novum: laus	e-	ius	in	ec-	cle-	si-	a	sanc-	to-	rum.
	12	13	14	15	16	17	18	19	20	21
	2855	2856	4	4	1	20	1898	16	1343	2857
	10	28	4380	4380	395	5528	31	1425	79	18

As we know plain chant was transmitted orally during centuries. It's a common believe that in the times of writing, of musical notation, there was no redaction from an oral tradition to a written transfer. In other words: we may try to find signs of an oral tradition in the written versions. As Leo Treitler has put it years ago, oral tradition has to do with "concepts [. . .] like 'formulas', 'tradition', 'archetype', 'work', 'structure', 'unity',

‘improvisation’, ‘memory’, ‘composition’, ‘orality’, ‘literacy’, ‘sameness’ and ‘difference’¹. In other words: we should not only find occurrences of the same segment (sameness meaning here: the same note-by-note) but sameness in the sense of similarity (similar shape and same function). How can we find it?

ChantDigger gives the possibility to look for the same segment and to look for the same in the sense of similar based on criteria which can be found as options after the input field for SM 2:



We try it and take segment 3415 as our candidate

1
775 A summo caelo
GR
GradualeR
GrTr 27

A	sum-mo	cae-
0	1 2	3
11	2 20	3415
971	5222 5528	11

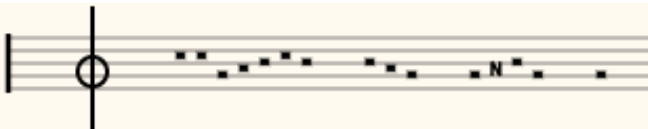
We take criterion 1 as criterion for similarity and we find

1
18 Deus in loco
GR
Introitus
GrTr 310
Deus in loco sancto suo:
Deus, qui inhabitare
facit unanimes in domo:
ipse dabit virtutem et
fortitudinem ple-

bi	su-	ae.
40	41	42
246	18	4
1	336	4380

¹ Leo Treitler, “Sinners and Singers: A Morality Tale”, in: *JAMS* 47 (1994), 148 (= Review: Peter Jeffery, *Re-Envisioning Past Musical Cultures: Ethnomusicology in the Study of Gregorian Chant*, Chicago [Chicago Studies in Ethnomusicology 1]) – see now id., *With Voice and Pen. Coming to Know Medieval Song and How it Was Made*, Oxford 2003. – Franz Bäuml made the difference between „wortwörtlich“ and „stofflich“: „wortwörtlich“ (verbatim) tradition as technique which is only possible in writing, whereas „stofflich“ (according to the shape) lacks writing: “Der Übergang mündlicher zur artes-bestimmten Literatur des Mittelalters”, in: Norbert Voorwinden, Max de Haan (Hrsg.), *Oral Poetry. Das Problem der Mündlichkeit mittelalterlicher epischer Dichtung*, Darmstadt 1979, 238–250 (*Wege der Forschung* 555); orig. in: G. Keil, R. Rudolf, W. Schmitt, H.J. Vermeer (Hrsg.), *Fachliteratur des Mittelalters. Festschrift für Gerhard Eis*, Stuttgart 1968, 1–10.

Segment 246 matches segment 3415 in four notes: first, last, highest and lowest. But is this enough? It's up to you! Or is segment 786 a better candidate?

<p>2 131 Victricem manum tuam ML Ingressa AntMed 222 Victricem manum tu-</p>		<table border="0"> <tr> <td>am,</td> <td>Do-</td> <td>mi-</td> <td>ne,</td> </tr> <tr> <td>6</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td>786</td> <td>787</td> <td>581</td> <td>2</td> </tr> <tr> <td>2</td> <td>131</td> <td>49</td> <td>5222</td> </tr> </table>	am,	Do-	mi-	ne,	6	7	8	9	786	787	581	2	2	131	49	5222
am,	Do-	mi-	ne,															
6	7	8	9															
786	787	581	2															
2	131	49	5222															

In analogy to SM1 you can enter a word of the text. You get then an ordered layout of the corresponding chant, the synopsis given by the selected word.

Sequences

SM3: Sequences are extremely important because their formulations are not so much influenced by a working hypothesis. There are two possibilities to find a sequence.

First possibility: You select a chant (let's say once again Nr. 775). Before you display it you select in the options for SM 1 the last one:

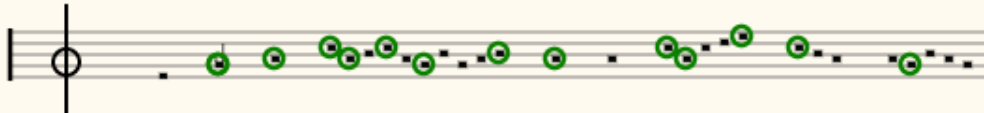
Presentation of SM 1: normal
 first tone
 last tone
 first and last tone
 Show with clicks

SM 2: Syllable seg

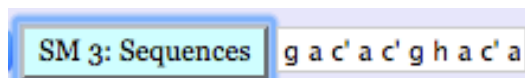
Press the display button *after* the selection!

Presentation of SM 1: Show w SM 1: Chant 775

And then you click with the mouse those notes which seem to be of importance for you. E.g.:

<p>75 A summo caelo GR GradualeR GrTr 27</p>		<table border="0"> <tr> <td>A</td> <td>sum-</td> <td>mo</td> <td>cae-</td> <td>lo</td> <td>e-</td> <td>gres-</td> <td>si-</td> <td>o</td> </tr> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>11</td> <td>2</td> <td>20</td> <td>3415</td> <td>20</td> <td>20</td> <td>3416</td> <td>407</td> <td>886</td> </tr> <tr> <td>971</td> <td>5222</td> <td>5528</td> <td>11</td> <td>5528</td> <td>5528</td> <td>13</td> <td>376</td> <td>66</td> </tr> </table>	A	sum-	mo	cae-	lo	e-	gres-	si-	o	0	1	2	3	4	5	6	7	8	11	2	20	3415	20	20	3416	407	886	971	5222	5528	11	5528	5528	13	376	66
A	sum-	mo	cae-	lo	e-	gres-	si-	o																														
0	1	2	3	4	5	6	7	8																														
11	2	20	3415	20	20	3416	407	886																														
971	5222	5528	11	5528	5528	13	376	66																														

The clicked notes have now a green circle. Press the SM 3 button. You get the sequence in alphanumeric characters:



When you press the button again you get the result:

<p>1 468 Tu es sacerdos GR AlleluiaV GrTr 449</p>		<p>Al- le- lu- ia. V. 0 1 2 3 4 101 2295 4 2296 22 2653 2 4380 2 14;</p>
<p>2 775 A summo caelo GR GradualeR GrTr 27</p>		<p>A sum-mo cae- lo e- gres- si- o e- 0 1 2 3 4 5 6 7 8 9 11 2 20 3415 20 20 3416 407 886 1696 971 5222 5528 11 5528 5528 13 376 66 54</p>
<p>3 779 Ab occultis meis GR GradualeR GrTr 101</p>		<p>Ab oc- cul- tis me- is mun- da me Do- 0 1 2 3 4 5 6 7 8 9 11 11 2 20 3415 20 3416 407 886 1696 971 971 5222 5528 11 5528 13 376 66 54</p>
<p>4 808 Dispersit dedit GR GradualeR GrTr 520</p>		<p>Di- sper-sit, de- dit pau-pe- ri- bus: iu- 0 1 2 3 4 5 6 7 8 9 11 2 20 3415 20 20 3416 407 886 2 971 5222 5528 11 5528 5528 13 376 66 5222</p>

Second possibility: You enter in the sequence field (SM 3) two numbers. The first indicates the number of notes in a segment and the segment the number of occurrences. Before you press the sequence button select a corpus. I select Gregorian and in the text field I get:

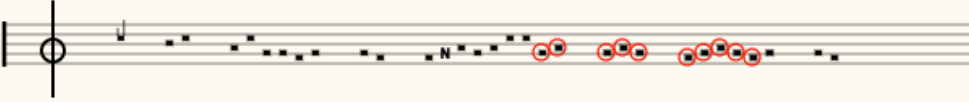
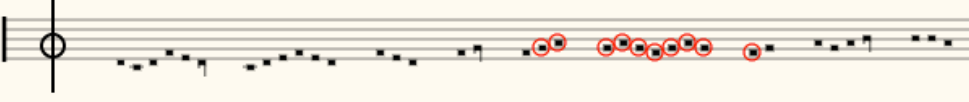
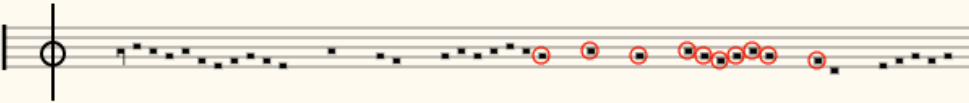
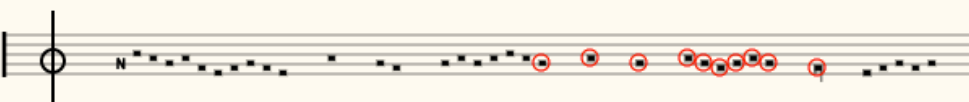

Num: 0:	f e f g g f f g f f	Occ: 16 Distr: Intr: 5 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 10 Comm: 0 Off: 1
Num: 1:	f g e f e d e f e d	Occ: 10 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 3 Off: 4
Num: 2:	g e f e d e f e d e	Occ: 12 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 5 Off: 4
Num: 3:	e f e d e f e d e e	Occ: 11 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 4 Off: 4
Num: 4:	f e d e f e d e e d	Occ: 27 Distr: Intr: 8 Ingr: 0 All: 0 Grad: 1 Psal: 0 Tract: 0 Comm: 10 Off: 8
Num: 5:	g a g a g f g a g f	Occ: 12 Distr: Intr: 1 Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 4 Off: 7
Num: 6:	a g a g f g a g f g	Occ: 20 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 2 Psal: 0 Tract: 0 Comm: 8 Off: 7
Num: 7:	g a g f g a g f g g	Occ: 21 Distr: Intr: 3 Ingr: 0 All: 0 Grad: 4 Psal: 0 Tract: 0 Comm: 9 Off: 5
Num: 8:	a g f g a g f g g f	Occ: 44 Distr: Intr: 12 Ingr: 0 All: 0 Grad: 5 Psal: 0 Tract: 0 Comm: 21 Off: 6

The informations given in one line are:

Num: 5: g a g a g f g a g f Occ: 12 Distr: Intr: 1
Ingr: 0 All: 0 Grad: 0 Psal: 0 Tract: 0 Comm: 4 Off: 7

On line 5 we get the segment g a g a g f g a g f It occurs 12 times and is distributed within the corpus: 1 Introitus, 4 Communiones, 7 Offertoria.

We try it:

<p>1 9 Circumdederunt me gemitus GR Introitus GrTr 117</p>		<p>Circumdederunt me gemitus mortis, sanc-to su- o vo- cem me- am. dolores inferni circumdederunt 48 49 50 51 52 53 54 55 me: et in tribulatione mea invo- 8 33 151 25 152 5 153 25 cavi Dominum, et exaudivit de temp- 4580 438 3 857 1 502 96 857 lo</p>
<p>2 166 Gaudete in domino AR Introitus MM 4</p>		<p>GAU- DE- TE in do- mi- no sem- per 1 2 3 4 5 6 7 8 329 89 22 1 168 22 77 275 9 400 1459 395 12 1459 35 22</p>
<p>3 487 Excita domine potentiam AR AlleluiaV MM 178</p>		<p>Alleluia. V.Excita do- mi- ne po- ten- ti- am tu- 7 8 9 10 11 12 13 14 20 25 1666 20 2 1670 107 469 5528 857 9 5528 5222 24 117 41</p>
<p>4 497 Laudate pueri dominum AR AlleluiaV MM 180</p>		<p>Alleluia. V.Lauda- te pu- e- ri do- mi- num lau- da- 6 7 8 9 10 11 12 13 14 1665 20 25 1666 20 2 1670 4 469 14 5528 857 9 5528 5222 24 4380 41</p>
<p>5 645 Eructavit cor meum AR GradualeV MM 112</p>		<p>Eructavit cor meum verbum bonum ve- lo- ci- ter scri- ben- dico ego opera mea regi lingua 31 32 33 34 35 36 mea calamus scribe 4 2914 47 2336 75 2915 4380 3 1458 10 204 2</p>

When we enlarge the search width then we get more results. Have all the same meaning?

BNA

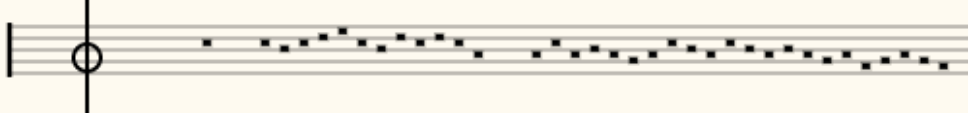
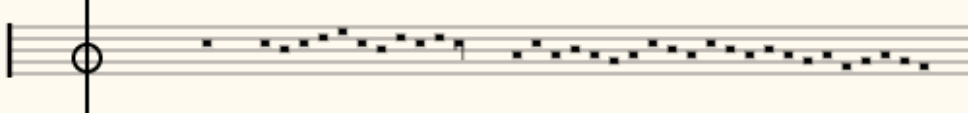
In analogy to the finding of segments and sequences there's a possibility to find BNA's. Enter (as for the segments) a letter and then three numbers. The first being the width of the nucleus, the second the width of *B*[efore], *N*[ucleus] and *A*[fter]. You get some results. We try it. With GR as corpus and Gradualia as genre selected I enter

SM 4: BNA a 5 15 5

and I get

0	29 407	(2)
1	2 2	(2)
2	8 2508	(3)
3	20 20	(2)
4	567 4	(2)
5	101 4374	(2)

Every line gives three informations: line number, BNA and number of occurrences. With the B_A of 8_2508 I get e.g.:

<p>3 561 Ab occultis meis AR GradualeR MM 84 Ab occultis meis munda me domine et ab a-</p>		<p>li- e- nis 15 16 17 8 2515 2508 4580 12 56</p>
<p>4 570 Angelis suis AR GradualeR MM 162 Angelis suis mandavit de te ut custo-</p>		<p>di- ant te 13 14 15 8 2507 2508 4580 9 56</p>

This leaves me with the question of the segments 2515 and 2507 (being the bridges between 8_2508) have the same function.

Find axis

We let *SM 5: Syllables* aside. There's nothing new about it. But we haven't experimented with the possibility to find axes. We speak of *repercussa* or *tenor* and mean an important note of a chant being something like the axis of it. One often get's the idea that there are two *tenores*, not only one. In any case: it could be interesting to find chants based on a quantitative criterion.

We try it. Enter 5 in the field:

Find axis 5

You see the results in the text field. The layout is already known from the sequence field. Now we go ahead. You may enter a line number after the 5 and see then the corresponding chants. If you enter 1 as a third number you see above the first line the five most used notes together with their colours:

Find axis 5 46 1

This input gives the information about the most used notes



and naturally the corresponding chants:

SM 4 | BNA: 8 2508 | Page: 1 GR Graduale | 3.11.2014 3:20:38 pm

c' a g h d'

1
67 In virtute tua
GR
Introitus
GrTr 473

In vir- tu- te tu- a Do- mi- ne, lae- ta- bi- tur iu- stus, et su-
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
2 2 20 20 294 2 90 172 8 59 51 415 364 5 2 2 536
5222 5222 5528 5528 31 5222 370 173 4580 636 89 38 46 502 5222 5222 48

2
71 Intret oratio mea
GR
Introitus
GrTr 363

In- tret o- ra- ti- o me- a in con- spe- ctu tu- o: in-
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
117 8 8 61 90 8 61 558 2 20 559 16 97 183 29
124 4580 4580 44 370 4580 44 2 5222 5528 1 1425 26 6 542

3
82 Laetabitur iustus
GR
Introitus
GrTr 473

Lae- ta- bi- tur iu- stus in Do- mi- no, et spe- ra- bit in
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
2 29 239 2 99 20 29 593 535 31 20 59 609 610 611
5222 542 67 5222 2 5528 542 56 14 425 5528 636 1 1 17

In the presentation of the data you see that the notes are coloured according to their occurrence.

It may be that you are not interested in all those data but would like to know if a particular chant has corresponding chants with the same quantitative distribution. You do it this way: enter the number of notes (the maximum is five) and the chant number of your main chant in the second field:

Find axis 5 42

You get a message about the corresponding line. The message will be somewhat different depending on the browser you use. In any case you learn from it that chant number 42 – together with chant numbers 807, 880, 886 – is presented in line 31

```
function alert() { [native code] }Num: 31: a f g c' h
Occ: 4 Distr: Intr: 1 Ingr: 0 All: 0 Grad:
3 Psal: 0 Tract: 0 Comm: 0 Off: 0 (42,807,880,886)
```

Enter now the line number in the first field. You get the display of the corresponding chant the normal way:

Find axis 5 31

Press the button and you get

SM 4 | BNA: 8 2508 | Page: 1 GR Graduale | 3.11.2014 3:33:46 pm

1
42 Ego autem in domino
GR
Introitus
GrTr 111

E- go au- tem in Do- mi- no spe- ra- vi: ex- sul- ta- bo, et lae- ta- bor in tu- a r
o 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
4 16 20 20 20 177 47 388 47 177 94 2 20 8 8 172 20 8 389 20 390 2 2
4380 1425 5528 5528 5528 66 1458 6 1458 66 504 5222 5528 4580 4580 173 5528 4580 7 5528 2 5222 5

2
807 Discerne causam meam
GR
GradualeR
GrTr 127

Dis- cer- ne cau- sam me- am, Do- mi- ne: ab ho- mi- ne in- i- quo et do- lo- so e- ri-
o 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
101 124 4 4 4 4 2 3619 4 4 4 3543 33 20 2 238 94 20 8 8 33 127 20
2653 307 4380 4380 4380 4380 5222 7 4380 4380 4380 9 438 5528 5222 211 504 5528 4580 4580 438 119 55

3
880 Timebunt gentes
GR
GradualeR
GrTr 265

Ti- me- bunt gen- tes no- men tu- um, Do- mi- ne, et om- nes re- ges
o 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
101 124 2 3619 4 3543 620 3921 20 4 153 25 4 199 499 238 59
2653 307 5222 7 4380 9 77 1 5528 4380 96 857 4380 73 14 211 636

4
886 Unam petii
GR
GradualeR
GrTr 358

U- nam pe- ti- i a Do- mi- no, hancre- qui- ram, ut in- ha- bi- tem in do
o 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
114 4 199 2 104 101 158 2 3534 20 36 3721 20 20 90 8 3943 94 37 127
58 4380 73 5222 47 2653 10 5222 4 5528 144 2 5528 5528 370 4580 3 504 1223 119