27 February 2023 5.00 pm GMT

# ResearchWorks

## Next steps in Scarlatti research

GUILD HALL SCHOOL

# TEXTING SCARLATTI

composition/reception/performance

# Project team

Luisa Morales

Marco Moiraghi

Jérémie Lumbroso

Jasper van der Klis

Barry Ife

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# The ‘Scarlatti paradox’

*Domenico Scarlatti research con boast no equivalent to the enormous progress in Bach and Handel scholarship since 1950; in fact, this period has witnessed the uncovering of more additional intelligence about the two German masters than one could locate with a microscope in the entire body of information about Scarlatti...*

*...The popularity of [Scarlatti’s] music brought serious study to it earlier than to much other music of the period; we embarked quite a while ago and yet we still cannot see the opposite shore. So many tasks remain that the state of our art would fail aesthetic inspection or information audit.*

Joel Sheveloff, ‘Domenico Scarlatti: Tercentenary Frustrations’, *MQ*, 1985

**Our objective is therefore to carry out the first comprehensive and systematic study of all surviving C18 MS and printed copies of Scarlatti’s keyboard sonatas**

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# Scope - the size of the task

- 555 sonatas in Kirkpatrick's catalogue, plus >30 attributed or attributable
- 55,469 bars of music
- ±3200 MS and printed witnesses
- In >100 volumes
- In >30 libraries and archives worldwide
- ±20,000,000 data points makes a bigg(ish) data set (by humanities standards)

**A jigsaw without the box and with most of the pieces missing**

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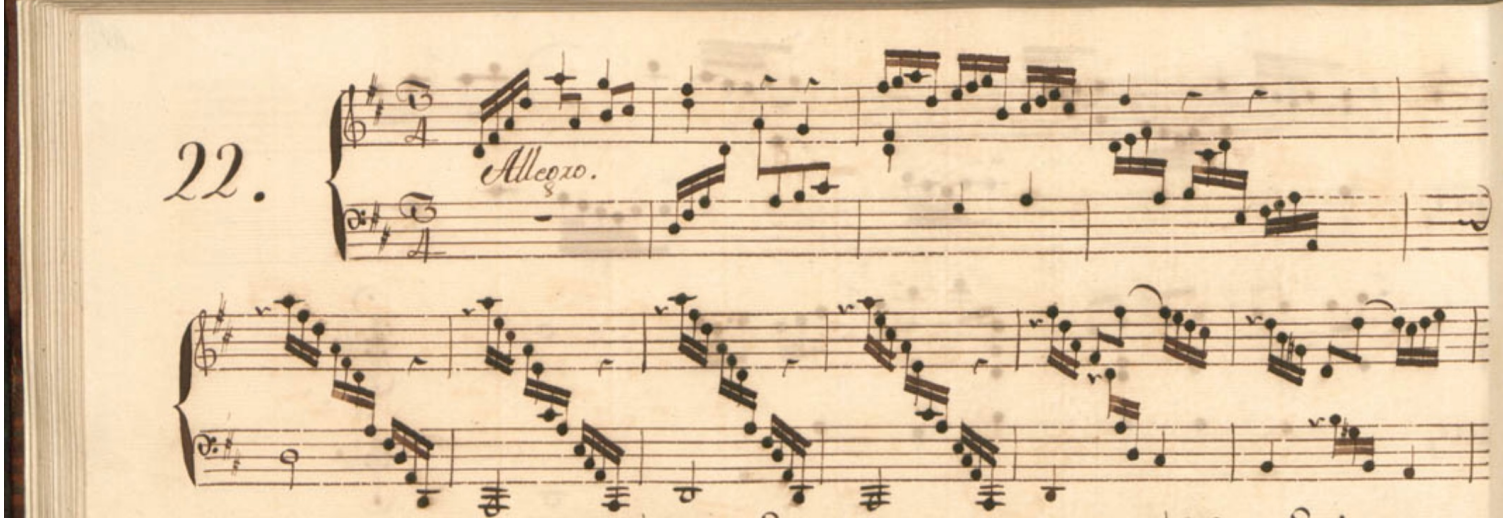


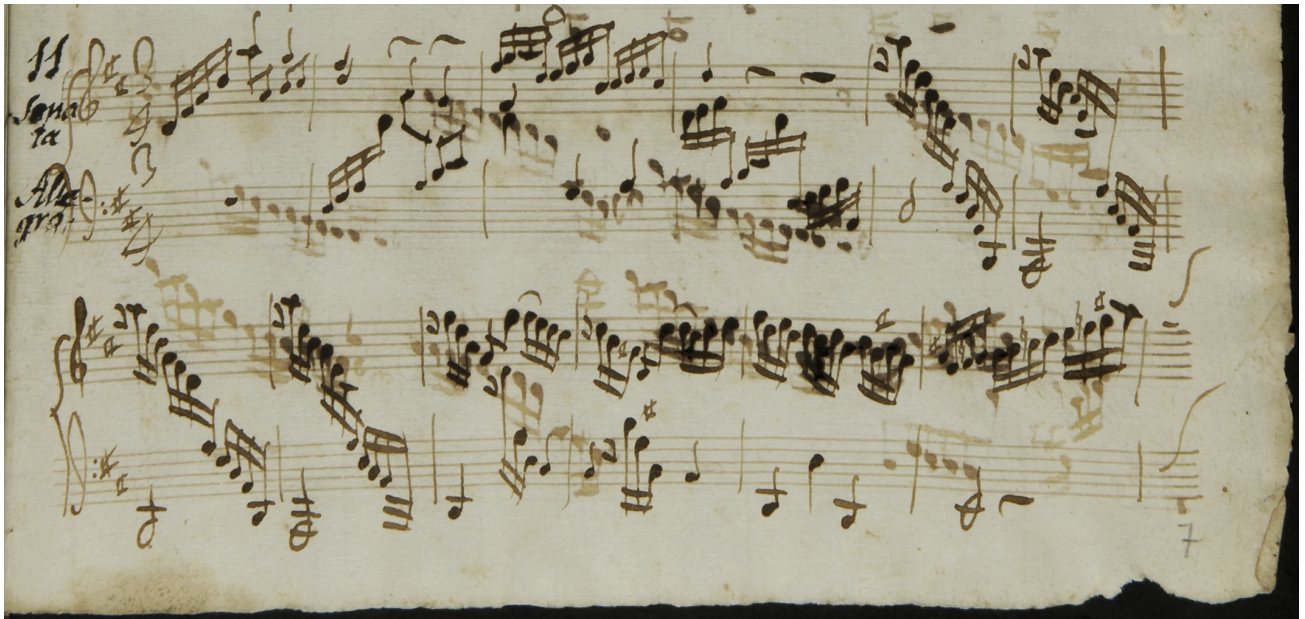


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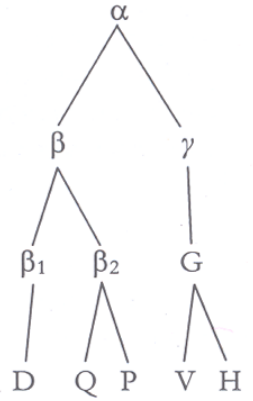
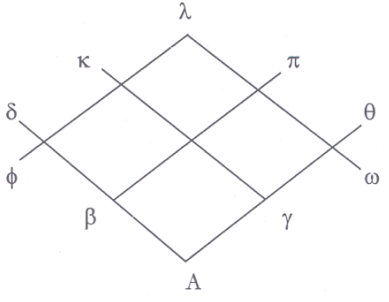
# Methodology – philology and phylogenetics

- ‘forensic’ philology – contact and transfer/copy and change
- but the conventional stemma will not work for a compilation - a matrix approach is needed
- phylogenetics and ‘reverse DNA’ – differences in common may indicate kinship




**Hence the need for detailed bar-by-bar, note-by-note collation of all witnesses against a common baseline (control)**

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# Success factors

- Teamwork – interdisciplinary and practitioner focused
- Citizen Science (the Argos team) – many extra pairs of eyes and hands
- Access to Jérémie Lumbroso's repository
- The 'Roseingrave' tool for data capture – powerful, flexible and adaptable
- The code – highly structured and legible by humans and computers
- 1 successful pilot project as proof of concept; a second pilot just launched
- Cash

**Our approach is empirical and data-driven; comprehensive, systematic and accessible; with a keen eye on future potential and the implications for performers**

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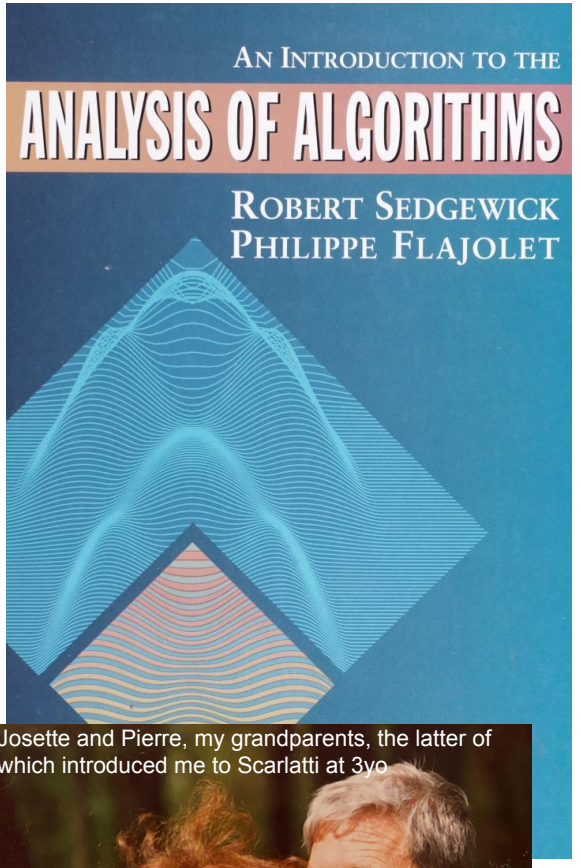
# Next Steps in Scarlatti Research
# *Computational Musicology*

ResearchWorks — Feb. 27th, 2023

Dr. Jérémie Lumbroso

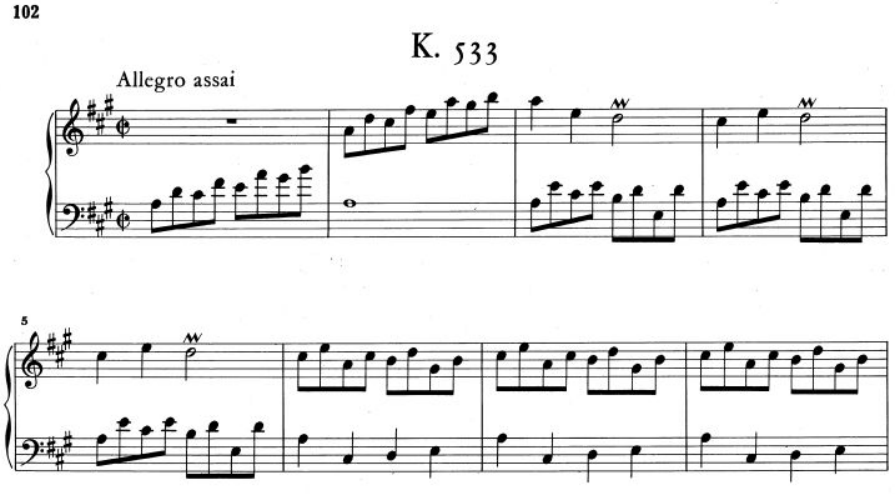
# From Computer Science to Music

- questions of scale
  - how to approach a composer that is known only through 555 sonatas
  - scaling issues arising from analysis
  - *how a composer created a generative formula that could scale to 500+ pieces*
- questions of data management
  - how to manage the data related to research projects
- questions of community building
  - how to build focused community and scholarship around the composer
  - how to bring together a critical mass of researchers



Josette and Pierre, my grandparents, the latter of which introduced me to Scarlatti at 3yo

# K. 533: Repetitions



# Princeton Center for Digital Humanities

PRINCETON UNIVERSITY

## Computer-Assisted Pattern Analysis of Domenico Scarlatti's Keyboard Sonatas

*Enabling new research on the Baroque composer by facilitating quantitative approaches*

Domenico Scarlatti's 555 keyboard sonatas hold the confusing honor of being, as W. Dean Sutcliffe phrased it, "one of the greatest but least well understood and covered repertories of Western keyboard music." A confluence of many factors seem to have led to this gap between importance and understanding. One of the main factors is the size, impenetrability, and density of the corpus of sonatas. This seems to have proven daunting for experts in musicology who may be used to more qualitative methods.

Lumbroso and his team believe the key to unlocking new, serious scholarship on Scarlatti's keyboard sonatas is to turn to quantitative methods and plan to employ computer science expertise on the processing of Big Data streams, to process a subset of the sonatas, and to establish a framework for the structural analysis of these sonatas. The proposal will be based on:

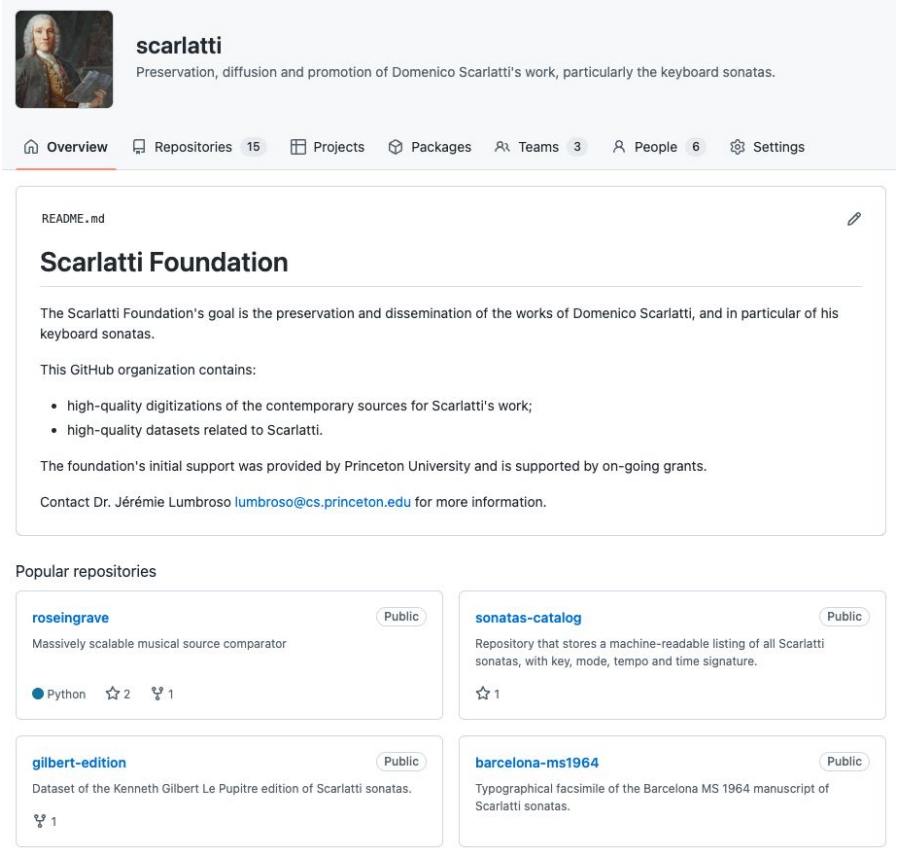
- The curation of an open-source machine-readable dataset of the keyboard sonatas, such as to enable a new generation of scholars to study the sonatas using existing tools (such as music21, etc.).
- The creation of a set of open-source scripts for the extraction and categorization of rhythmic micro-patterns and structural macro-patterns within the sonatas

### CDH Grant History

2020–2022 Dataset Curation

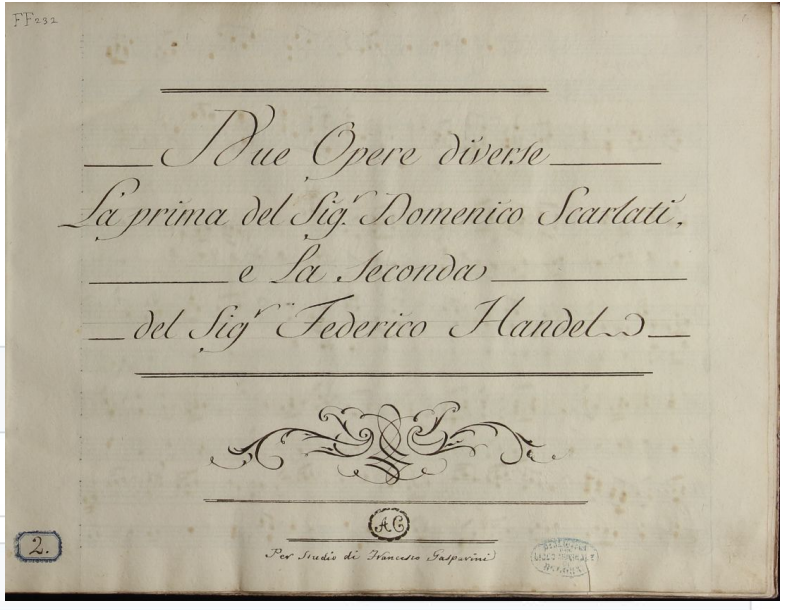
THE CENTER FOR DIGITAL HUMANITIES @PRINCETON

# The repository




- Aggregate all data related to Scarlatti in open access
- **ALL manuscripts EVER**
- **ALL prints EVER**
  - (except Longo 😈)
- ALL datasets related to Scarlatti

# Cataloguing manuscripts




main ▾ **sources** / scores / manuscripts / bologna / **bologna-ff-232.csv**

**jlumbroso** Updated all score catalogs to have `"codex"` field

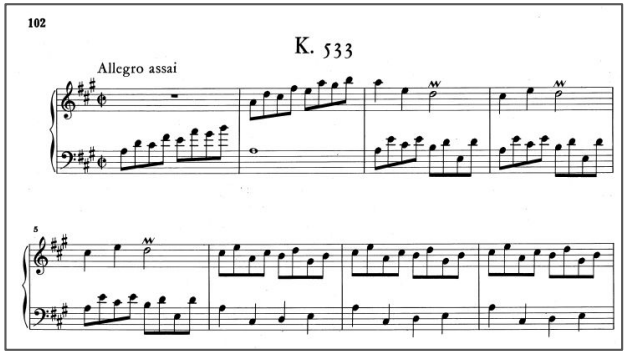
**1** contributor

19 lines (19 sloc) | 1023 Bytes

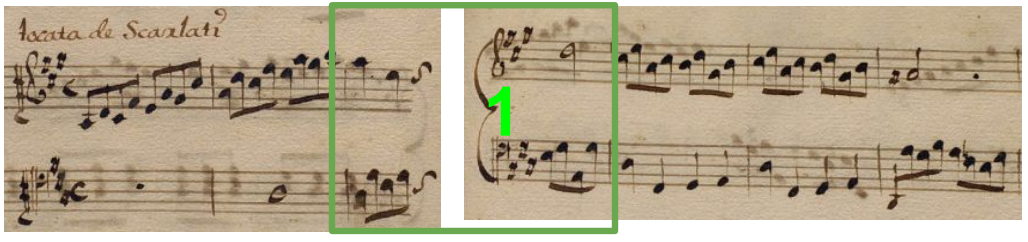
Search this file...

| | file | kirkpatrick | local_index | page_start | page_length | memo | codex |
|---|---|---|---|---|---|---|---|
| 2 | ff-232.pdf | | 1 | 6 | 2 | Fuga [Roseingrave] | Bologna FF 232 |
| 3 | ff-232.pdf | 41 | 2 | 8 | 4 | Fuga and. mod. | Bologna FF 232 |
| 4 | ff-232.pdf | | 3 | 11 | 4 | Fuga in G dorico [Scarlatti?] | Bologna FF 232 |
| 5 | ff-232.pdf | 30 | 4 | 14 | 4 | Fuga | Bologna FF 232 |
| 6 | ff-232.pdf | 58 | 5 | 18 | 2 | Fuga | Bologna FF 232 |
| 7 | ff-232.pdf | 155 | 6 | 19 | 3 | Allegro | Bologna FF 232 |
| 8 | ff-232.pdf | 150 | 7 | 21 | 2 | Allegro | Bologna FF 232 |

# K. 533 (across manuscripts)

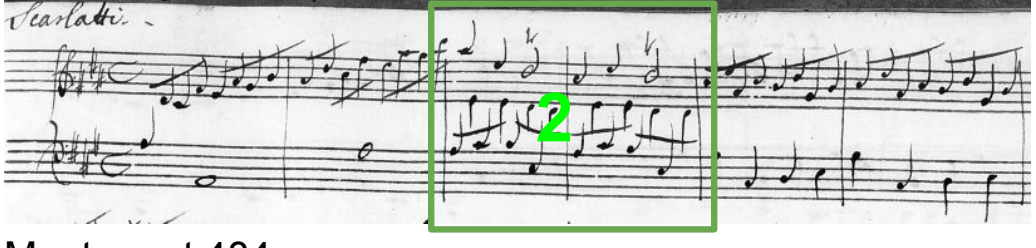



Barcelona Orfeo 1766

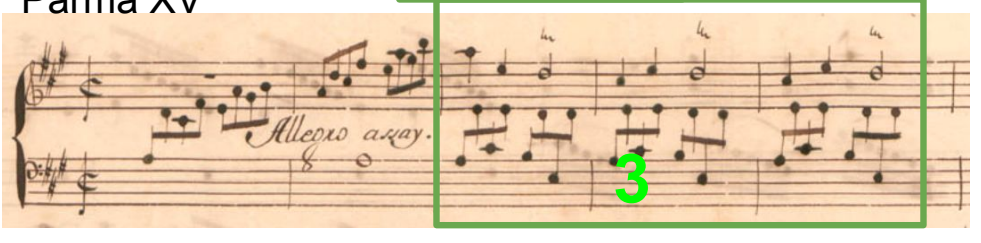



New York Cary

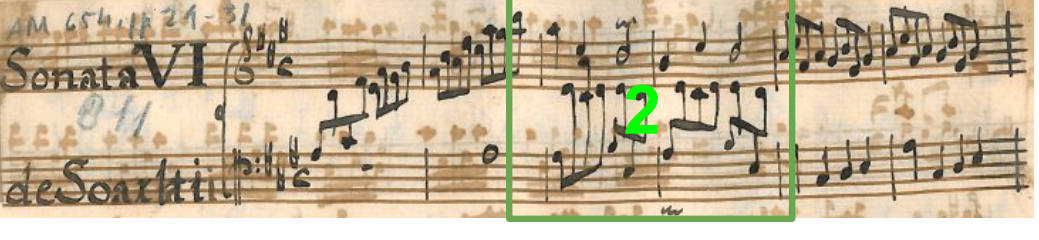
Cambridge 147



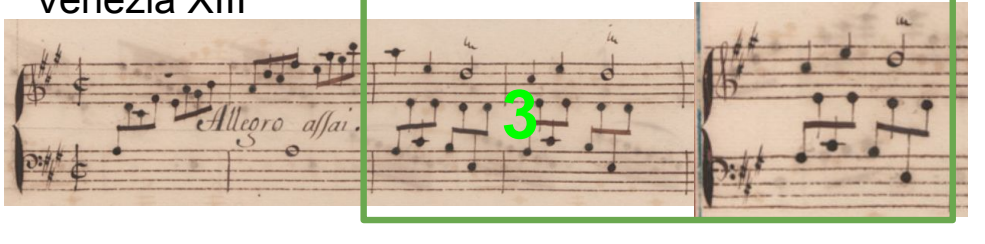

Parma XV



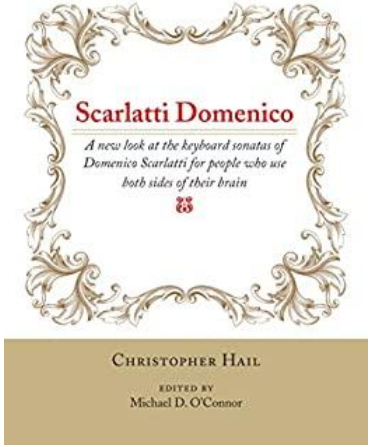

Montserrat 484




Venezia XIII



# Completist approaches




A Dissertation
Presented to
The Faculty of the Graduate School of Arts and Sciences
Brandeis University
Department of Music
In Three Volumes

In Partial Fulfillment
of the Requirements of the Degree
Doctor of Philosophy

By
Joel Leonard Sheveloff
June 1970
Volume I

FACULTAT DE FILOSOFIA I LLETRES
DEPARTAMENT D'HISTÒRIA DE L'ART I MUSICOLOGIA
EDUCACIÓ MUSICAL I INTERPRETACIÓ DE LA MÚSICA ANTIGA

UAB
Universitat Autònoma de Barcelona

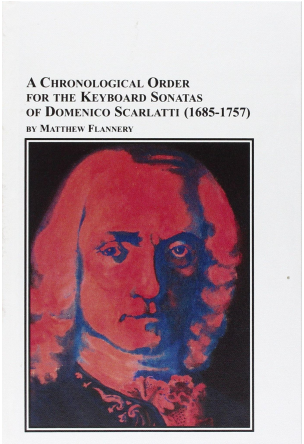
Tesis Doctoral presentada por
Celestino YÁÑEZ NAVARRO

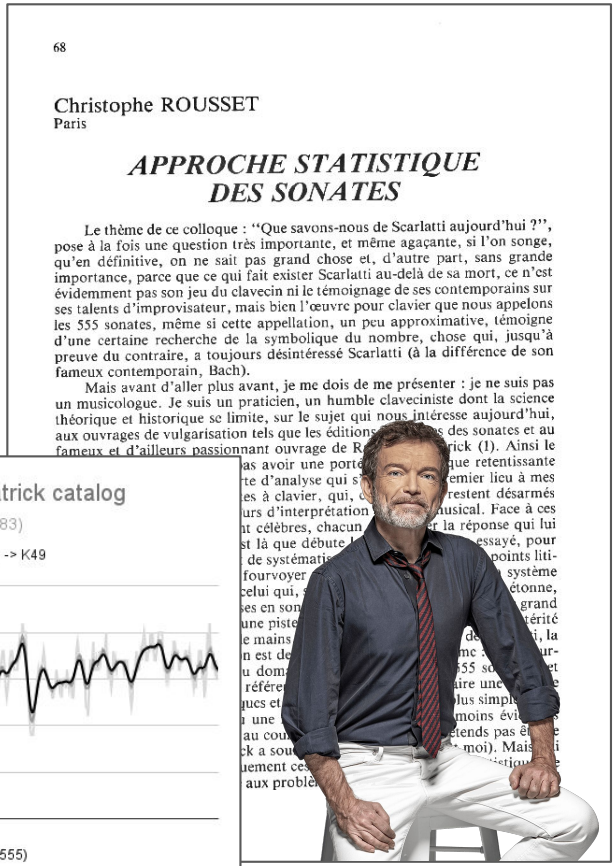
*NUEVAS APORTACIONES PARA EL ESTUDIO DE LAS SONATAS DE DOMENICO SCARLATTI.*
*LOS MANUSCRITOS DEL ARCHIVO DE MÚSICA DE LAS CATEDRALES DE ZARAGOZA*

Co-directores
Dr. Antonio EZQUERRO ESTEBAN
&
Dr. Luis Antonio GONZÁLEZ MARÍN
Tutor: Dr. Francesc Bonastre i Bertran

Diciembre de 2015

VOLUMEN II. ANEXOS



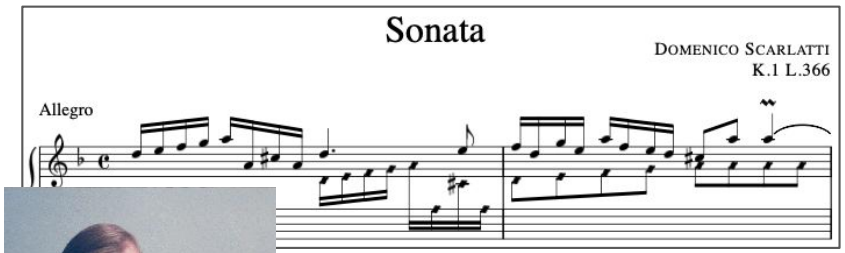


68

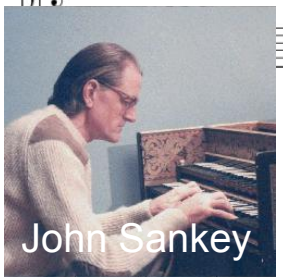
Christophe ROUSSET
Paris

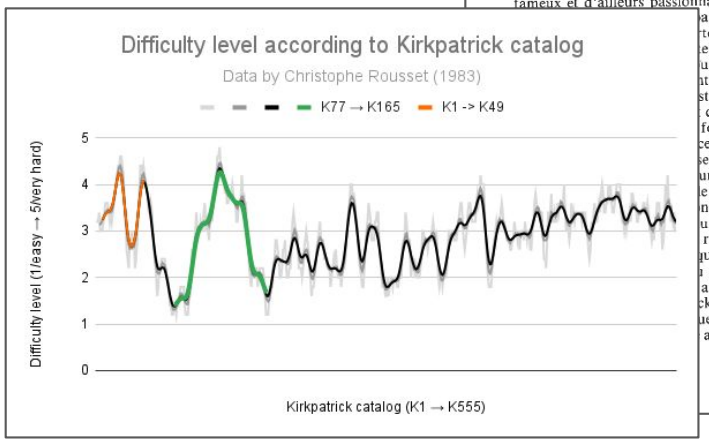
*APPROCHE STATISTIQUE DES SONATES*

Le thème de ce colloque : "Que savons-nous de Scarlatti aujourd'hui ?", pose à la fois une question très importante, et même agaçante, si l'on songe, qu'en définitive, on ne sait pas grand chose et, d'autre part, sans grande importance, parce que ce qui fait exister Scarlatti au-delà de sa mort, ce n'est évidemment pas son jeu du clavecin ni le témoignage de ses contemporains sur ses talents d'improvisateur, mais bien l'œuvre pour clavier que nous appelons les 555 sonates, même si cette appellation, un peu approximative, témoigne d'une certaine recherche de la symbolique du nombre, chose qui, jusqu'à preuve du contraire, a toujours désintéressé Scarlatti (à la différence de son fameux contemporain, Bach).

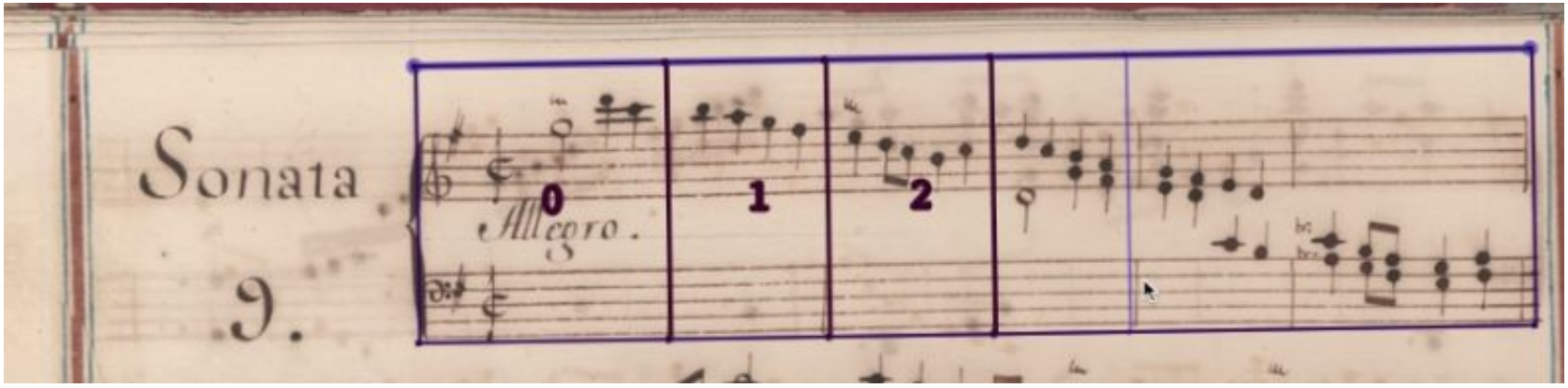
Mais avant d'aller plus avant, je me dois de me présenter : je ne suis pas un musicologue. Je suis un praticien, un humble claveciniste dont la science théorique et historique se limite, sur le sujet qui nous intéresse aujourd'hui, aux ouvrages de vulgarisation tels que les éditions [illegible] des sonates et au fameux et d'ailleurs passionnant ouvrage de R[illegible]rick (1). Ainsi le [illegible]as avoir une porté[illegible]que retentissante [illegible]te d'analyse qui s'[illegible]emier lieu à mes [illegible]es à clavier, qui, [illegible]restent désarmés [illegible]urs d'interprétation [illegible]musical. Face à ces [illegible]nt célèbres, chacun [illegible]r la réponse qui lui [illegible]st là que débute [illegible]essayé, pour [illegible] de systémati[illegible]points liti- [illegible]fourvoyer [illegible]système [illegible]celui qui, [illegible]étonne, [illegible]ses en son[illegible]grand [illegible]une piste[illegible]érité [illegible]e mains[illegible]i, la [illegible]n est de[illegible]ur- [illegible]u dom[illegible]555 so[illegible] [illegible]référe[illegible]ire une[illegible] [illegible]ques et[illegible]lus simpl[illegible] [illegible]une[illegible]moins évi[illegible] [illegible]au cou[illegible]etends pas ê[illegible] [illegible]k a sou[illegible]moi). Mais[illegible] [illegible]uement ce[illegible]istiqu[illegible] [illegible]aux proble[illegible]

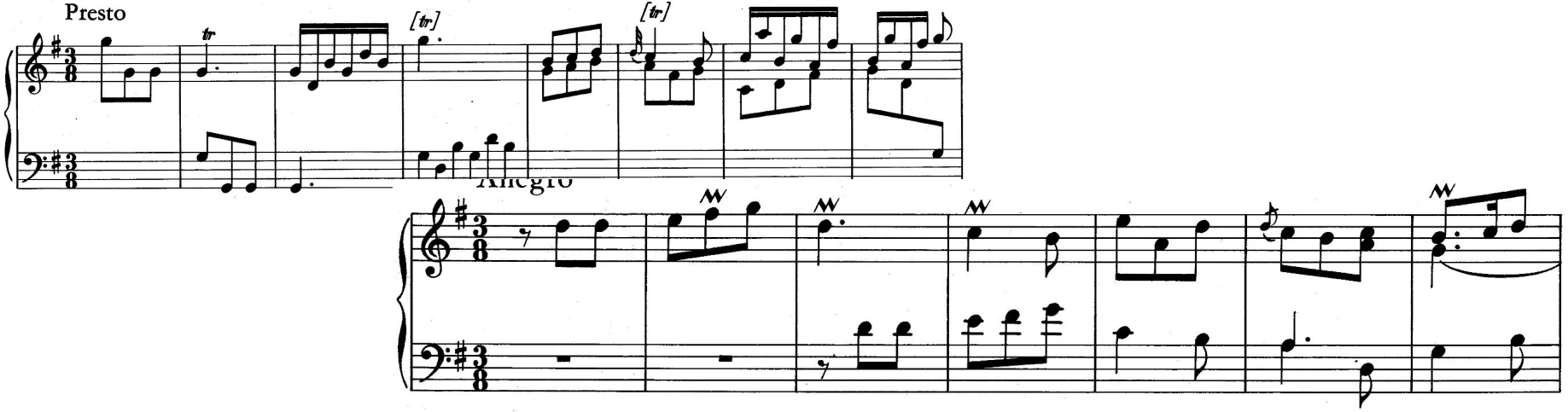


# Barcutter + Incipits



# Searchable Sonata Catalog

main ▾ sonatas-catalog / catalog.csv — Go to file

jlumbroso Italian spelling fixes, thanks @jaspervanderklis — Latest commit 8a943fd on Jun 6, 2022 — History

1 contributor

557 lines (557 sloc) | 24.3 KB — Raw | Blame

Search this file...

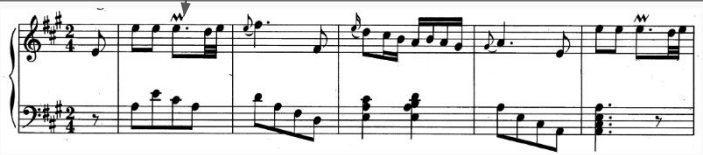
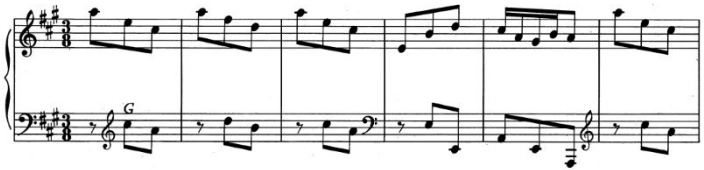
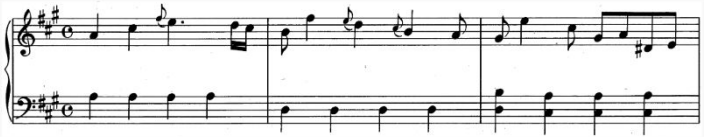
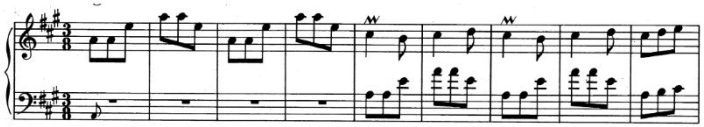
| | K | Fl | F | L | P | Cz | Key | Tempo | Signature |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 49 | — | 366 | 57 | 6 | D minor | Allegro | C |
| 3 | 2 | 50 | — | 388 | 58 | 7 | G major | Presto | 3/8 |
| 4 | 3 | 51 | — | 378 | 59 | 8 | A minor | Presto | ¢ |
| | | 52 | — | 390 | 60 | 9 | G minor | Allegro | C |

key, tempo, time signature

incipit (another dataset)

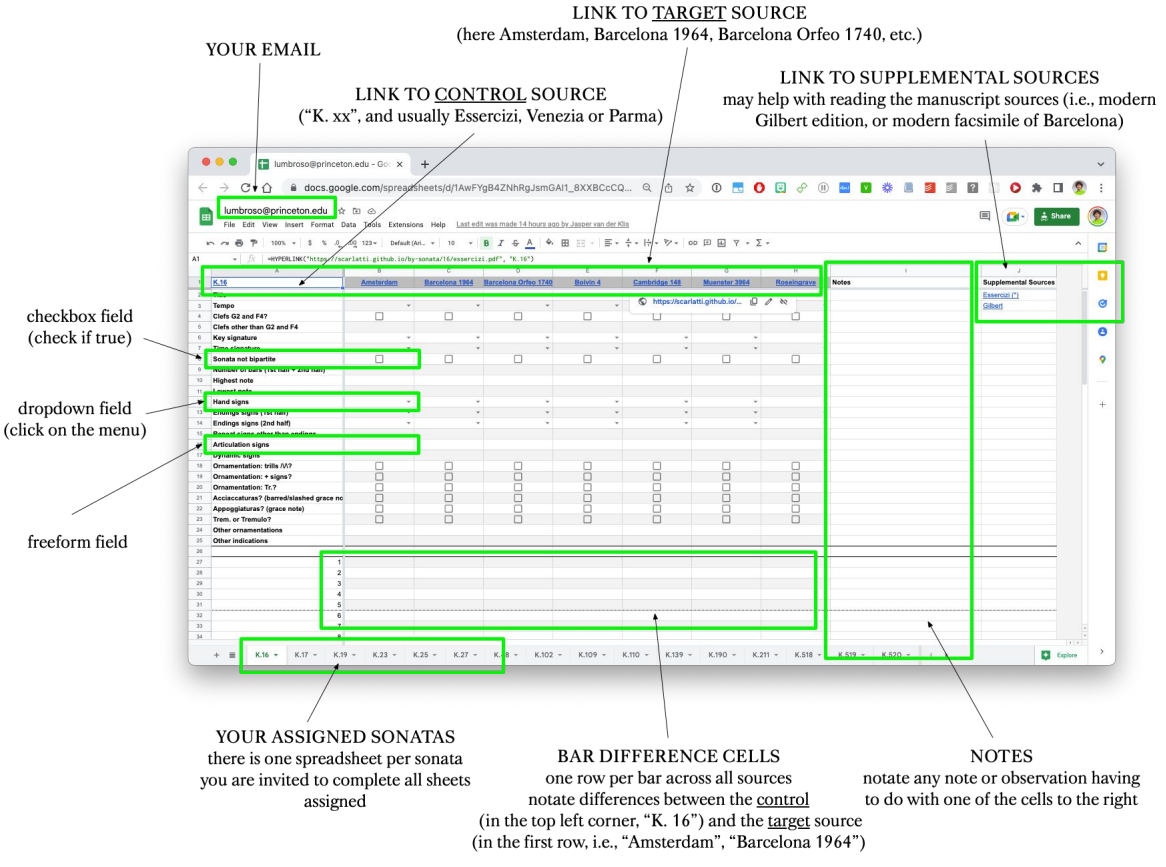
Gilbert edition (a dataset)

Show 10 entries — Search: "A major"

| Kirkpatrick | Key | Tempo | Time Signature | Incipit |
|---|---|---|---|---|
| 181 | A major | — | 2/4 |  |
| 182 | A major | Allegro | 3/8 |  |
| 208 | A major | Adagio è cantabile | C |  |
| 209 | A major | Allegro | 3/8 |  |

# Roseingrave

**Joseph Lou**




- Compare every pair of manuscripts
  - Crowdsourcing
- Derive "difference code"
- Eventually rebuild the full text of each manuscript using "control" + "diff code"
- Goal is to obtain a fully searchable dataset of all musical content

# Open-source edition

- Reference edition for machine queries
- Control text in LilyPond
- Variants derived programmatically from diff codes (Roseingrave) and control text
- Research project involving **Nicolas Sceaux**

Éditions Nicolas Sceaux

LilyPond

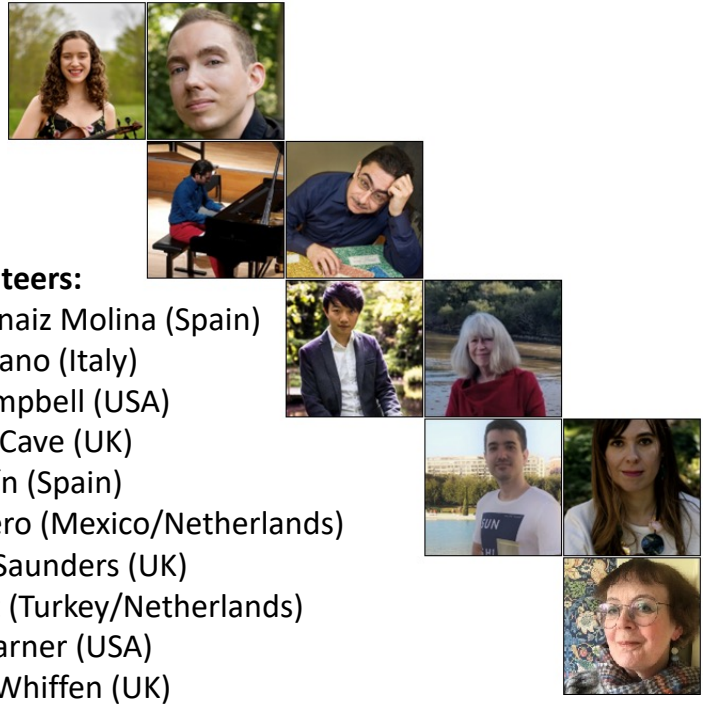
*... music notation for everyone*

# Overall deliverables

- Our own research questions
- Creating the data infrastructure to make it easier for EVERYBODY to investigate research questions on Scarlatti
  - All of our byproducts available publicly
- Many tools to support future research both on Scarlatti and on digital musicology of manuscripts

# People and Process: the Argos team

- International group of expertly trained musicians and researchers
  - Guildhall School, Royal Academy of Music, Juilliard, Utrecht Conservatoire, Conservatorio ‘G. Verdi’…
  - We are recruiting more devotees!
- Over 55.000 bars of music in the Kirkpatrick catalogue



**Our volunteers:**
Miguel Arnaiz Molina (Spain)
Enrico Baiano (Italy)
Alyssa Campbell (USA)
Penelope Cave (UK)
Laia Martín (Spain)
Luis Romero (Mexico/Netherlands)
Christine Saunders (UK)
Idil Turgut (Turkey/Netherlands)
Robert Warner (USA)
Christine Whiffen (UK)
Raymond Wui Man Yiu (Hong Kong/UK)

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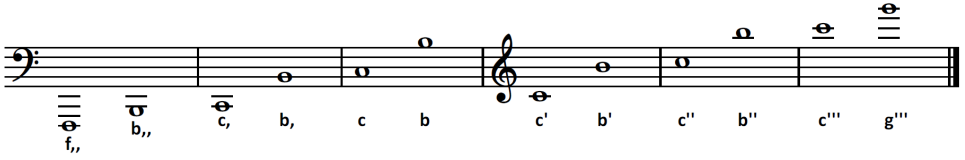
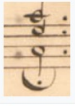
# People and Process

- Notation system
- Lilypond pitch conventions
  - Free text-based music engraving software
  - Letters, numbers, and punctuation: c2 dsharp’’4 eflat’’8.
  - Special abbreviations for ornamentation: app acc tr etc.




| Type of ornament | Example | Abbreviation/code |
|---|---|---|
| Acciaccatura (slashed grace note) | | `acc` (K. 109, Cambridge 148) |
| Appoggiatura | | `app` (K.522, Venezia 13) |
| Trill (squiggly/wavy line) | | `trill` |
| Trill | *tr*; t; + | `tr` |
| Long wavy line | | `longwavyline` (K. 109, Parma 3) |
| Mordent | | `mordent` (K. 522, New York Cary) |
| Slide | | `slide` (K. 109, Venezia 1749) |
| Line of dots | | `lineofdots` |
| Tremulo | *tre*; *trem*; *trem.lo* | `trem` |
| Turn | | `turn` |
| Double appoggiatura | | `dblapp` |
| Fermata |  | `fermata` (K. 544, Parma 15) |

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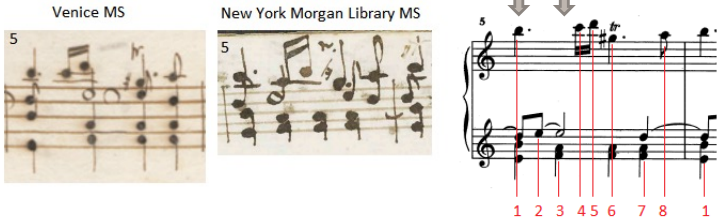
# Recording variants: step one

- Counting notes
  - Special rules for ornaments, tied notes, rests
- Separate vertical sound events
  - Use of Kenneth Gilbert's edition

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# Recording variants: step two

- Pre-defined formats

| Code | Meaning |
|---|---|
| `9c'] c''` | The ninth note in the bar, which is a middle C in the control, is an octave higher in this witness. |
| `9c'] 0` | The c' on position 9 is not present in the witness. |
| `9c'] r4` | The c' on position 9 is a crotchet rest in the witness. |
| `9] +c4` | Crotchet c present in witness on position 9 but not in control. |

- Separation of variants

**Incorrect notations**

`7a8b9c] 7b8c9d`

`7a] +natural -tr`

These notations are incorrect: please record each variant **separately**, even if multiple variants occur on the same note.

**Correct notations**

`7a] b ; 8b] c ; 9c] d`

`7a] +natural ; 7a] -tr`

- Online user manual: constant refinement

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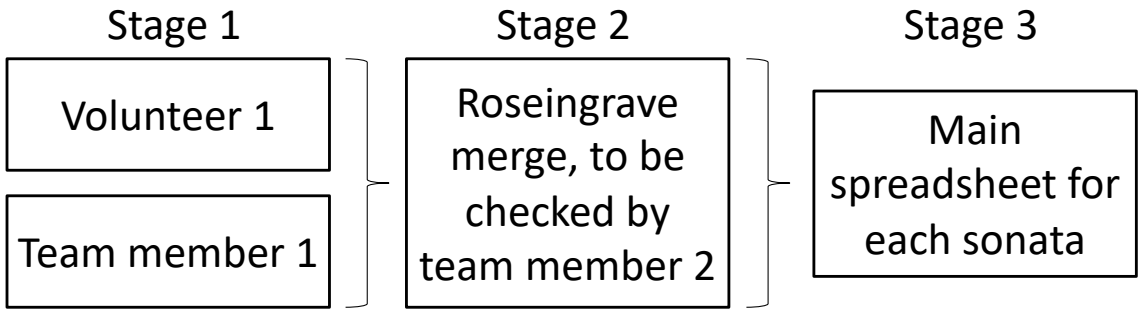
# Recording variants: workflow




- Workflow ensures quality and accuracy

| K.522 | Barcelona 1964 | Muenster 3966 | New York Cary | Parma 15 | Notes |
|---|---|---|---|---|---|
| 43 | | | | | |
| 44 | | | | | |
| 45 | 7g'] -tie | | | | |
| 46 | 6csharp'] -tr | | 6csharp'] -tr | | |
| 47 | 2fsharp"] -tr | 1d] fsharp | 2fsharp"] -tr | | |
| 48 | | 1acc] app16 ; 5csharp"] +tr | 1acc] app ; 2d"] g' | | NY Cary: pitch of appoggiatura unclear, assumed a" as in Venezia 13 |
| 49 | | 3fsharp'] +tr | 2fsharp'] +tr ; 8fsharp'] g | | Barcelona 1964: heavy ink ghosting, still legible ; NY Cary: squiggle between 2sharp' and 3fsharp' assumed to be a trill (cf. second half), while trill in Muenster 3966 is clearly on 3fsharp' (perhaps erroneously) |
| 50 | | 1acc] app16 | 1acc] app ; 1g] e ; 2d'] g | | |
| 51 | 1] +d1 | | | | |
| 52 | | 5r] 0 | | | Barcelona 1964: rest on 5 ambiguous, assumed |

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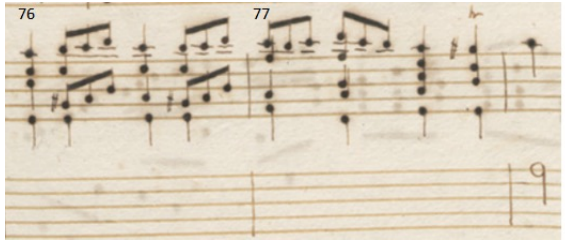
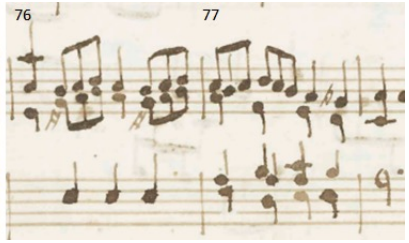
# Recording variants: example

K. 109, bars 76-78

⇩ Venezia 1749




⇩ Cary 703




- Complex notation: over 400 keystrokes!

```
1e"] 0 ; 2e'] e ; 2e"] 0 ; 2b"] b' ; 3c"'] c" ; 4d"'] d" ; 5e'] e ; 5e"] 0 ; 5c"'] c" ; 6e'] e ; 6e"] 0 ; 6b"] b' ; 7c"'] c" ; 8d"'] d"
```

```
1] +f ; 1f] a ; 1f"] 0 ; 1c"'] c" ; 2b"] b' ; 3c"'] c" ; 4d'] d ; 4a'] a ; 4b'] b ; 4f"] f ; 4d"'] d" ; 5c"'] c" ; 6b"] b' ; 7e'] e ; 7a'] a ; 7c"] c' ; 7e"] e' ; 7a" ] a' ; 8e'] e ; 8b'] b ; 8d"] d' ; 8gsharp"] gsharp' ; 8gsharp"] -tr
```

```
1a] 2. ; 1] +c'4 ; 1a"] a'
```

- Preliminary conclusions?

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# People and Process: final thoughts

- Roseingrave: exciting developments ahead!
- Barcelona M1964 pilot: early findings promising

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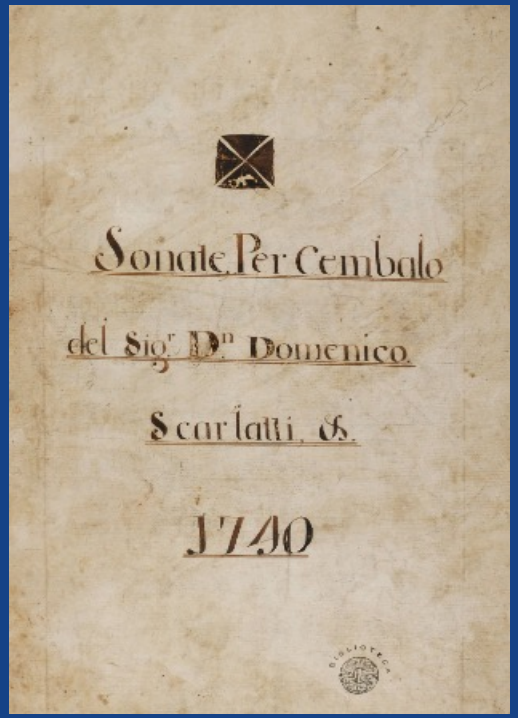
RESEARCHWORKS

# Next Steps in Scarlatti research

## *Research into Practice*

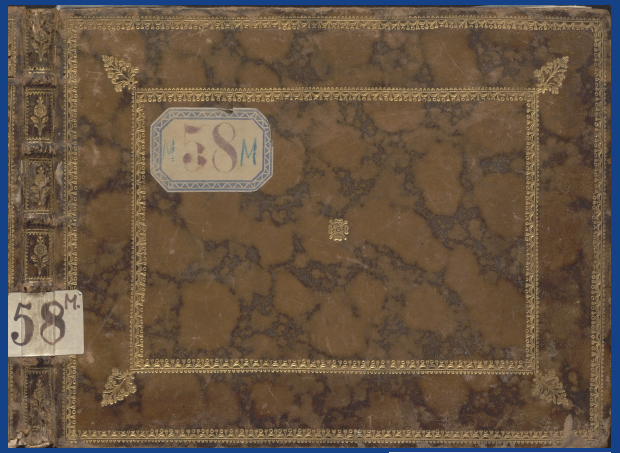
27 February 2023 5pm GMT

FIMTE

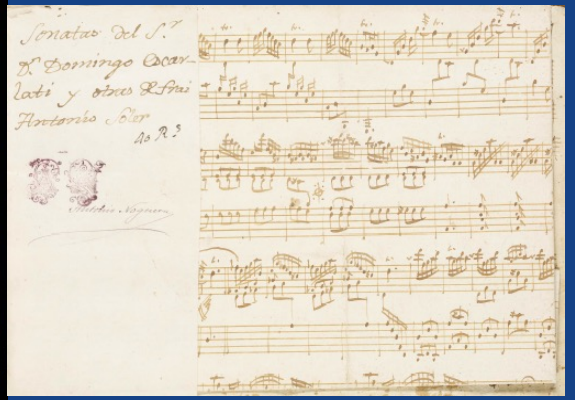



Orfeo Català, Barcelona

Venezia




Coimbra, Ms 58



Cary, New York (Morgan Library)

# Header overview

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | K.110 | Barcelona 1964 | | | Cambridge 148 | | | New Haven | | | New York Carey | | | Parma 3 | | |
| 2 | Volunteer | amc5@juilliard.edu | roberteverettwarner@g | SUMMARY | amc5@juilliard.edu | roberteverettwarner@g | SUMMARY | amc5@juilliard.edu | roberteverettwarner@g | SUMMARY | amc5@juilliard.edu | roberteverettwarner@g | SUMMARY | amc5@juilliard.edu | roberteverettwarner@g | SUMMARY |
| 3 | Title | 4a Sonata | 4a Sonata | 4a Sonata | Sonata 2a | Sonata 2a | Sonata 2a | XXII | XXII | XXII | | | | 4 | 4 | 4 |
| 4 | Tempo | | | | Allegro | | Allegro | Allegro | Allegro | Allegro | | | | Allegro | Allegro | Allegro |
| 5 | Clefs G2 and F4? | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| 6 | Clefs other than G2 and F4 | | | | | | | | | | | | | | | |
| 7 | Key signature | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats |
| 8 | Time signature | 44628 | 44628 | 3/8 | 44628 | 44628 | 3/8 | 44628 | 44628 | 3/8 | 44628 | 44628 | 3/8 | 44628 | 44628 | 3/8 |
| 9 | Sonata not bipartite | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10 | Number of bars (1st half + 2nd half) | 63+60 | 63 + 60 | 63+60 | 63+64 | 63 + 64 | 63 + 64 | 64+65 | 64 + 65 | 64+65 | 64+65 | 64 + 65 | 64+65 | 65+66 | 65 + 66 | 65 + 66 |
| 11 | Highest note | d''' | csharp''' | d''' | d''' | csharp''' | d''' | d''' | csharp''' | d''' | c''' | c''' | | d''' | csharp''' | d''' |
| 12 | Lowest note | $e_{,,}$ | $a_{,}$ | $a_{,}$ | $d_{,,}$ | $b_{,}$ | $b_{,}$ | $e_{,,}$ | $a_{,}$ | $a_{,}$ | $e_{,,}$ | $a_{,}$ | | $e_{,,}$ | $a_{,}$ | $a_{,}$ |
| 13 | Hand signs | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) |
| 14 | Endings signs (1st half) | End double bar witho | | End double bar witho | End double bar with i | End double bar with # | End double bar with # | End double bar with i | End double bar with # | End double bar with # | End double bar with i | End double bar with # | End double bar with # | End double bar with i | End double bar with # | End double bar with # |
| 15 | Endings signs (2nd half) | End double bar witho | | End double bar witho | End double bar with i | End double bar with # | End double bar with # | End double bar with i | End double bar with # | End double bar with # | End double bar with i | End double bar with # | End double bar with # | End double bar with i | End double bar with # | End double bar with # |
| 16 | Repeat signs other than endings | | | | | | | | | | | | | | | |
| 17 | Articulation signs | | | | | | | | | | | | | | | |
| 18 | Dynamic signs | | | | | | | | | | | | | | | |
| 19 | Ornamentation: trills /M? | ☑ | ☑ | ☑ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| 20 | Ornamentation: + signs? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 21 | Ornamentation: Tr.? | ☐ | ☐ | ☐ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 22 | Acciaccaturas? (barred/slashed grace no | ☑ | ☑ | ☐ | ☑ | ☑ | ☑ | ☐ | ☐ | ☐ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| 23 | Appoggiaturas? (grace note) | ☑ | ☑ | ☑ | ☑ | ☐ | ☑ | ☑ | ☑ | ☑ | ☐ | ☑ | ☑ | ☑ | ☑ | ☑ |
| 24 | Trem. or Tremulo? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 25 | Other ornamentations | | | | | | | | | | | | | | | |
| 26 | Other indications | Muta Ideti | | mutai déti;-fermata; -D.C | Muta Ideti, Fin | | mutai deti; Fin | Muta Ideti , D.C. | | "mata: deli"; -D.C.; | Muta Ideti | | Muta i deti; Fermata ; -D | Muta Ideti | | Mutai deti; fermata |
| 27 | | | | | | | | | | | | | | | | |
| 28 | 1 | | | | | | | | | | | | | | | |
| 29 | 2 | | | | | | | | 2a.] -Manca | 2a.] -Manca | | 2a.] -Manca | 2a.] -M | | | |
| 30 | 3 | | 1d] 4 | 5d4]8 | | 1d] 4 | 5d4]8 | | 1d] 4 | 5d'] 8 | | 1d] 4 | 5d'] 8 | | 1d] 4 | 5d'] 8 |
| 31 | 4 | 1d"app32] a | 1c'8] 8. ; 1app] Ø ; 2gsha | 1app] -app | 1d"app32] a ; 2gsharp'8 | 1c'8] 8. ; 1app] Ø ; 2gsha | 1c'8] 8. ; 1app] Ø ; 2gsha | 1d"app32] d"app16 | 1app] 16 | 1app] 16 | 1d"app32] d"acc8 | 1app] acc8 | 1app] acc8 | 1d"app32] d"app16 | 1app] 16 | 1app] 16 |
| 32 | 5 | | | | | | | 5f'8] ø | 5f'] Ø | 5f'] Ø | | | | | | |
| 33 | 6 | 1a'app32] a'app8 | 1app] 8 | 1app] 8 | 1a'app32] a'app8 | 1app] 8 | 1app] 8 | 1a'app32] a'app16 | 1app] 16 | 1app] 16 | 1a'app32] a'app8 ; 6a'] b | 1app] 8 | 1app] 8 | 1a'app32] a'app16 | 1app] 16 | 1app] 16 |
| 34 | 7 | | 1d] 4 | 1d4.]4 | 1d4.] ø | 1d] Ø | 1d] Ø | | 1d] 4 | 1d] 4 | 1d4.] d4 | 1d] 4 | 1d] 4 | 1d4.] d4 | 1d] 4 | 1d] 4 |
| 35 | 8 | 1d"app32] d"app8 | 1c'8] 8. ; 1app] Ø ; 2gsha | 1app] Ø ; 2gsharp'] 16 | 1d"app32] d"app8 ; 2gsh | 1c'8] 8. ; 1app] Ø ; 2gsha | 1c'8] 8. ; 1app] Ø ; 2gsha | 1d"app32] d"app16 | 1app] 16 | 1app] 16 | 1d"app32] d"acc8 | 1app] acc8 | 1app] acc8 | 1d"app32] d"app16 | 1app] 16 | 1app] 16 |
| 36 | 9 | 5a'] gsharp' ; 6gsharp'] a | 5a'] gsharp' ; 6gsharp'] a' | 5a'] gsharp' ; 6gsharp'] a' | 5a'] gsharp' ; 6gsharp'] a | 5a'] gsharp' ; 6gsharp'] a | 5a'] gsharp' ; 6gsharp'] a | 5a'] gsharp' ; 6gsharp'] a | 5a'] gsharp' ; 6gsharp'] a | 5a'] gsharp' ; 6gsharp'] a | | | | | | |
| 37 | 10 | 1gsharp'app32] gsharp'a | 1app] 8 | 1app] 8 | 1gsharp'app32] gsharp'a | 1app] 8 | 1app] 8 | 1gsharp'app32] gsharp'a | 1app] 4 | 1app] 4 | 1gsharp'app32] g'acc8 | 1app] acc8 | 1app] acc8 | 1gsharp'app32] gsharp'a | 1app] 16 | 1app] 16 |
| 38 | 11 | 3gsharp] -sharp | 1e] -Manca ; 1gsharp] -D | 1e] -Manca ; 1gsharp] -D | 1e16] fsharp4; 1gsharp1 | see notes | 1e16] fsharp4; 1gsharp16] | a4 ; 2fsharp16] g4 ; 2a1 | 1e] -Manca ; 1gsharp] -D | ritta | 3gsharp] -sharp | 1e] -Manca ; 1gsharp] -D | 1e] -M ; 1gsharp] -D ; 3gsharp] -sharp | | | |
| 39 | 12 | | | | | | | | | | | | | | | |
| 40 | 13 | | | | | | | 1e"] esharp" | | 1e"] esharp" | | 6csharp'"] c''' | | | | |

| K.110 | Barcelona 1964 | | | Cambridge 148 | | | New Haven | | |
|---|---|---|---|---|---|---|---|---|---|
| Volunteer | amc5@juilliard.edu | roberteverettwarner@g | SUMMARY | amc5@juilliard.edu | roberteverettwarner@g | SUMMARY | amc5@juilliard.edu | roberteverettwarner@g | SUMMARY |
| Clefs G2 and F4? | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| Clefs other than G2 and F4 | | | | | | | | | |
| Key signature | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats | no sharps/flats |
| Time signature | 44628 | 44628 | 3/8 | 44628 | 44628 | 3/8 | 44628 | 44628 | 3/8 |
| Sonata not bipartite | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Number of bars (1st half + 2nd half) | 63+60 | 63 + 60 | 63+60 | 63+64 | 63 + 64 | 63 + 64 | 64+65 | 64 + 65 | 64+65 |
| Highest note | d''' | csharp''' | d''' | d''' | csharp''' | d''' | d''' | csharp''' | d''' |
| Lowest note | e,, | a,, | a,, | d,, | b,, | b,, | e,, | a,, | a,, |
| Hand signs | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) | M(anca) and D(ritta) |
| Endings signs (1st half) | End double bar witho | | End double bar witho | End double bar with | End double bar with | End double bar with | End double bar with | End double bar with | End double bar with |
| Endings signs (2nd half) | End double bar witho | | End double bar witho | End double bar with | End double bar with | End double bar with | End double bar with | End double bar with | End double bar with |
| Repeat signs other than endings | | | | | | | | | |
| Articulation signs | | | | | | | | | |
| Dynamic signs | | | | | | | | | |
| Ornamentation: trills /\/\? | ☑ | ☑ | ☑ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Ornamentation: + signs? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Ornamentation: Tr.? | ☐ | ☐ | ☐ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| Acciaccaturas? (barred/slashed grace no | ☑ | ☑ | ☐ | ☑ | ☑ | ☑ | ☐ | ☐ | ☐ |
| Appoggiaturas? (grace note) | ☑ | ☑ | ☑ | ☑ | ☐ | ☑ | ☑ | ☑ | ☑ |

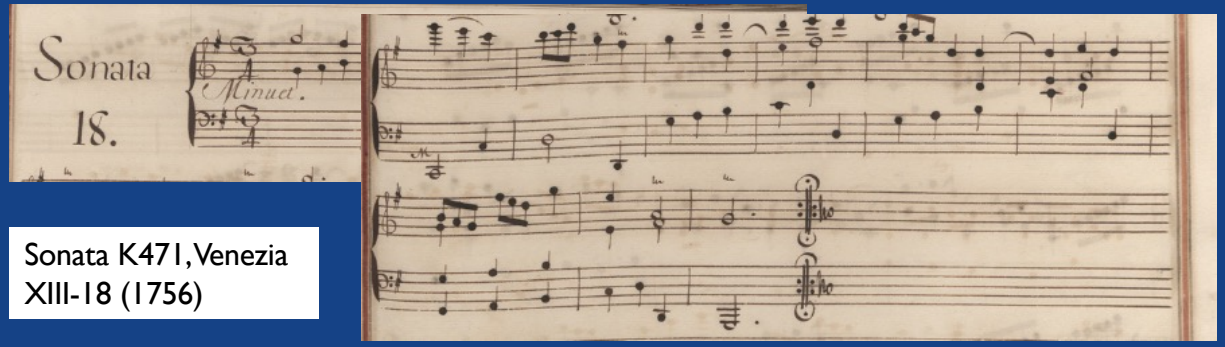
# Variants of compass: local performance practices

Fortepiano Francisco Pérez Mirabal (c.1745) (Private Collection, Mallorca)

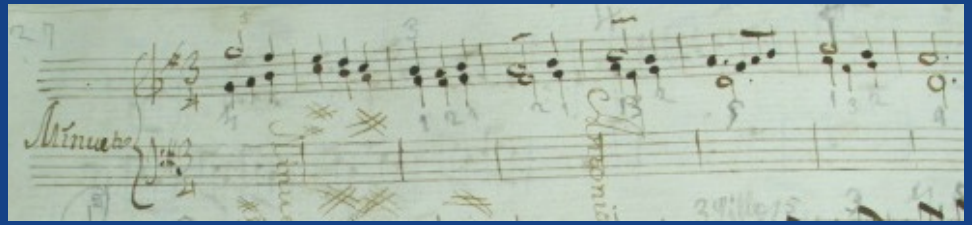
Harpsichord Salvador Bofill, Barcelona, 1743. (Museo Diocesano Arte Sacro, Bilbao)

Harpsichord Joseph Bueno, 1712 (Museo Joaquín Díaz Urueña,Valladolid)

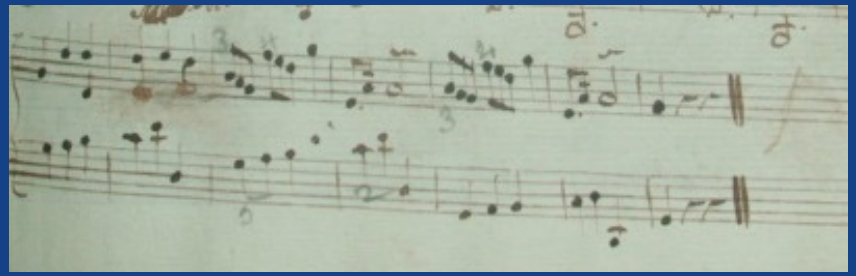
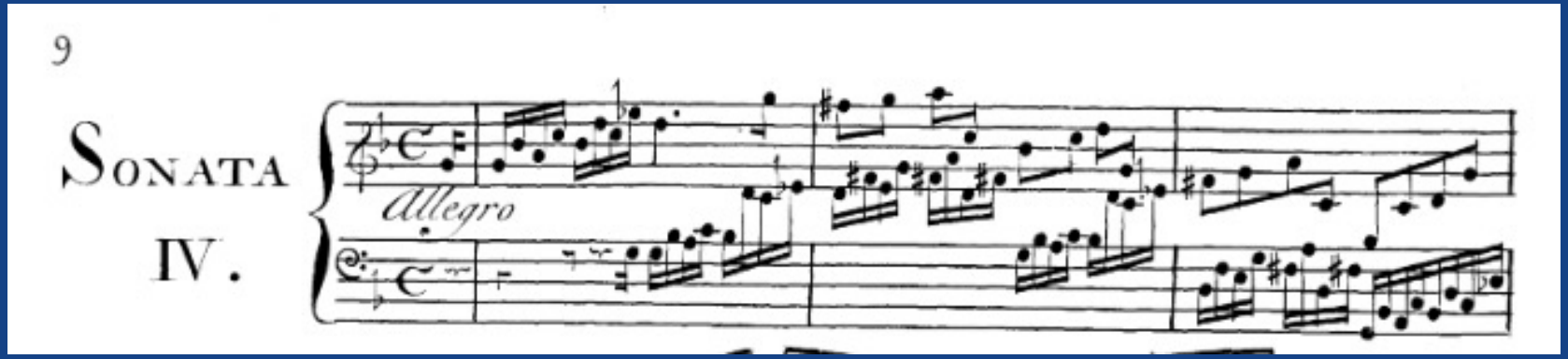
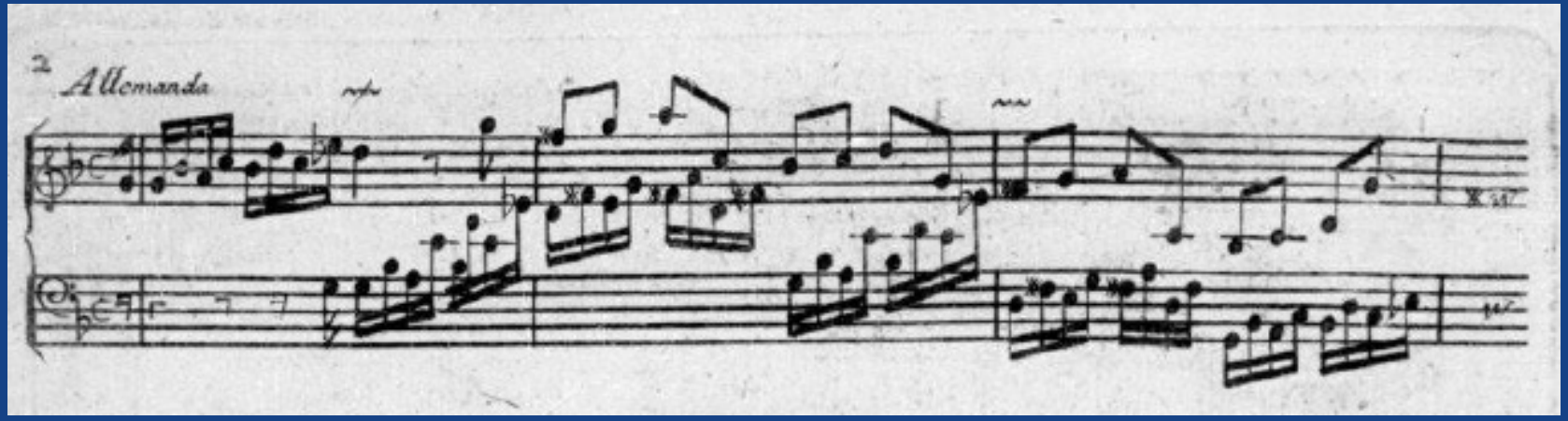
# Variants of compass: local performance practices




Sonata K471, Venezia XIII-18 (1756)




Sonata K471, (SPD III) Convento San Pedro de las Dueñas, León (1769)



# Variants on the Title: *Essercizi IV Allegro* vs. *Allemanda* (Boivin)