Tonalities

An application for the collaborative online analytical exploration of digital scores: a demonstration based on secular polyphonic works by Guillaume Dufay

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Thomas Bottini, Philippe Cathé, Achille Davy-Rigaux,
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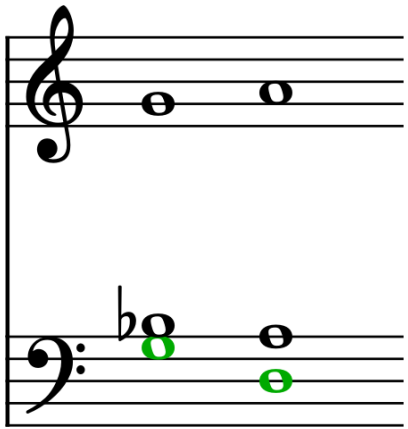
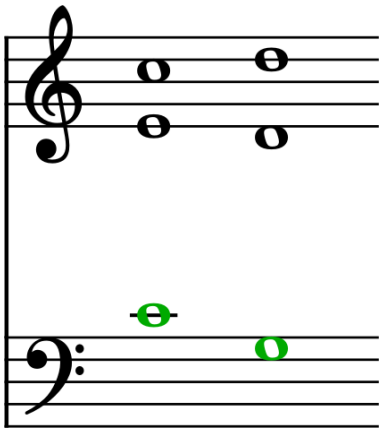
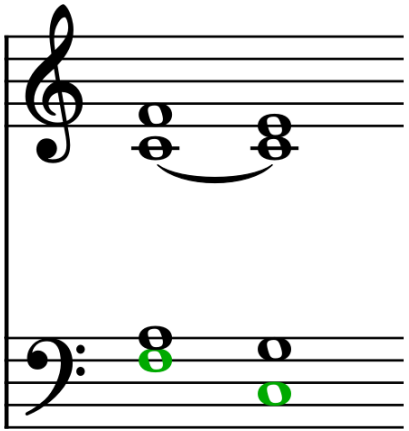
Second international conference on computational and cognitive musicology
Utrecht University, Netherlands, 17 October 2024

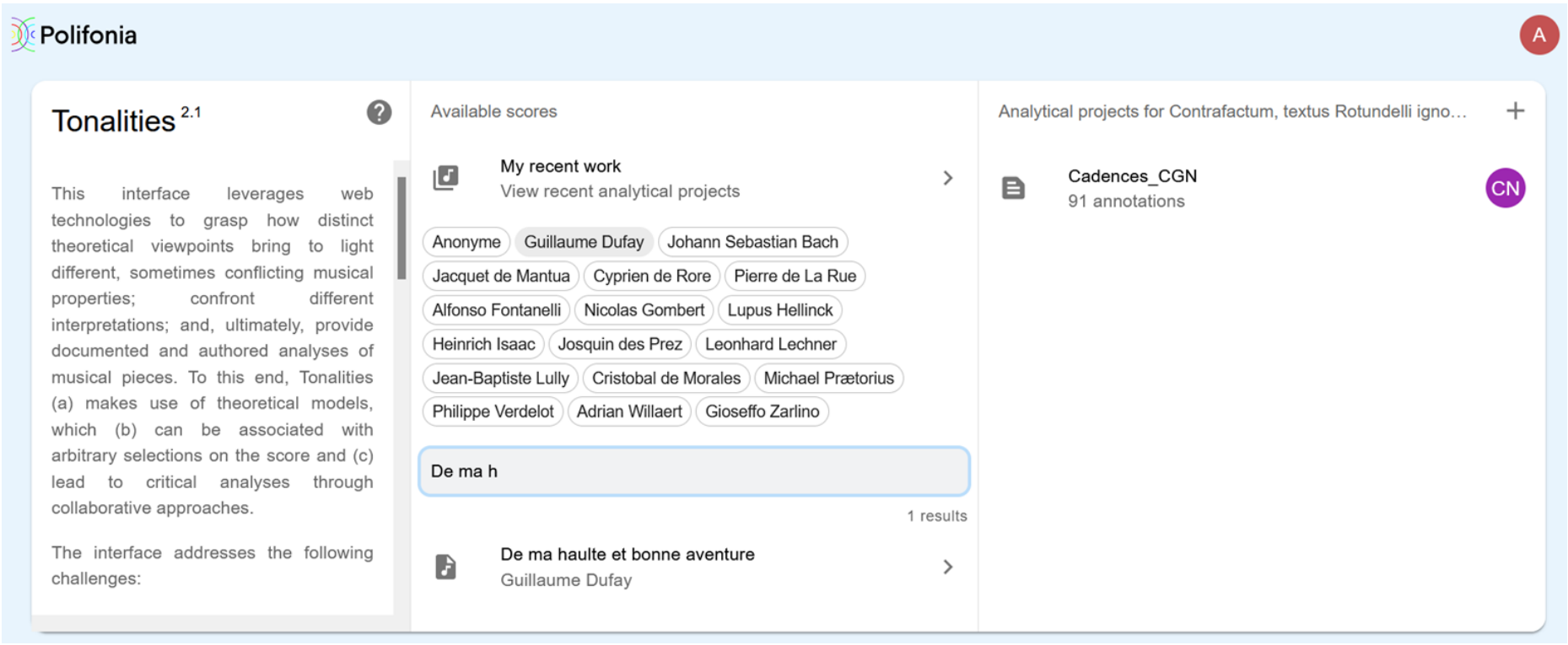
Aim of this research

Investigating the origins and contrapuntal logic of cadences with a descending fourth in the lowest voice



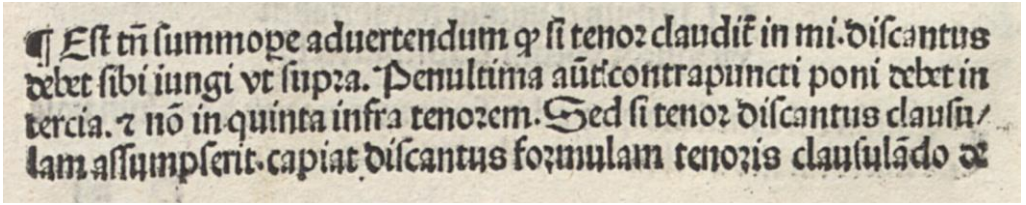




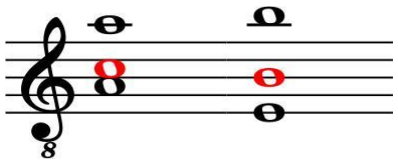

Polifonia
A
Tonalities 2.1
This interface leverages web technologies to grasp how distinct theoretical viewpoints bring to light different, sometimes conflicting musical properties; confront different interpretations; and, ultimately, provide documented and authored analyses of musical pieces. To this end, Tonalities (a) makes use of theoretical models, which (b) can be associated with arbitrary selections on the score and (c) lead to critical analyses through collaborative approaches.
The interface addresses the following challenges:
Available scores
My recent work
View recent analytical projects
Anonyme
Guillaume Dufay
Johann Sebastian Bach
Jacquet de Mantua
Cyprien de Rore
Pierre de La Rue
Alfonso Fontanelli
Nicolas Gombert
Lupus Hellinck
Heinrich Isaac
Josquin des Prez
Leonhard Lechner
Jean-Baptiste Lully
Cristobal de Morales
Michael Prætorius
Philippe Verdelot
Adrian Willaert
Gioseffo Zarlino
De ma h
1 results
De ma haulte et bonne aventure
Guillaume Dufay
Analytical projects for Contrafactum, textus Rotundelli igno…
Cadences_CGN
91 annotations
CN

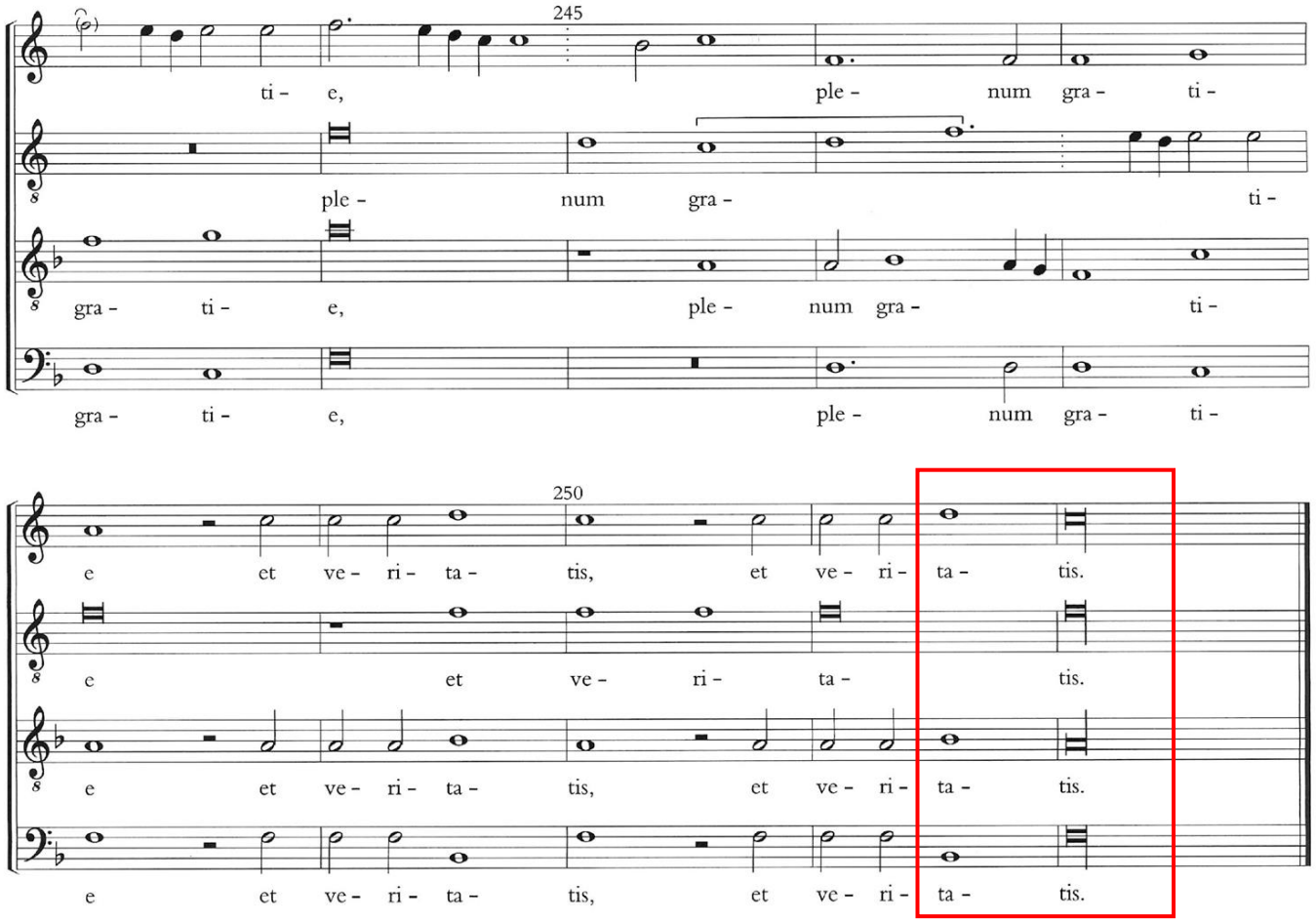
What theory says and what it doesn't

Nicolaus Wollick (Melchior Schanppecher), *Opus aureum*, fol. H4v-5r.



It must, however, be noted most diligently that if the tenor closes (clauditur) on mi, the discant ought to be joined to it as above, but the penult of the counterpoint [i.e. the bass] ought to be placed a third and not a fifth below the tenor (C. Mutch, *Studies in the History of the Cadence*, p. 94).

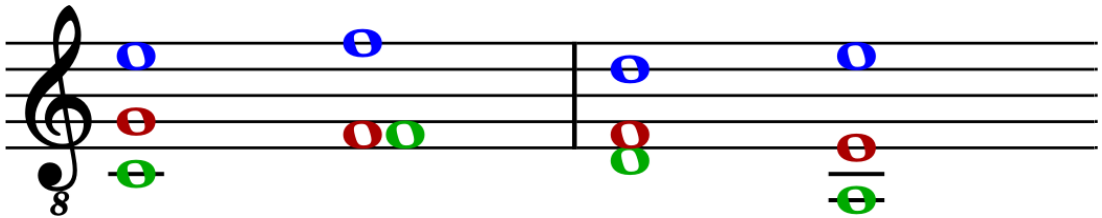




Josquin des Prez (?),
In principio erat verbum,
ed. M. Just (NJE)

"Plagal cadence"

Analytical model

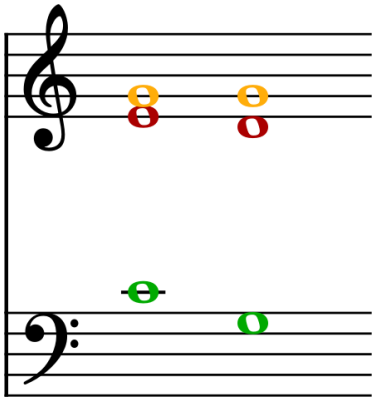


Cantizans_C

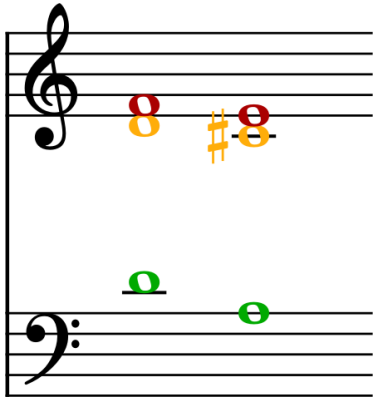
Tenorizans_T

Bassizans_B

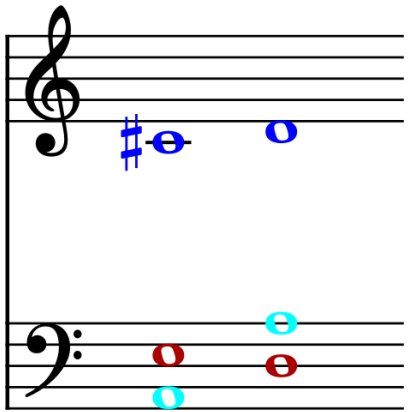
Bassizans_P



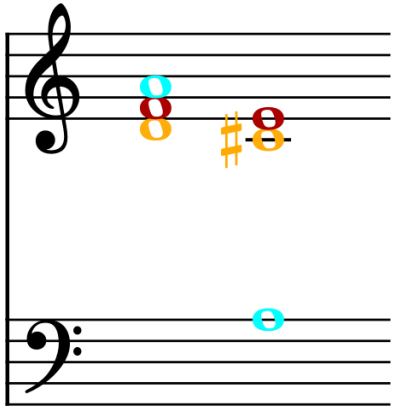
Altizans_A



Altizans_a

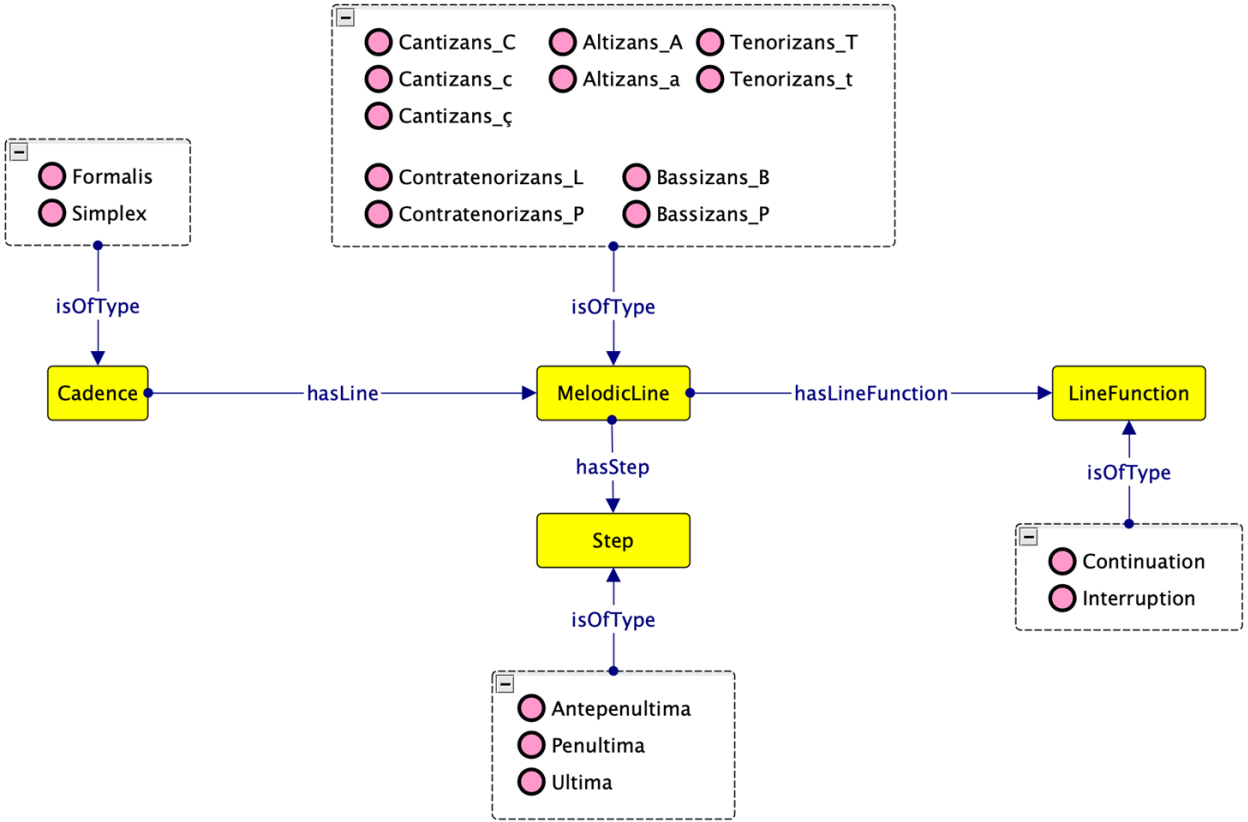


Contratenorizans_L

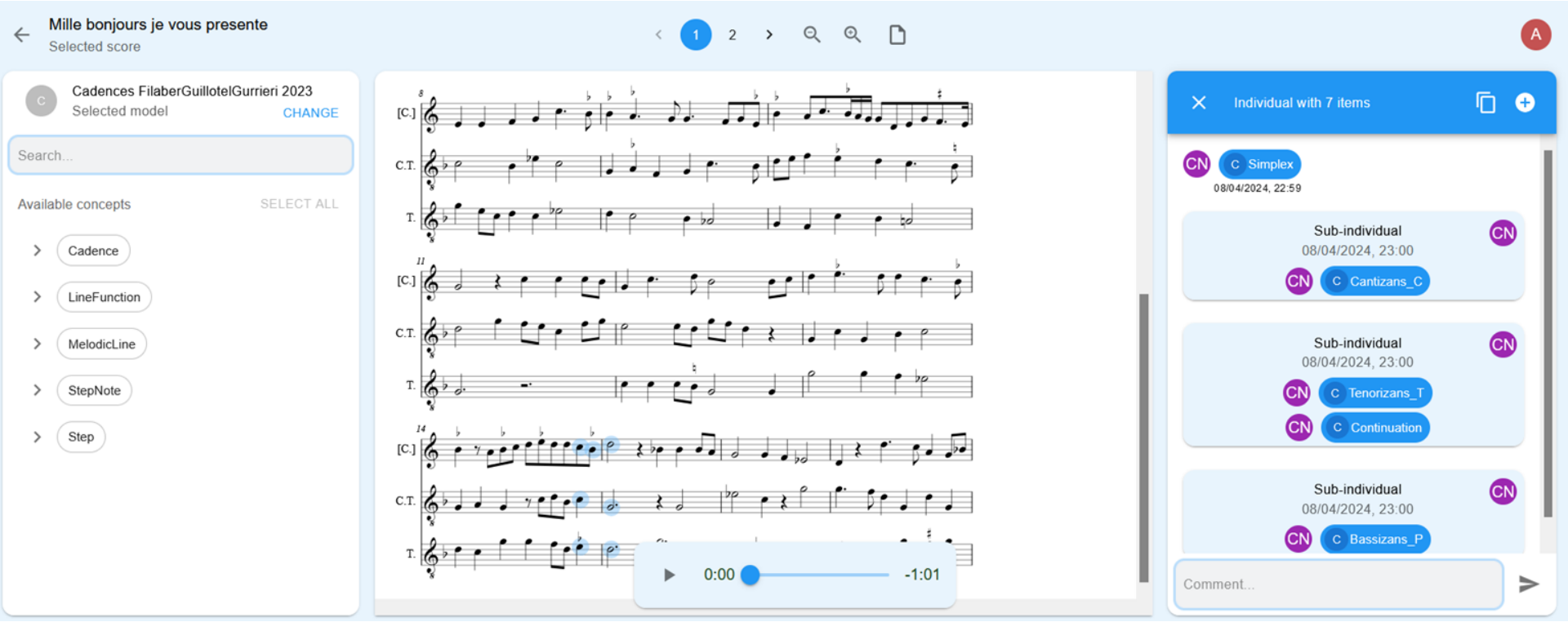


Contratenorizans_P

Analytical model



Analytical model



Tonalities annotation interface: https://data-iremus.huma-num.fr/tonalities/

https://yasgui.triply.cc/#

Polifonia - Home | PolifoniaGA - Home | Bibliothèque SU | Grove Music Online | JSTOR | BibCnrs | RILM | guillotel-nothmann/... | Funding & tenders | Dictionnaire de l'Ac... | HmT | TONALITIES | CollabScore | Other Bookmarks

Query | Query +

https://data-iremus.huma-num.fr/sparql/

```
PREFIX cadences: <https://w3id.org/polifonia/ontology/modal-tonal/Cadences_FilaberGuillotelGurrieri_2023/>
PREFIX crm: <http://www.cidoc-crm.org/cidoc-crm/>
PREFIX dcterms: <http://purl.org/dc/terms/>
PREFIX graph: <http://data-iremus.huma-num.fr/graph/>
PREFIX iremus: <http://data-iremus.huma-num.fr/id/>
PREFIX sherlock: <http://data-iremus.huma-num.fr/ns/sherlock#>

SELECT DISTINCT ?project ?concept ?annotation


WHERE {
  GRAPH graph:tonalities-contributions {
    ?project crm:P9_consists_of ?E13 .
   ?E13 sherlock:has_document_context ?docContext.
  ?E13 crm:P177_assigned_property_of_type crm:P2_has_type.
  ?E13 crm:P141_assigned cadences:Bassizans_P.
  ?E13 crm:P141_assigned ?concept.
  filter( regex(str(?docContext), "Dufay" ))
  }
}
```

Table | Response | Gallery | Chart | Geo | Geo-3D | Geo events | Markup | Network | Pivot | Timeline | 38 results in 1.175 seconds

Simple view ☐ Ellipse ☑ Filter query results Page size: 50

	project	concept
1	iremus:14c2b848-7927-4ece-b30f-dd48bceebfbb	cadences:Bassizans_P
2	iremus:1657a5df-0ba3-4673-bf41-e3ffd58ea27c	cadences:Bassizans_P
3	iremus:f6e11d7f-c136-468b-87c1-cb5ba25de0ba	cadences:Bassizans_P
4	iremus:e6b82ba3-b8c2-4405-94e0-584fee0b24b2	cadences:Bassizans_P
5	iremus:5e3683ef-7a0d-4e73-bd9b-4b747a12dee5	cadences:Bassizans_P
6	iremus:a849e9e8-8c34-41d6-a919-5c0201471eaa	cadences:Bassizans_P
7	iremus:acb3dcb0-f1b4-4cba-b861-a193cee25ae1	cadences:Bassizans_P
8	iremus:5e93c8f5-c441-4e28-bb7c-1b5ffef2a16f	cadences:Bassizans_P
9	iremus:f0156796-52b7-4dd6-976d-03eaca662073	cadences:Bassizans_P
10	iremus:62409bcf-6f10-4937-b7fe-5ddd493ae260	cadences:Bassizans_P
11	iremus:f5604b9e-f49a-454b-8db8-8d88dafdd3e1	cadences:Bassizans_P
12	iremus:bff0ce9d-fd36-4395-8977-f8cc975043d0	cadences:Bassizans_P

Try it yourself ?

Tonalities sparql endpoint: https://data-iremus.huma-num.fr/sparql/

Works

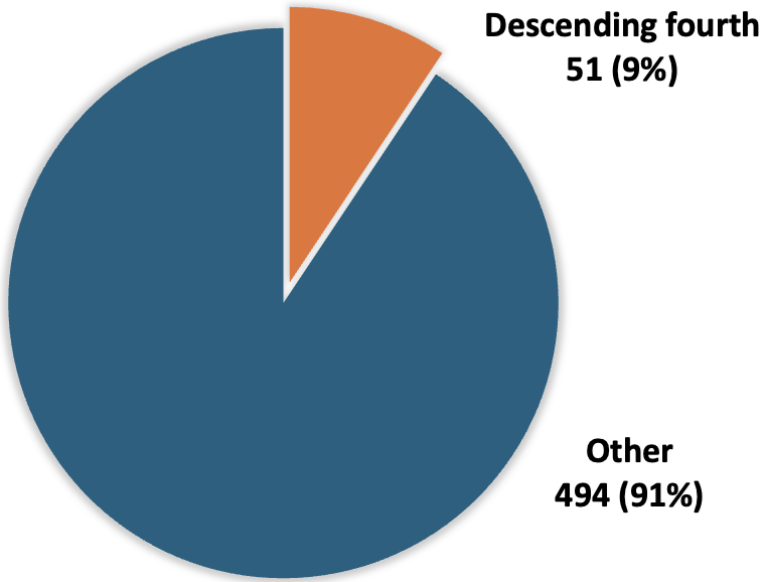
- 74 Chansons
- 4 Mass cycles

Annotations

- 545 Cadences
- 1530 Melodic lines

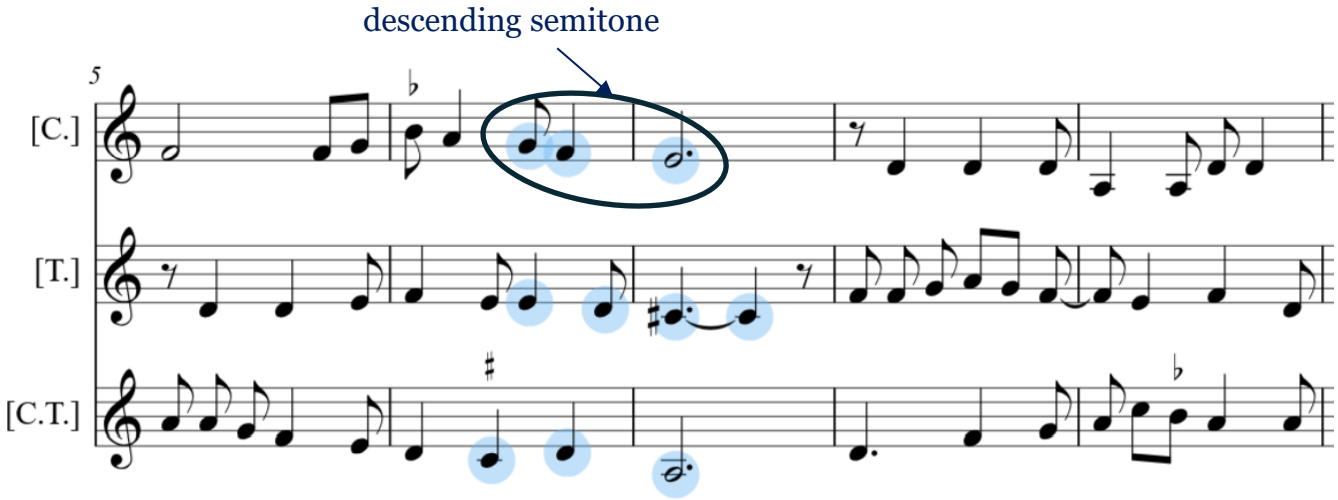
Comments

- 732 Analytical comments

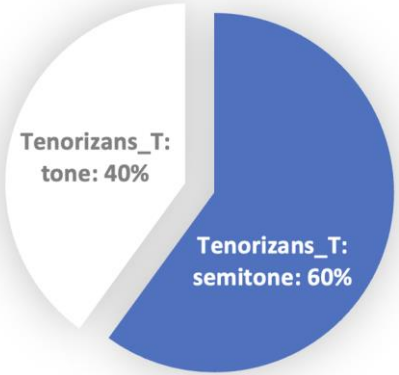


Melodic movements

Tenorizans line

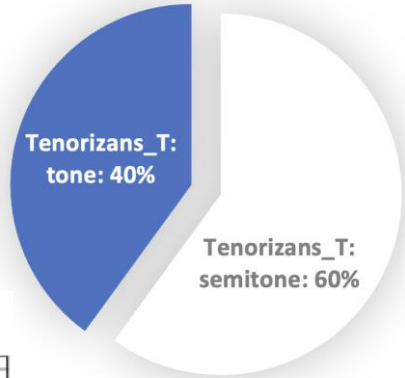


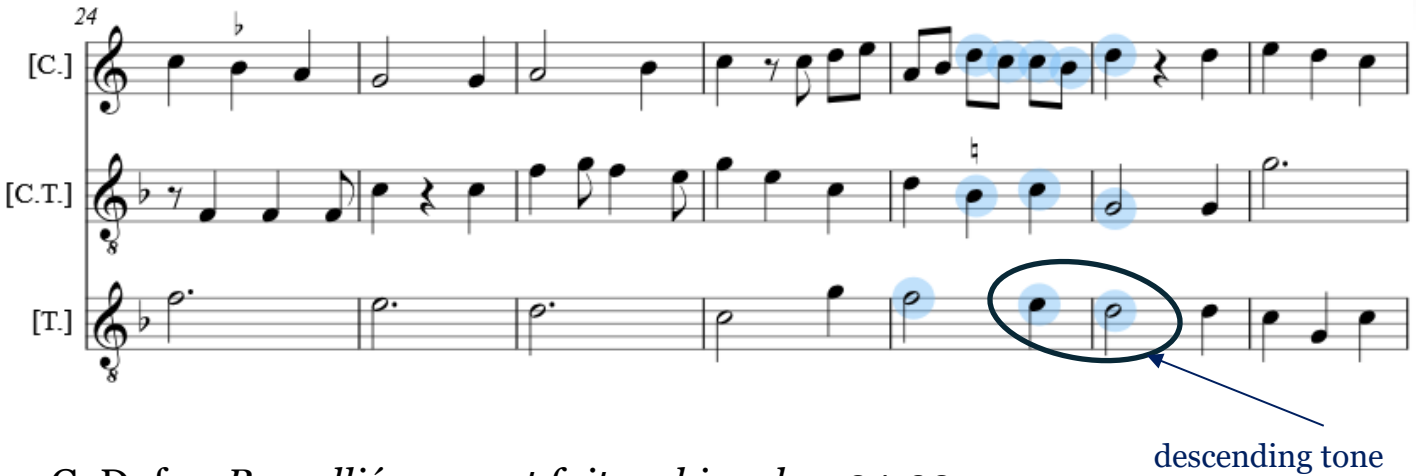
G. Dufay, *Je me complains*, 5-9.



Melodic movements

Tenorizans line



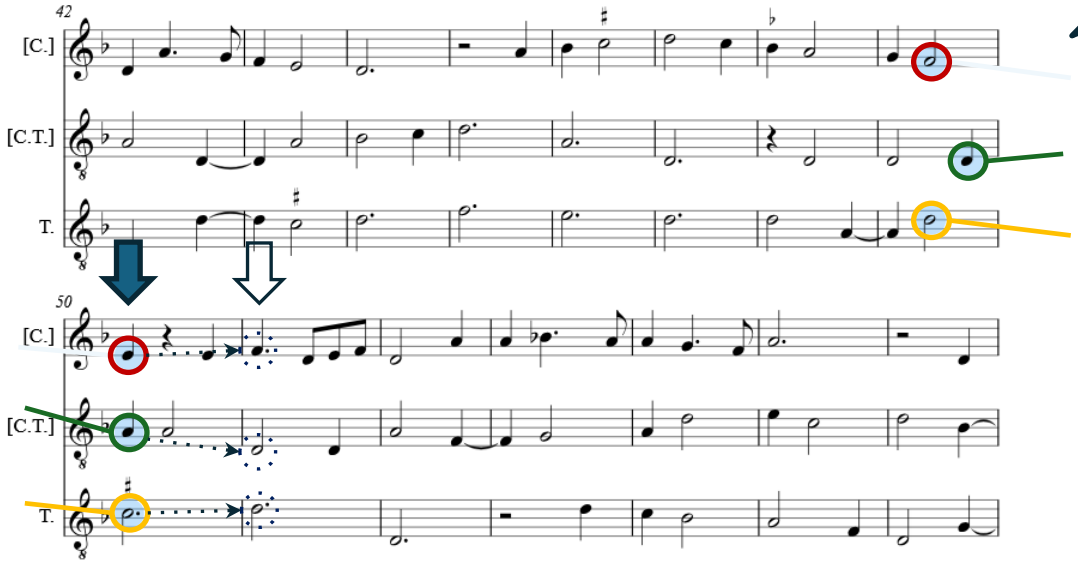


G. Dufay, *Resvelliés vous et faites chiere lye*, 24-30

Melodic movements

Altizans line

Mi cadence
and/or
Interrupted cadence ?

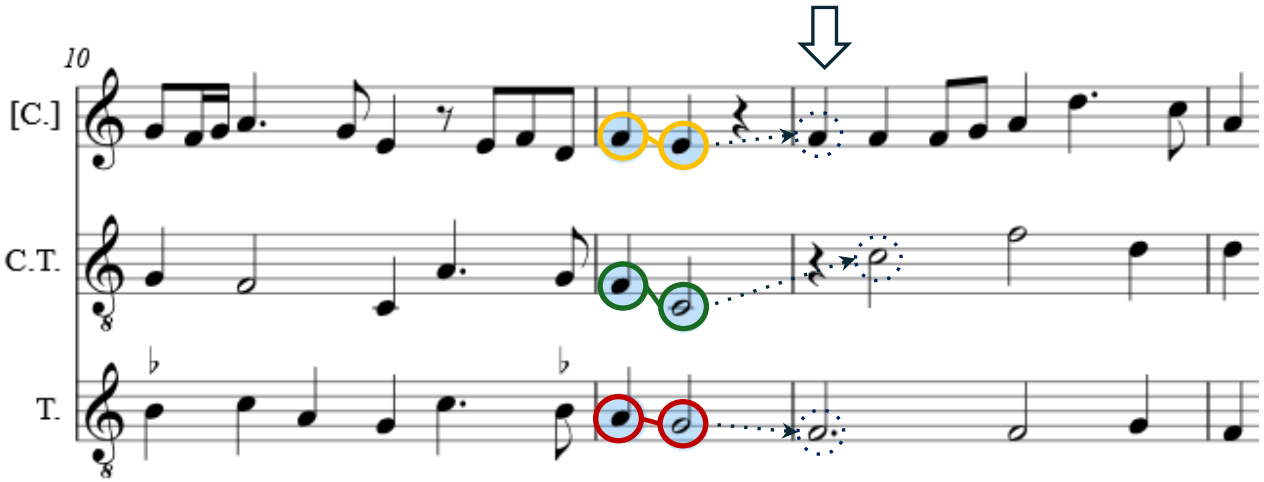


G. Dufay, *Ce jour le doibt*, 42-56

Melodic movements

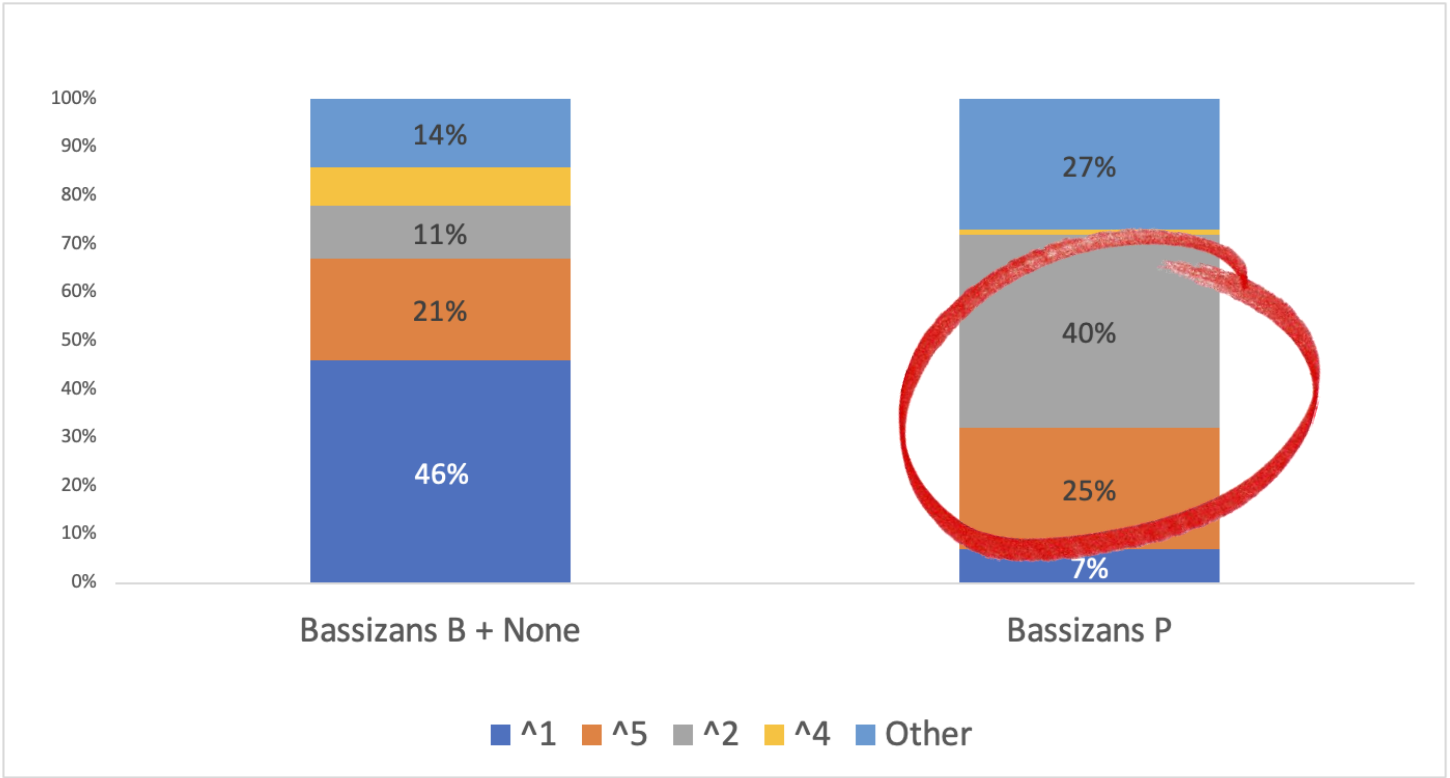
Altizans line

Interrupted cadence !

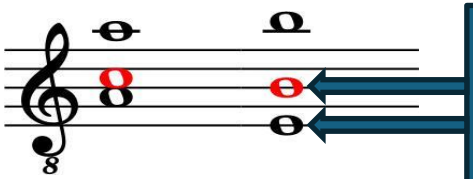


G. Dufay, *J'ay grant (dolour)*, 10-12

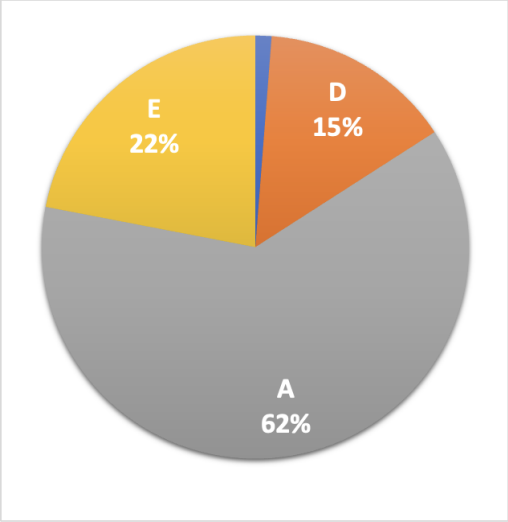
Cadence degrees



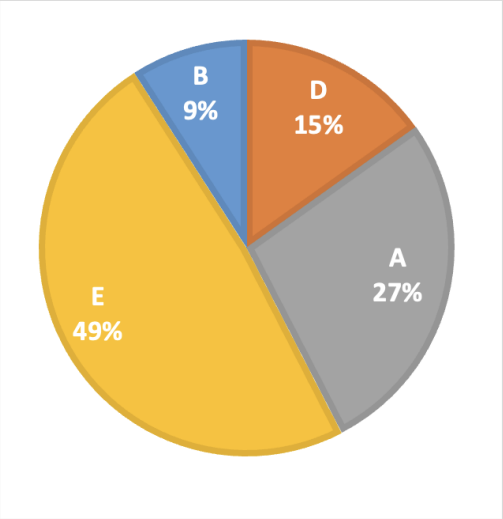
Cadence degrees



What's the target note of a descending fourth cadence ?



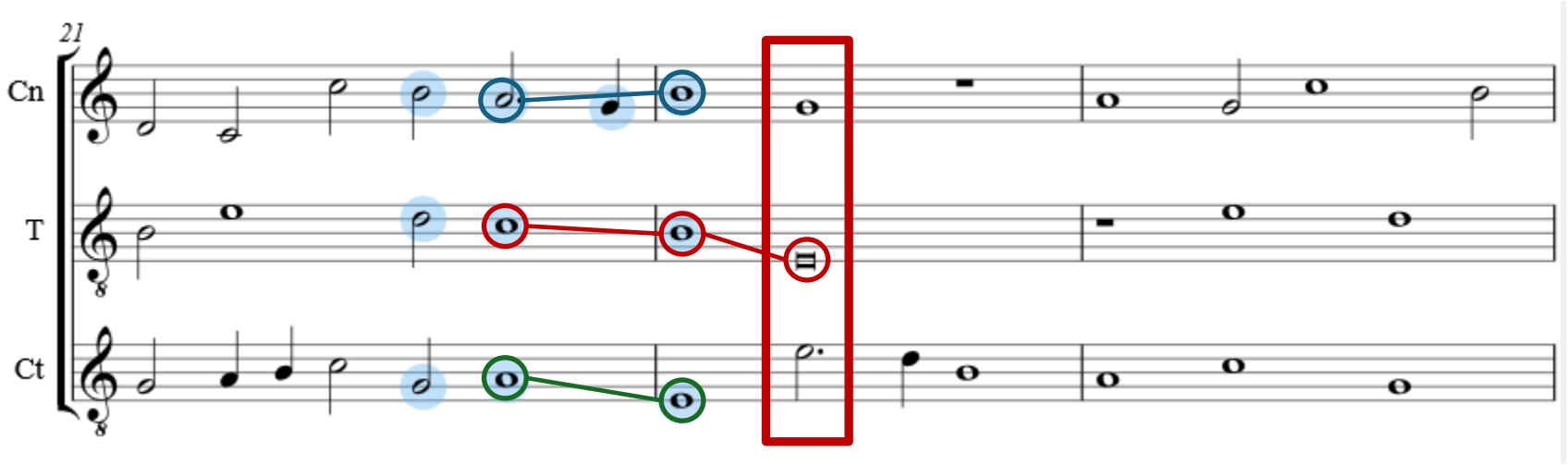
Mi cadences without bassizans line
(cadence degrees relate to the tenorizans line)



Mi cadences with bassizans line
(cadence degrees relate to the tenorizans line)

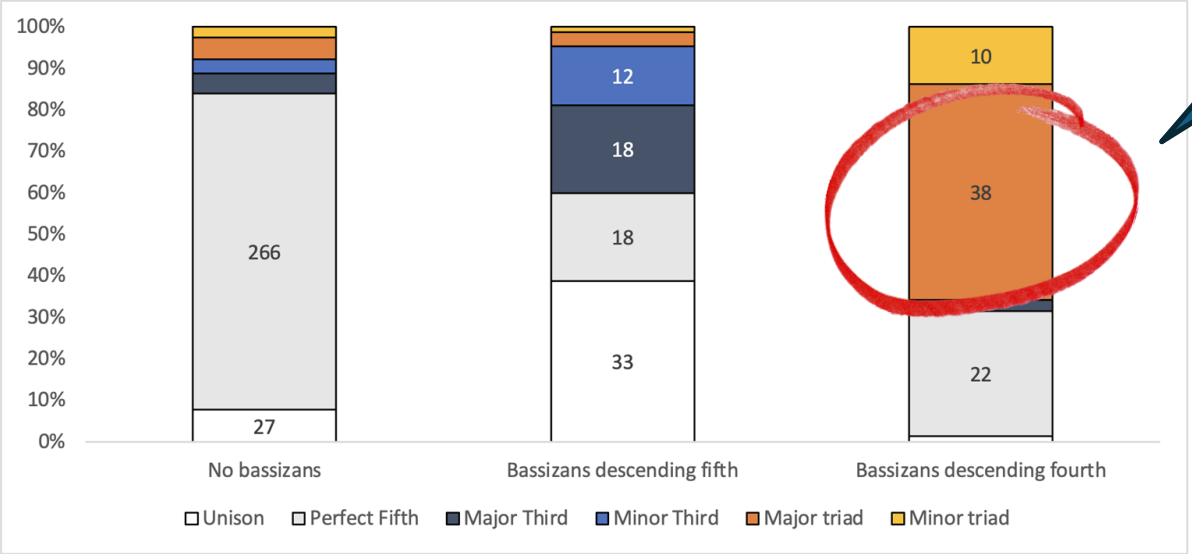
Cadence degrees

What's the target note of a descending fourth cadence ?



G. Dufay, *Malheureulx cueur, que vieulx tu faire*, m. 21-24

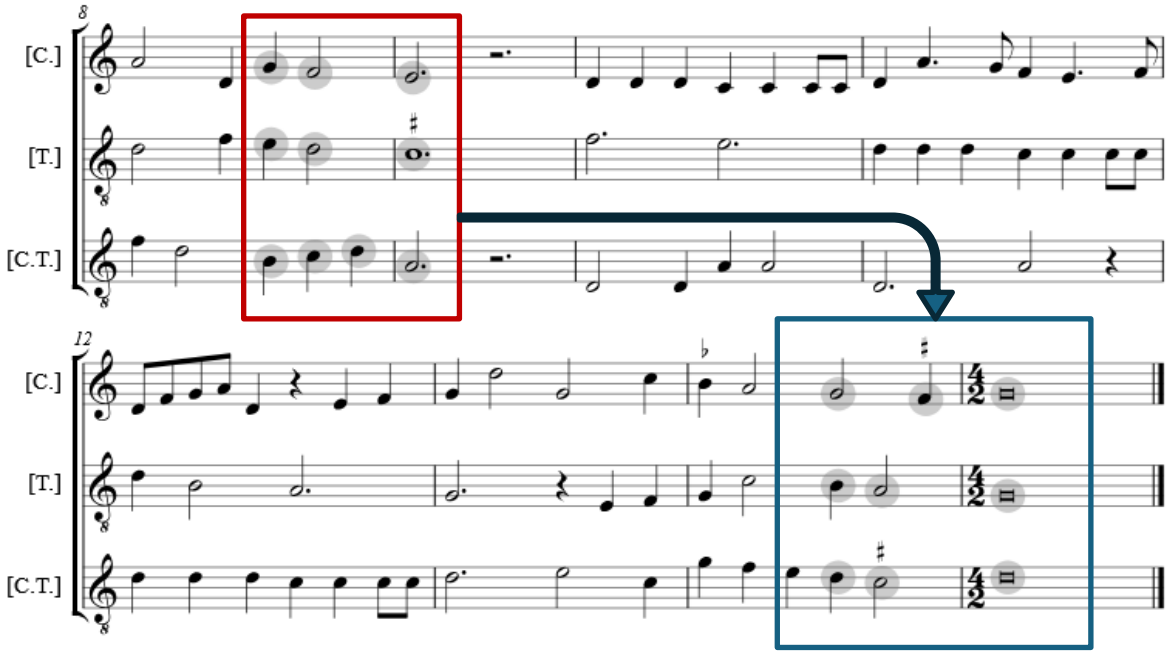
Final sonorities



Complete triads, and especially major triads, predominate in descending fourth cadences !

1. A horizontal and dynamic process: open cadences

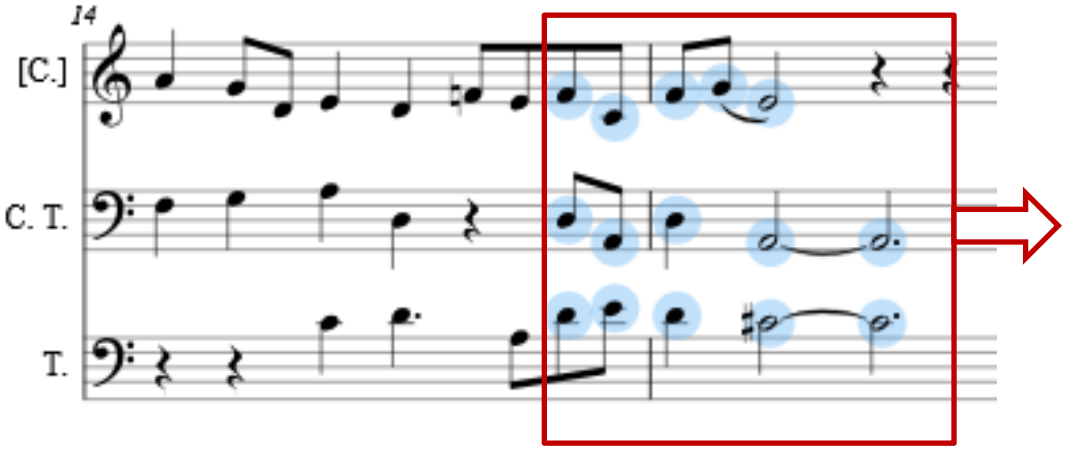
a) Alternating 'open' and 'closed' endings



G. Dufay, *Je ne suy plus*, 8-15

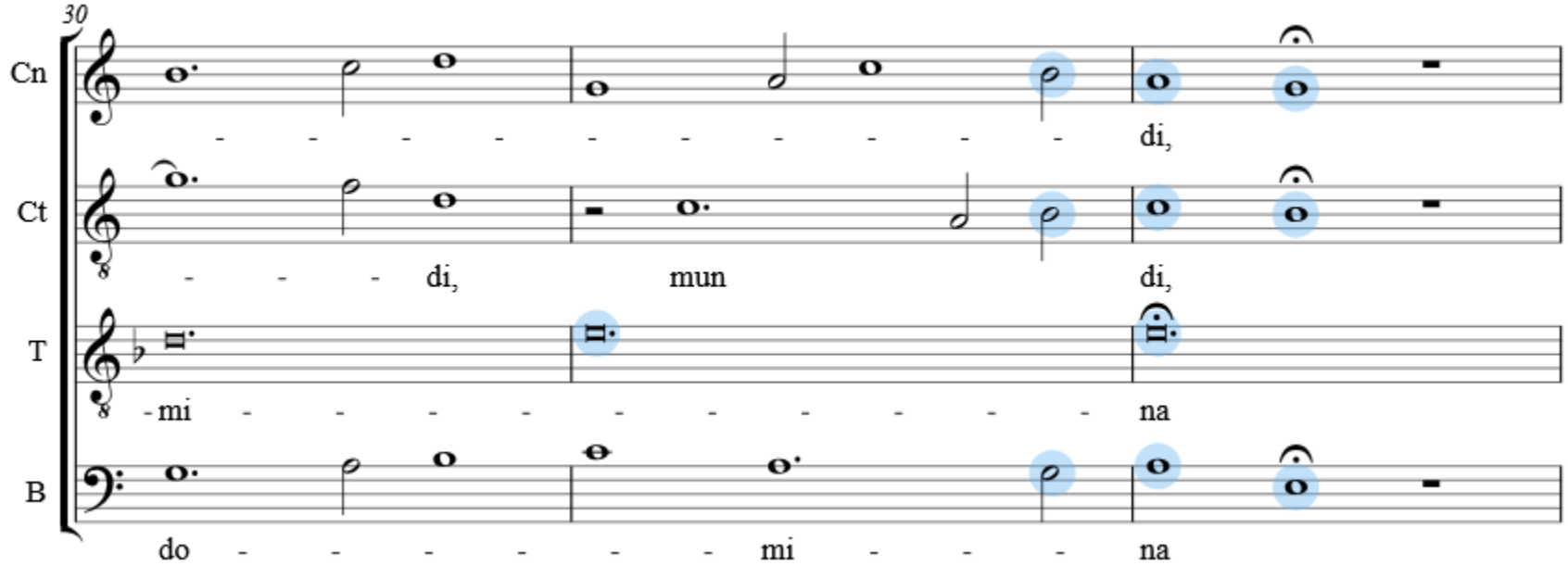
1. A horizontal and dynamic process: open cadences

b) Interruptions



G. Dufay, *Je languis en piteux martire*

2. A static and vertical state: plagal cadences



G. Dufay, *Missa Ave Regina celorum,* 30-32

Conclusion

- The notion of cadence is a complex one. Tonalities has proven useful to annotate a large corpus, to confront our analytical viewpoints, and to explore some qualitative hypotheses based on quantitative data.
- Our analyses clarify: the complex links between the mi cadence and the interrupted cadence; the different tonal functions of the descending fourth cadence; and its harmonic implications.

- Seth J. Coluzzi, “Black Sheep: The Phrygian Mode and a Misplaced Madrigal in Marenzio’s Seventh Book (1595)”, *The Journal of Musicology* 30.2 (2013), 129-179
- Caleb Mutch, *Studies in the History of the Cadence*, Ph.D. Columbia University, 2015
- Caleb Mutch, “Blainville’s New Mode, or How the Plagal Cadence Came to be ‘Plagal’”, *Eighteenth-Century Music* 12.1 (2015), 69-90
- Liam Patrick Hynes-Tawa, *How the Phrygian Final Lost Its Finality*, Ph.D. Yale University, 2020
- Megan Kaes Long, “Reassessing the Plagal Cadence in Byrd and Morley”, *Music Theory Online*, 28.3, sept. 2022, https://mtosmt.org/issues/mto.22.28.3/mto.22.28.3.long.html
- Richard Freedman, Alexander Morgan, Daniel Russo-Batterham, *Musicologists and Data Scientists Pull out all the Stops: Defining Renaissance Cadences Systematically*, 2023, https://hcommons.org/deposits/item/hc:59281/