A Methodology for Encoding Mensural Music:

Introducing the Mensural MEI Translator

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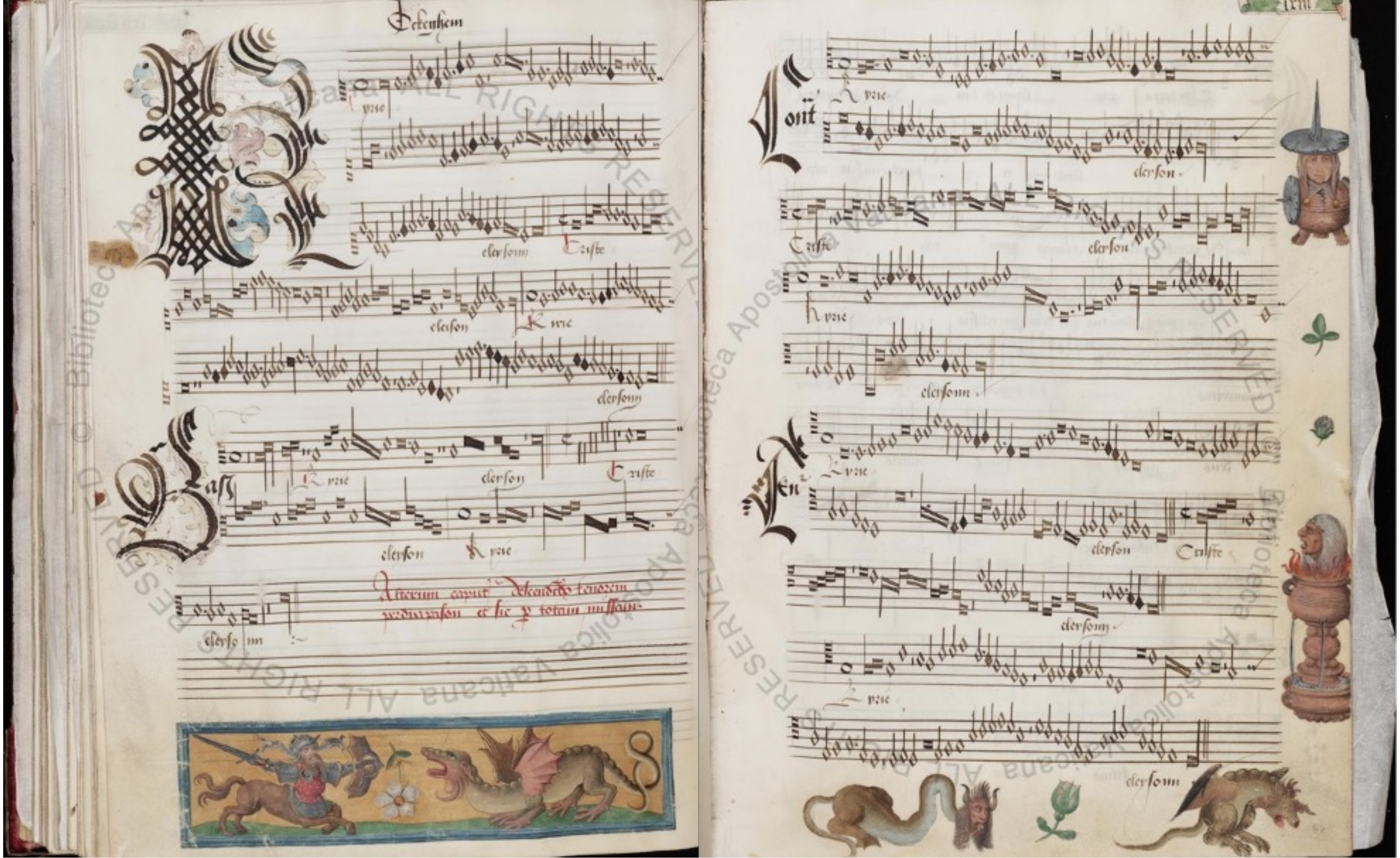
Music Encoding Conference
Tours, May 17th, 2017


Kyrie
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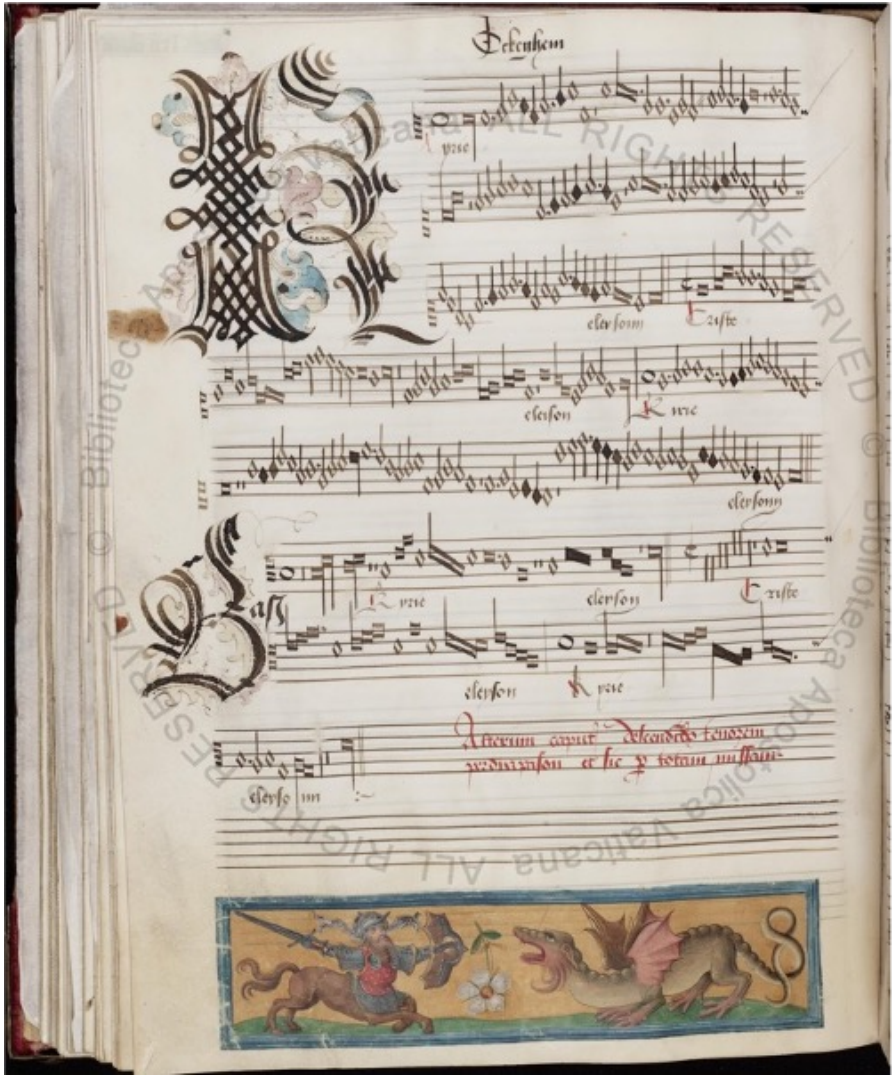
What is the best way to get musicologists to enter a large amount of musical documents into the computer?

And how can we get them encoded into Mensural MEI files?

The Mensural MEI Translator

A straightforward method to encode music repertories from the later Middle Ages and the Renaissance
as they were originally notated.

Mensural Notation 101



Mensural Notation

System of notation used from the 1250s to 1600s

Looks similar to our common Western music notation (CMN):

- Already uses staff-lines and clefs to indicate pitch
- Mensural note-shapes are similar to CMN note-shapes

Modern Notes	(White) mensural notes
	

Mensural Notation

- The note-shapes are similar and there is a clear hierarchy in the note duration

- But, the actual value of these notes is ambiguous

longest

shortest

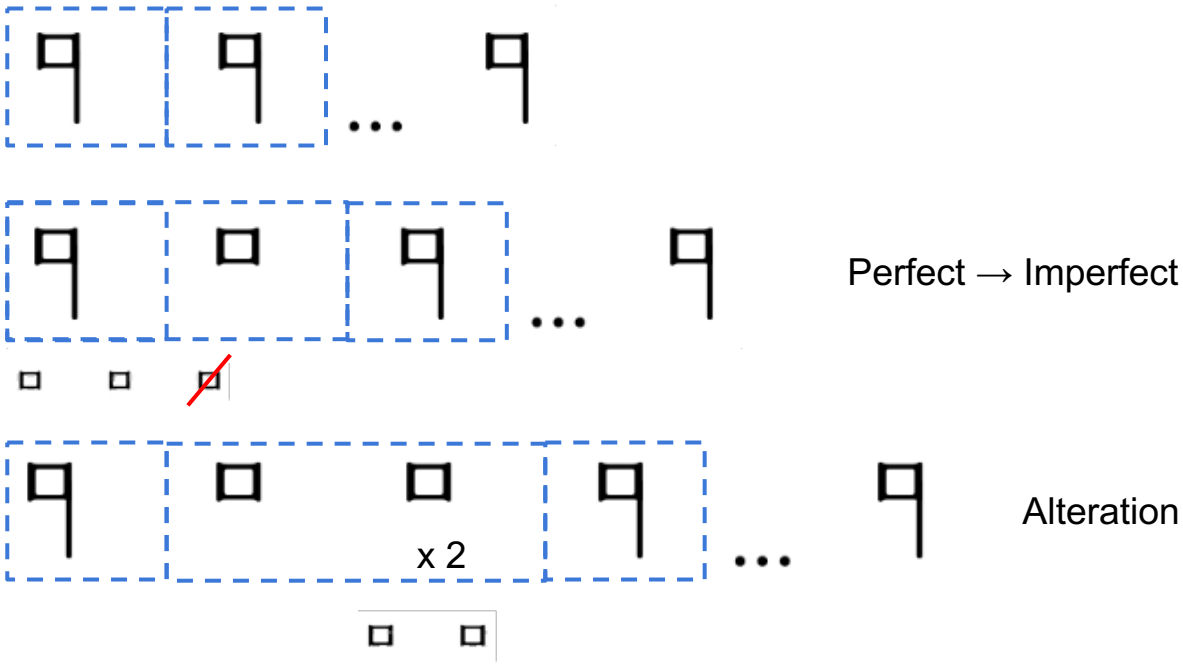
Notes		Values	
Name	**Shape**	**Perfect**	**Imperfect**
Maxima			
Long			
Breve			
Semibreve			

- It can either be triple (i.e., “perfect”) or duple (i.e., “imperfect”)

- The value is determined by two factors:
  - Mensuration
  - Context

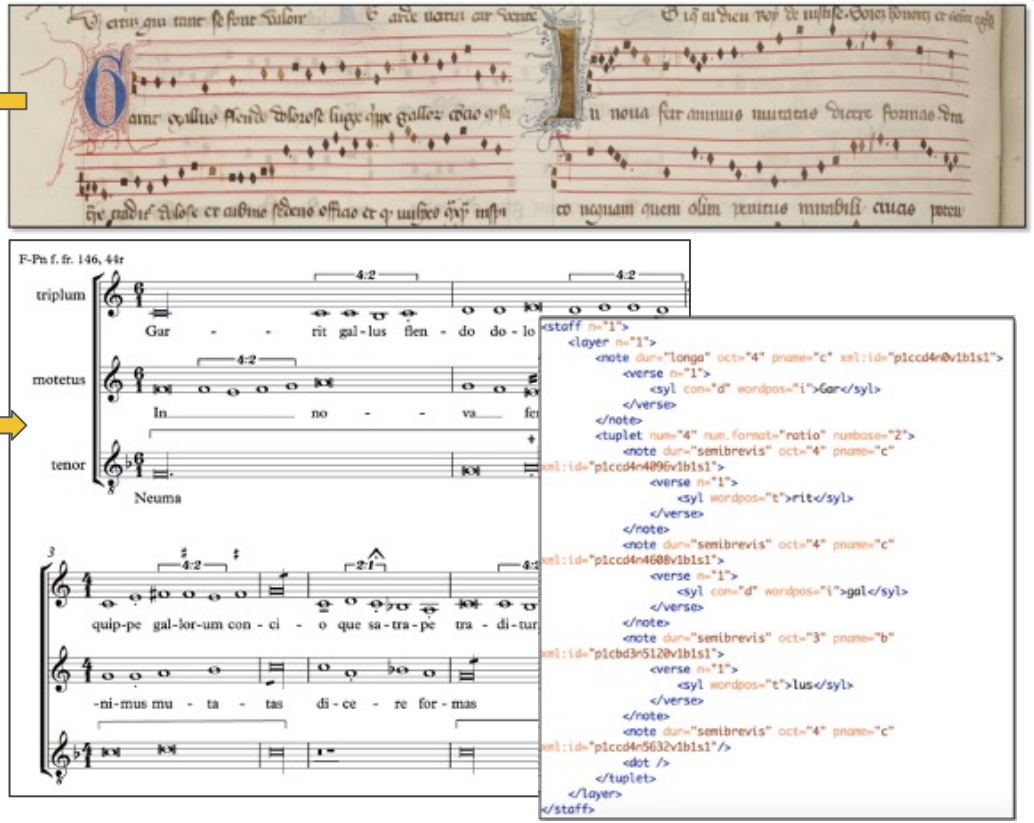
Examples of Context Changing the Note's Value

Mensuration: modus (longs) = 3 → Longs are perfect by default



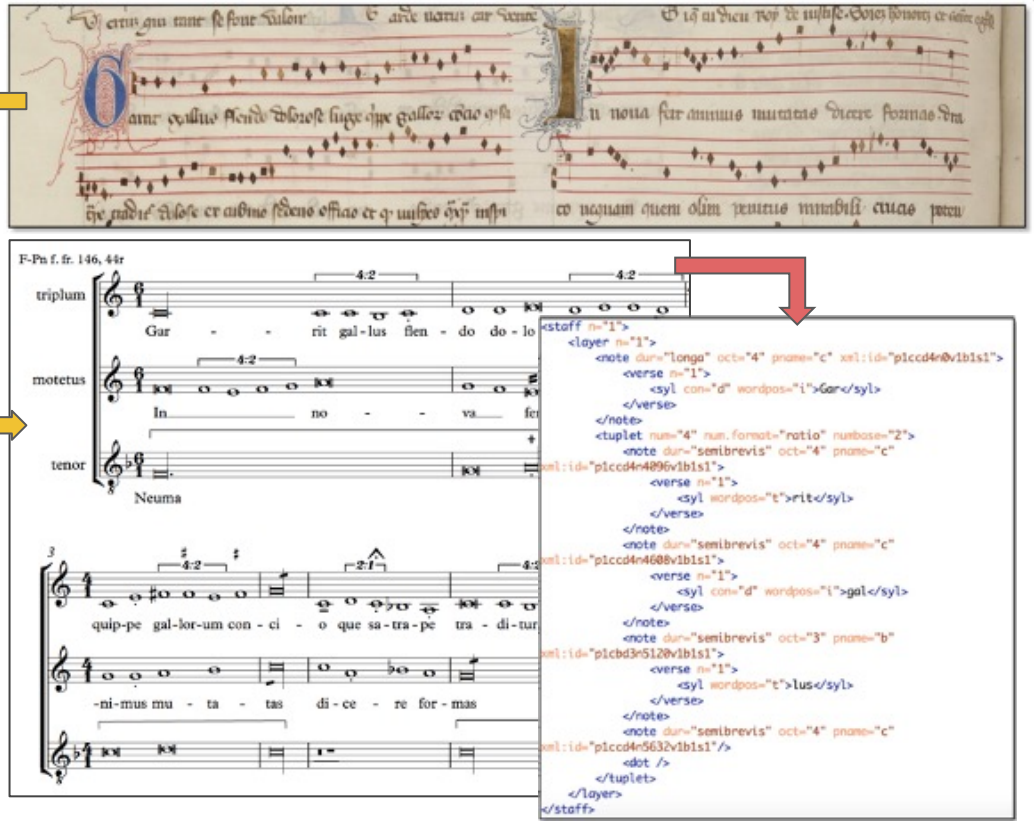
Methodology for Encoding Mensural Music

Methodology



Opening of the motet Garrit gallus / In nova from the manuscript Paris, Bibliothèque nationale, f. fr. 146.

Methodology



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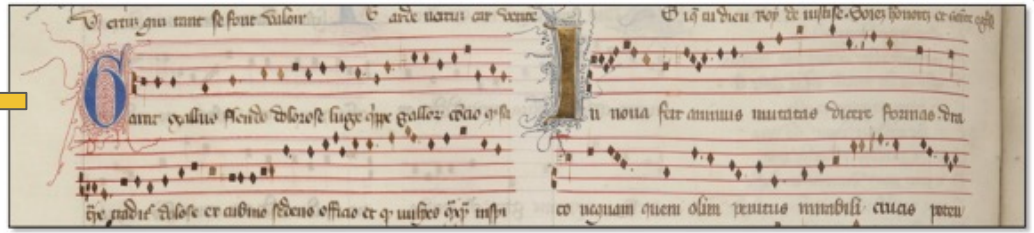
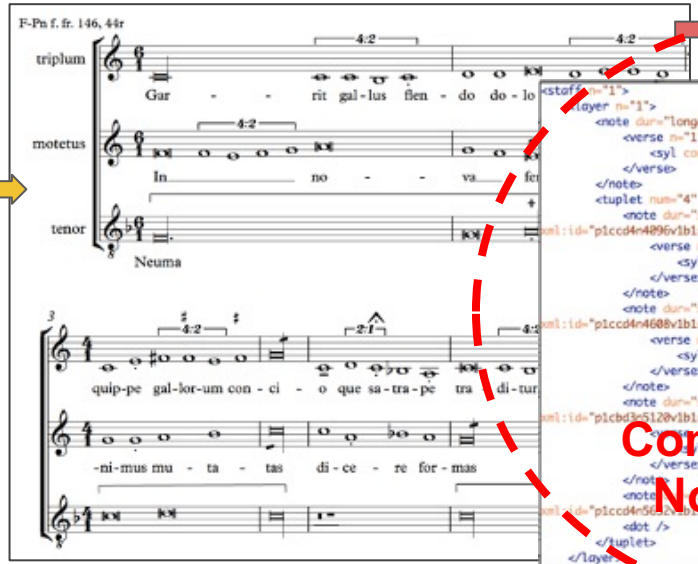
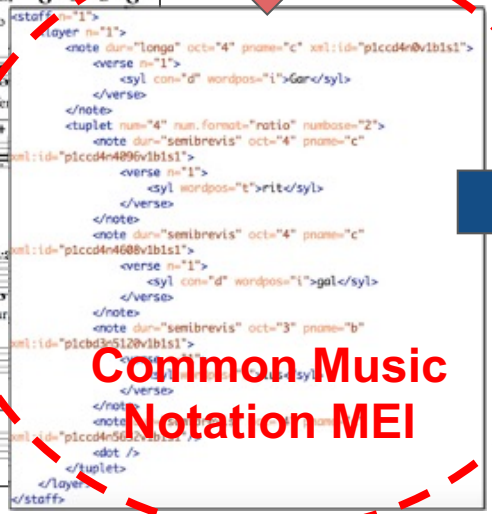
Methodology



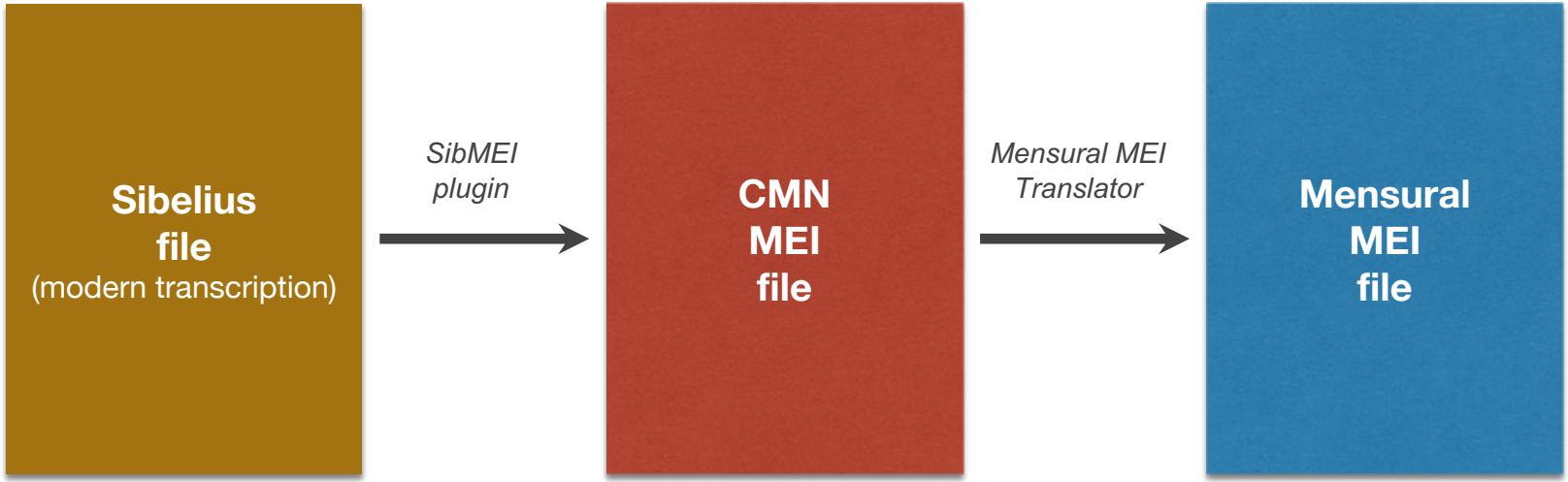




Mensural MEI Document

Opening of the motet Garrit gallus / In nova from the manuscript Paris, Bibliothèque nationale, f. fr. 146.

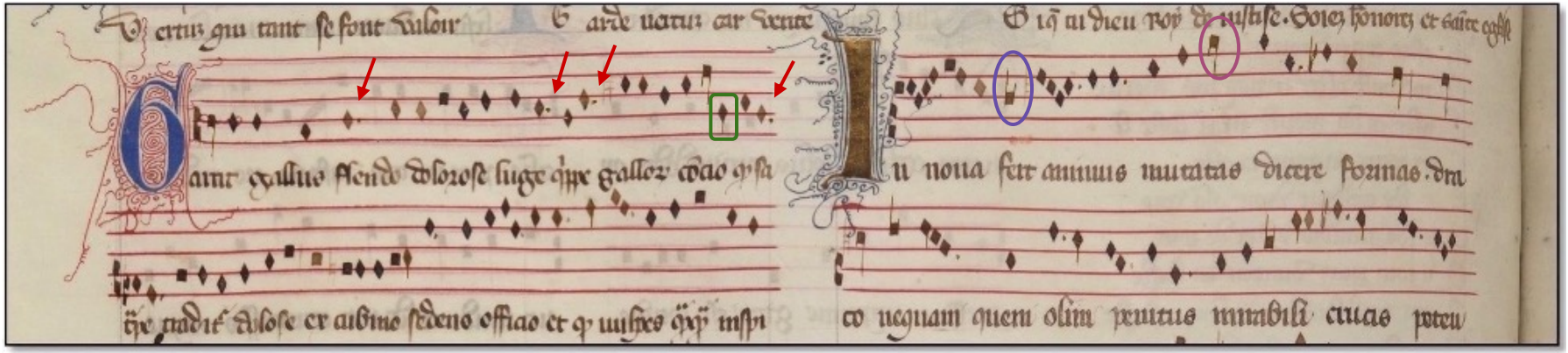
Methodology



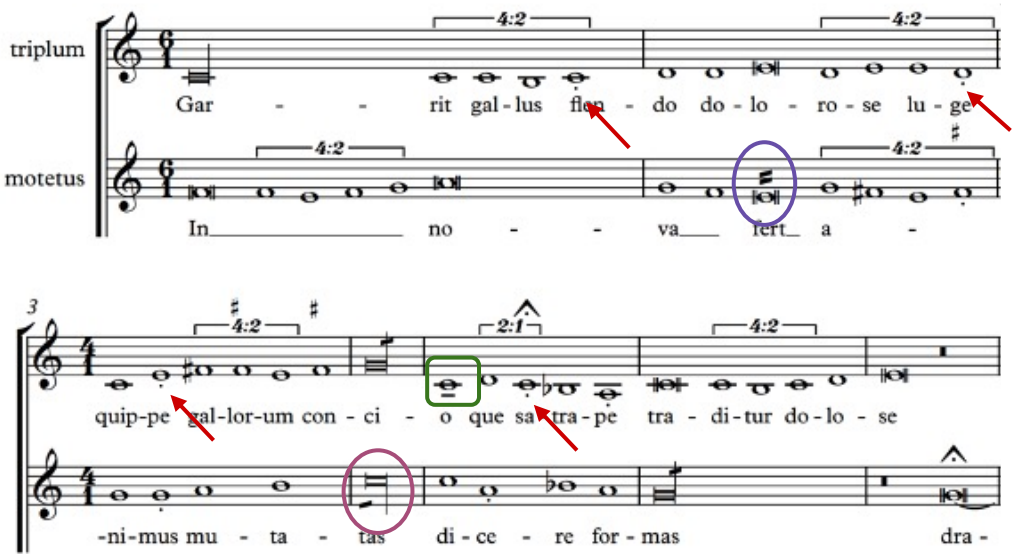
Step 1: Transcribe

Sibelius file
(modern transcription)

- Modern transcriptions usually do not record all the features contained in the mensural sources
- We developed a system of articulation marks to represent specific mensural notation features in the Sibelius transcriptions



Opening of the motet Garrit gallus / In nova from the manuscript Paris, Bibliothèque nationale, f. fr. 146.

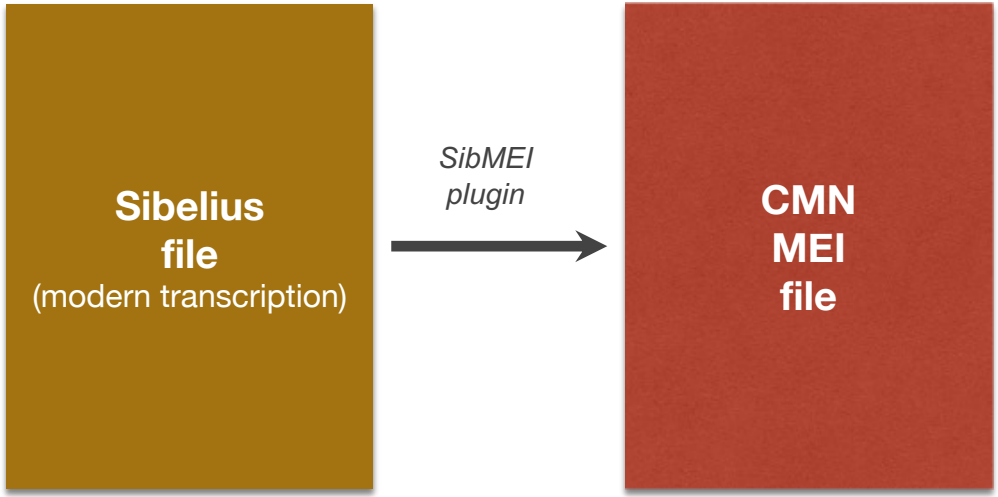


Repertoire for first phase of ‘Measuring Polyphony’ project

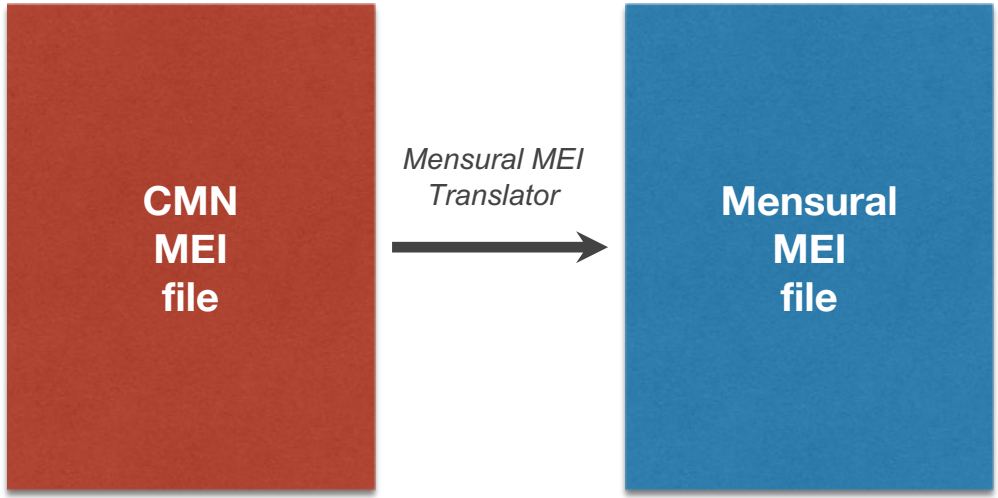
64 polyphonic motets representing:

- *Ars antiqua* (c. 1280–1320):
  - **Montpellier Codex** (Montpellier, Bibliotheque interuniversitaire, Section de medecine, H. 196)
  - ***Roman de Fauvel* manuscript** (Paris, Bibliotheque nationale, f. fr. 146)
  - **Brussels rotulus** (Brussels, Bibliotheque royale, Ms. 19606)
- *Ars nova* (c. 1320–1350):
  - Ivrea Codex (Ivrea, Biblioteca capitulare, Ms. 115)

Step 2: Convert into MEI



Step 3: The Mensural MEI Translator



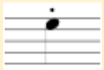
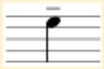
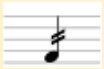
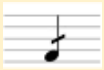
Four actions

1. Removes measure-related information
2. Substitutes the CMN articulation marks with the appropriate mensural notation element (or attribute), according to the standards developed by the MEI
3. Changes the **CMN note names** to the corresponding **mensural note names**
4. Determines and encodes the quality (perfect / imperfect) of the note within the `<note>` element

1. Remove measure-related information

- The CMN MEI `<measure>` elements were removed
- The measure-rest `<mRest>` elements were substituted by `<rest dur = “longa”>`

2. Substitutes the CMN articulation marks with the appropriate mensural notation element (or attribute)

Mensural feature	Sibelius	CMN MEI	Mensural MEI
Alteration		`@artic = "stop"`	`@num = "1"` `@numbase = "2"`
Dots		`@artic = "stacc"`	`<dot>`
Downward stem (major semibreves)		`@artic = "ten"`	`@stem.dir = "down"`
Plica upward		`@stem.mod = "2slash"`	`@plica = "asc"`
Plica downward		`@stem.mod = "1slash"`	`@plica = "desc"`

3. Changes the *CMN note names* to the corresponding *mensural note names*

CMN MEI `@dur` value	Mensural MEI `@dur` value	Mensural MEI `@dur` value (if '+')
 "long"	 "longa"	 "brevis"
 "breve"	 "brevis"	 "semibrevis"
 "1"	 "semibrevis"	 "minima"
 "2"	 "minima"	 "semiminima"
 "4"	 "semiminima"	-

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CMN MEI `@dur` value	Mensural MEI `@dur` value	Mensural MEI `@dur` value (if '+')
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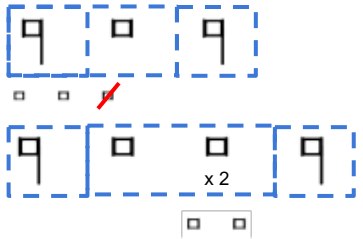
"1"	"semibrevis"	"minima"
"2"	"minima"	"semiminima"
"4"	"semiminima"	-

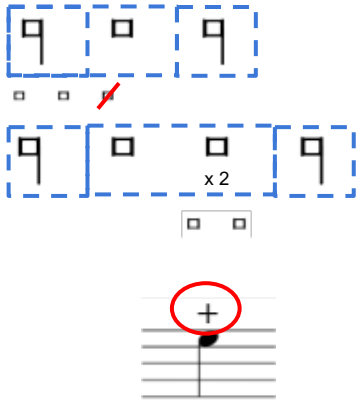


Perfect → Imperfect

Alteration

3. Changes the *CMN note names* to the corresponding *mensural note names*

CMN MEI `@dur` value	Mensural MEI `@dur` value	Mensural MEI `@dur` value (if '+')
"long"	"longa"	"brevis"
"breve"	"brevis"	"semibrevis"
"1"	"semibrevis"	"minima"
"2"	"minima"	"semiminima"
"4"	"semiminima"	-



4. Determines and encodes the quality of the note within the `<note>` element

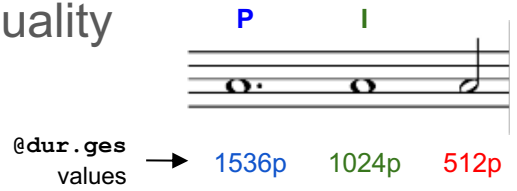
The quality values (relates to the **realized durations**) are:

- Perfect
- Imperfect
- Altered
- Minor and major semibreves *(Ars antiqua)*
- Partial imperfection *(Ars nova)*

4. Determines and encodes the quality of the note within the `<note>` element

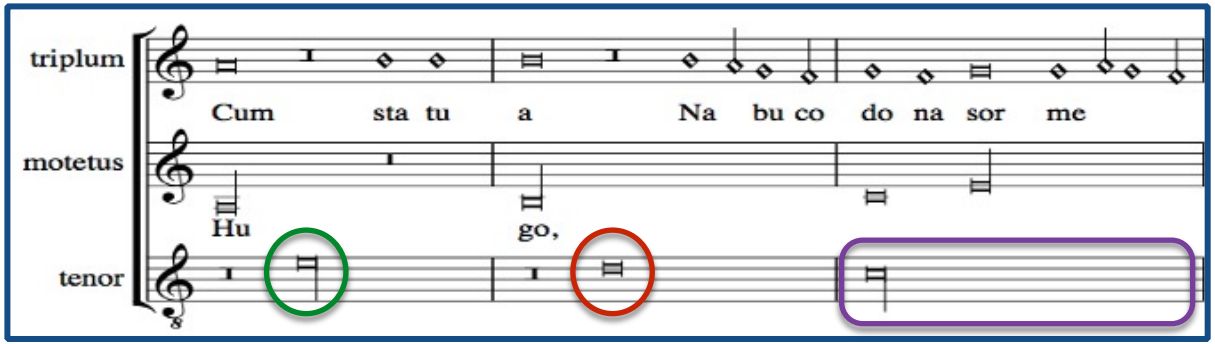
To encode the quality of the note:

- Use the **performed duration** (encoded in the `@dur.ges` attribute) of the note to determine its perfect / imperfect quality



- Then, **mensuration** is used to determine whether the perfect / imperfect value, is the default value or an “exception”
  - In case of an “exception” value, the quality of the note is encoded by using the `@num` and `@numbase` attributes

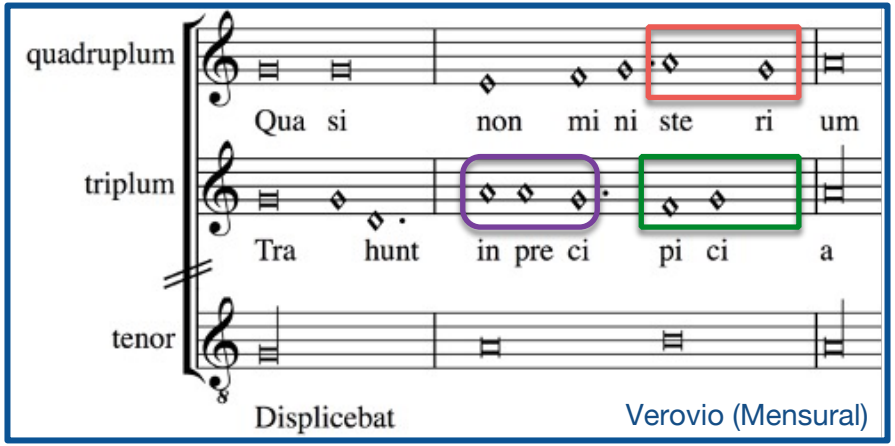
Examples: Imperfect, Altered, Perfect

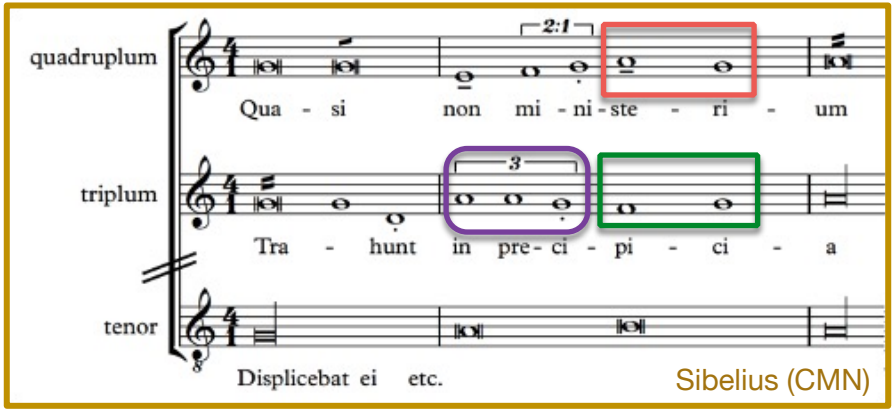


Verovio (Mensural)

Piece: Hugo (Ivrea)

Examples: Minor and Major Semibreves





In *ars antiqua* pieces

Piece: Ve qui gregi (*Fauvel*)

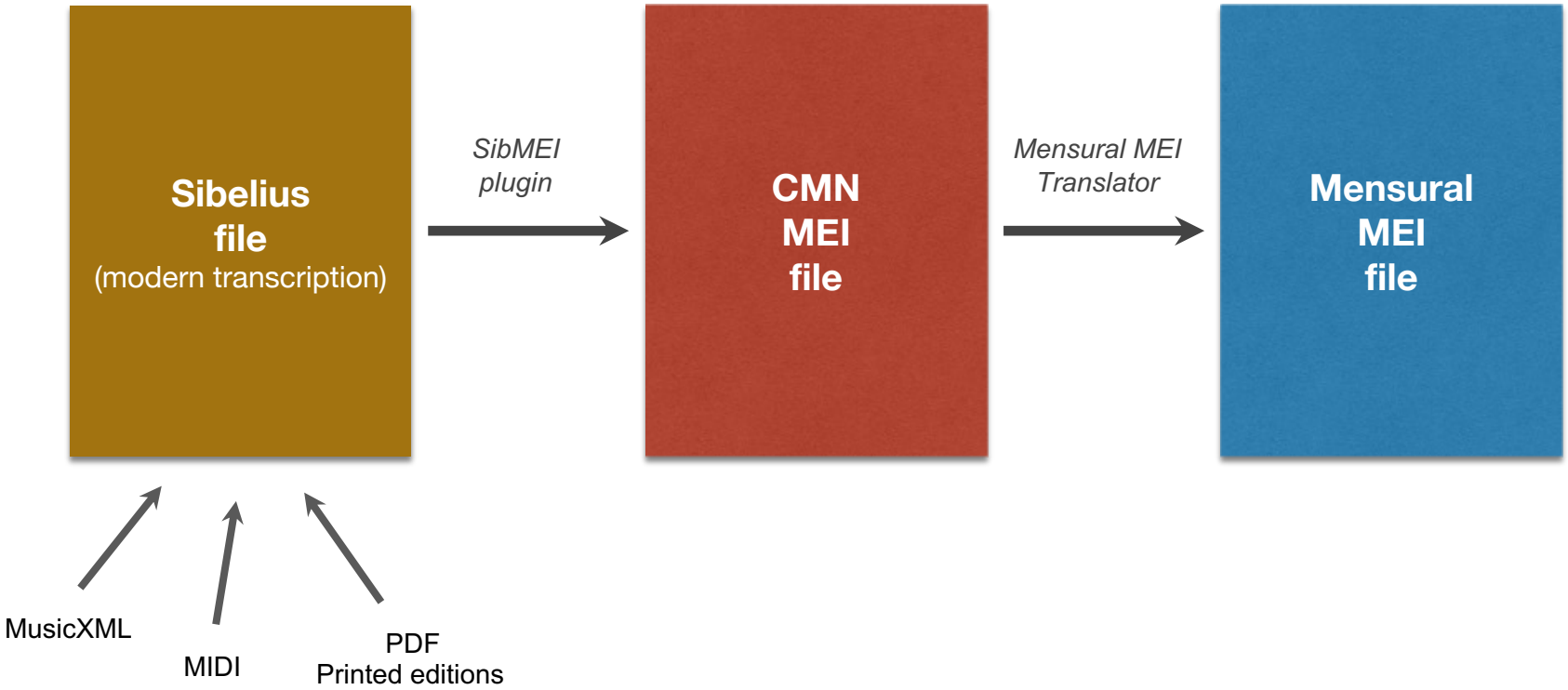
Mensural MEI Translator

Python module

Parameters:

- Piece
- Style (*Ars antiqua* or *Ars nova*)
- Mensuration of each voice

In Conclusion



In Conclusion

- Streamlines the process for digitally encoding this repertory
- Encodes the original medieval notation in a standardized machine-readable format
  - Searched or analyzed
  - Available to other websites and applications
- The pieces can be displayed in Verovio
  - Freely available to performers, scholars, and the public
- Stay tuned for the ‘Measuring Polyphony’ website which will be launched in 2017/early 2018

  http://www.measuringpolyphony.com

Thank you!

https://github.com/DDMAL/CMN-MEI_to_MensuralMEI_Translator