Differentiae in the *Cantus Manuscript Database*: Standardization and Musicological Application

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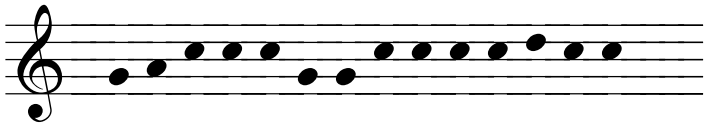
Digital Libraries for Musicology Conference

September 28, 2018

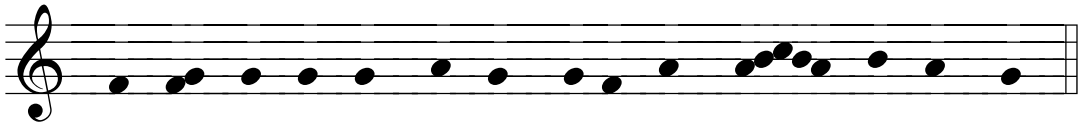
Social Sciences and Humanities Research Council of Canada
Conseil de recherches en sciences humaines du Canada
Canada

2. Psalm



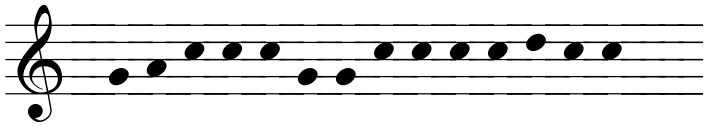
[Mode 8 psalm tone from *Liber Usualis*]

1. Antiphon



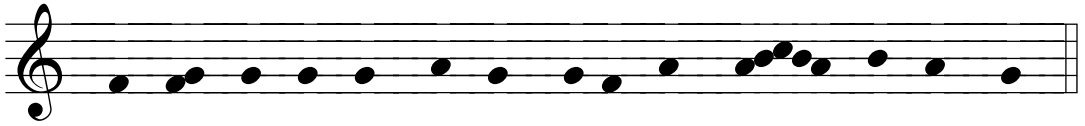
Do-mi-ne in vir- tu-te tu-a lae-ta- bi-tur rex.

2. Psalm



[Mode 8 psalm tone from *Liber Usualis*]

3. Antiphon



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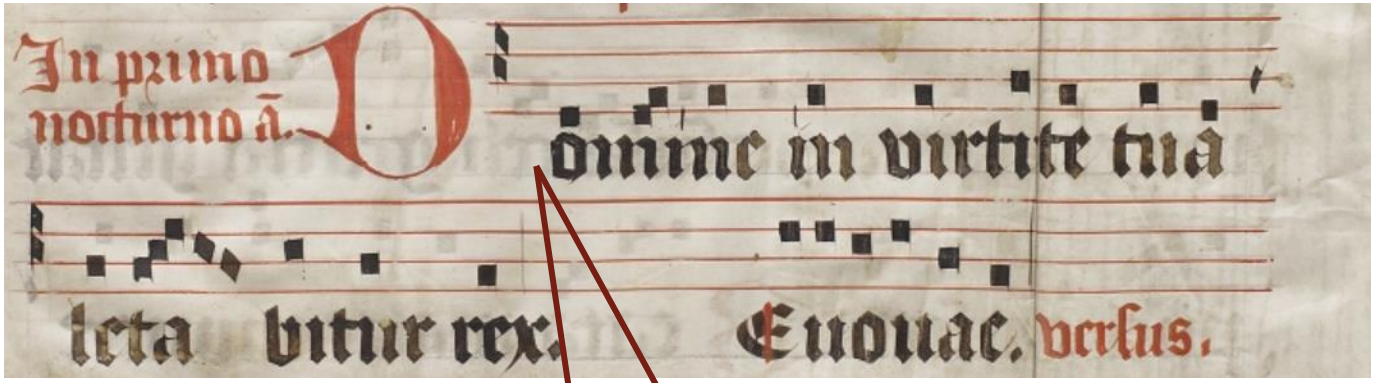
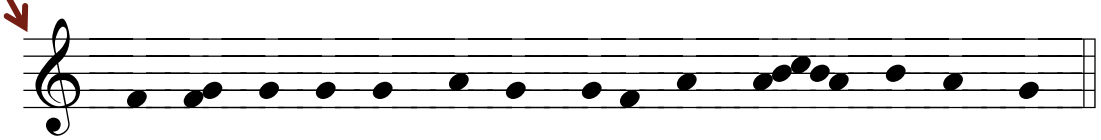


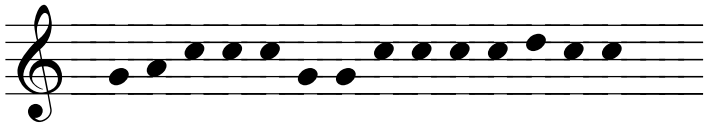
Domine in virtute tua laetabitur (f. 1v) from the *Salzinnes Antiphoner*, Mode 8 Psalm Tone, Mode 8, *Liber Usualis*

1. Antiphon



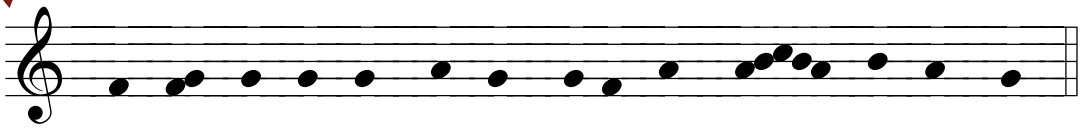
Do-mi-ne in vir- tu-te tu-a lae-ta- bi-tur rex.

2. Psalm



[Mode 8 psalm tone from *Liber Usualis*]

3. Antiphon



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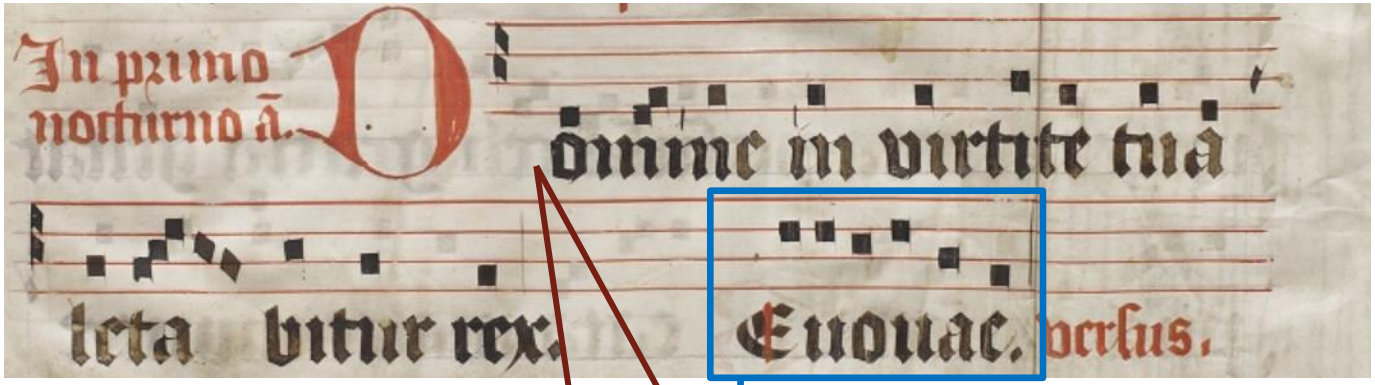

Domine in virtute tua laetabitur (f. 1v) from the *Salzinnes Antiphoner*, Mode 8 Psalm Tone, Mode 8, *Liber Usualis*

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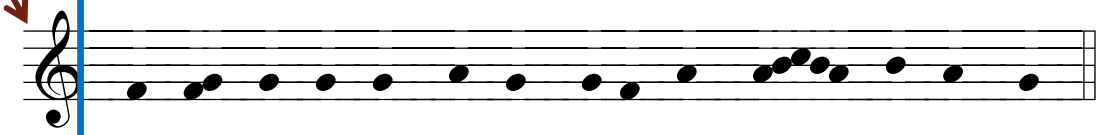
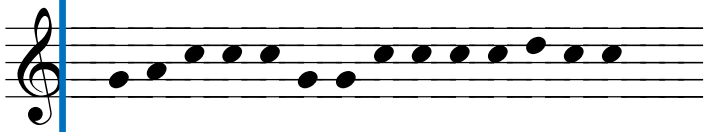


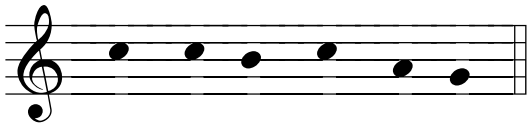
Do-mi-ne in vir- tu-te tu-a lae-ta- bi-tur rex.

2. Psalm



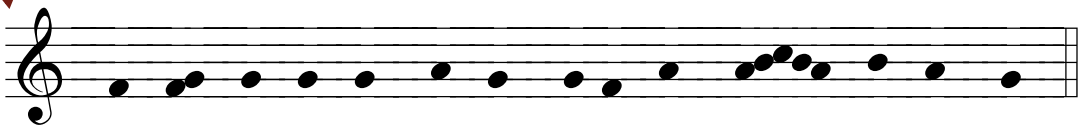
[Mode 8 psalm tone from *Liber Usualis*]

2a. *Differentia*

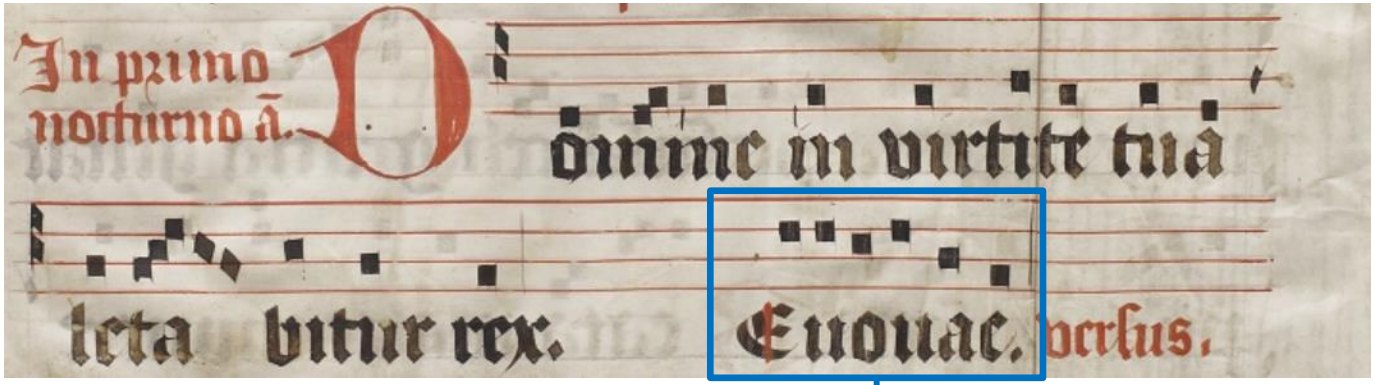


Sae-cu-lo-rum a-men

3. Antiphon



Do-mi-ne in vir- tu-te tu-a lae-ta- bi-tur rex.



Gloria Patri, et Filio, et Spiritui Sancto.

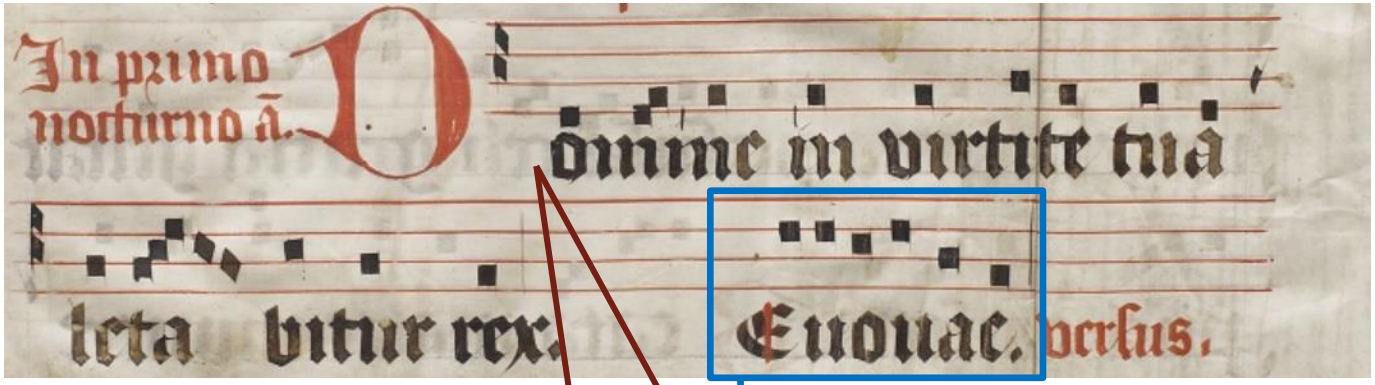
Sicut erat in principio, et nunc, et semper, et in sæcula

saeculorum. Amen.

Glory [be] to the Father, and to the Son, and to the Holy Ghost.

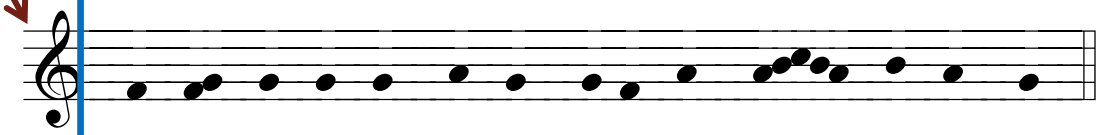
As it was in the beginning, and now, and always, and into the ages of ages. Amen.

Doxology



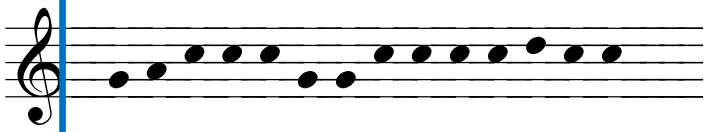
Domine in virtute tua laetabitur (f. 1v) from the *Salzinnes Antiphoner*, Mode 8 Psalm Tone, Mode 8, *Liber Usualis*

1. Antiphon



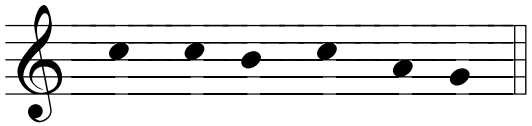
Do-mi-ne in vir- tu-te tu-a lae-ta- bi-tur rex.

2. Psalm



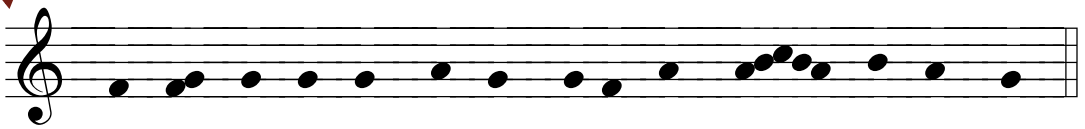
[Mode 8 psalm tone from *Liber Usualis*]

2a. *Differentia*

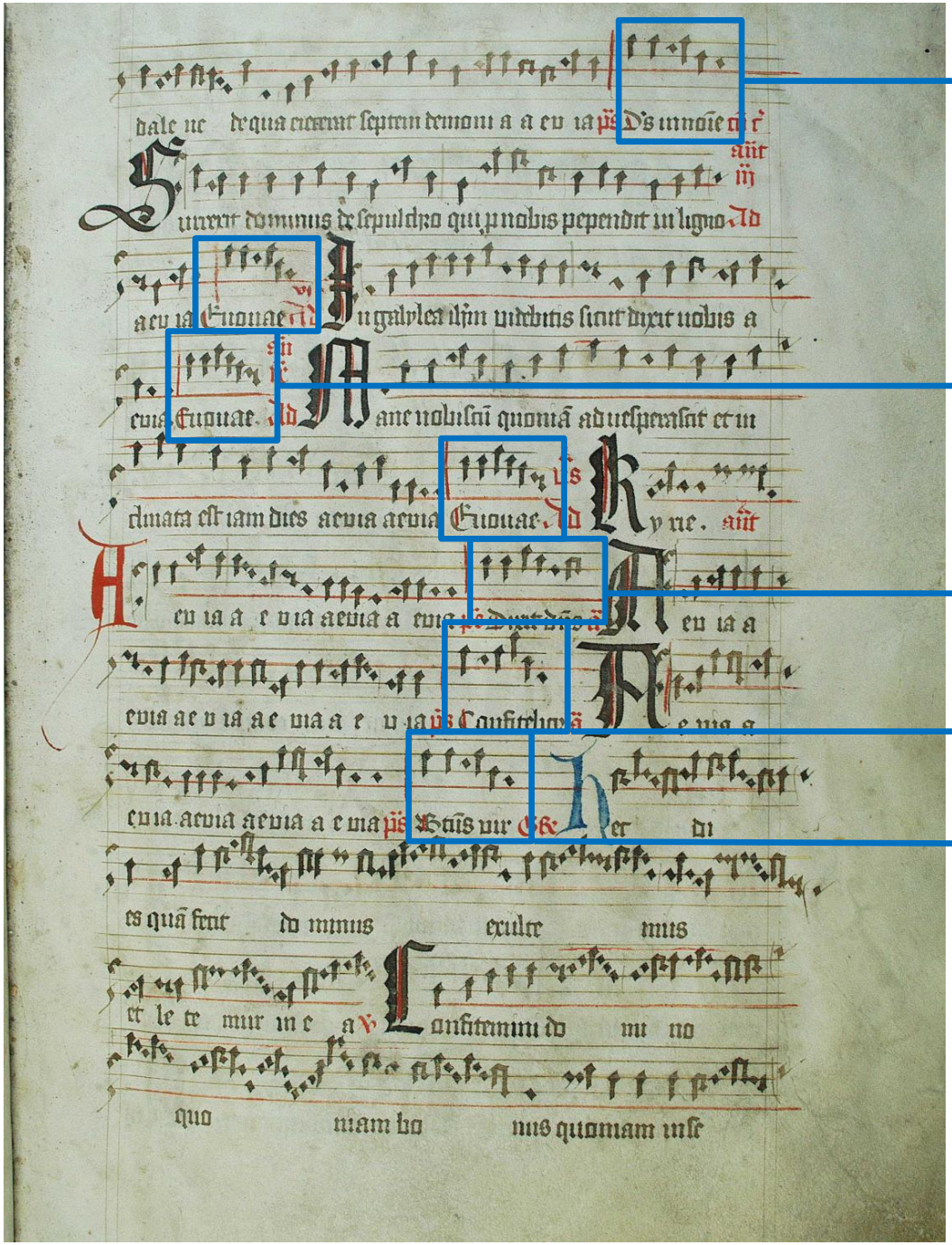


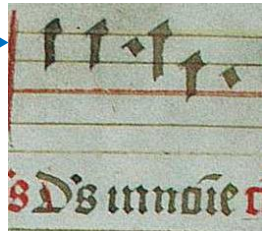
Sae-cu-lo-rum a-men

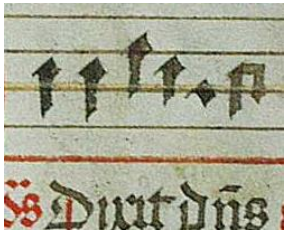
3. Antiphon

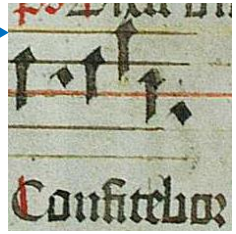


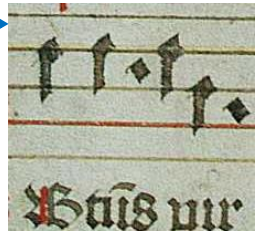
Do-mi-ne in vir- tu-te tu-a lae-ta- bi-tur rex.











Fulda, Hessische Landesbibliothek, Aa 55 (f. 4r)

1) Standardization project

2) Musicological application
   a) Melodic connection
   b) Mnemonic function

Ecce nomen domini venit de

Example of antiphon indexed in *Cantus Manuscript Database*

Source:

Wien, Österreichische Nationalbibliothek - Handschriftensammlung, 1799**

Folio:	Sequence:
001r	8

Feast:	Office/Mass:	Genre:	Position:	Cantus ID:	Mode:
Dom. 1 Adventus	V	A	M	002527	1

Differentia:

G1

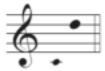
Manuscript Reading Full Text (standardized spelling):

Ecce nomen domini venit de longinquo et claritas ejus replet orbem terrarum

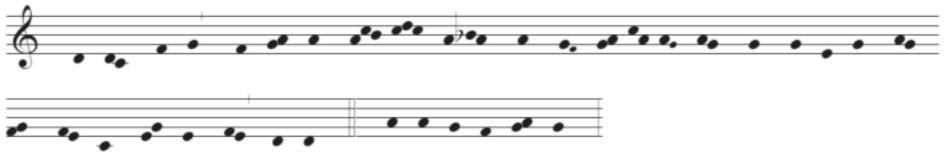
Manuscript Reading Full Text (MS spelling):

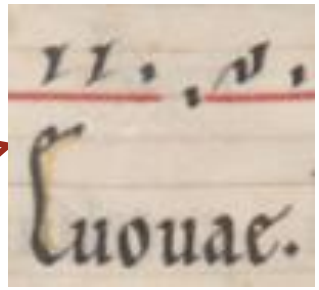
Ecce nomen domini venit de longinquo et claritas eius replet orbem terrarum | Euouae

Range:

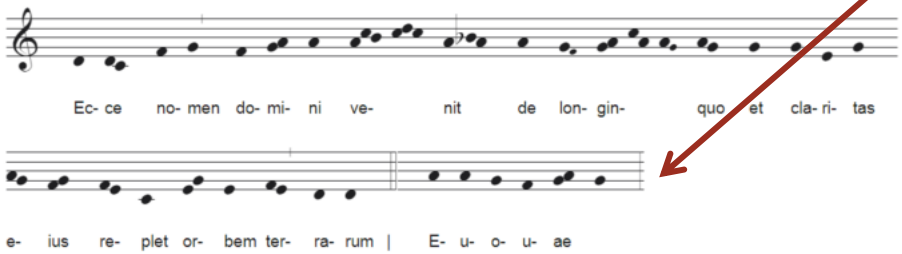


Volpiano:





Melody with text



Scope of the standardization project to date

- 1,268 unique *differentiae*
- 152 manuscripts
- 14 - 96 unique *differentiae* per manuscript

Ecce nomen domini venit de

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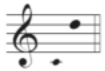
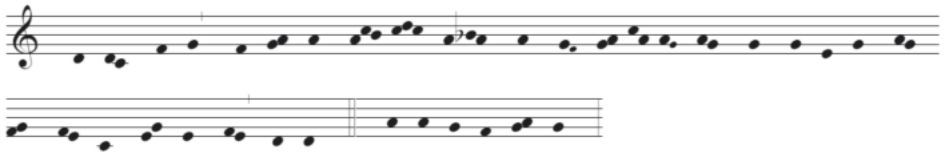
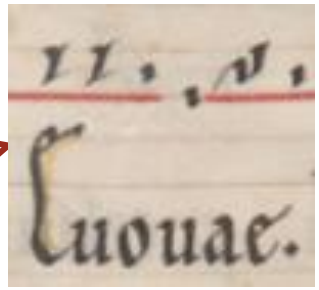
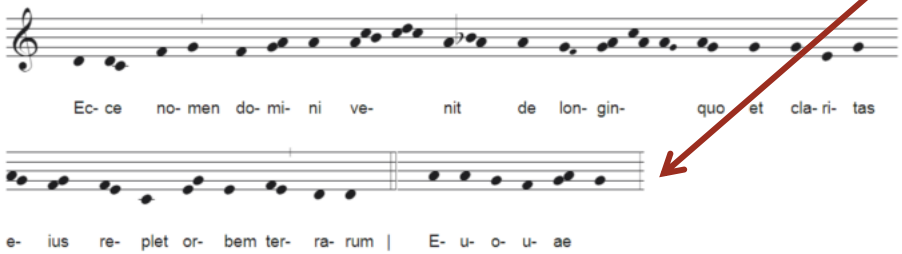


Volpiano:



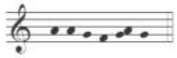


Melody with text



Example of *differentia* indexed in *Differentiae Database*

66d



Saeculorum:

Amen:

Mode: Mode 1

Generic contour: n-n-n-n-nu-n

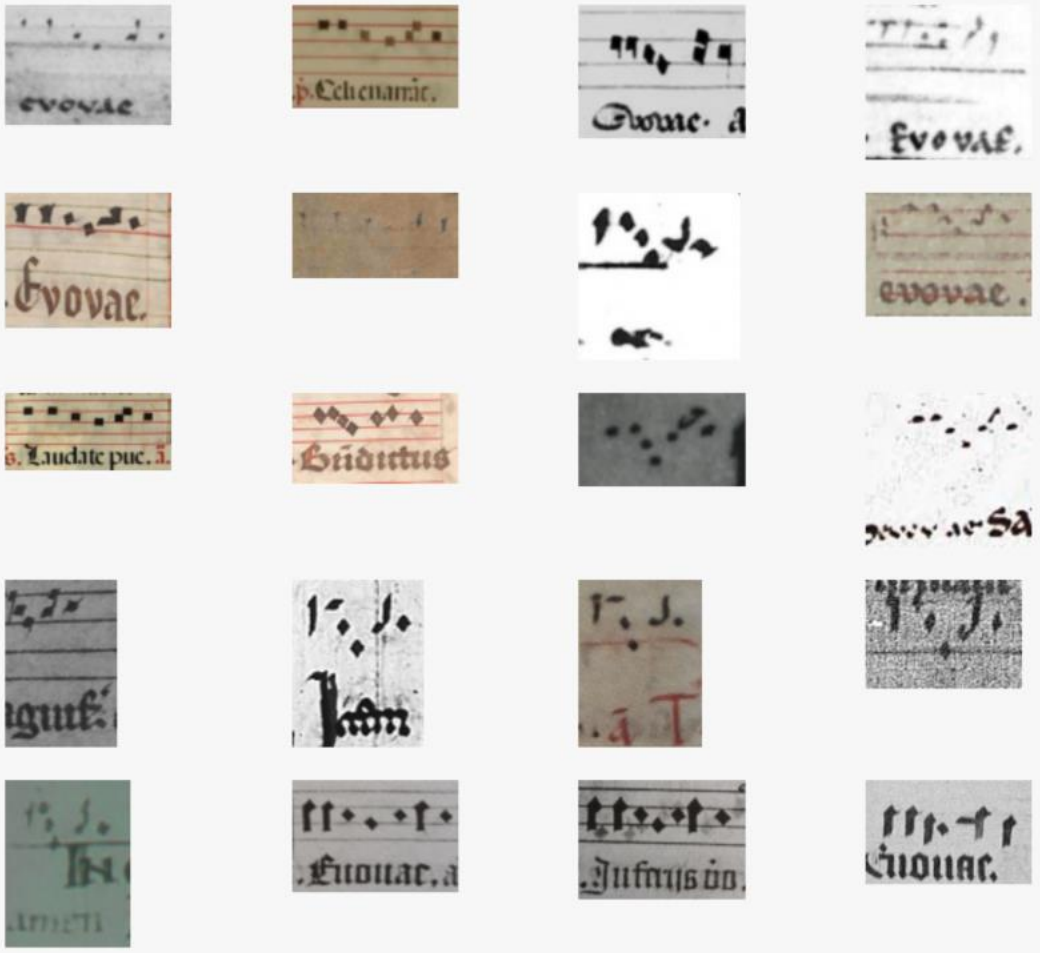
Contour:

Overall direction: Down

Overall movement:

Range:

Manuscript examples



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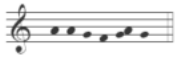


Saeculorum:

Amen:

Mode: Mode 1

Generic contour: n-n-n-n-nu-n

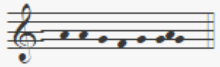
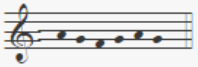
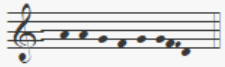
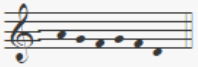
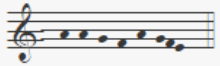
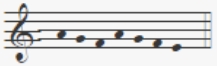
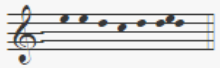
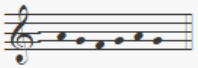
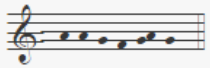
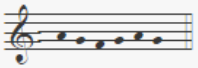
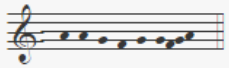
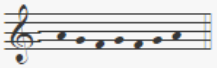
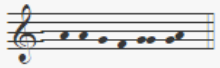
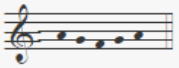
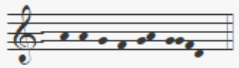
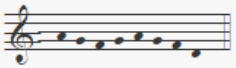
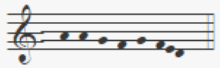
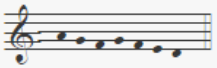
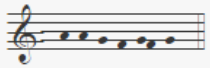
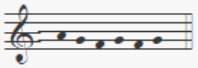
Contour:

Overall direction: Down

Overall movement:

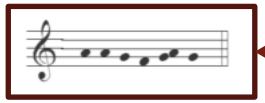
Range:

Displaying 1 - 129 of 129

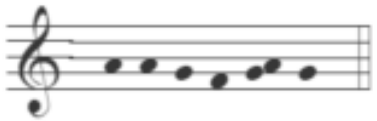
	Mode	Melodic transcription	Contour	Saeculorum	Amen
66l	Mode 1				
74g	Mode 1				
59a	Mode 1				
T66l	Mode 1				
66d	Mode 1				
76b	Da				
64x	Mode 1				
70e	Mode 1				
75f	Mode 1				
124a	Mode 1				

Unique Identifier

66d



Melodic transcription



Saeculorum:

Amen:

Mode: Mode 1

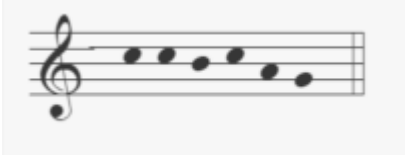
Generic contour: n-n-n-n-nu-n

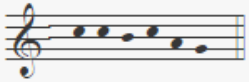
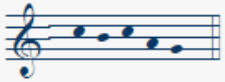
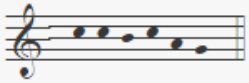
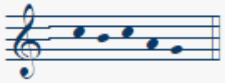
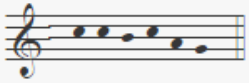
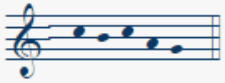
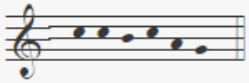
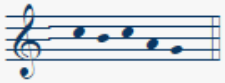
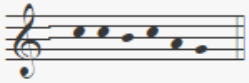
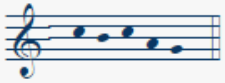
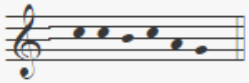
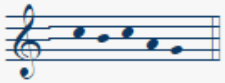
Contour:

Overall direction: Down

Overall movement:

Range:

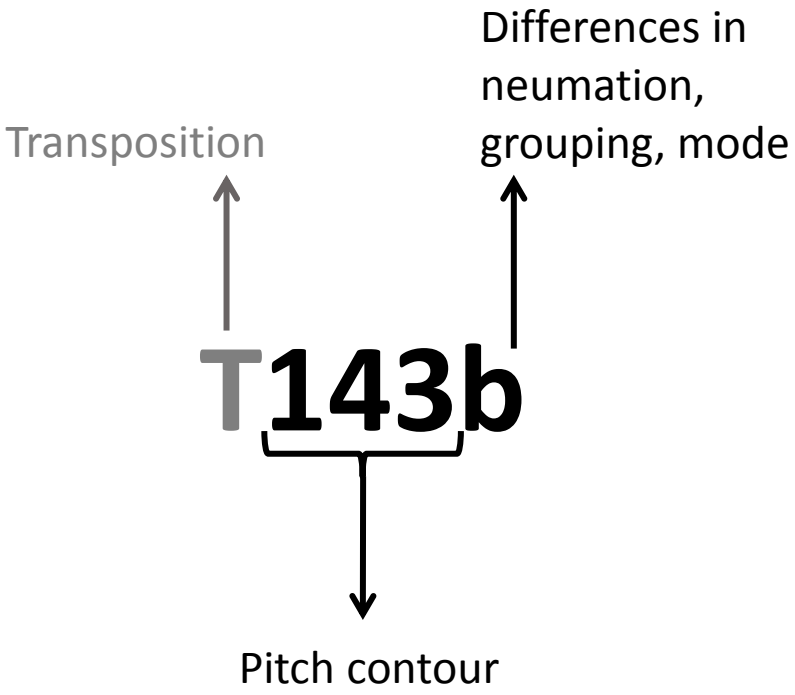
Same melodic transcription: 

Diff. ID	Melodic transcription	Mode	Pitch Contour	Saeculorum	Amen	No. of mss.
118a		Mode 8				134
118r		Mode 3				10
118ff		Gc				1
118ii		ac				1
118jj		Ec				1
118c		Mode 5				1

Transposition

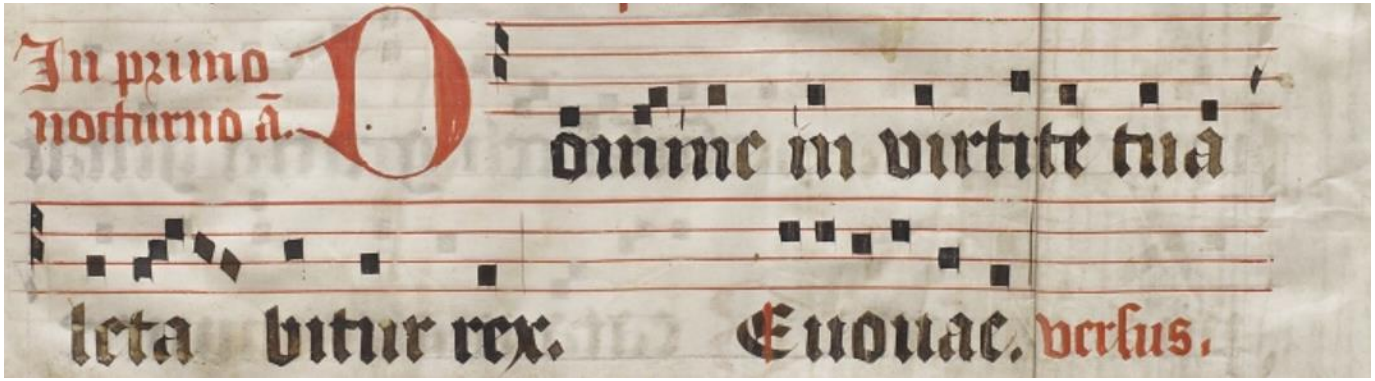
143b

T143b


Differences in neumation, grouping, mode
Transposition
T143b
Pitch contour

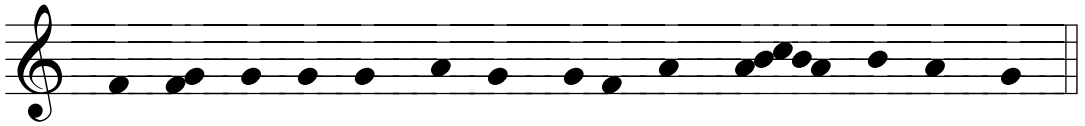
1) Standardization project

2) Musicological application
   a) Melodic connection
   b) Mnemonic function



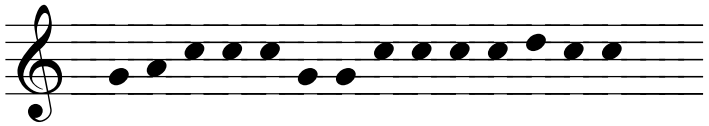
Domine in virtute tua laetabitur (f. 1v) from the *Salzinnes Antiphoner*, Mode 8
Psalm Tone, Mode 8, *Liber Usualis*

1. Antiphon



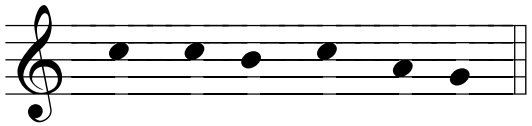
Do-mi-ne in vir- tu-te tu-a lae-ta- bi-tur rex.

2. Psalm



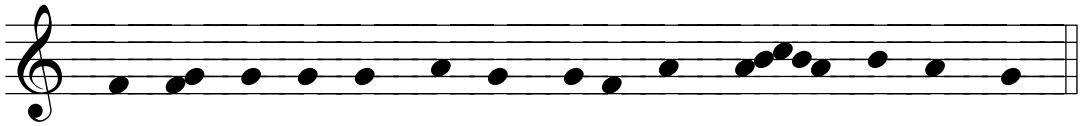
[Mode 8 psalm tone from *Liber Usualis*]

2a. *Differentia*

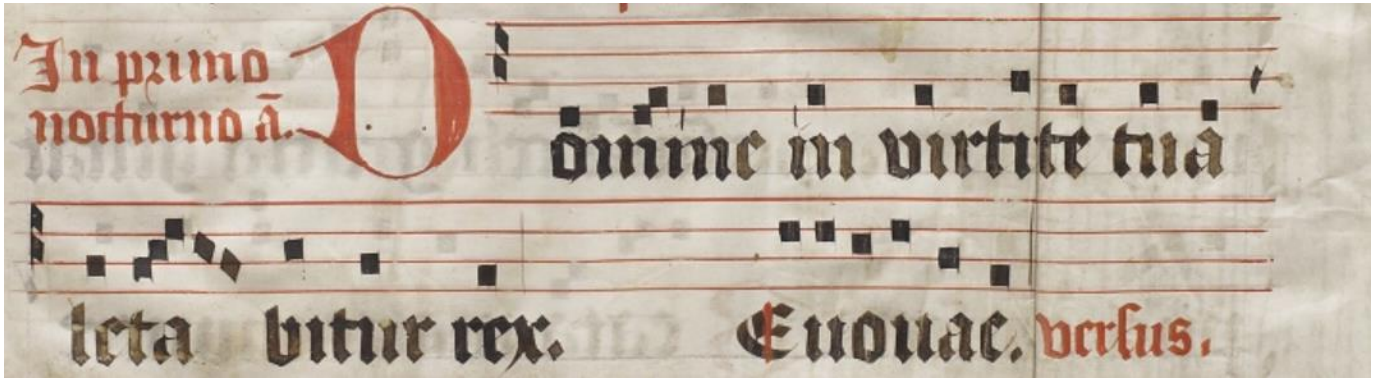


Sae-cu-lo-rum a-men

3. Antiphon

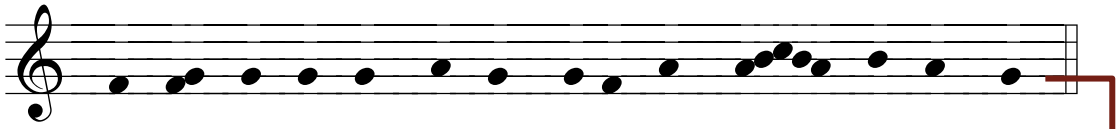


Do-mi-ne in vir- tu-te tu-a lae-ta- bi-tur rex.



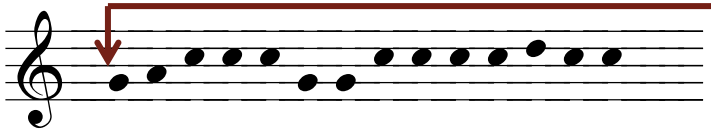
Domine in virtute tua laetabitur (f. 1v) from the *Salzinnes Antiphoner*, Mode 8
Psalm Tone, Mode 8, *Liber Usualis*

1. Antiphon



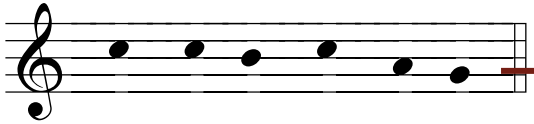
1

2. Psalm



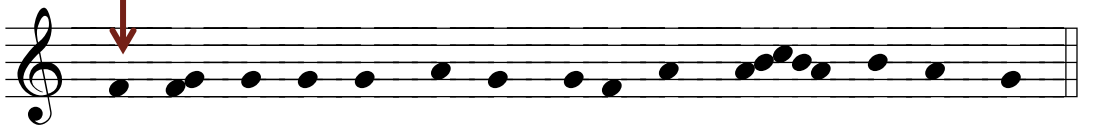
[Mode 8 psalm tone from *Liber Usualis*]

2a. *Differentia*



2

3. Antiphon

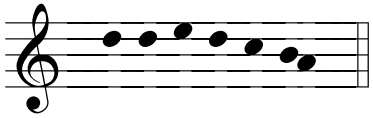
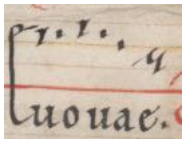


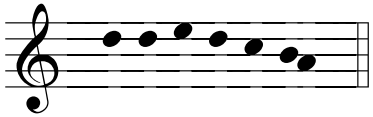
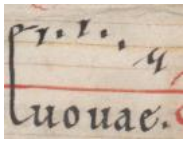
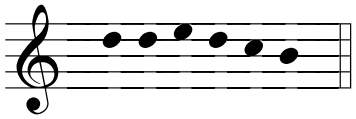
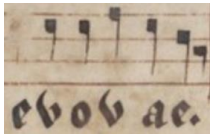
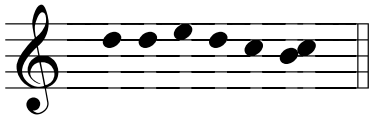
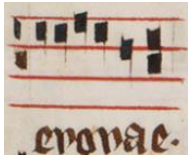
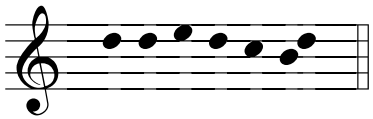
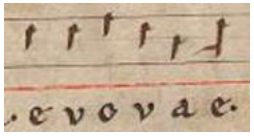
1) Standardization project

2) Musicological application
   a) Melodic connection
   b) Mnemonic function

Dataset

- 16, 314 antiphons and their *differentiae*
- 34 manuscripts (1100s – 1500s)

Differentiae	Manuscript examples	Last Note	No. of Antiphons	No. of Manuscripts
		A	966	30

Differentiae	Manuscript examples	Last Note	No. of Antiphons	No. of Manuscripts
		A	965	30
		B	102	7
		C	393	11
		D	231	4

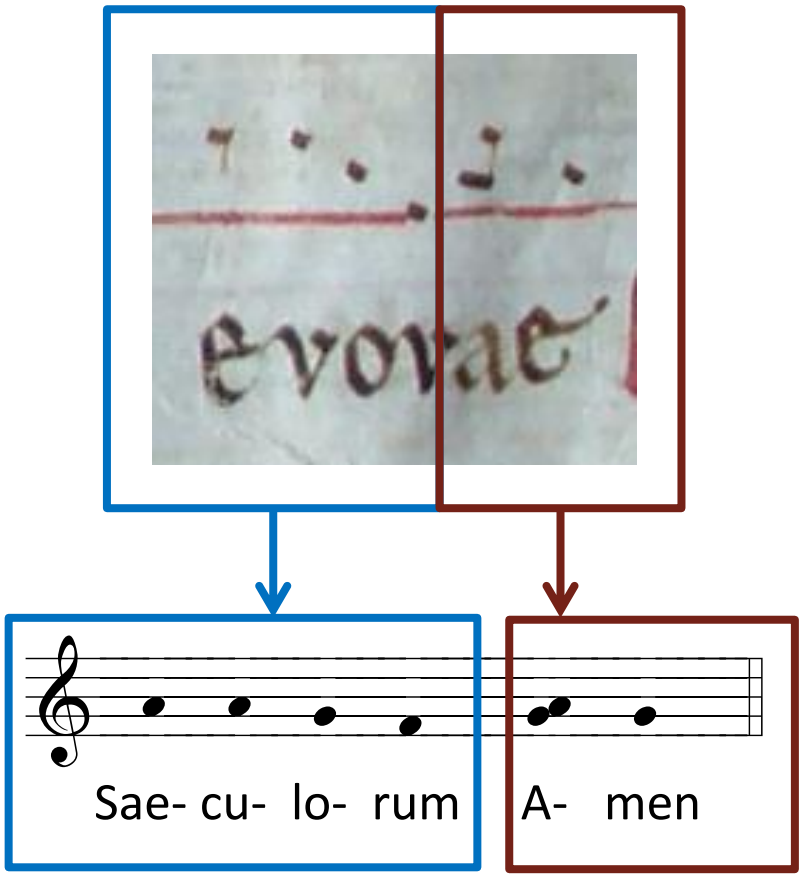
Last note of *differentiae* →

First note of antiphons →	A	B	C	D
A	8	2	7	**22**
B	7	**48**	14	**15**
C	15	3	5	3
D	13	**112**	**365**	**56**
E	1	2		
F				1
G	**921**	**64**	2	5

Mode 7, select *differentiae*

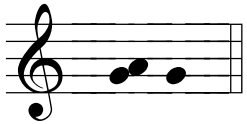
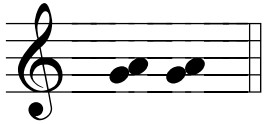
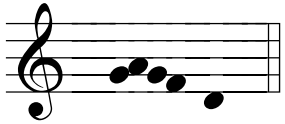
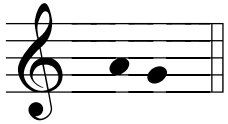
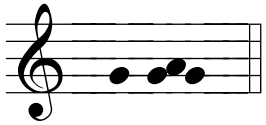
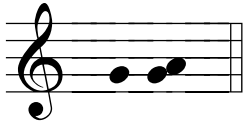
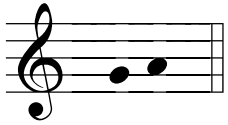
Dataset: Mode 1

- 3,489 antiphons
- 67 unique *differentiae*
- 34 manuscripts (1100s – 1500s)



Psalm → “Saeculorum”

“Amen” → Antiphon

“Amen” endings	Antiphon beginnings
	D F G
	D-A C-D-A
	C (no leap from D-A)
	F-A-G
	F-G-A
	F-E-D-C
	A

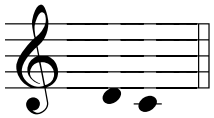
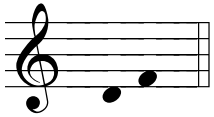
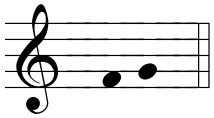
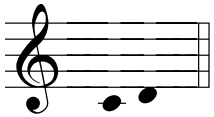
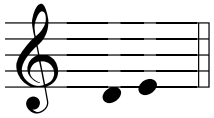
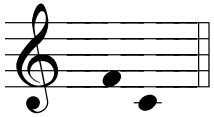
Johannes Cotto,

De Musica (12th c.),

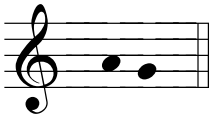
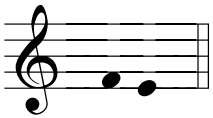
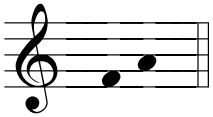
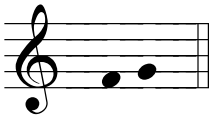
Mode 1

“Amen”	No. of antiphons	No. of manuscripts
GAG	2456	34
GA	264	27
GAGFED	334	24
GAGA	163	20
AG	15	11
GFGA	41	6
GFD	35	6
G	11	4
GFED	258	3
GAGFD	101	3
FGFD	112	1
AGA	37	1
FGFDE	4	1
EFE	3	1

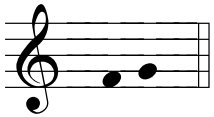
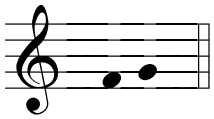
Mode 1, “Amen” endings

Antiphon Incipit	No. of Antiphons	No. of Manuscripts
	820	33
	535	32
	306	27
	252	26
	180	27
	88	22

Antiphon incipits for GAG “Amen” endings

Antiphon Incipit	No. of Antiphons	No. of Manuscripts
	139	21
	49	8
	28	15
	19	10

Antiphon incipits for GA “Amen” endings

“Amen” ending	Antiphon Incipit	No. of Antiphons	No. of Manuscripts
GA		19	10
GAG		306	27

Shared antiphon incipit for GA and GAG “Amen” endings

Mode 1 “Amen” categories:

1. Descend from A to D
2. Centred around A

Mode 1 Antiphon categories:

1. Contain A in opening gesture but not D
2. Contain D in opening gesture, A optional

Group 1 Antiphons	Group 2 "Amen"							Group 1 "Amen"					
	G	AG	GAG	GA	GFGA	GAGA	AGA	FGFD	FGFDE	GAGFD	GAGFED	GFD	GFED
AC			4										
AE				3									
AF				9									
AG		4	7	139			22						
FA		4	44	28			10						
FG(A)	10	3	302	19			3						
Group 2 Antiphons													
BD										14			
CD			252			71		78	4	64	275		92
CE			6										
DA			72	9	37	85							
DB			9										
DC			820					9			27	3	46
DE			177							1	5	18	12
DF			535					16			17	4	80
EC(D)			21										
ED			9										
EF(D)			6										
FC(D)			87										
FD			21										3
FE(D)			27	49									7
GC(D)			26										

		Group 2 "Amen"							Group 1 "Amen"					
		G	AG	GAG	GA	GFGA	GAGA	AGA	FGFD	FGFDE	GAGFD	GAGFED	GFD	GFED
Group 1 Antiphons	AC			4										
	AE				3									
	AF				9									
	AG		4	7	139			22						
	FA		4	44	28			10						
	FG(A)	10	3	302	19			3						
Group 2 Antiphons	BD										14			
	CD			252			71		78	4	64	275		92
	CE			6										
	DA			72	9	37	85							
	DB			9										
	DC			820					9			27	3	46
	DE			177							1	5	18	12
	DF			535					16			17	4	80
	EC(D)			21										
	ED			9										
	EF(D)			6										
	FC(D)			87										
	FD			21										3
	FE(D)			27	49									7
	GC(D)			26										

		Group 2 "Amen"							Group 1 "Amen"					
		G	AG	GAG	GA	GFGA	GAGA	AGA	FGFD	FGFDE	GAGFD	GAGFED	GFD	GFED
Group 1 Antiphons	AC			4										
	AE				3									
	AF				9									
	AG		4	7	139			22						
	FA		4	44	28			10						
	FG(A)	10	3	302	19			3						
Group 2 Antiphons	BD										14			
	CD			252			71		78	4	64	275		92
	CE			6										
	DA			72	9	37	85							
	DB			9										
	DC			820					9			27	3	46
	DE			177							1	5	18	12
	DF			535					16			17	4	80
	EC(D)			21										
	ED			9										
	EF(D)			6										
	FC(D)			87										
	FD			21										3
	FE(D)			27	49									7
	GC(D)			26										

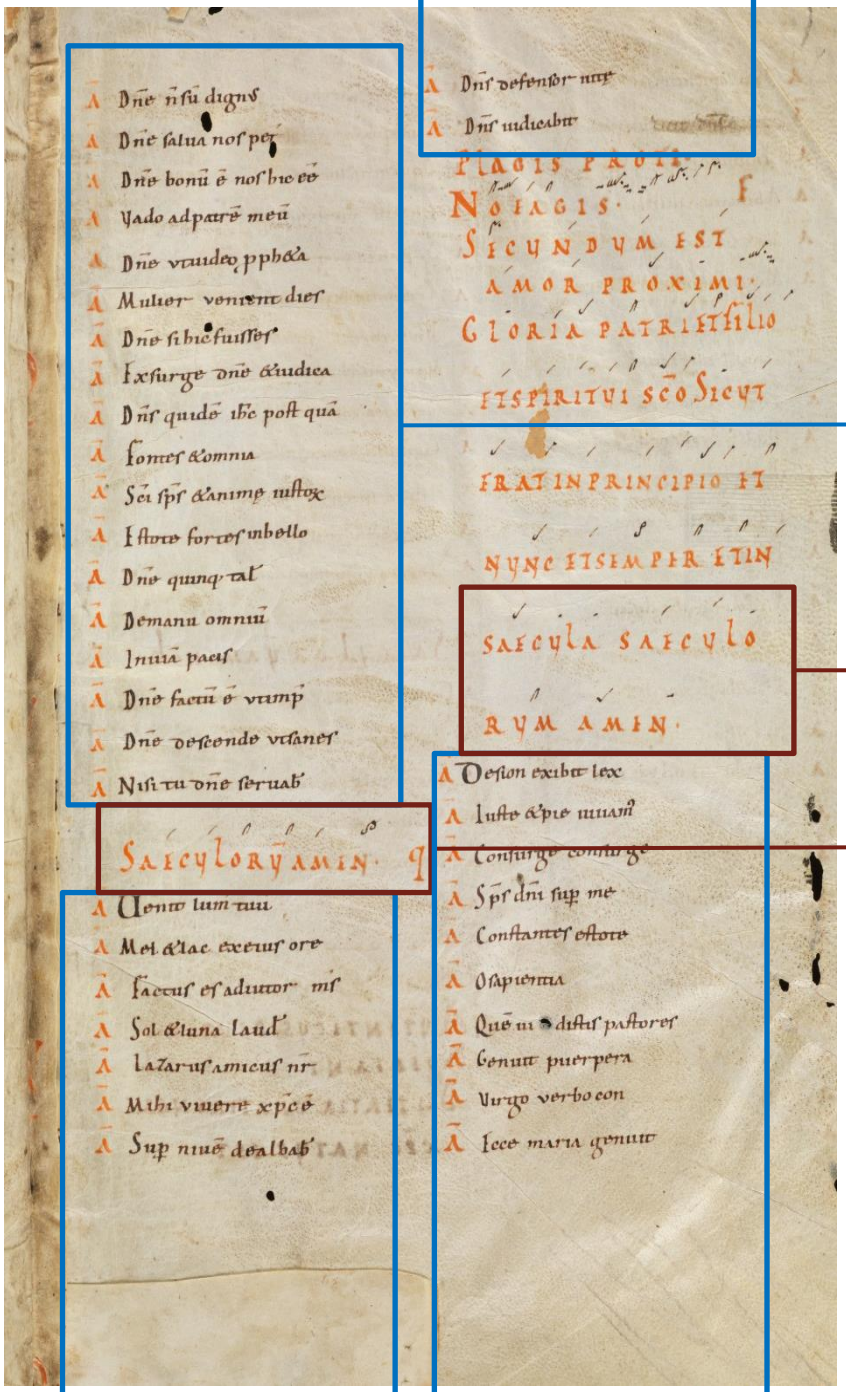
Smooth connection
Emphasis on
reciting tone

Connection by leap
Emphasis on final

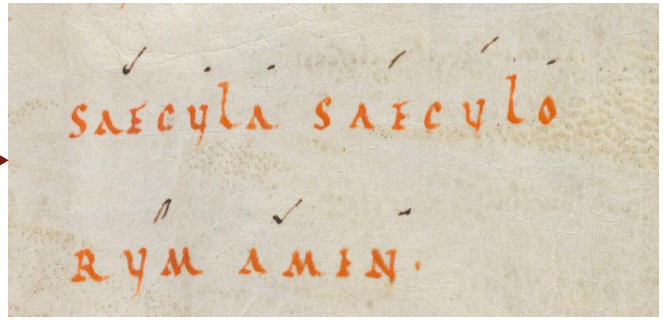
Smooth connection
Emphasis on final

1) Standardization project

2) Musicological application
   a) Melodic connection
   b) Mnemonic function



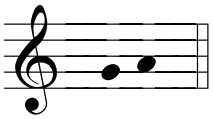
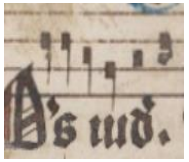
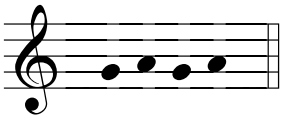
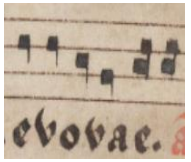
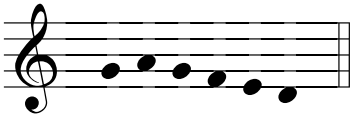
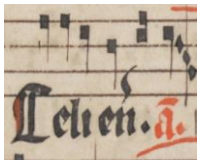
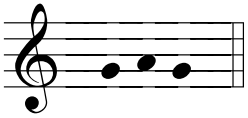
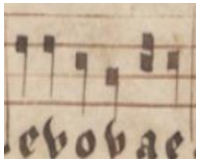
Antiphon lists



Differentiae

Tonary as mnemonic aide

e.g., Sankt Gallen, Stiftsbibliothek, 391 (p. 5)

“Amen” contour	Manuscript Example	Number of Antiphons
		13
		28
		112
		299

Einsiedeln 611, Mode 1 “Amen” endings

		Group 2 "Amen"			Group 1 "Amen"
		GA	GAG	GAGA	GAGFED
Group 1 Antiphons	**A**B	1	Smooth melodic transition to the reciting tone		
	AF	2			
	AG	3			
	CG(**A**)		1		
	FG(**A**)	1	30		
	F**A**	2	1		
Group 2 Antiphons	C**D**		4	2	109
	FE(**D**)	4	4		Smooth melodic transition to the final
	DA		1	25	
	DC		127	1	2
	DE		31		1
	DF		100		
	E**D**		1		
	FC(**D**)		14	Leap to final	
	F**D**		5		

Confirmed

- ✓ *Differentiae* provided melodic connections between psalm tones and antiphons
- ✓ *Differentiae* served as mnemonic devices for remembering antiphons

Discovered

- ✓ Three specific types of mode 1 *differentiae*-antiphon connections
- ✓ Certain types of connections preferred depending on provenance of the manuscript (possibilities for chant transmission studies)

Quantifiable evidence of *differentiae* function

Questions, comments?

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