Hypermeter and Form as Temporal Structure, and Beethoven's Formal Innovations

Presentation to the McGill Music Research Doctoral Colloquium Series

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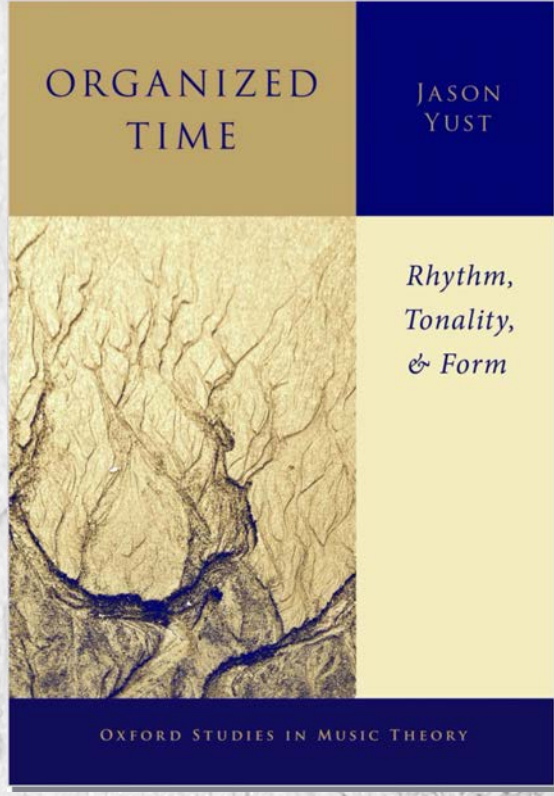
Organized Time:
Temporal Structure in the Musical Domains of Rhythm, Tonality, and Form



Outline

(1) Hypermeter and closure
- *(a)* Meter as temporal hierarchy
- *(b)* The rule of tonal-rhythmic closure
- *(c)* Two methods of closure (simple, expanded)

(2) Expositional closure
- *(a)* Simple closure in expositions — *Exx:* Haydn Op. 54/2, Beethoven Op. 9/2
- *(b)* Delaying closure via elision — *Ex:* Beethoven Op. 7
- *(c)* The open exposition — *Exx:* Beethoven Op. 47, Op. 59/2

(3) Network model of musical form and the disjunctive coda
- *(a)* Formal structure: Basic principles
- *(b)* Integrated and disjunctive codas — *Exx:* Haydn Symph. 101, Beeth. Op. 59/2

(4) Innovative tonal-formal disjunction in Beethoven's middle period
- *(a)* Off-tonic recapitulation — *Ex.:* Op. 9/1 Scherzo
- *(b)* Non-standard subordinate keys — *Ex.:* Op. 29 Quintet

(5) Relating structural shapes: The associahedron

(1) Hypermeter and Closure

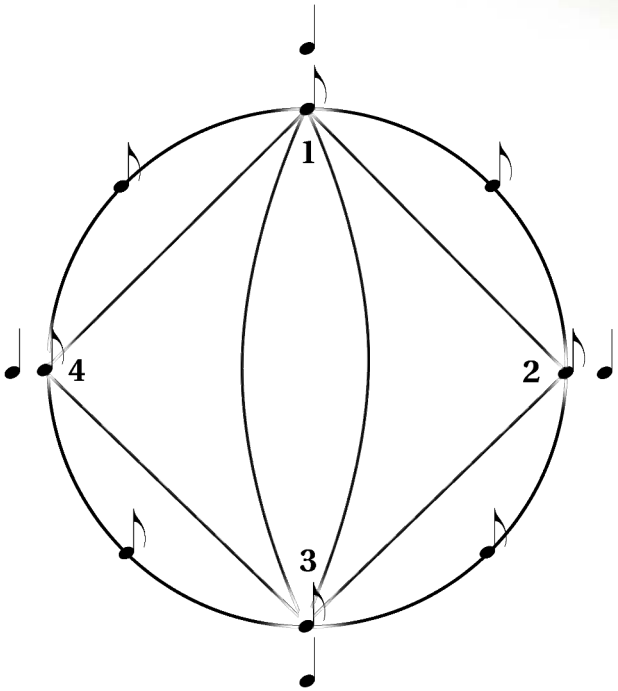
(a) Meter as temporal hierarchy

(b) Rule of tonal-rhythmic closure

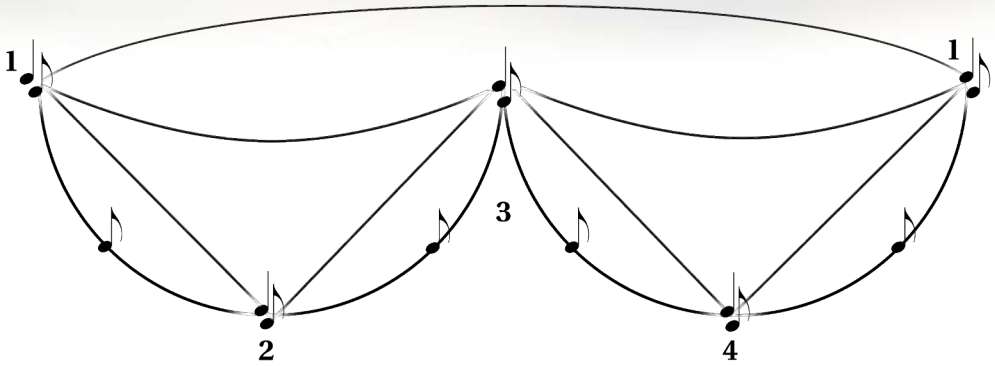
(c) Two methods of closure
(simple, expanded)

Meter as temporal hierarchy

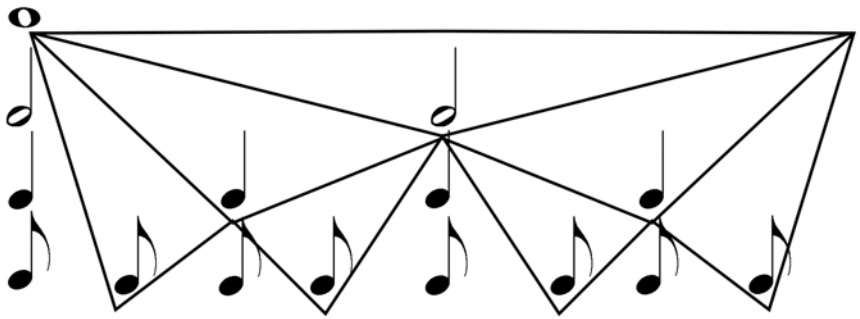
A measure of 4/4
from Justin London,
Hearing in Time:



Unfolded:

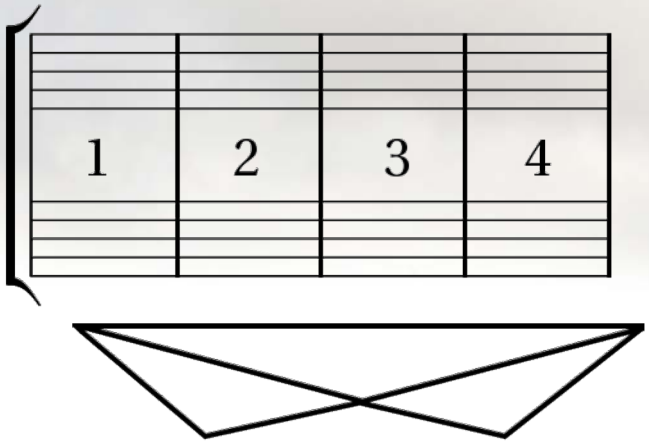


As a network on timepoints:



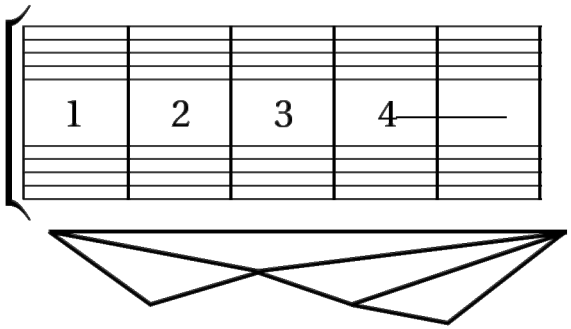
Meter as temporal hierarchy

Normal hypermeter is a structural relationship between downbeats in four-measure groups:

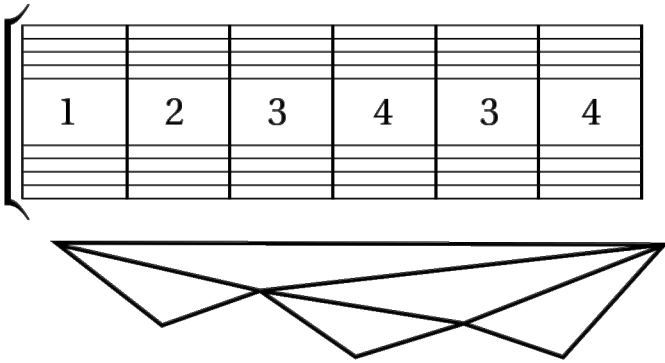


It also commonly allows for various types of irregularity:

One-measure extension:



Two-measure extension:

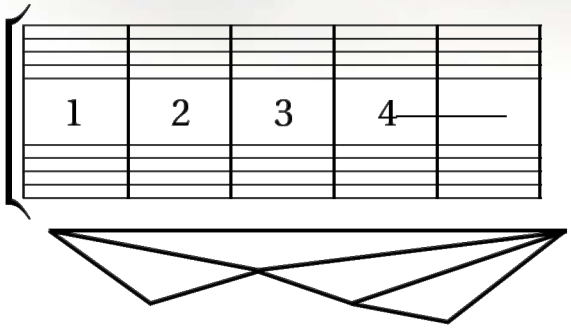


Meter as temporal hierarchy

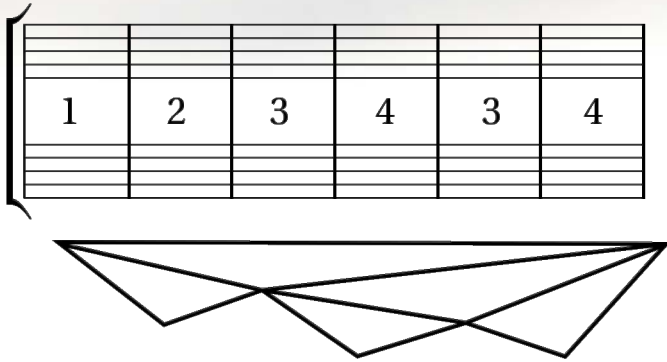
Irregularities

Extensions:

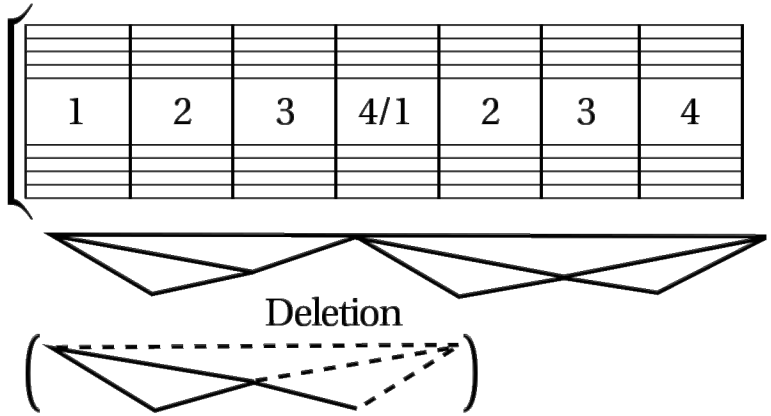
One-measure extension:



Two-measure extension:

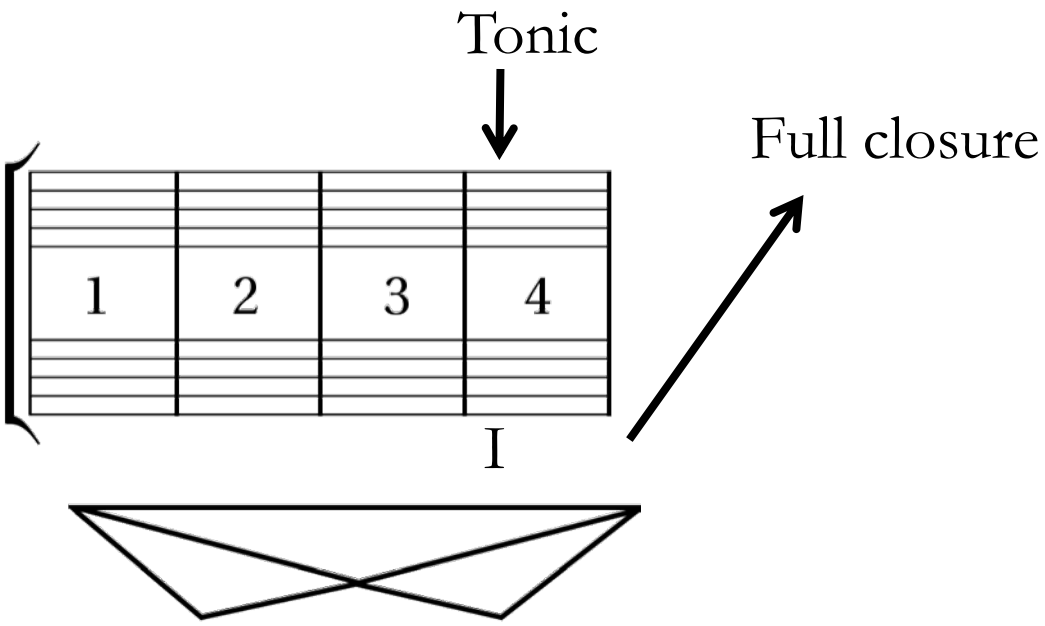


Deletion:



Rule of tonal-rhythmic closure

Tonal and rhythmic closure are *coordinated* when the cadential **final tonic** occupies the **final measure** of a group.

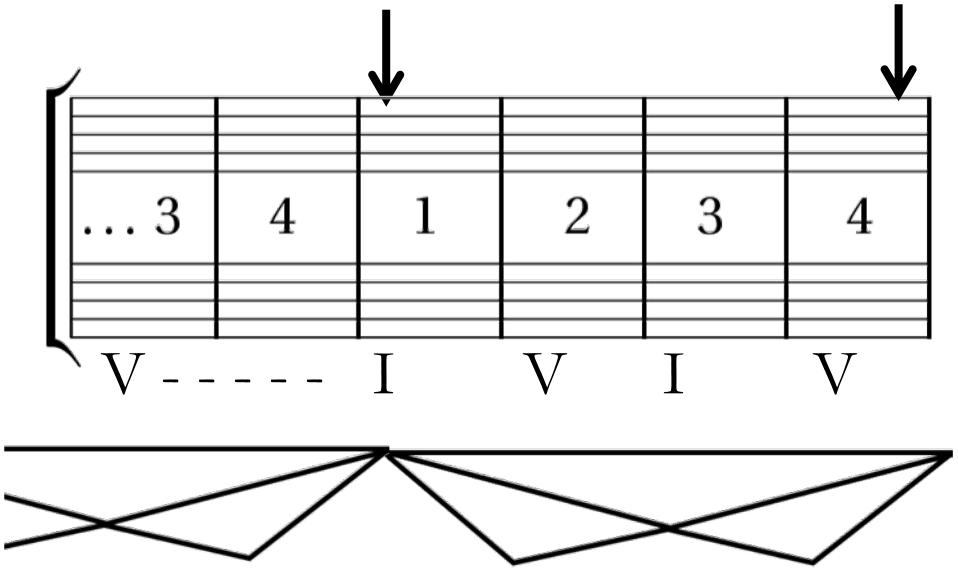


Rule of tonal-rhythmic closure

Elided cadences lack tonal-rhythmic coordination and therefore are a method of **avoiding full closure**

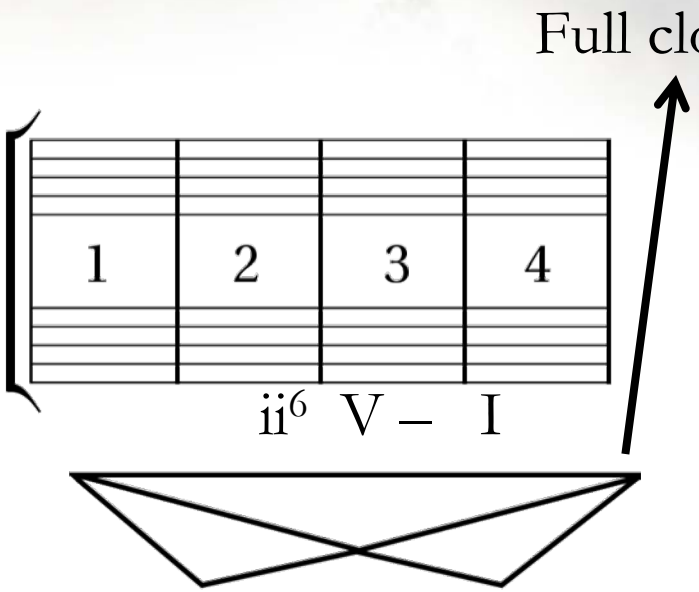
Cadence elided.
Not full closure

Doesn't end on tonic.
No closure

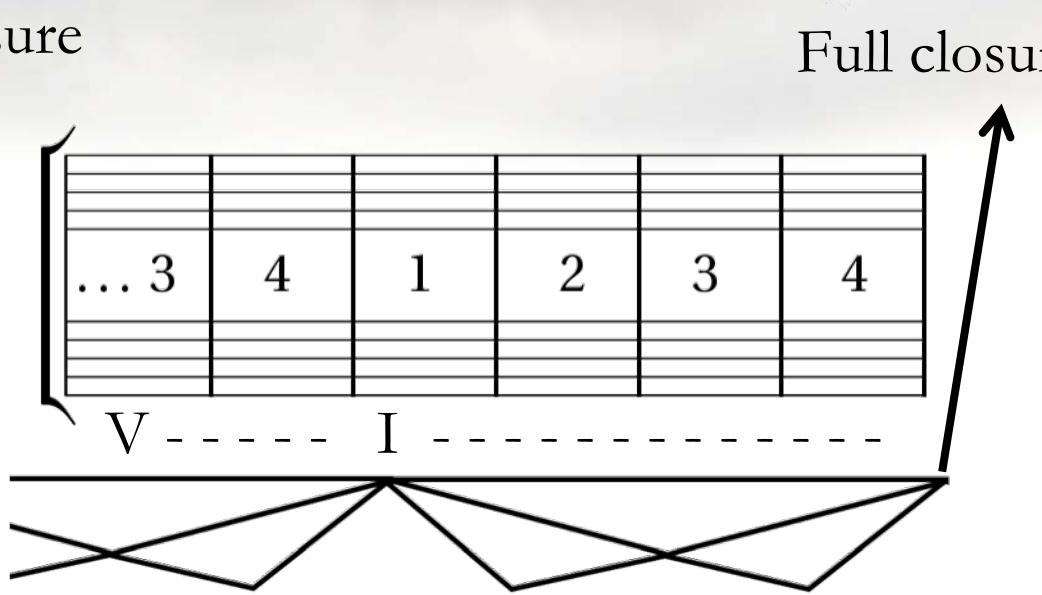


Rule of tonal-rhythmic closure

Two ways to satisfy the rule of closure:



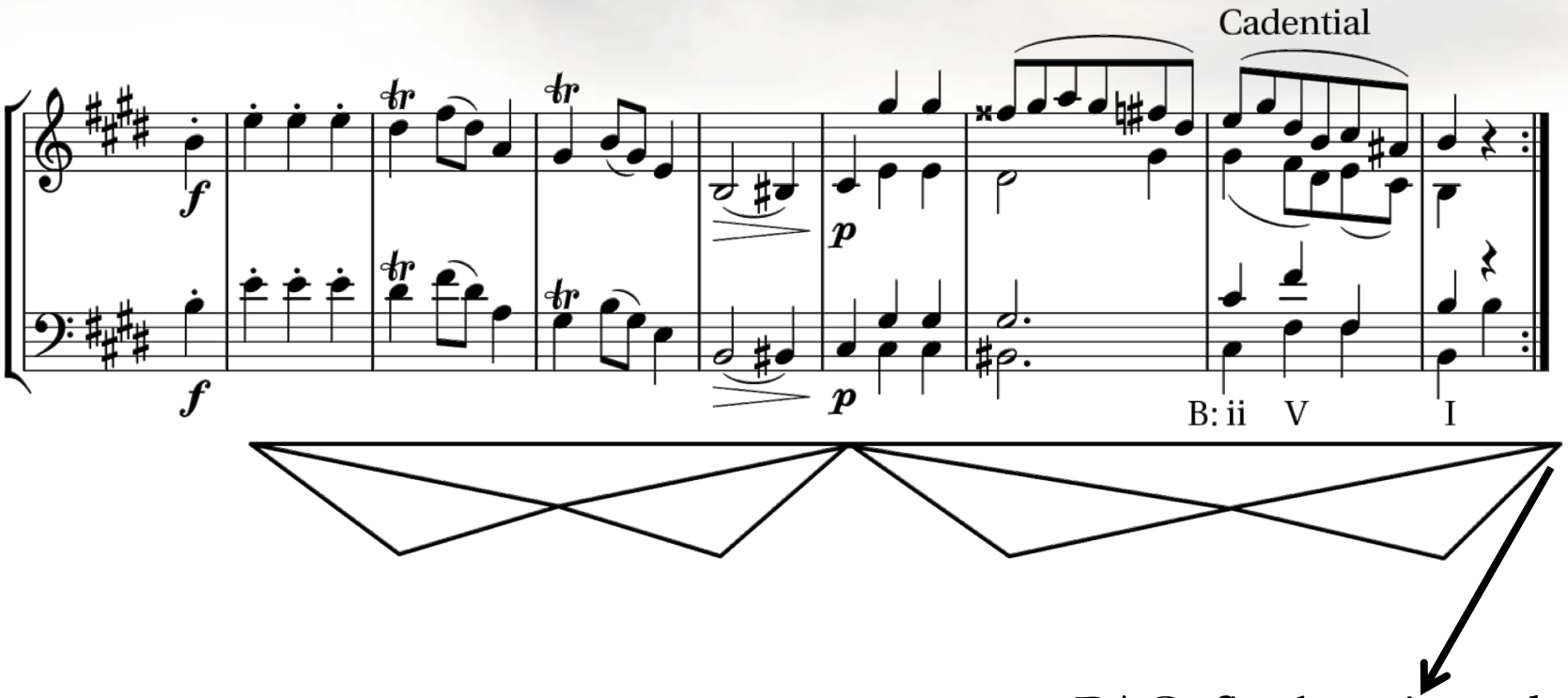
Simple method:
Cadence in bar 4



Expanded method:
Cadence at the beginning of a group
and hold tonic through entire group

Rule of tonal-rhythmic closure

Example of simple closure,
Haydn Op. 54/3, Trio



PAC, final tonic ends 4-bar group: full tonal-rhythmic closure

(2) Expositional Closure

(a) Simple closure

(b) Elided closing material

(c) Open exposition

Methods of Expositional Closure: Simple Closure

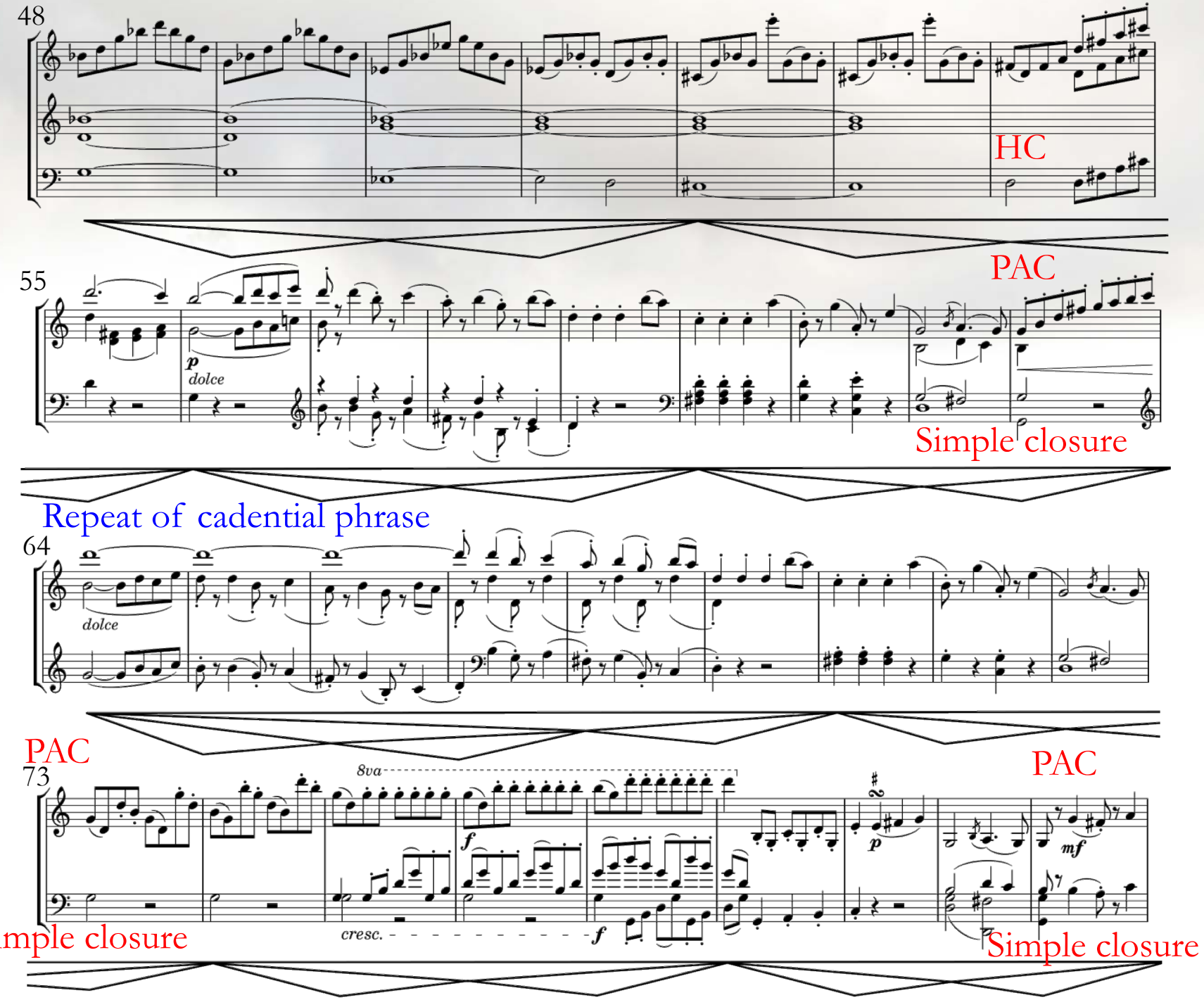
Haydn usually gives full tonal-metrical closure through simple closure (PAC in the fourth bar of a group).

Example: String Quartet in C major, Op. 54/2

Many early works of Beethoven follow this precedent.

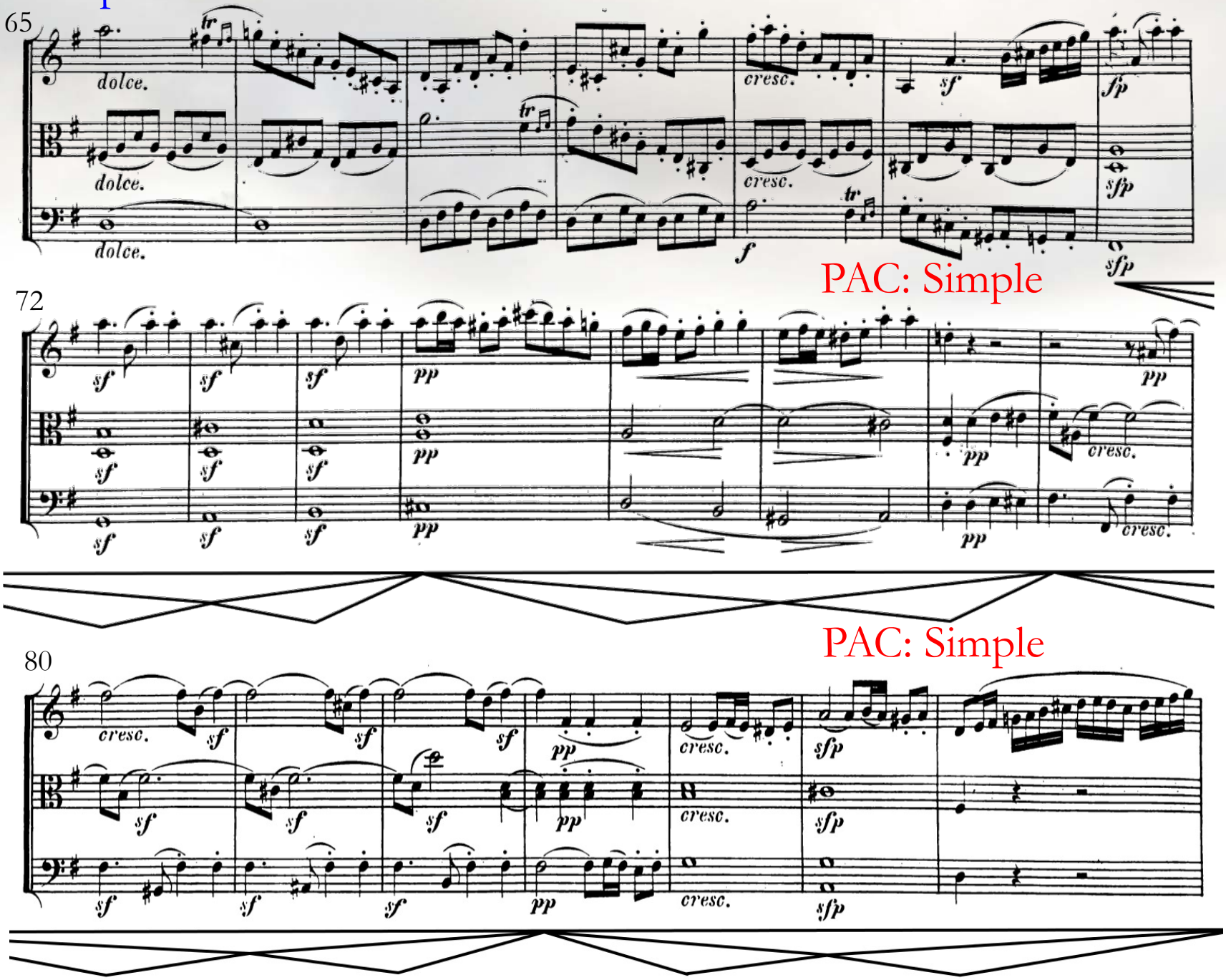
Example: String Trio in G major, Op. 9/1

Haydn, Op. 54/2, End of ST group



Beethoven Op. 9/1, End of ST group

ST part 2

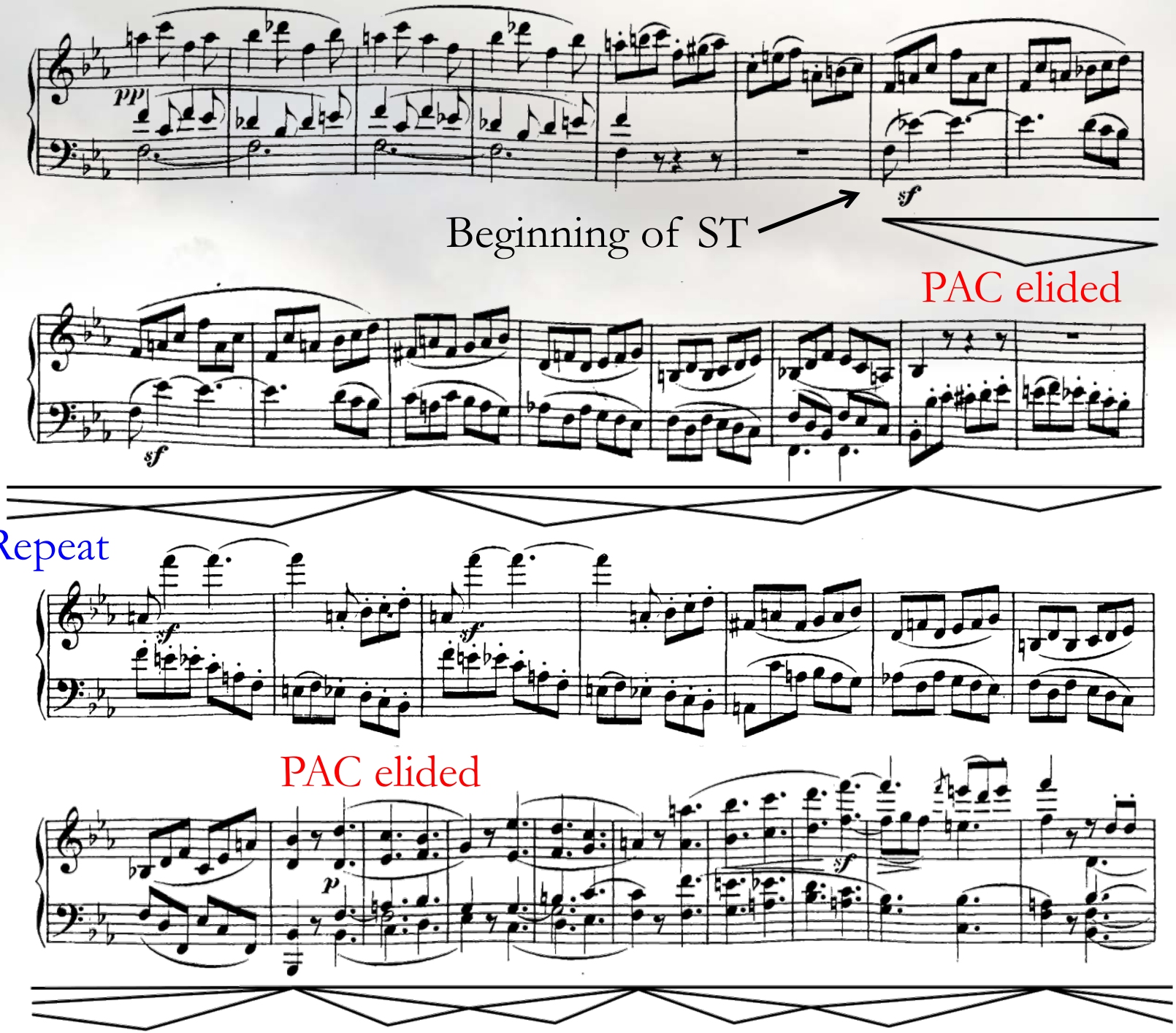


Elided Closing Material: Beethoven Op. 7

Persistent elision of cadences can push the moment of tonal-metrical closure to the end of the exposition.

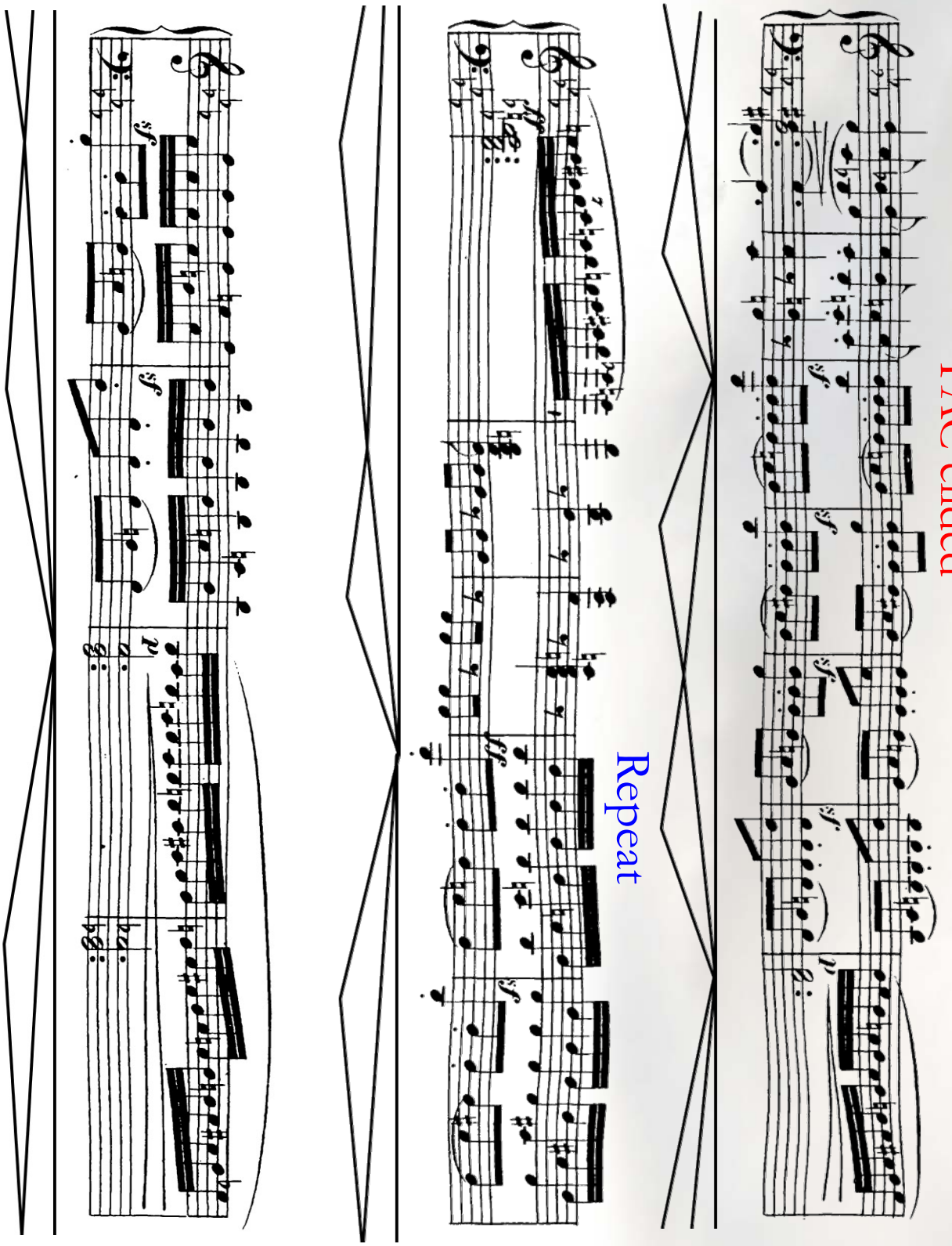
This is common in Beethoven's Piano Sonatas and middle period works in many genres.

Beethoven, Op. 7 Piano Sonata, Exposition



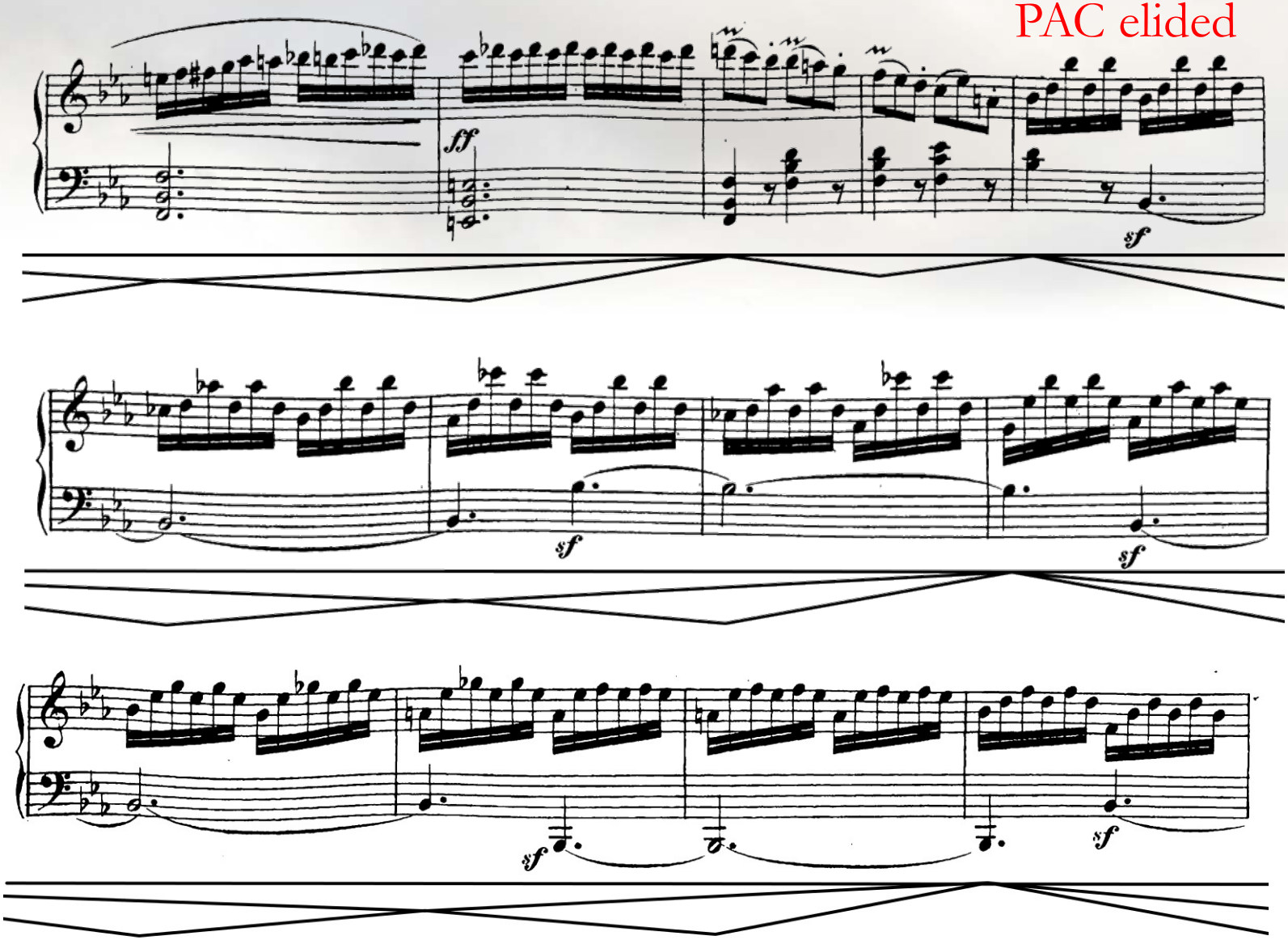
Beethoven, Op. 7 Piano Sonata, Exposition

Beethoven, Op. 7 Piano Sonata, Exposition

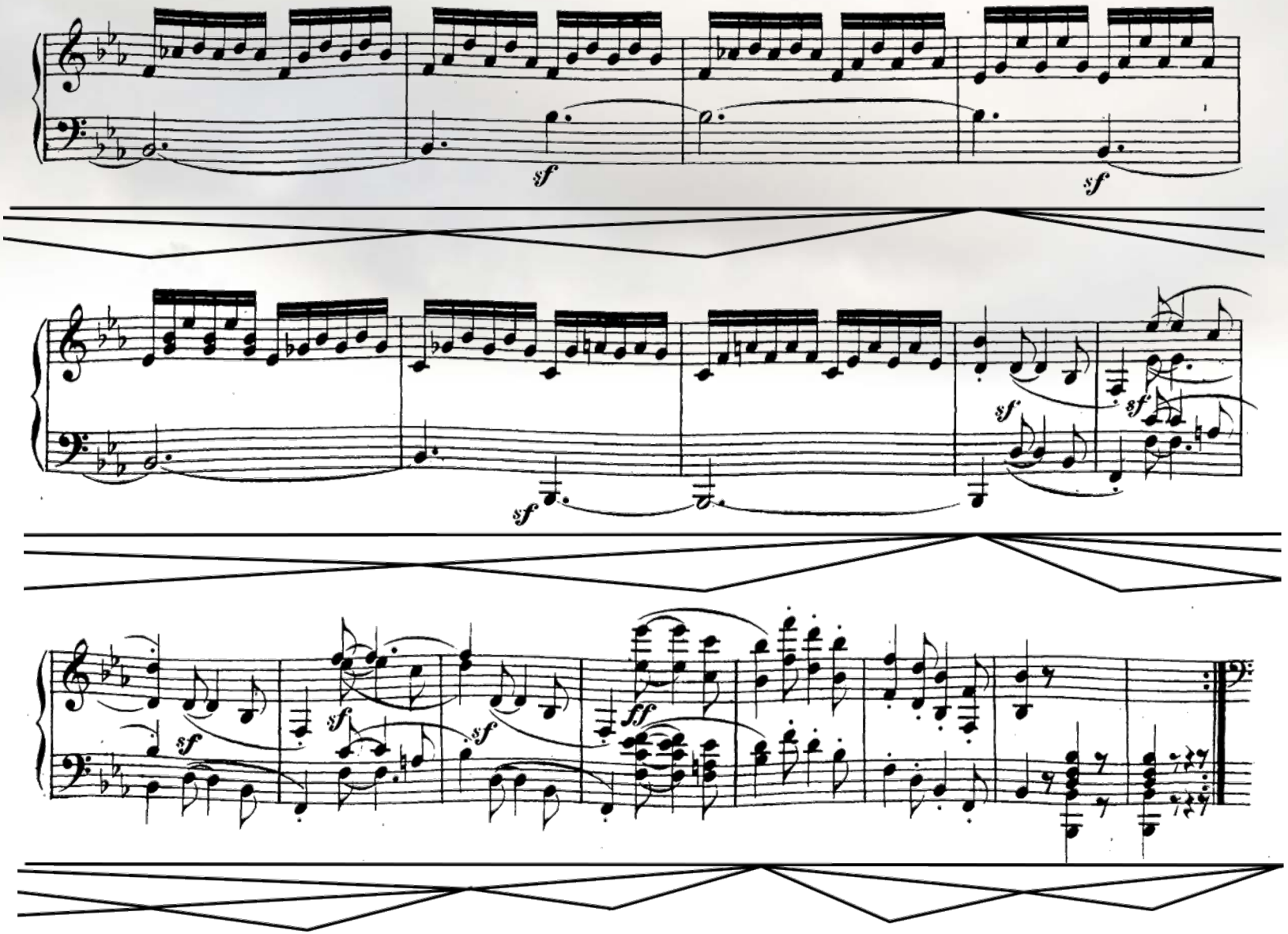


Beethoven, Op. 7 Piano Sonata, Exposition

Closing
PAC elided



Beethoven, Op. 7 Piano Sonata, Exposition



Closure: hypermetric unit ends on tonic

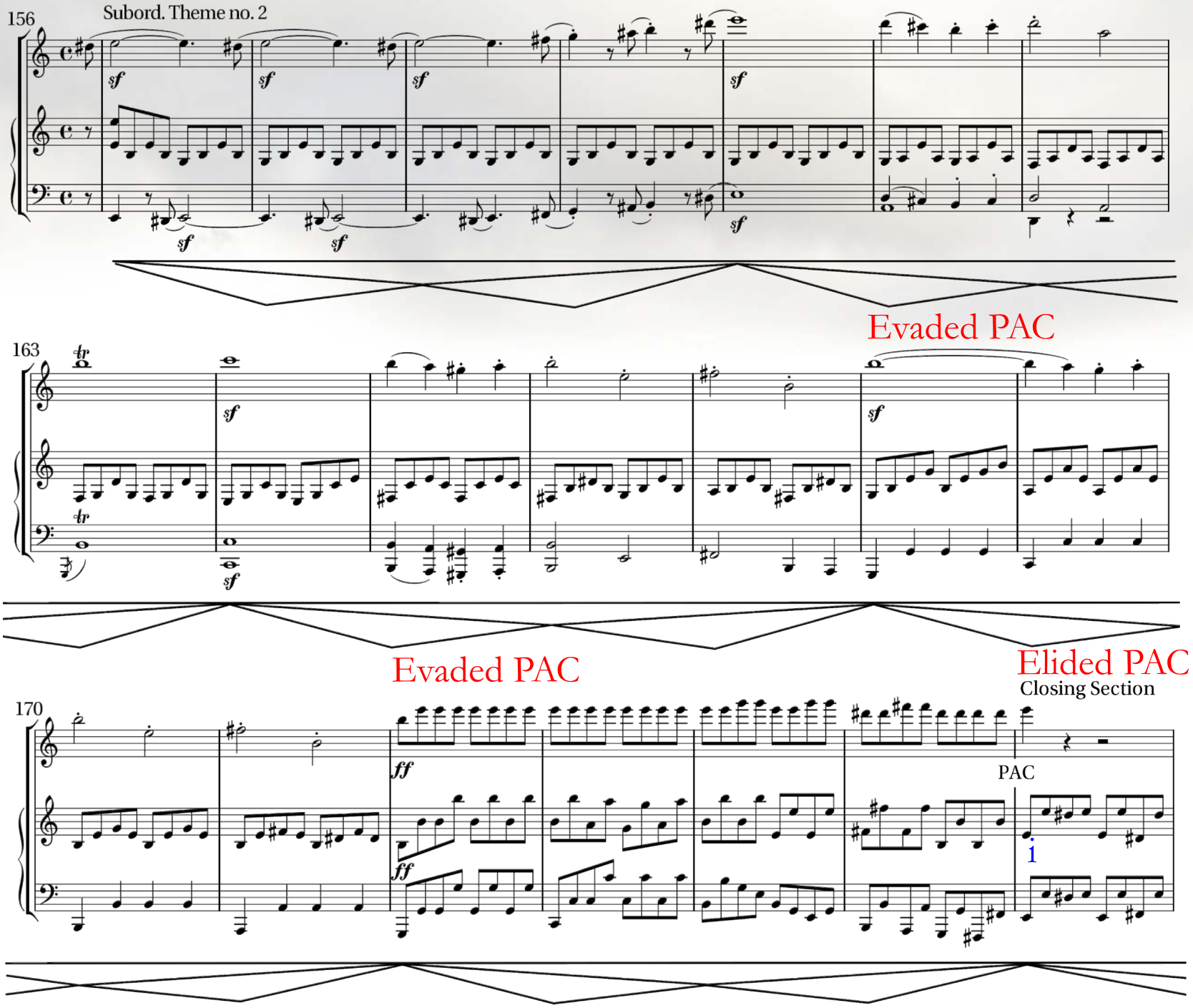
Open Expositions

In Beethoven's middle period, the tendency to delay closure in expositions evolves into a **denial of closure**, resulting in **open expositions**, ones that lacks tonal or tonal-metrical closure altogether.

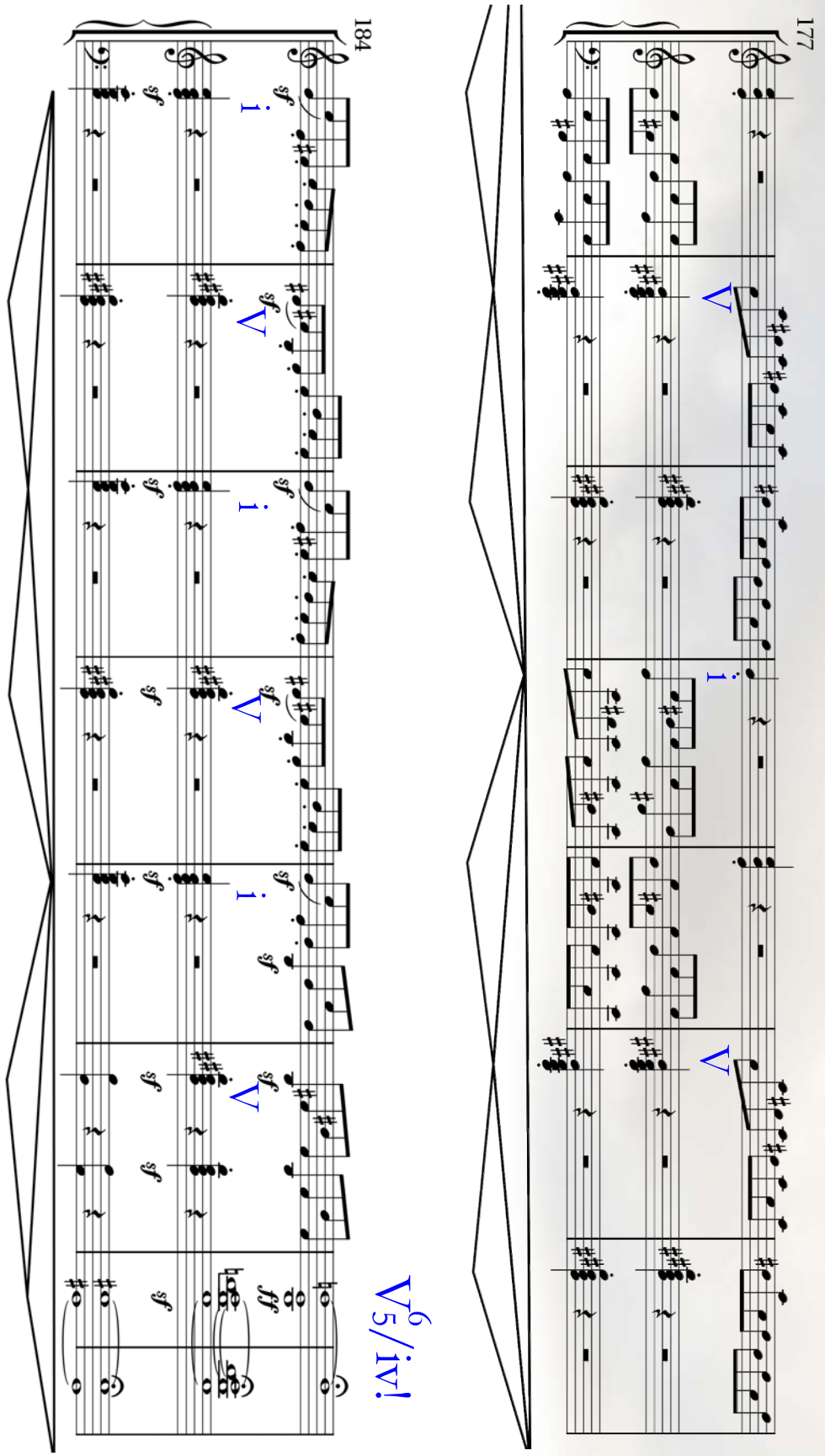
Examples:

- Op. 47 Violin Sonata ("Kreutzer," "Bridgetower"): Tenacious hypermeter prevents full tonal-metrical closure despite multiple PACs through elision.
- Op. 59/2 String Quartet (E minor): Also has strong hypermeter, but also no completed PAC—all cadences are deceptive, evaded, or imperfect.

Beethoven, Op. 47 Violin Sonata, end of exposition



Beethoven, Op. 47 Violin Sonata, end of exposition



Open Expositions

Denial of tonal-metrical closure in Haydn:

Op. 20/3 String Quartet (G minor)

Op. 76/2 String Quartet (D minor)

Early examples from Beethoven:

Op. 13 Piano Sonata ("Pathetique")*

Op. 24 Violin Sonata ("Spring")*

Op. 30/3 Violin Sonata (G major)*

Op. 47 Violin Sonata ("Kreuzer," "Bridgetower")

Op. 53 Piano Sonata ("Waldstein")

Op. 69 Cello Sonata (A major)

* Weak examples: dissonance over tonic pedal

Open Expositions

Beethoven's denial of *tonal-metrical* closure quickly evolves into a **complete denial of tonal closure** in more adventurous works:

Op. 30/2 Violin Sonata (C minor)

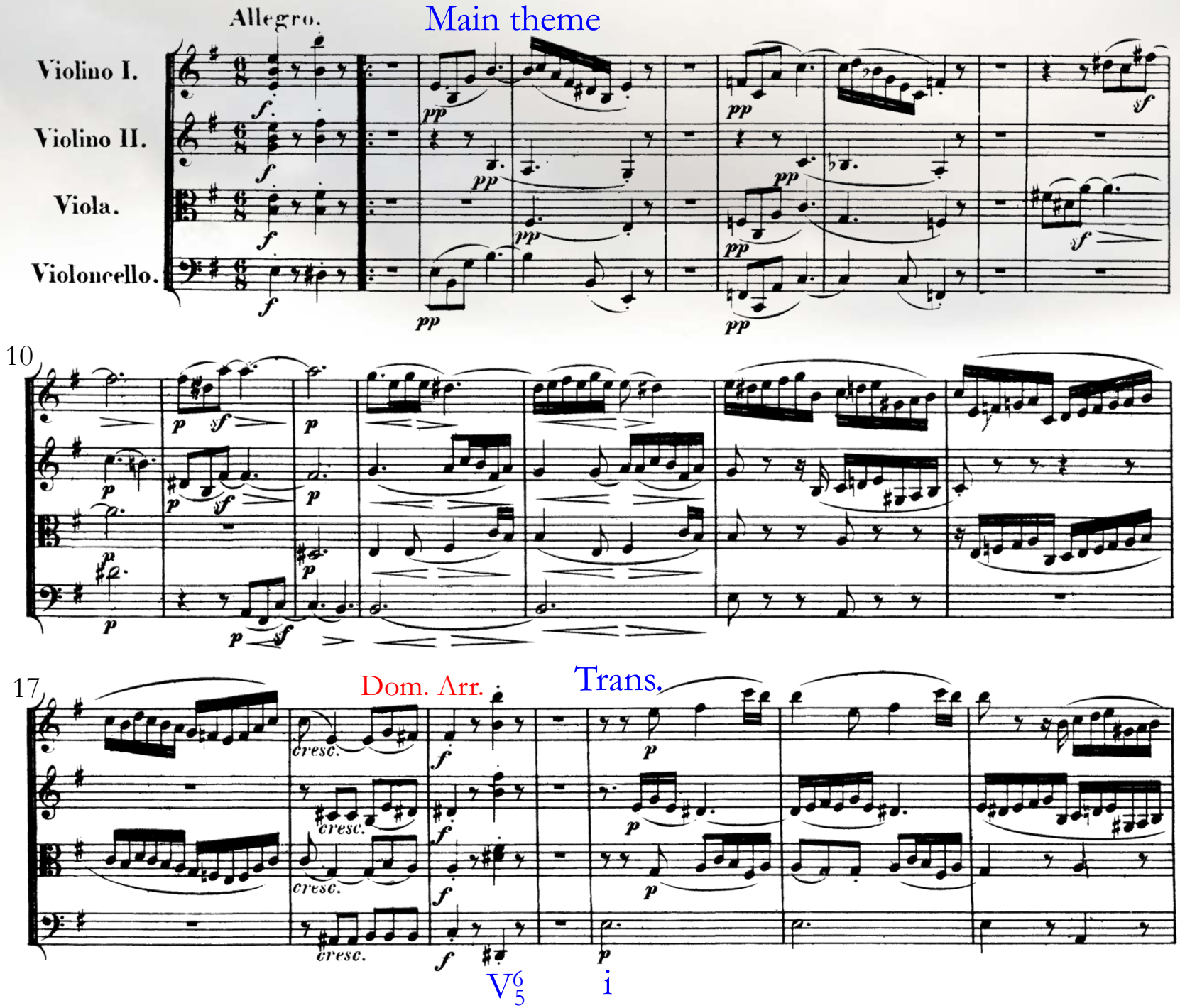
Op. 59/2 String Quartet (E minor)

Fifth Symphony (Op. 67) Finale

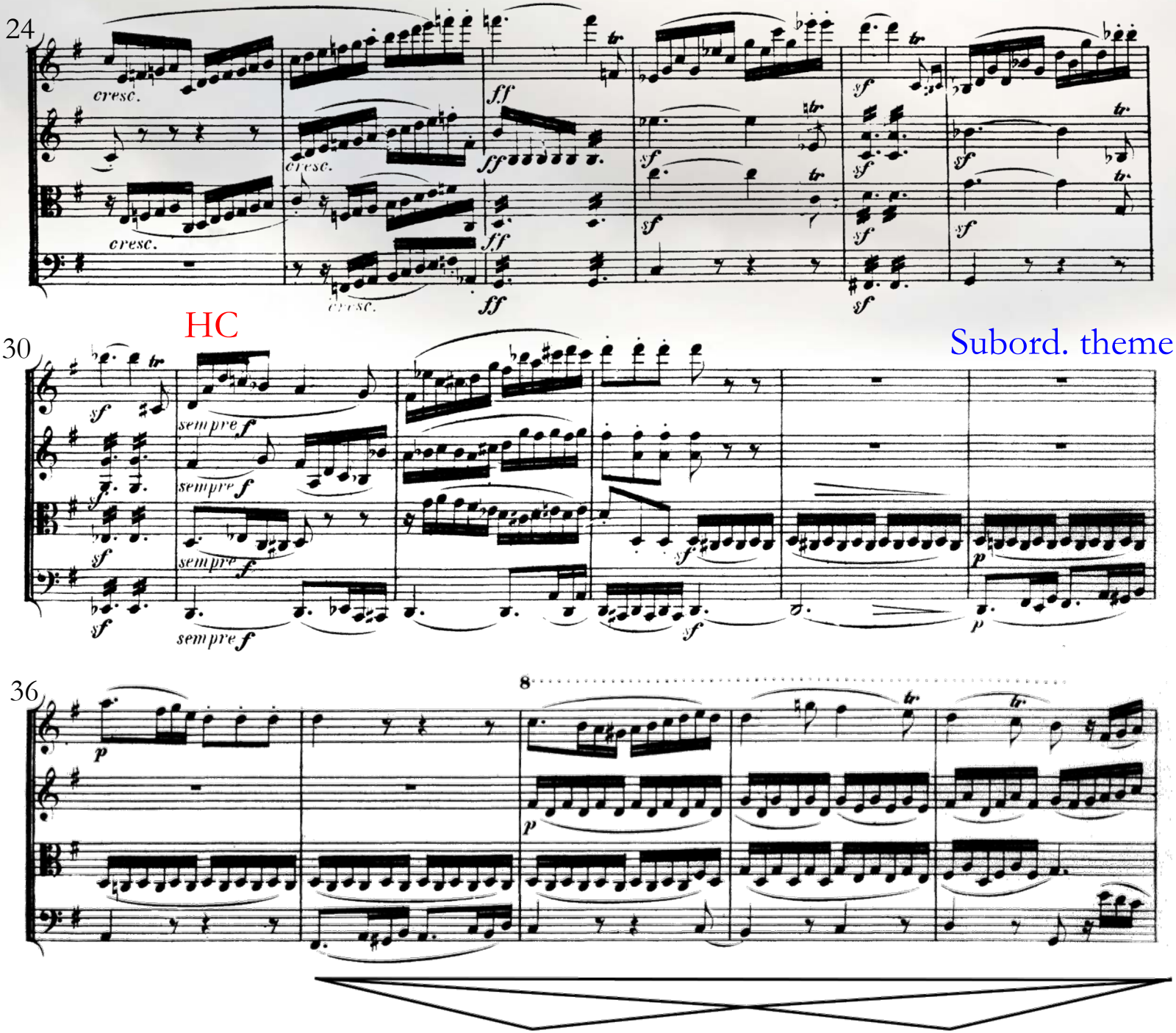
Op. 70/2 Piano Trio (E-flat major)

Op. 95 String Quartet ("Serioso")

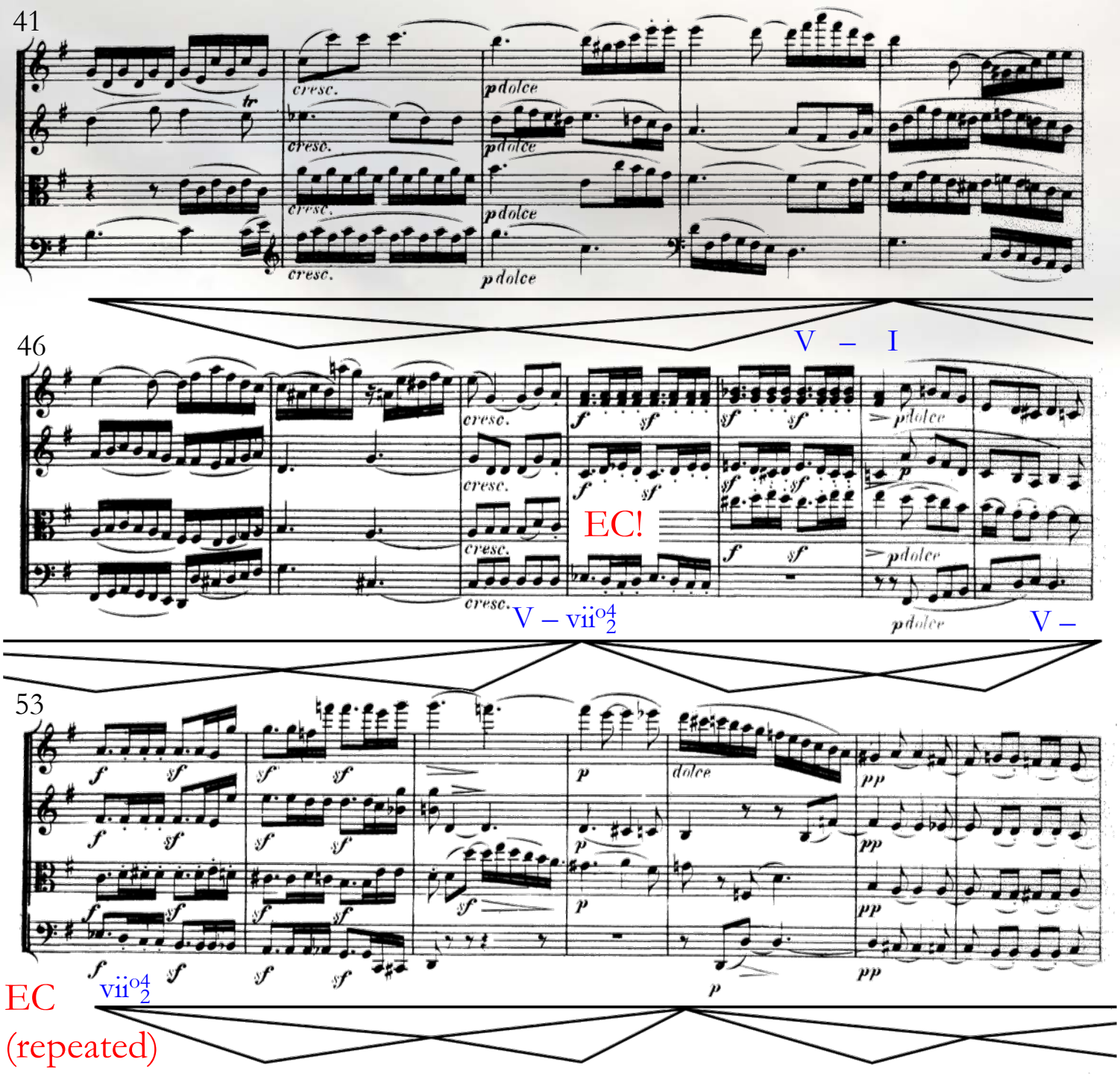
Beethoven, Op. 59/2 String Quartet, exposition



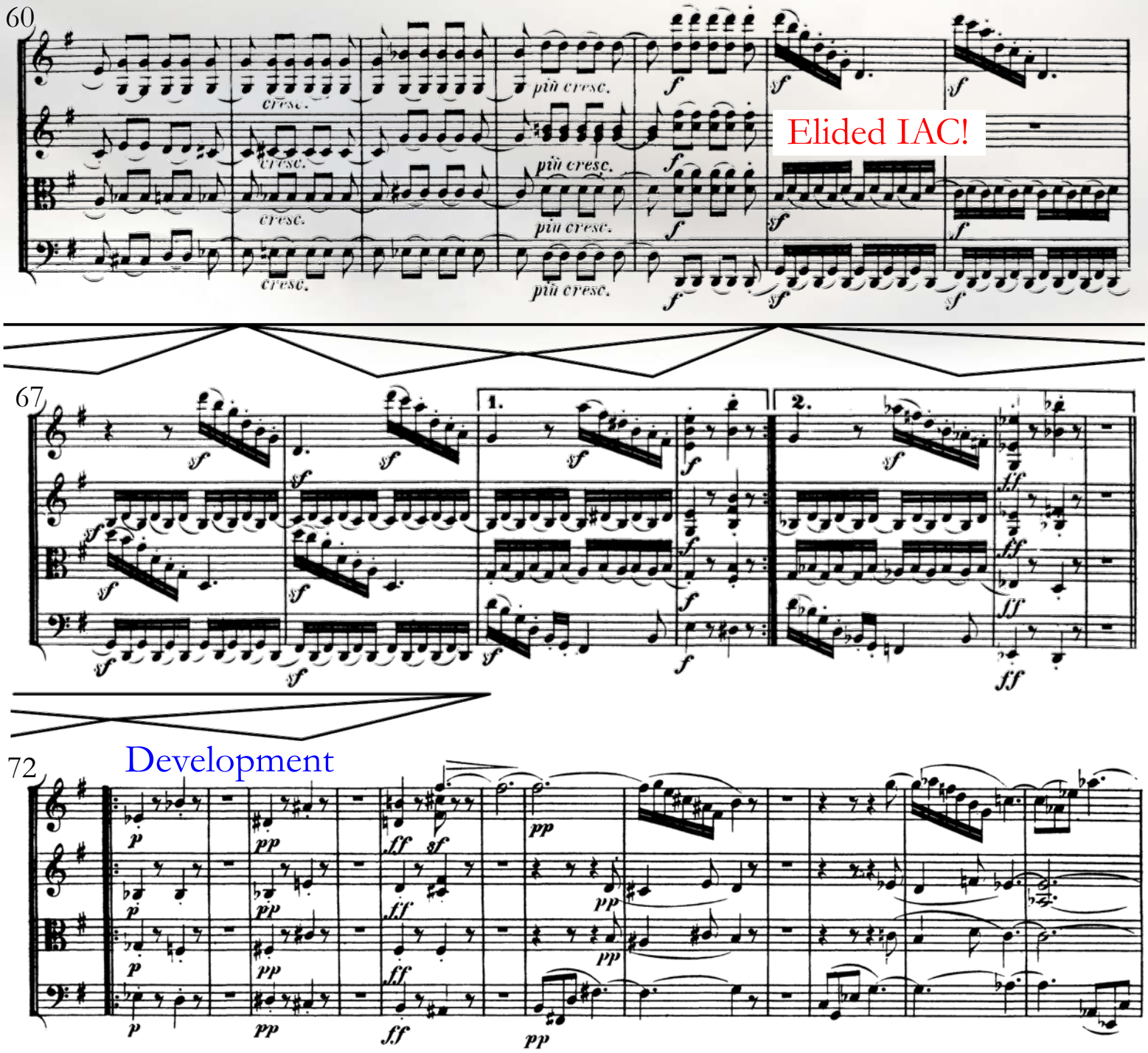
Beethoven, Op. 59/2 String Quartet, exposition



Beethoven, Op. 59/2 String Quartet, exposition



Beethoven, Op. 59/2 String Quartet, exposition



(3) Network Model of Musical Form and the Disjunctive Coda

(a) Formal structure

(b) The integrated coda

(c) Disjunctive coda, examples:

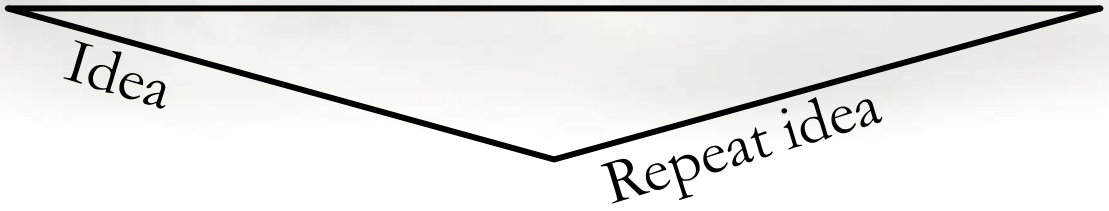
Haydn Symphony 101 ("Clock")

Beethoven Op. 59/2

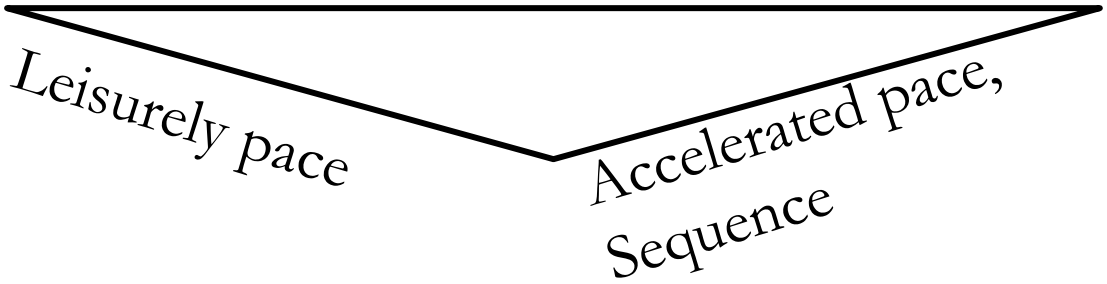
Formal structure: Basic principles

Building blocks of formal structure:

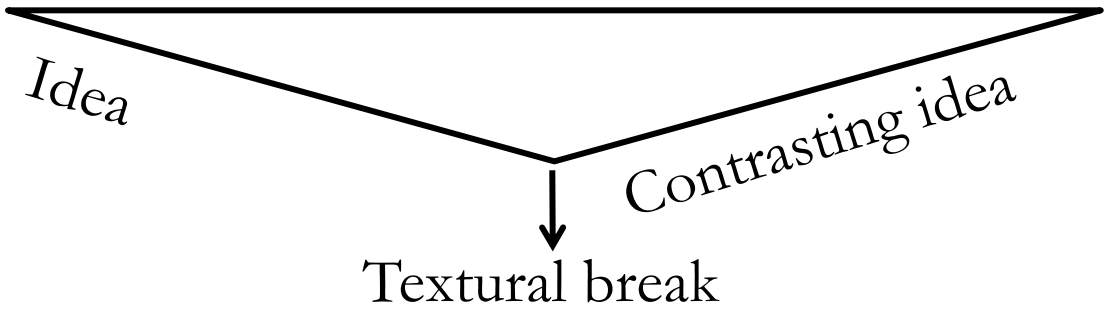
Repetition:
(Examples: Period
"monothematic exposition")



Fragmentation:
(Examples: Sentence
continuous exposition)



Caesura/Contrast:
(Examples: Contrasting period,
secondary theme)

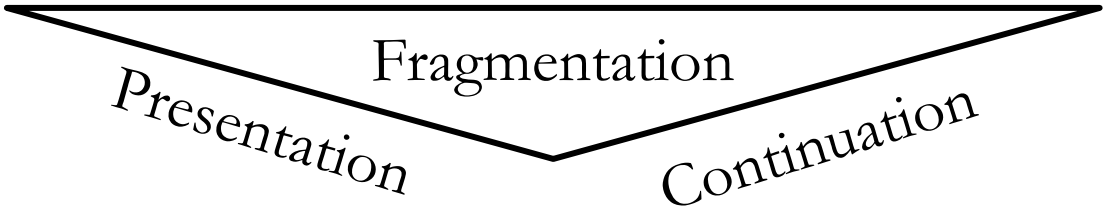


Formal structure: Basic principles

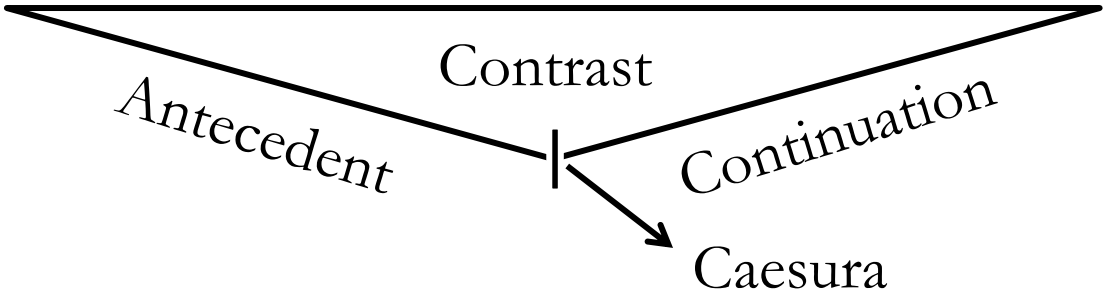
Examples, basic theme types:

Period:

Sentence:



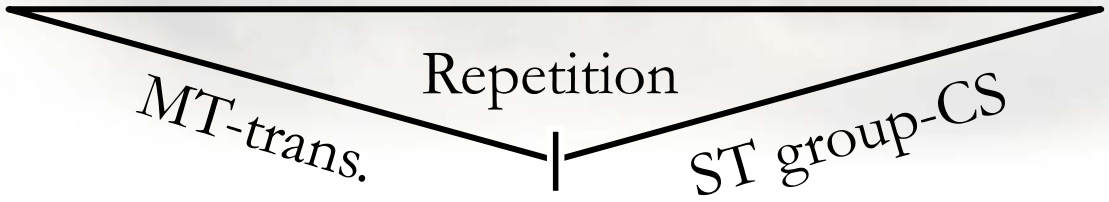
Contrasting period:



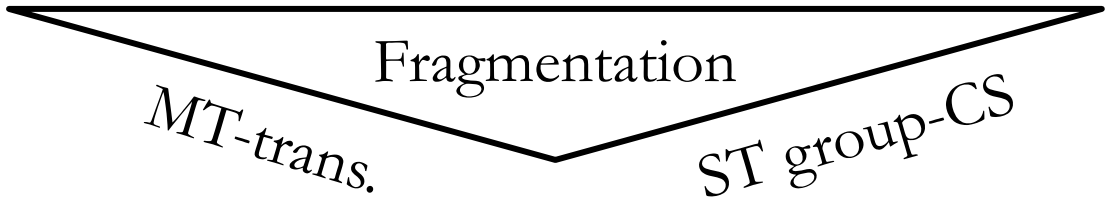
Formal structure: Basic principles

Examples, expositional strategies:

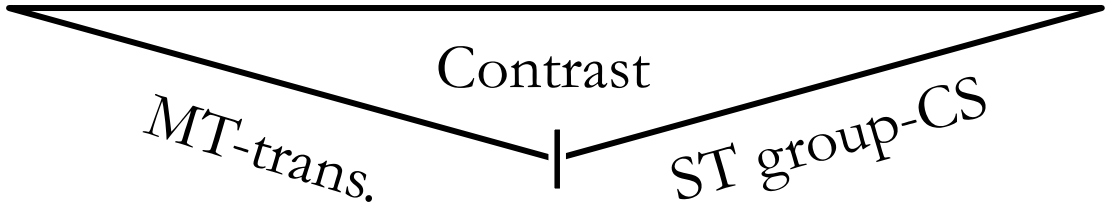
"Monothematic":



"Continuous":



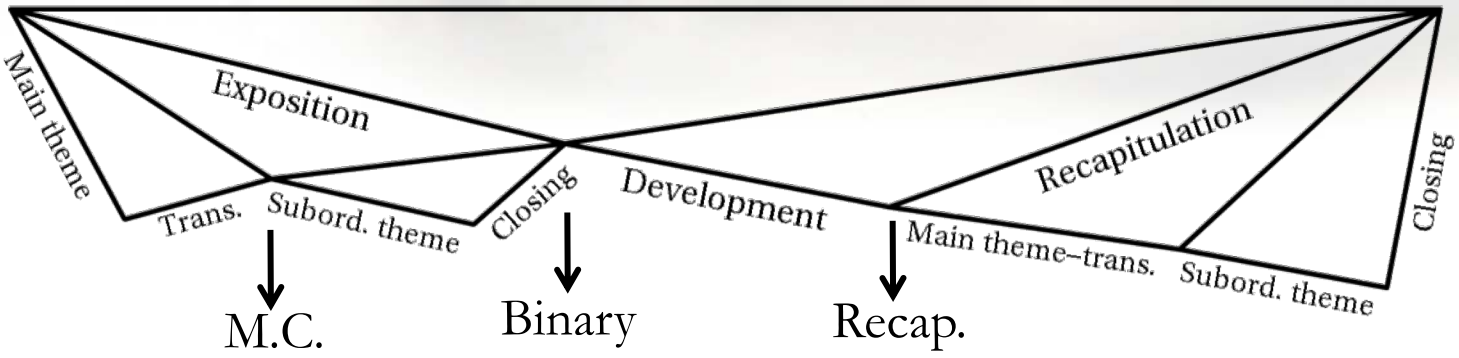
Secondary theme:



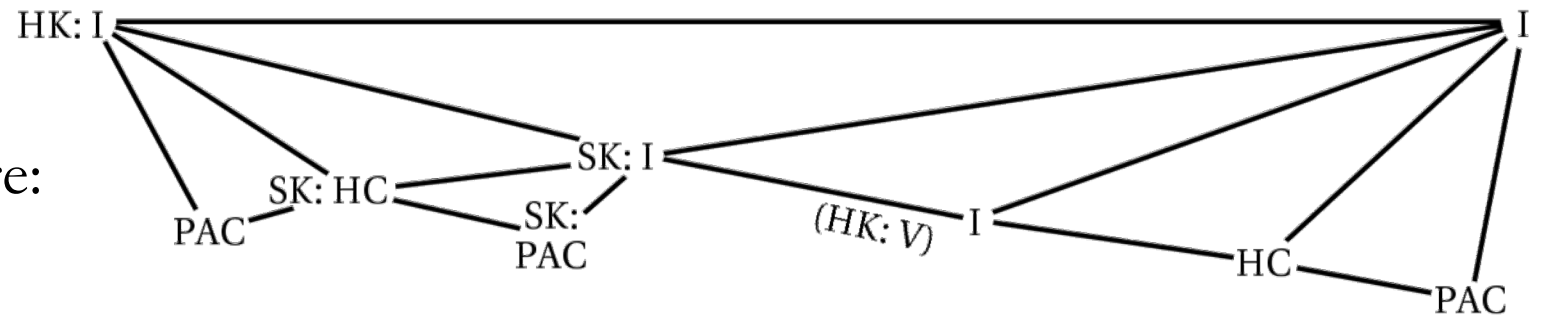
Example: Sonata Form

Sonata form conventionally involves *coordinated* structures in two modalities, **formal** and **tonal:**

Form:

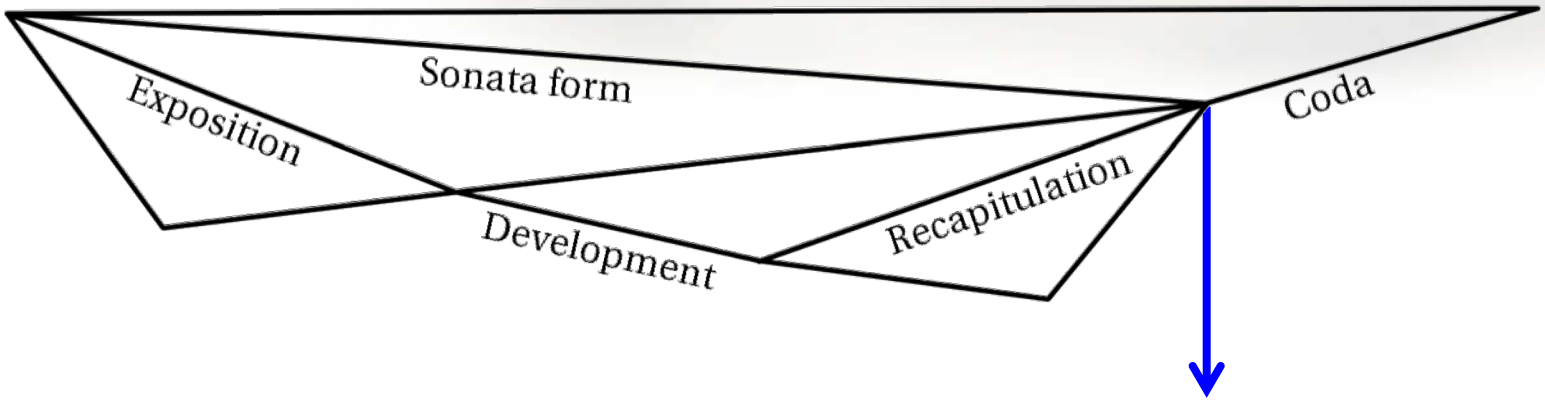


Tonal structure:



The integrated coda (formal structure)

Most codas use some device to formally *integrate* the coda with the preceding sonata form, as a **third part.**



Repetition or fragmentation integrates coda

In an *integrated coda* the coda makes a larger structure with the sonata form using techniques of *repetition* —return of main theme—and/or *fragmentation*, e.g. development-like sequence (hence the notion of "second development.")

On Beethoven's Codas

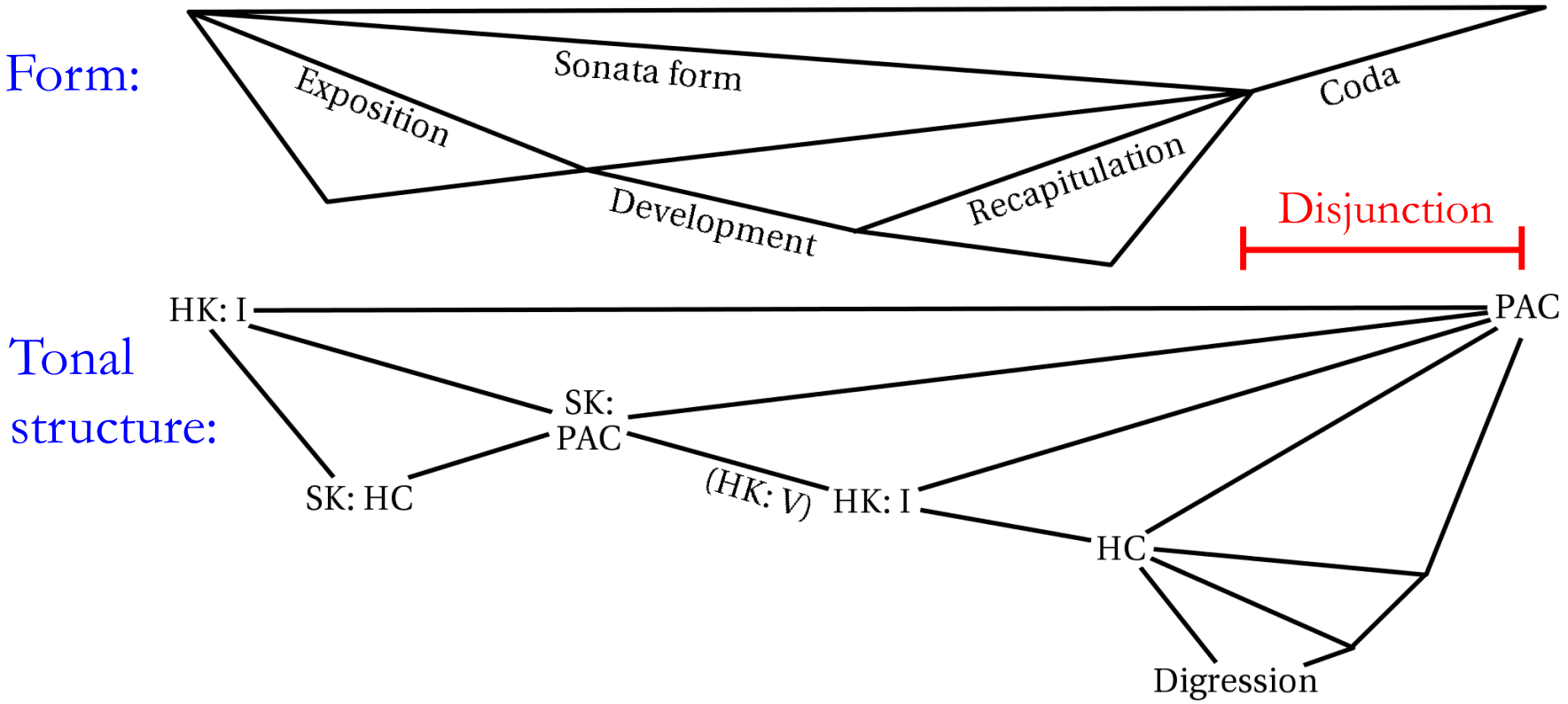
Kerman (1982): "On Beethoven's Codas"
Rosen (1988): *Sonata Forms* (Revised Edition)
Hopkins (1988): "When a Coda is More than a Coda"
Morgan (1993): "Coda as Culmination: The First Movement of the *Eroica* Symphony"

Analysis focuses on problems of individual works
(Why is there a coda in this piece?)
Observations are not generalizable
(E.g., coda solves outstanding problem)

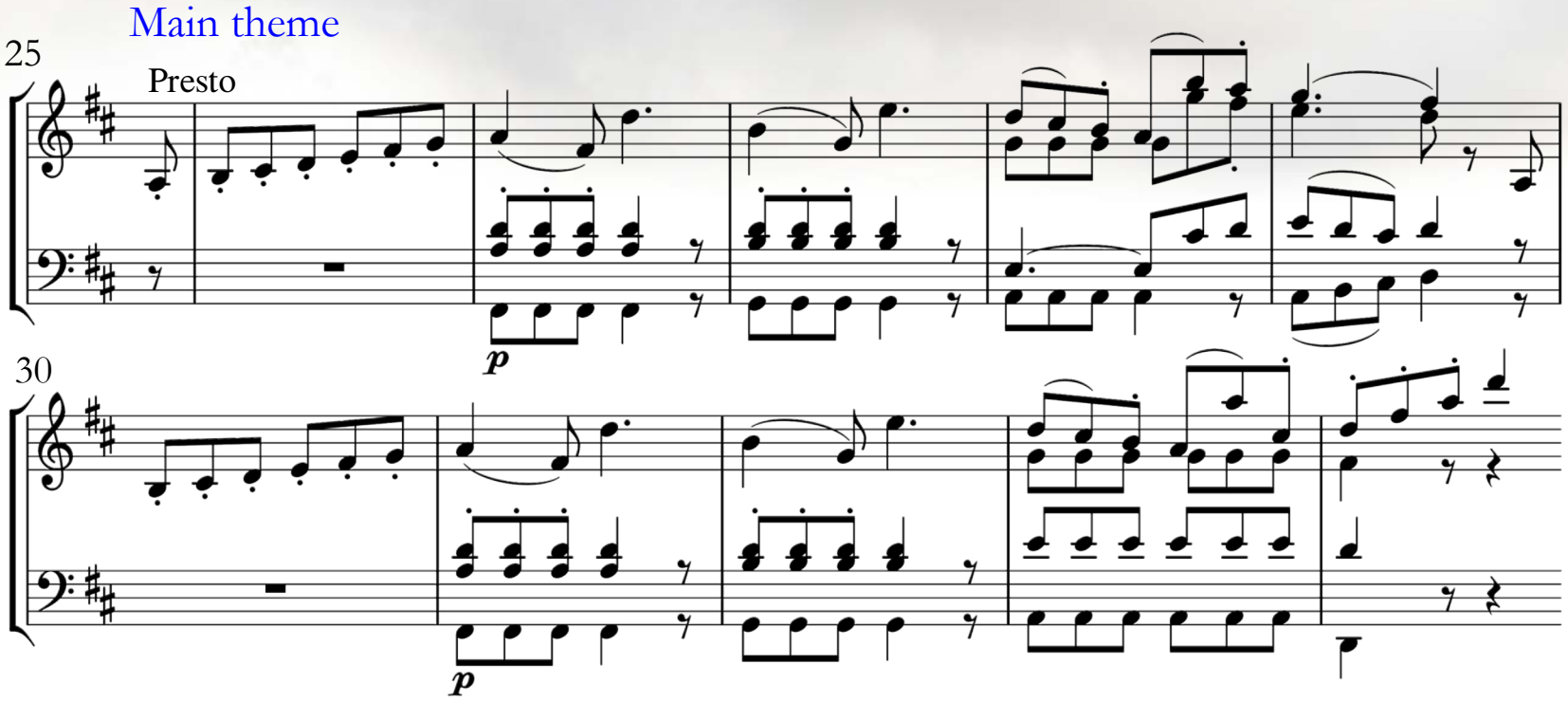
A different question: How do codas work (in general)?

Disjunctive coda,
Examples: Haydn Symphony 101, Beethoven, Op. 59/2

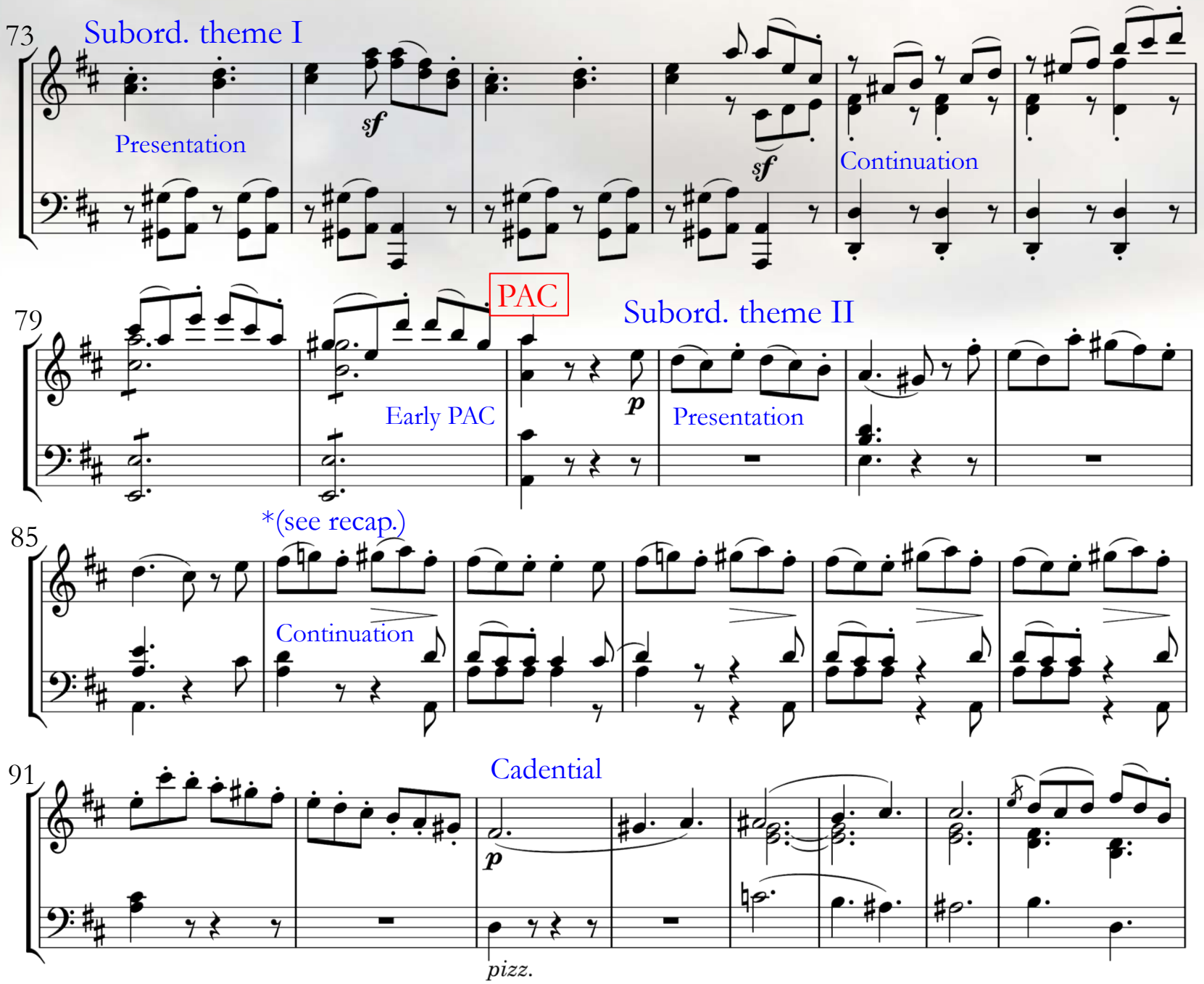
In a *disjunctive coda* the denial of tonal closure perpetuates the *tonal* recapitulation, while the *formal* recapitulation is completed by the closing material.

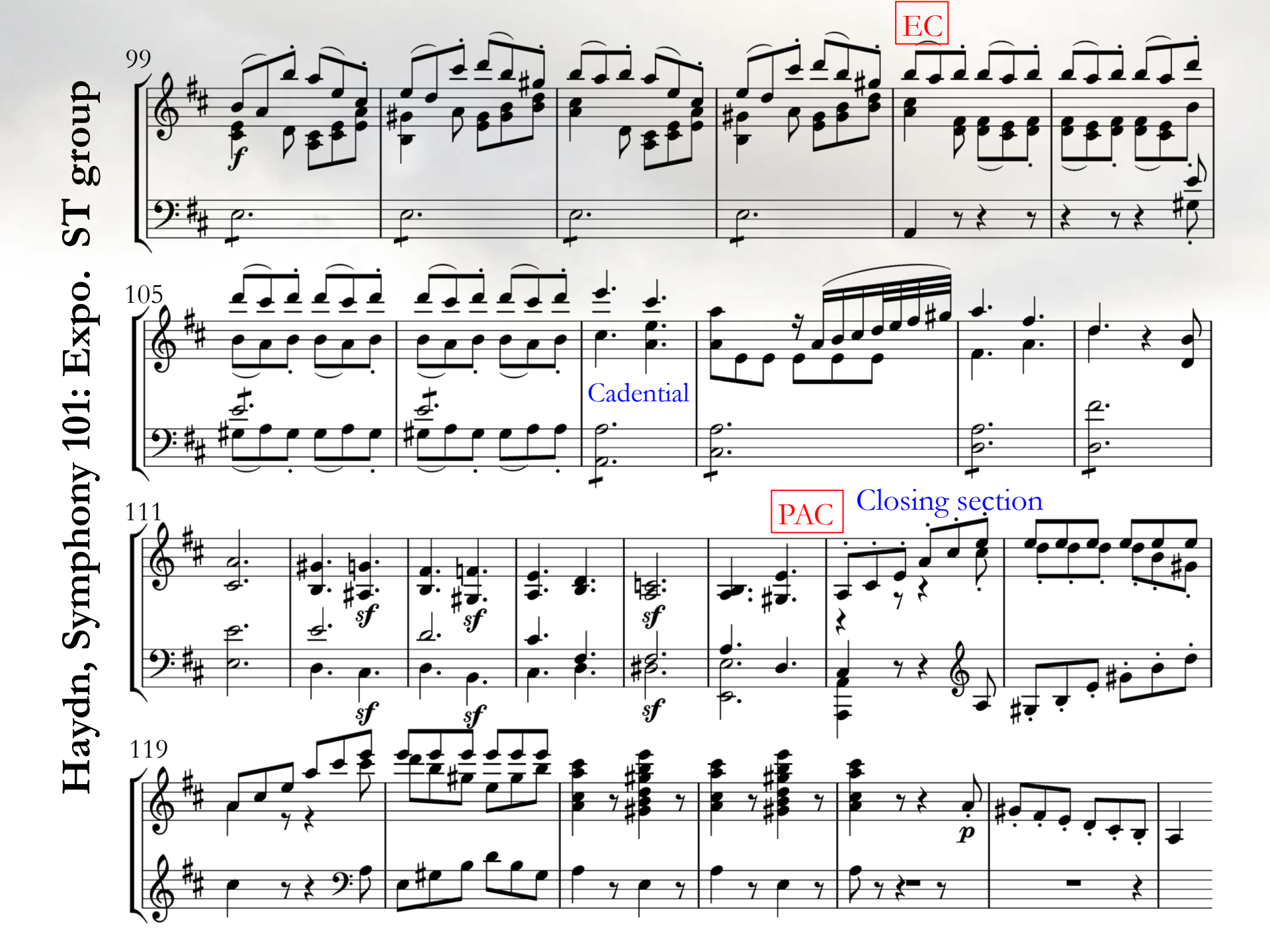


Haydn, Symphony 101: Main theme



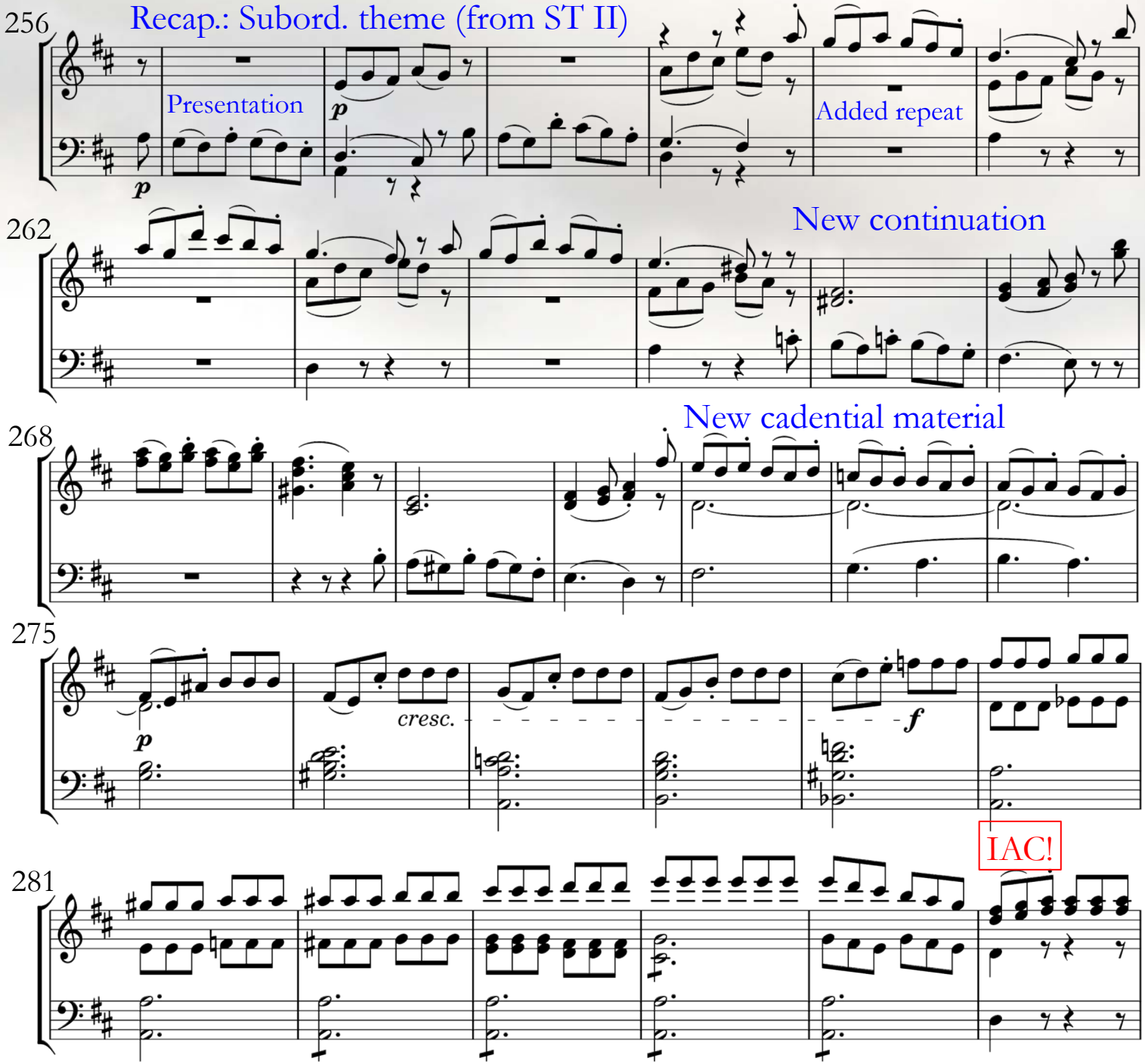
Haydn, Symphony 101: Subord. th. group



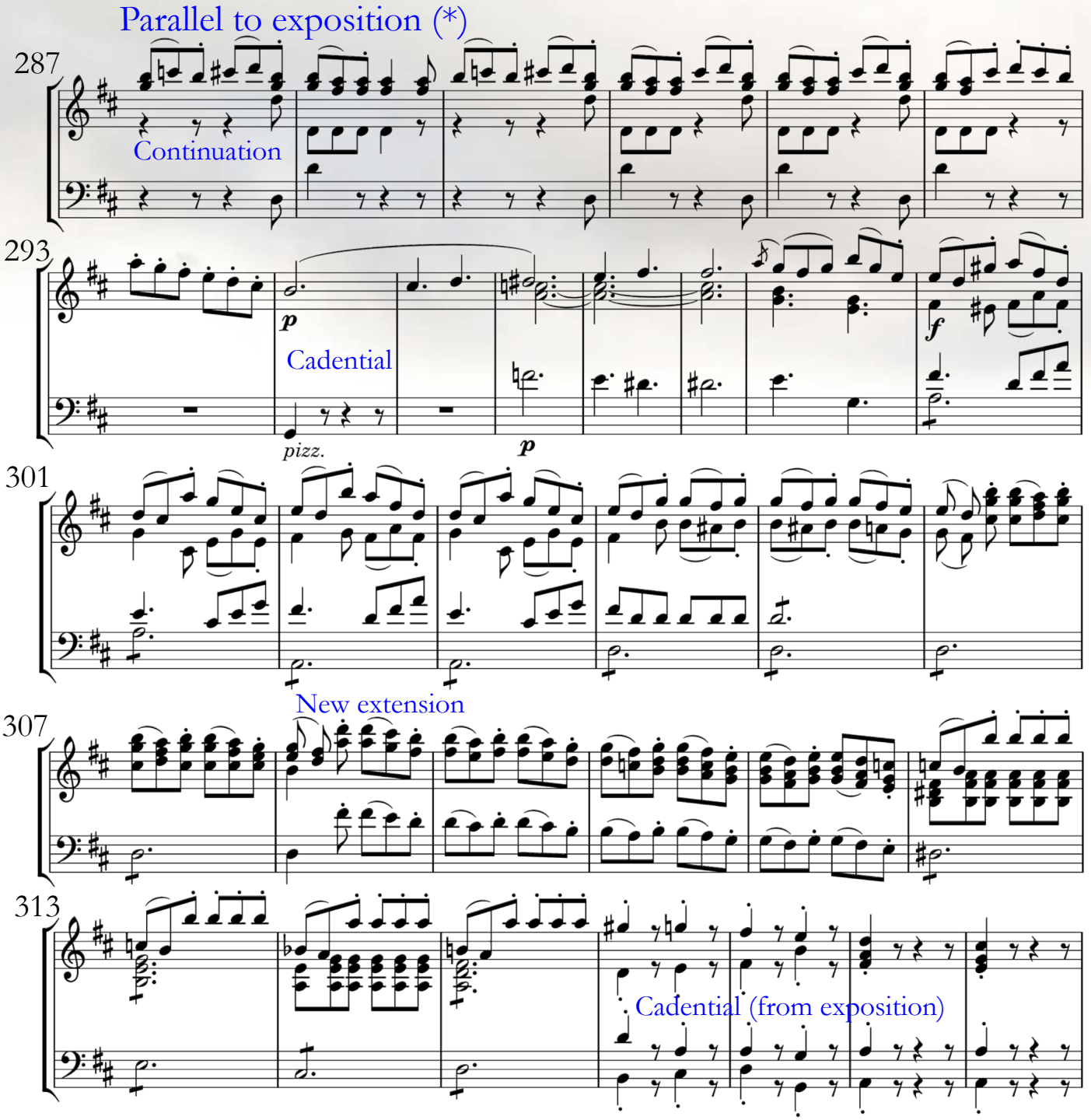

Haydn, Symphony 101: Expo. ST group
99
EC
105
Cadential
111
PAC
Closing section
119

Haydn, Symphony 101: Recap. ST group

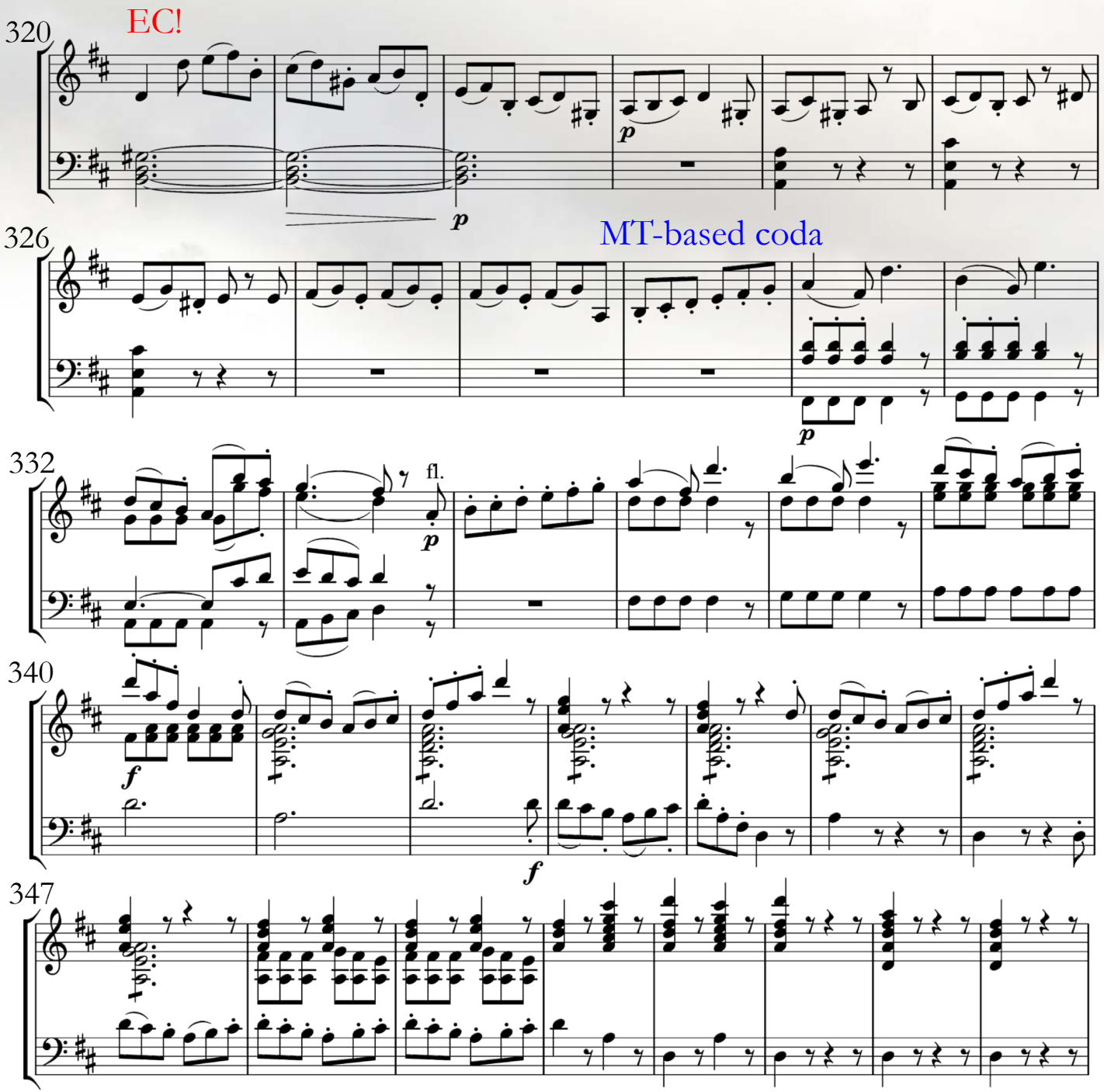
(No ST I material in recap.)



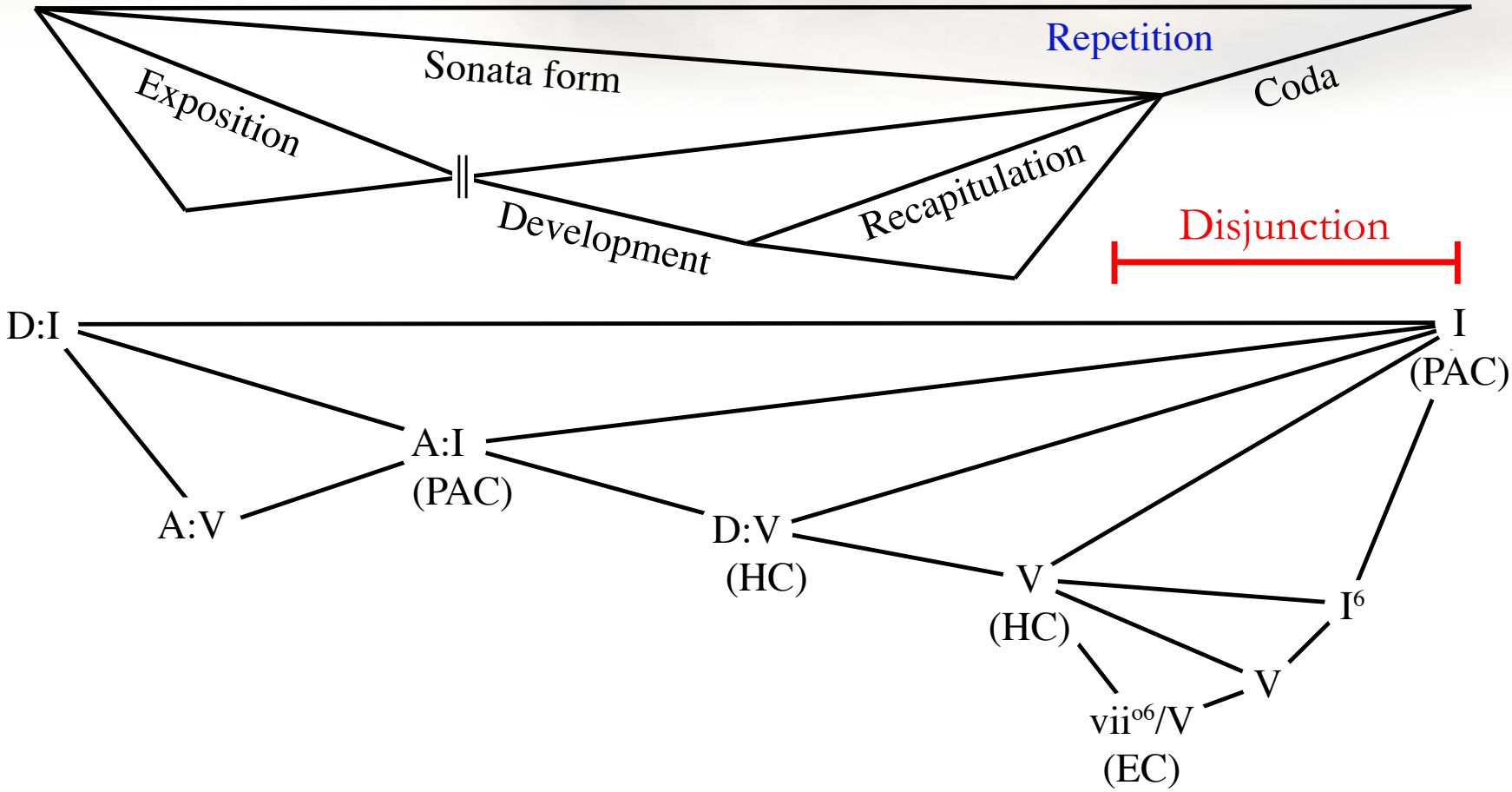
Haydn, Symphony 101 : Recap. ST group



Haydn, Symphony 101 : Recap. ST group



Disjunctive coda:
Haydn Symphony 101



Open expositions and codas

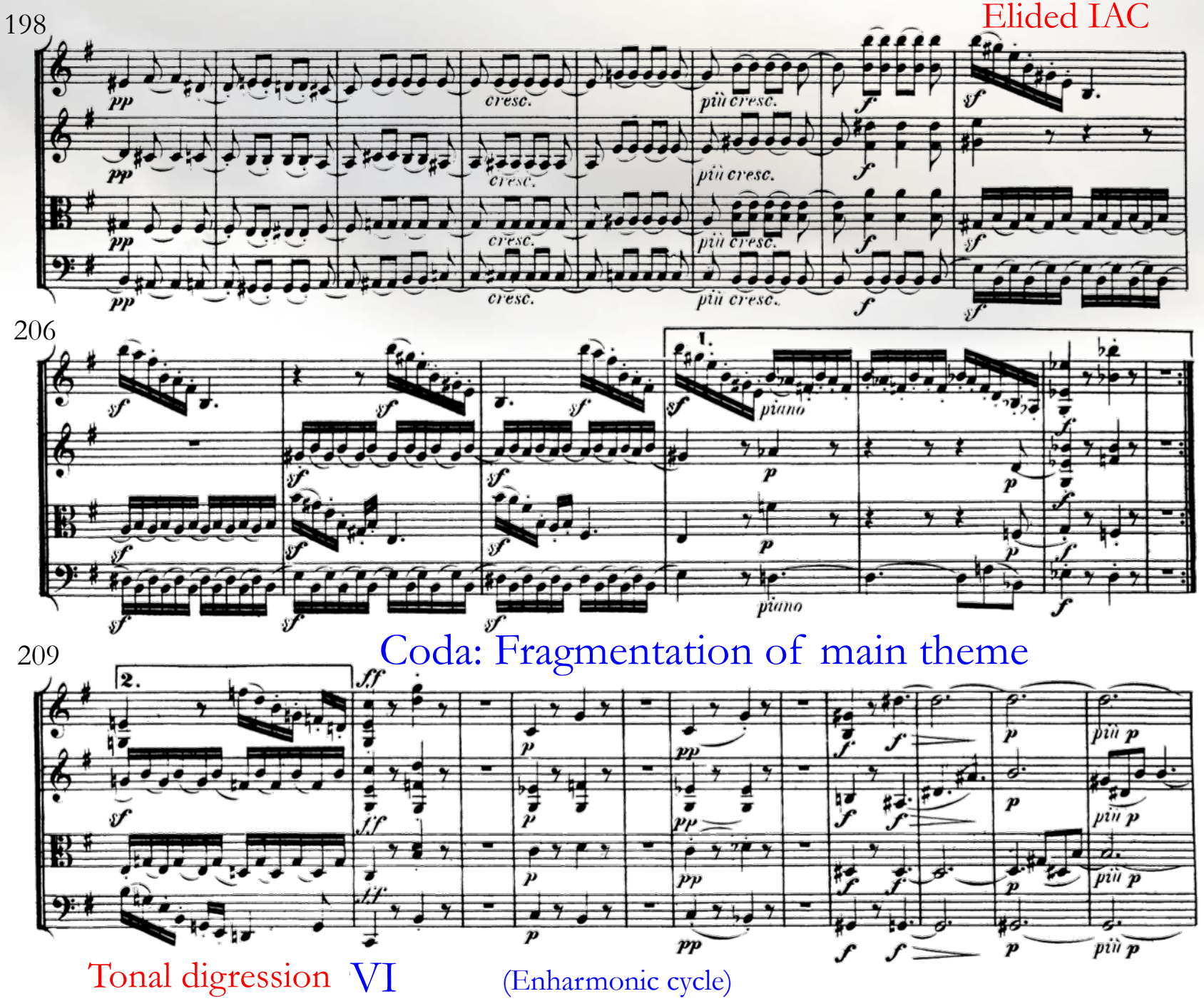
Beethoven's use of **open expositions** is related to his use of **codas**

If the end of recapitulation parallels an open exposition, a coda is *required*.

If the exposition and recapitulation **lack tonal closure** then there must be a **disjunctive coda.**

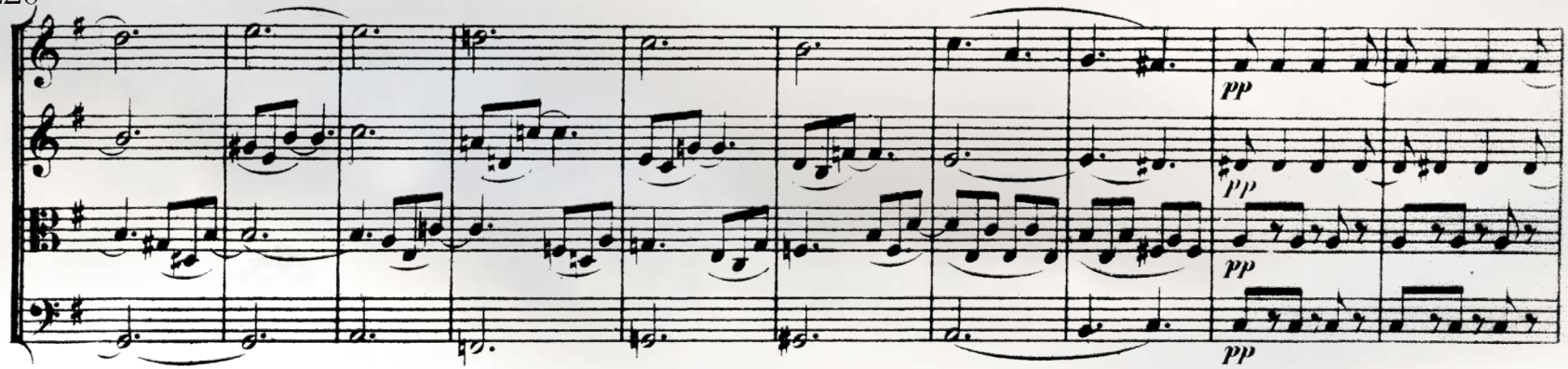
Example: Op. 59/2

Beethoven, Op. 59/2: Coda

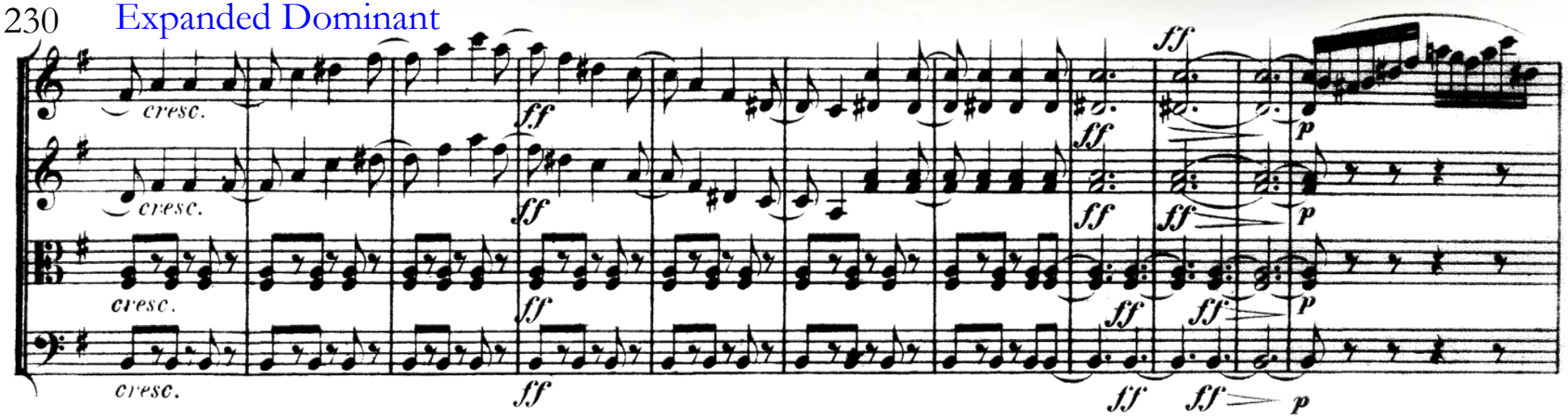


Beethoven, Op. 59/2: Coda

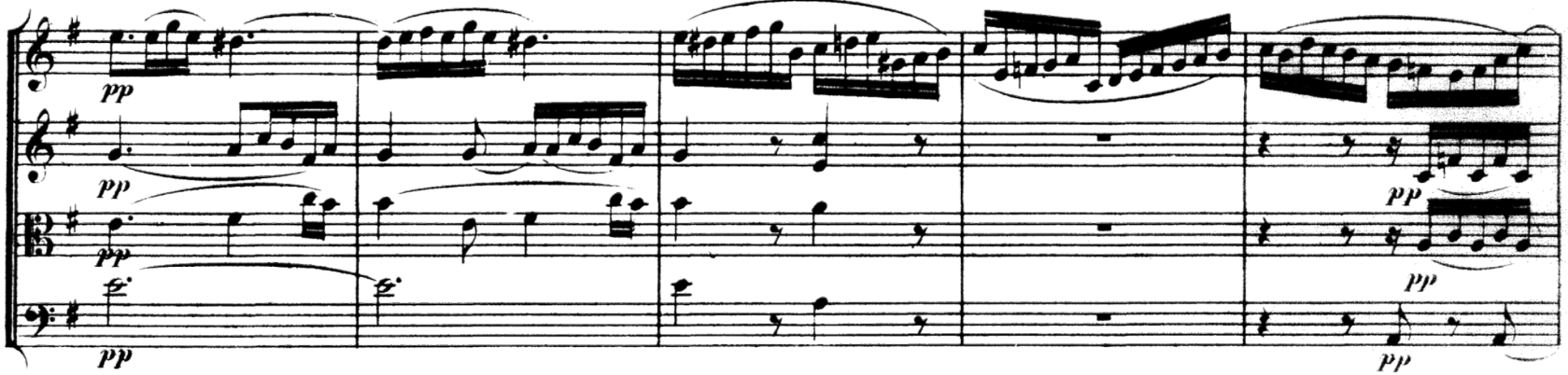
220 Cadential



230 Expanded Dominant

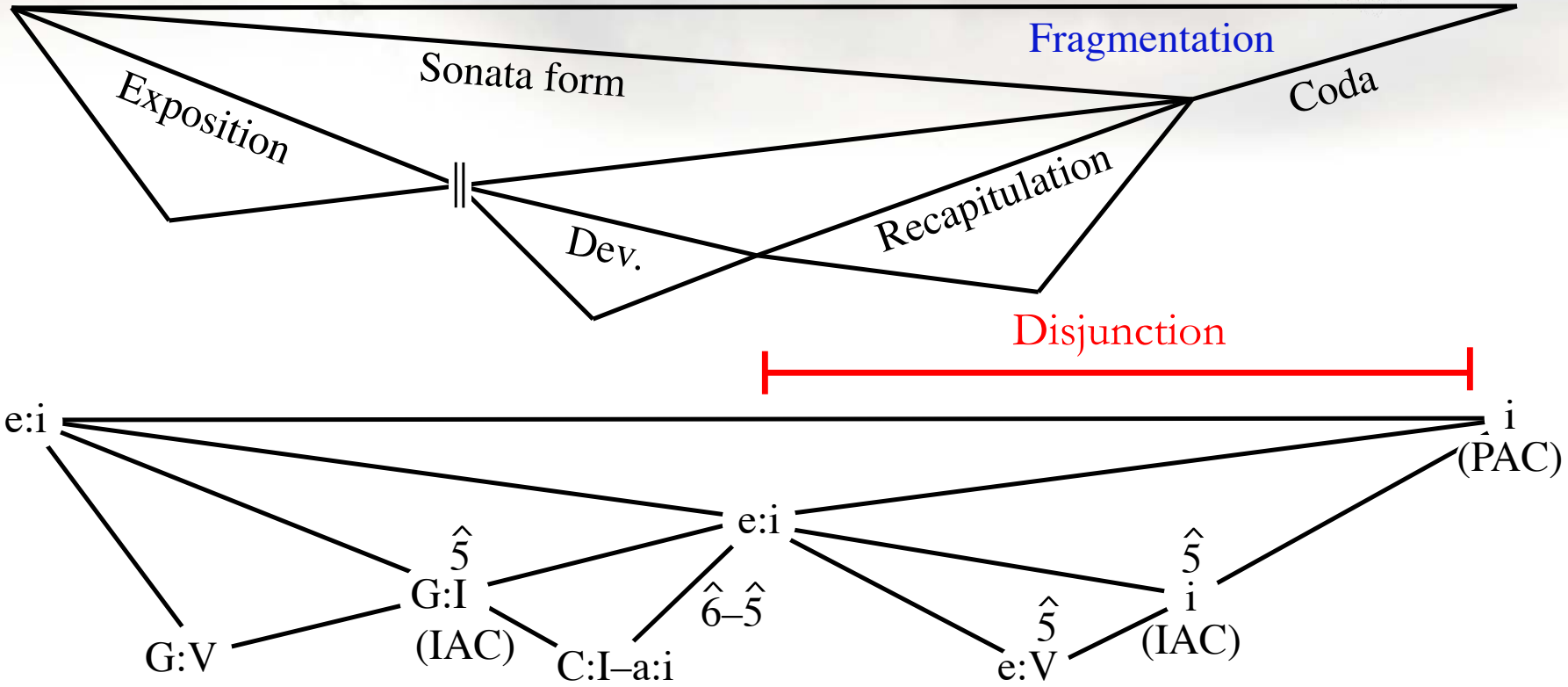


241



i

Disjunctive coda:
Beethoven Op. 59/2



(4) Innovative Formal Disjunction in Beethoven's Middle Period

(a) Off-Tonic Recapitulation
Ex.: Op. 9/1 Scherzo

(b) Non-standard subordinate keys
Ex.: Beethoven Op. 29 Quintet

Disjunctive Techniques

Beethoven evidently adopted the disjunctive coda from Haydn. But it may have inspired the use of other forms of disjunction that were distinctively Beethovenian innovations:

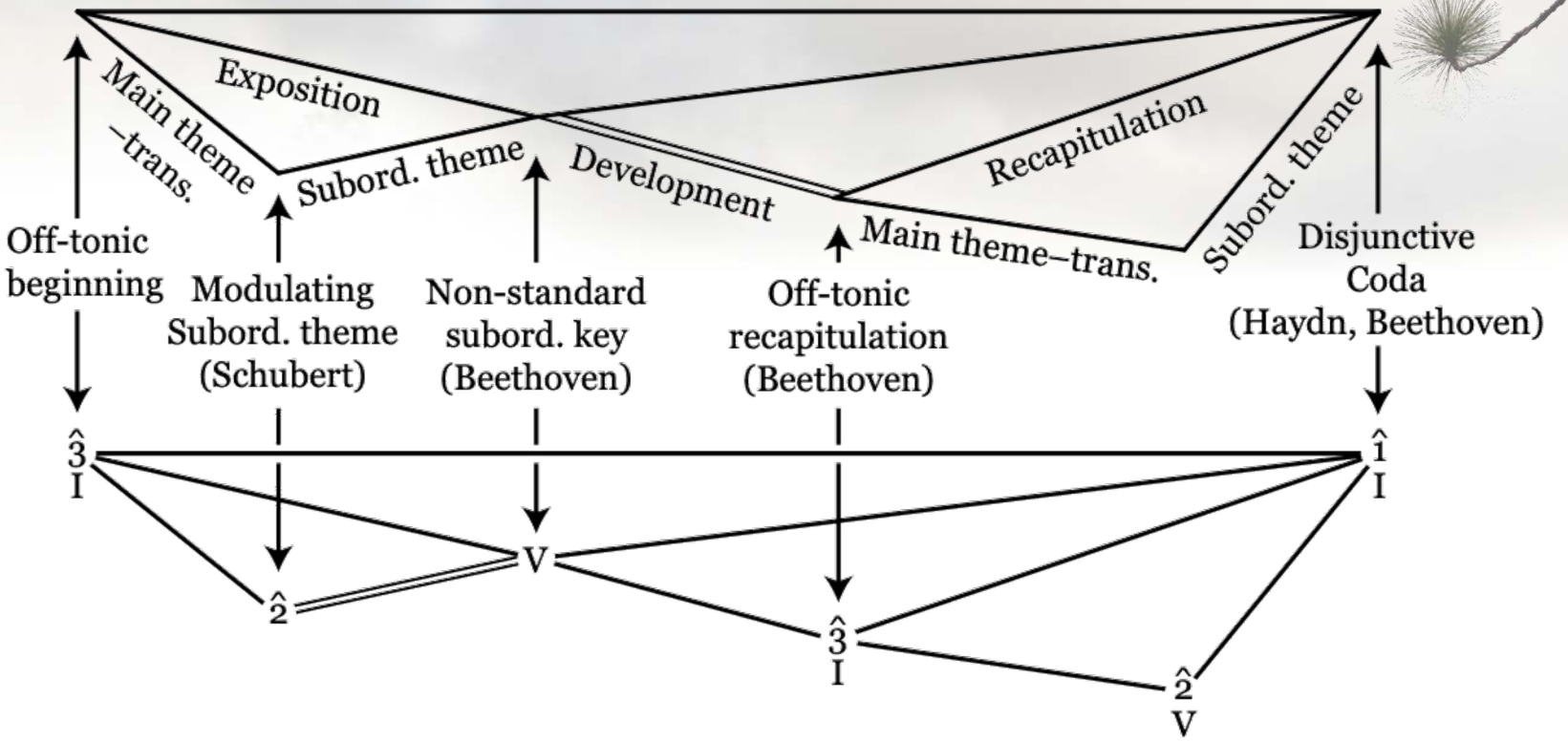
- Off-tonic recapitulation (Op. 9/1 first mvt. and scherzo, Op. 18/3, Op. 26 scherzo, Op. 27/2 allegretto, Op. 31/3, Op. 47, Op. 59/1 scherzando, etc.):

  (Not unique to Beethoven, but cultivated as a disjunction by him to novel aesthetic ends)

  —See Burstein "The Off-Tonic Return in Beethoven's Piano Concerto No. 4 in G major, Op. 58, and Other Works." *Music Analysis* 24/3 (2005)

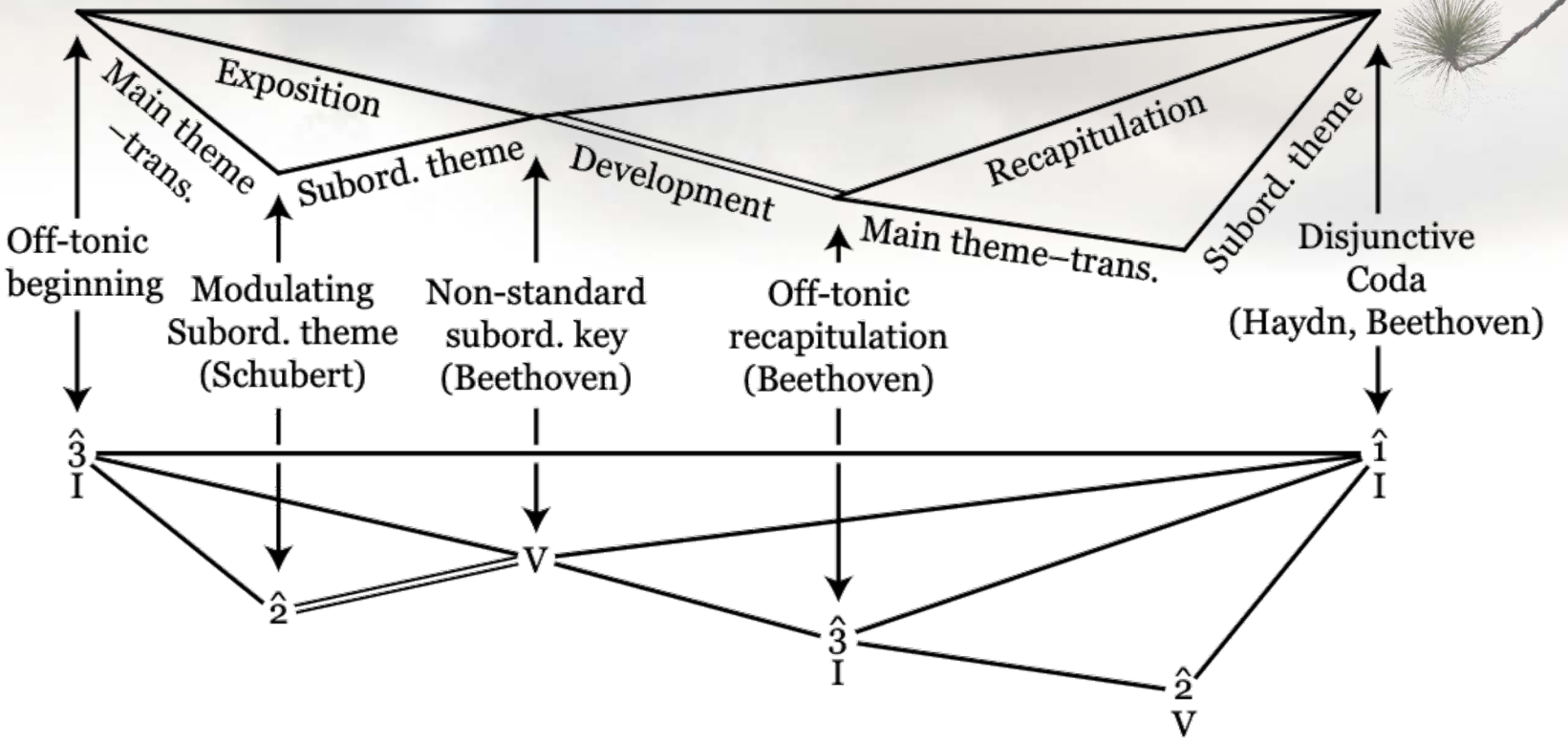
- Non-standard subordinate keys (Opp. 28, 31/1, 53, 56, Lenore) = disjunction at the binary division (exposition/development)

Large-Scale Disjunctive Techniques



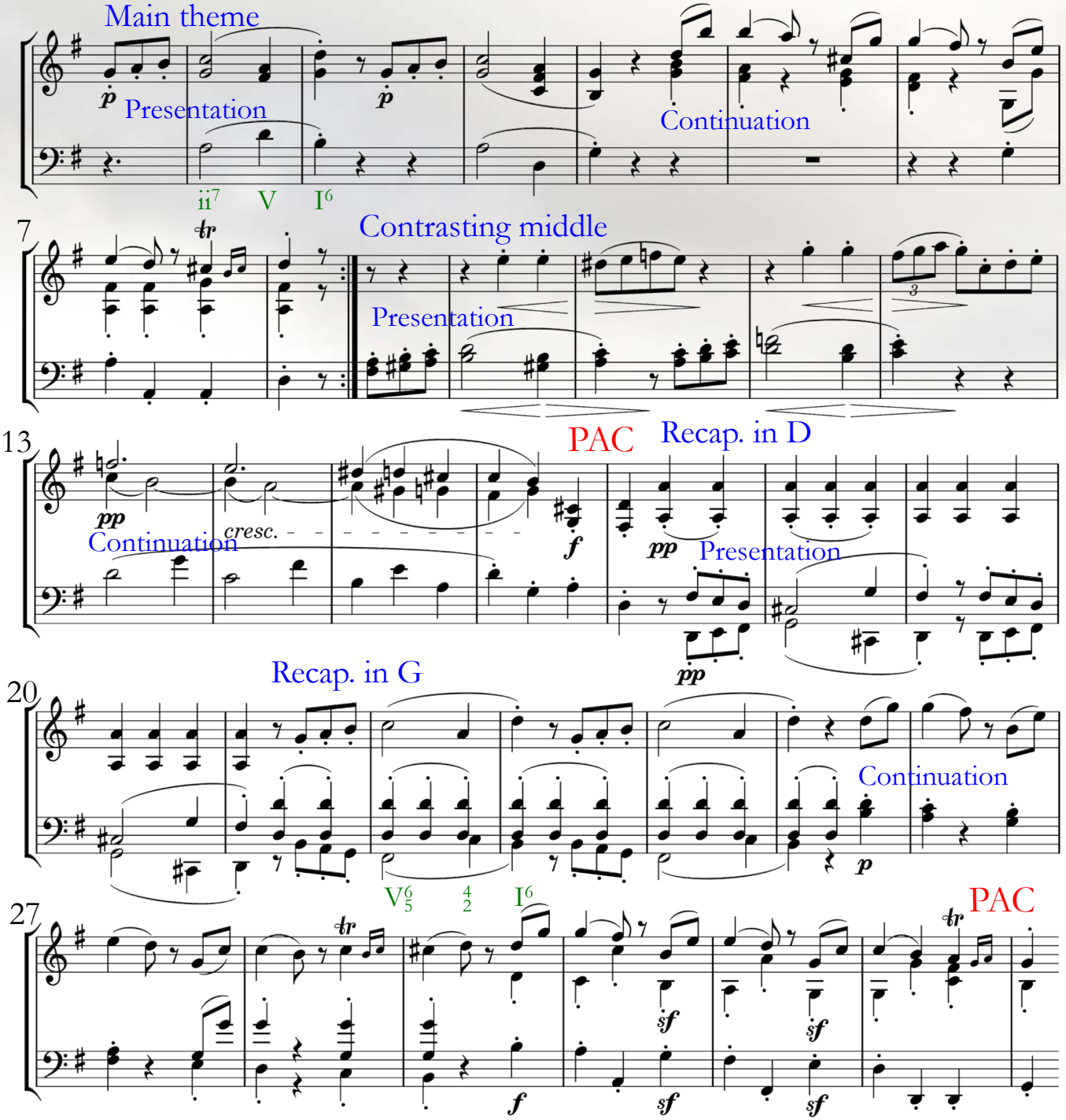
The possible types of large-scale tonal-formal disjunction can be classified by the point in the sonata form where the disjunction occurs.

Large-Scale Disjunctive Techniques



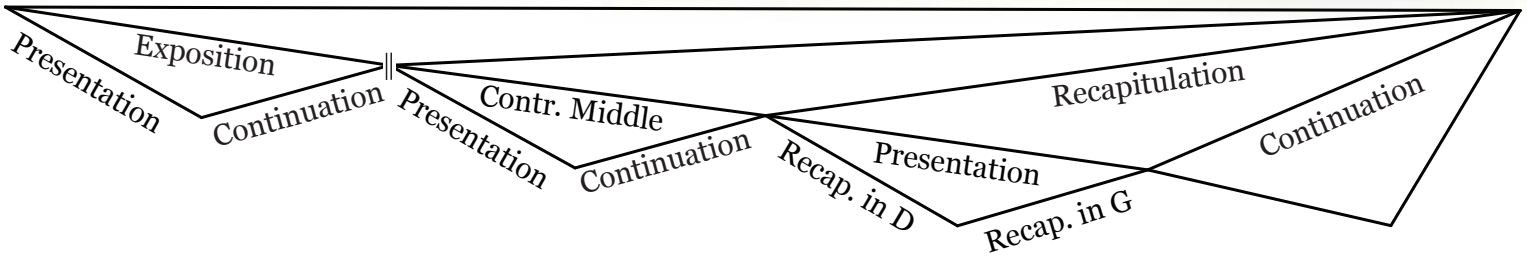
These common types of disjunction are all **structural appoggiaturas** (except the disjunctive coda), meaning the corresponding point in the tonal structure is delayed to a later, lower-level, formal event.

Beethoven Op. 9/1 Scherzo

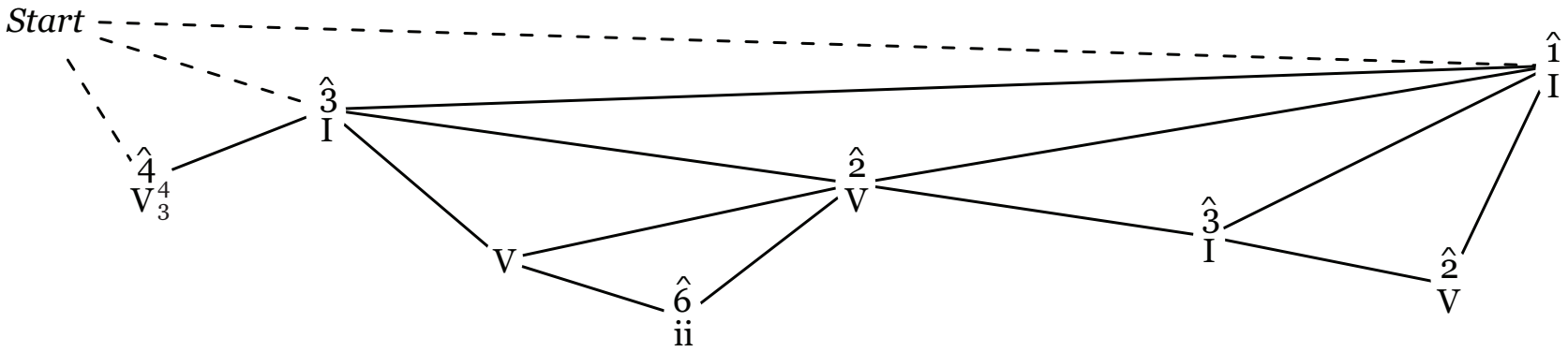


Off-tonic beginning:
Beethoven Op. 9/1 Scherzo

Form:



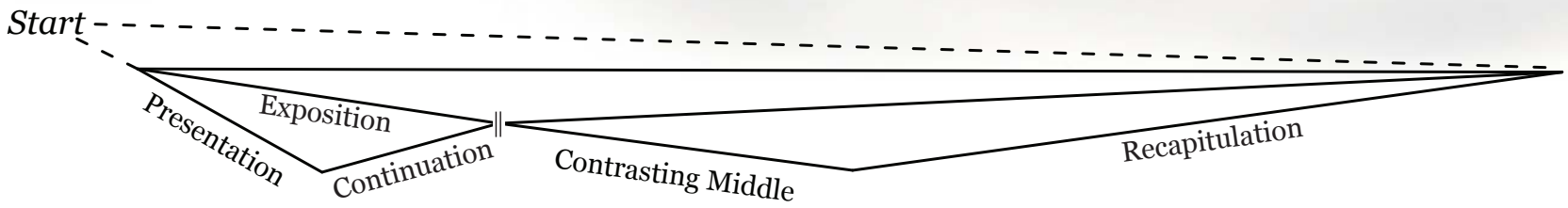
Tonal structure:



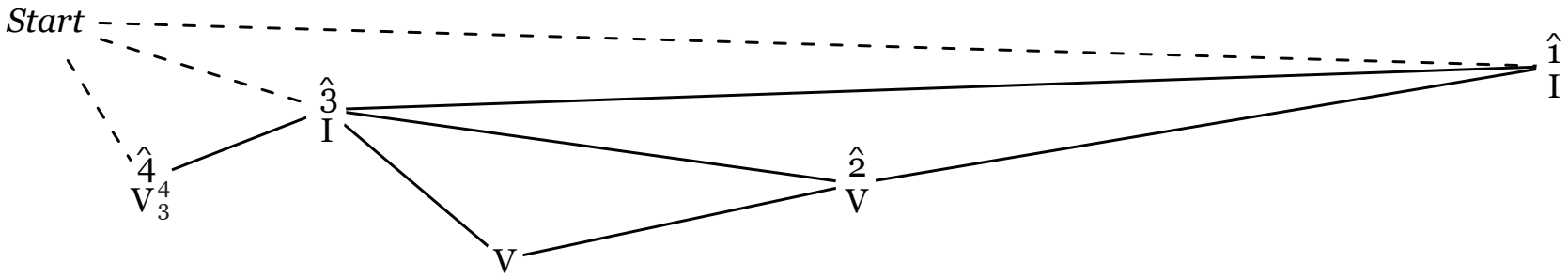
Off-tonic beginning: Beethoven Op. 9/1 Scherzo

Disjunction isolated

Form:



Tonal structure:

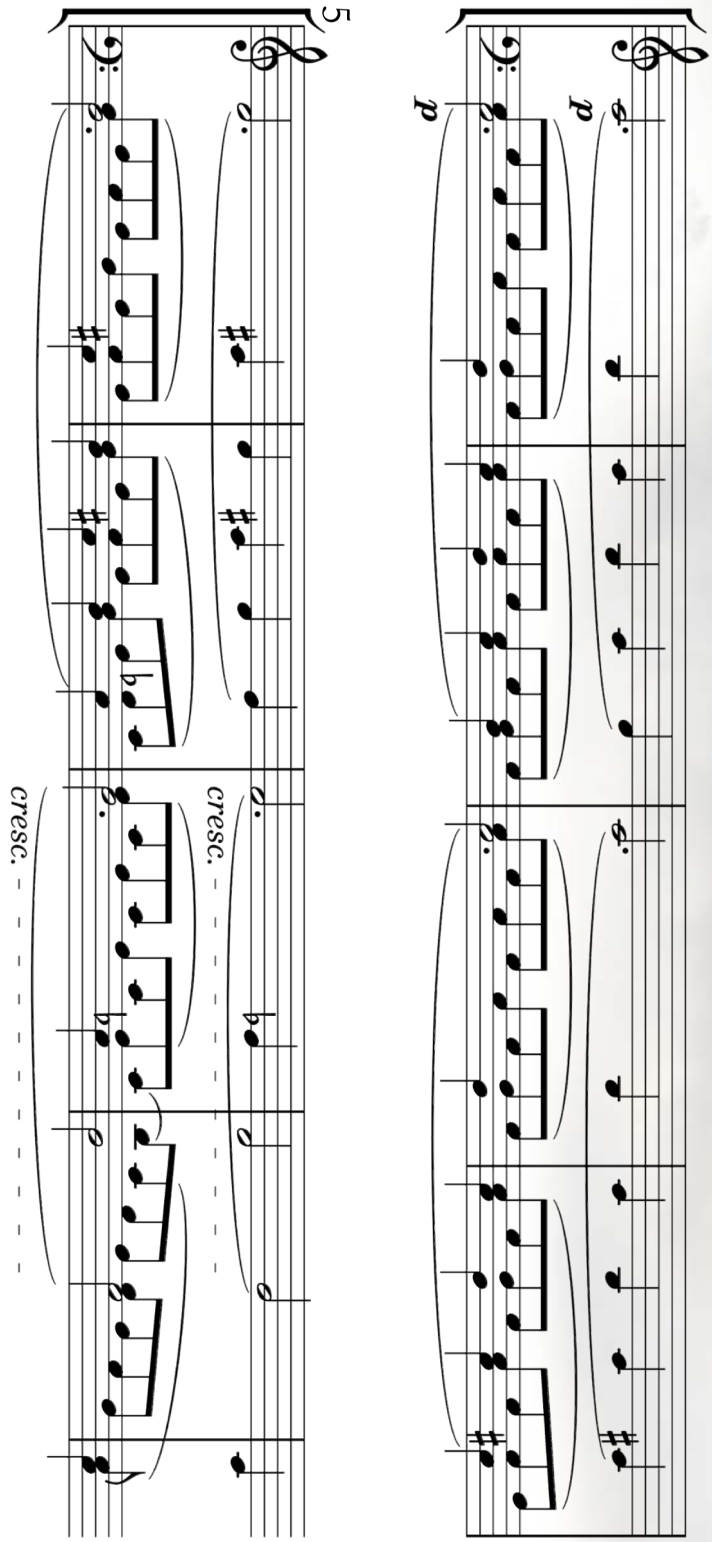


Beethoven's Non-Standard Subordinate Keys

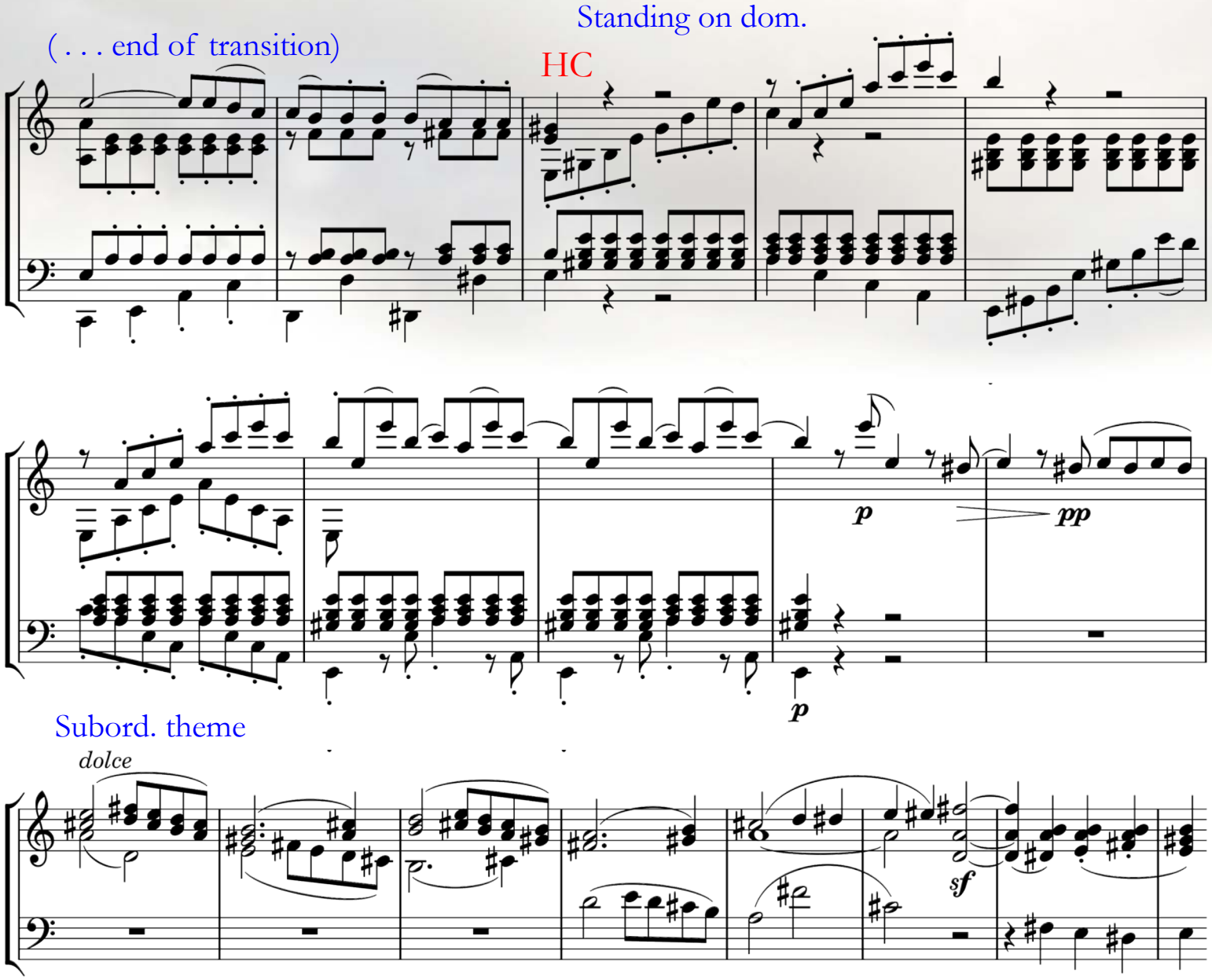
Work	Mvt.	Date	Key	SK	Rel.	ST Recap.
String Quintet, Op. 29	i	1801	C maj.	A min.	LM*	HK
Piano Sonata, Op. 31/1	i	1802	G maj.	B min.	UM*	LSM–LM–HK
Triple Concerto, Op. 56	i	1803	C maj.	A min.	LM*	HK
Piano Sonata, Op. 53	i	1803–4	C maj.	E maj.	USM	LSM–LM–HK
Lenore Overture No.2		1804–5	C maj.	E maj.	USM	—**
Lenore Overture No.3		1805–6	C maj.	E maj.	USM	HK
Piano Trio, Op. 70/2	iv	1808	E♭ maj.	G maj.	USM	LSM–HK
String Quartet, Op. 95	i	1810–11	F min.	D♭ maj.	LM	MajHK
Piano Trio, Op. 97	i	1810–15	B♭ maj.	G maj.	LSM	HK
Piano Sonata, Op. 106	i	1816–18	B♭ maj.	G maj.	LSM	HK
Piano Sonata, Op. 111	i	1821–22	C min.	A♭ maj.	LM	HK
Symphony no. 9	i	1817–24	D min.	B♭ maj.	LM	MajHK–HK
String Quartet, Op. 127	i	1823–4	E♭ maj.	G maj.	UM	HK
String Quartet, Op. 132	i	1825	A min.	F maj.	LM	UM–MajHK–HM***
String Quartet, Op. 130	i	1825–6	B♭ maj.	G♭ maj.	LFM	UFM–HK
String Quartet, Op. 135	iv	1826	F maj.	A maj.	USM	LSM–HK

** Begins in the parallel major (LSM or USM). ** Does not have a full recapitulation.*
**** Has two full recapitulations in different keys.*

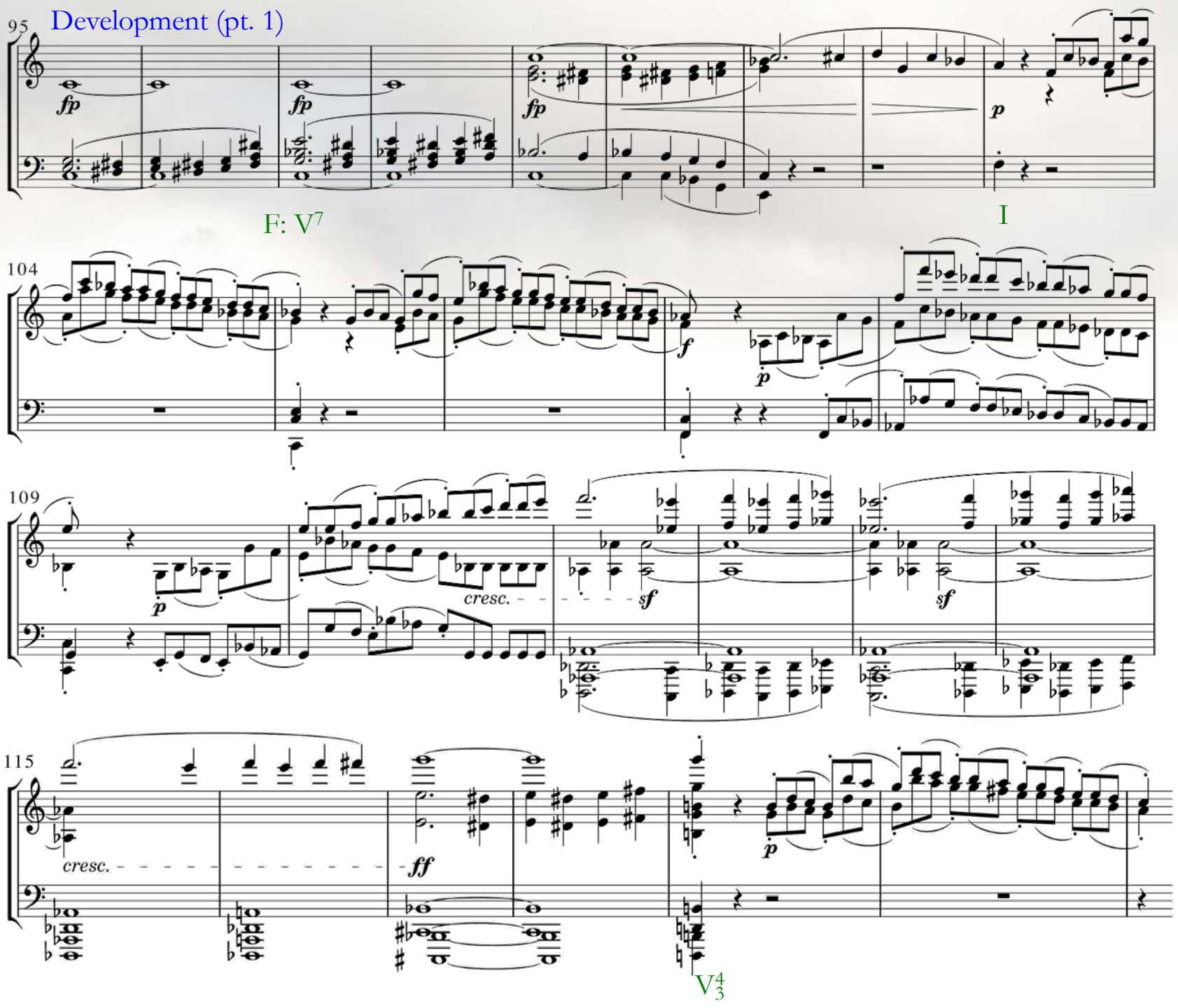
Beethoven Op. 29 Quintet, Main theme



Beethoven Op. 29 Quintet, End of transition

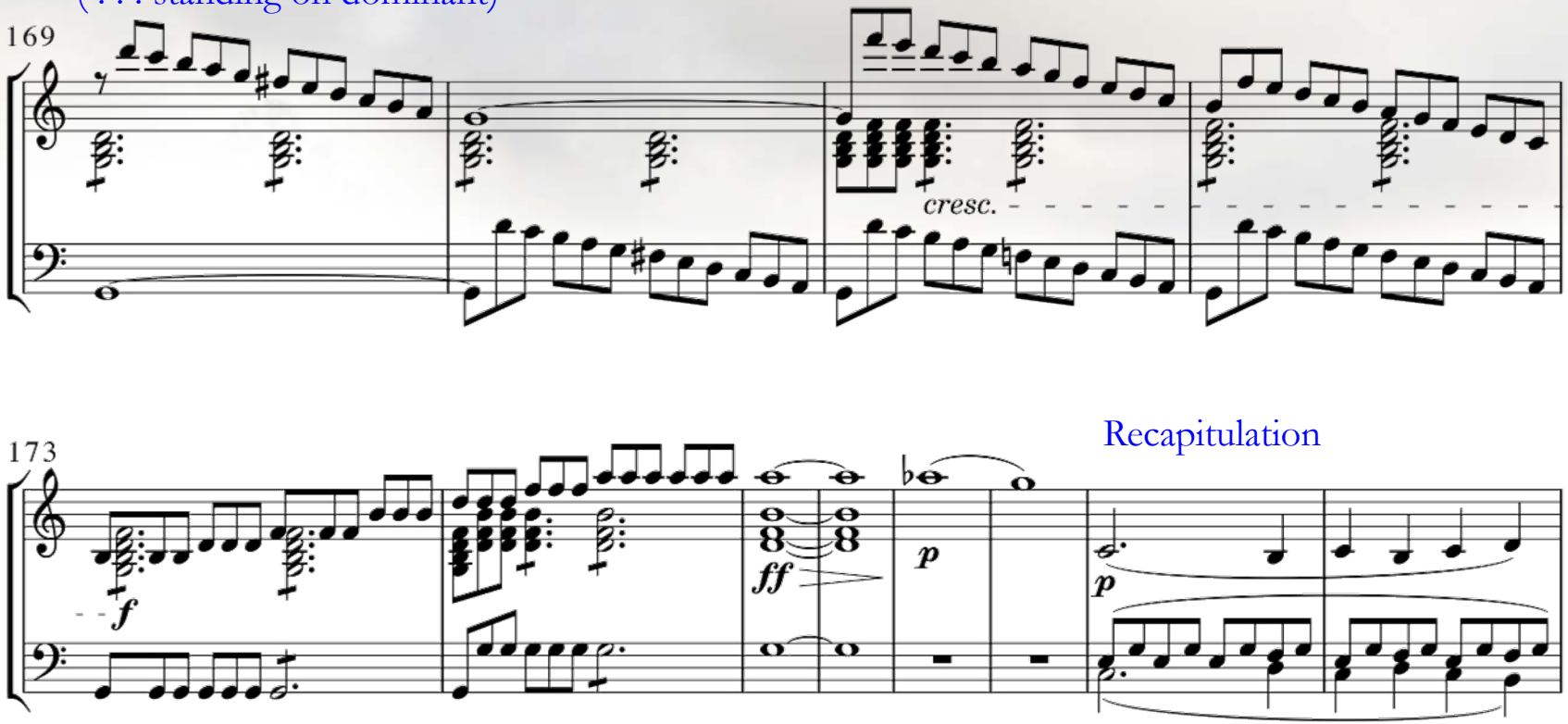


Beethoven Op. 29 Quintet, Development

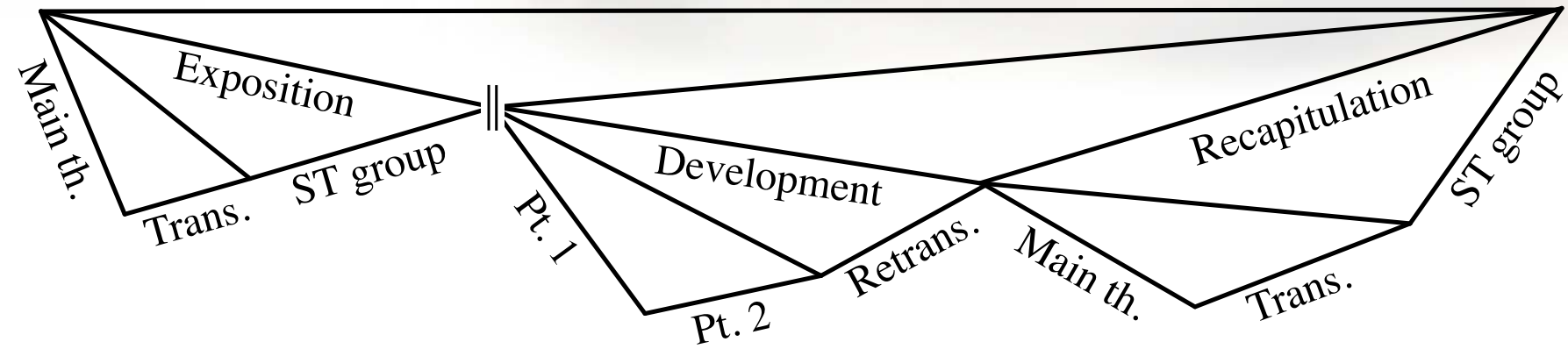


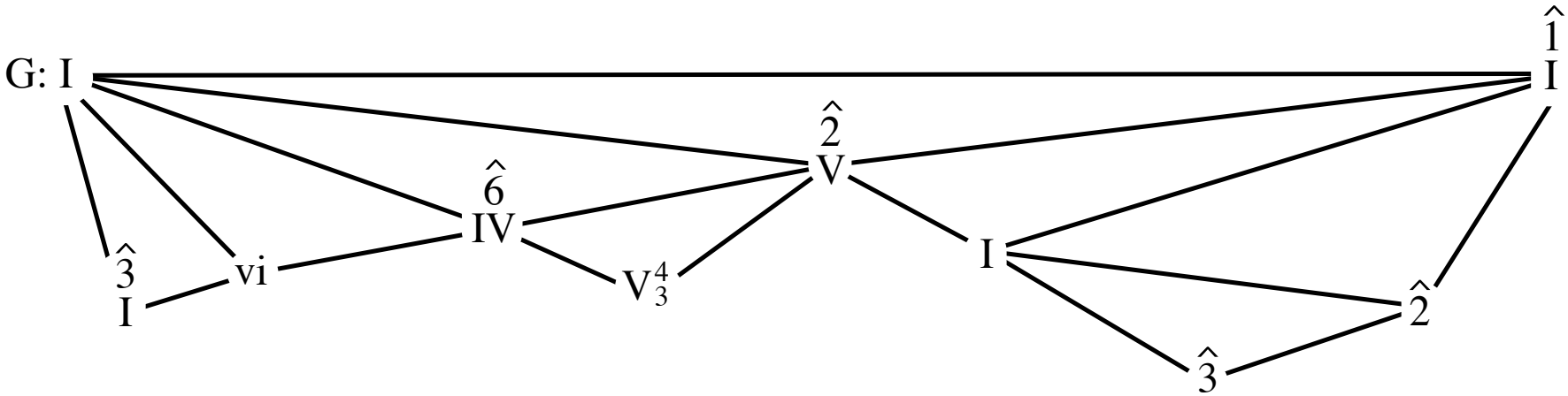
Beethoven Op. 29 Quintet, end of development

(. . . standing on dominant)



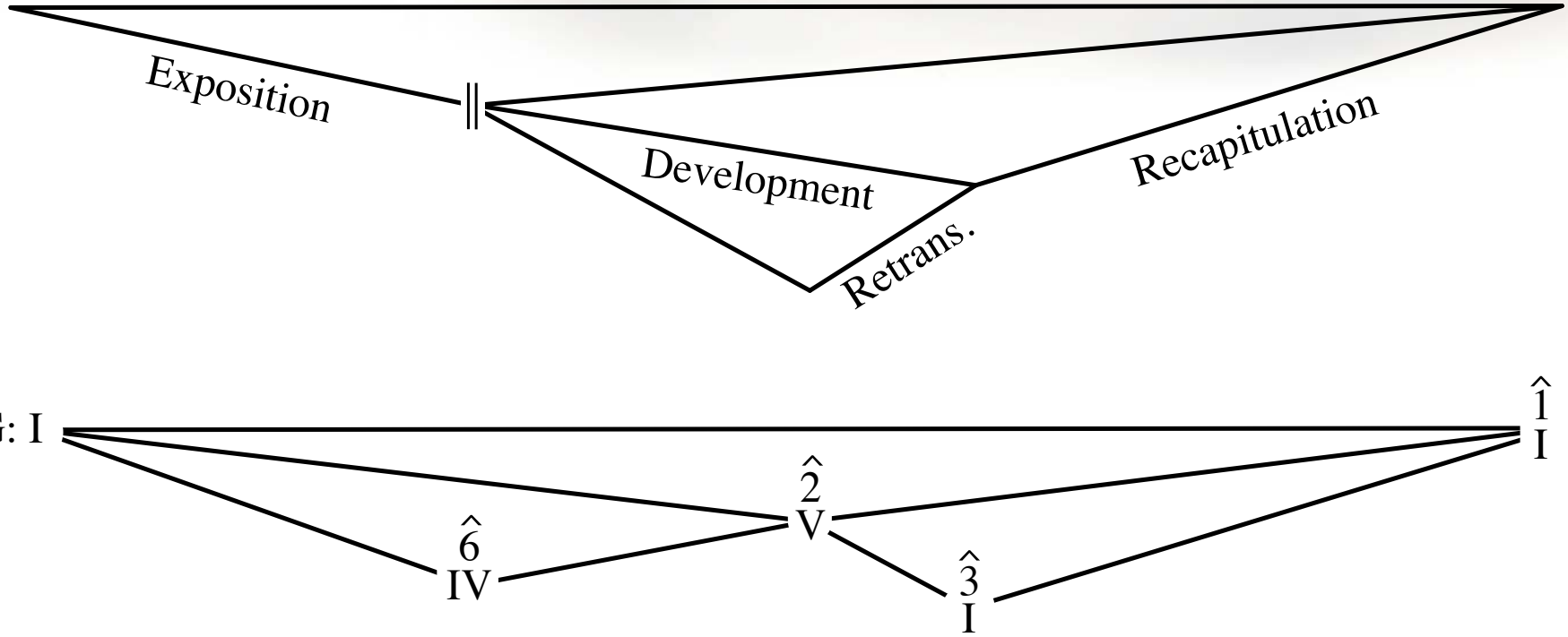
Non-standard subordinate key: Beethoven Op. 29, mvt. 1





Non-standard subordinate key: Beethoven Op. 29, mvt. 1

Disjunction isolated

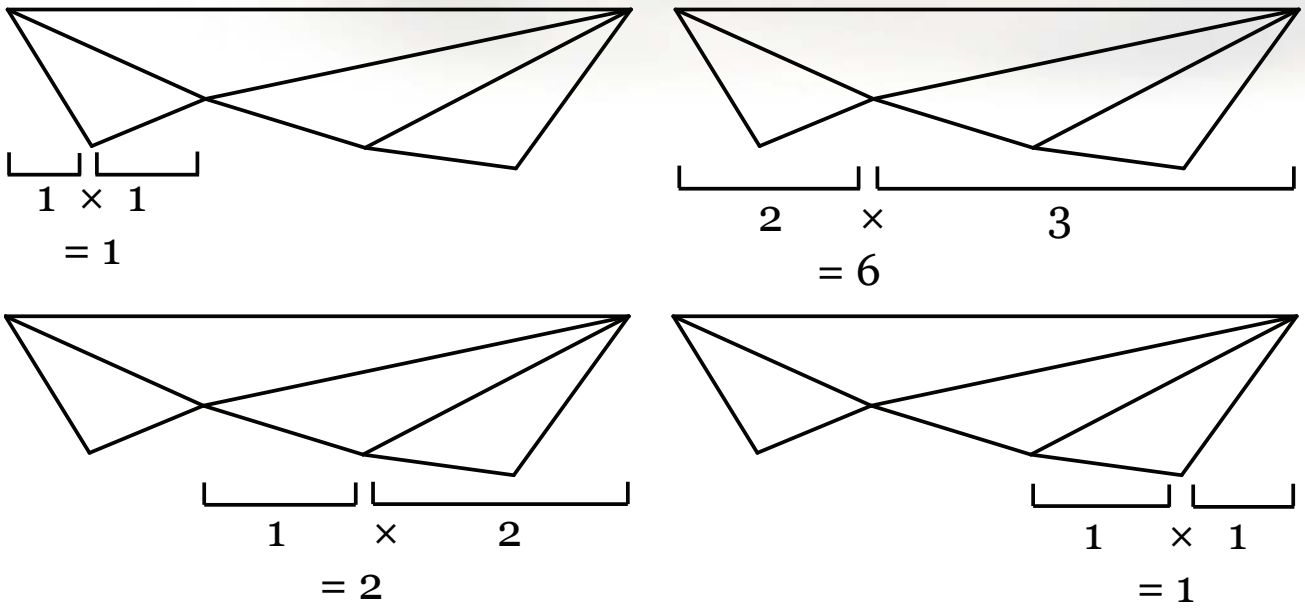


(5) The associahedron

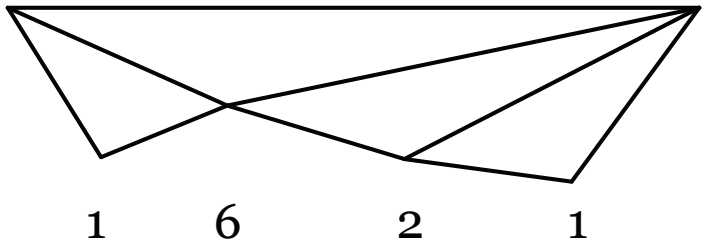
Calculating the coordinates for a structure

Each vertex gets a value by multiplying the number of edges to its left and right

Example:

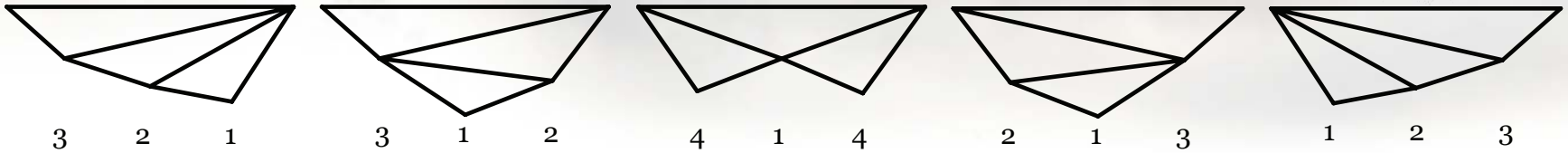


Result:

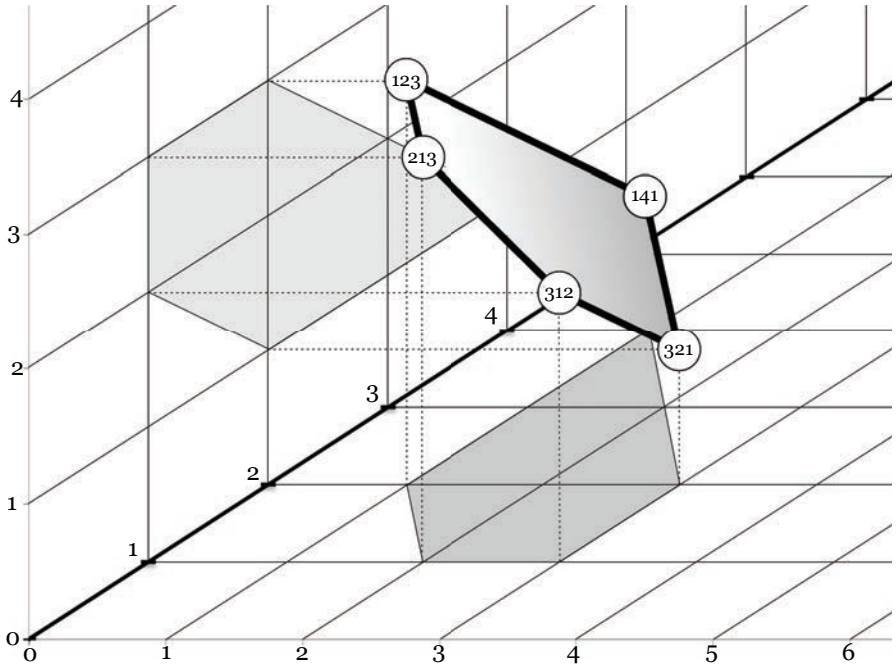


The 3-associahedron

Coordinates for all structures with 3 internal nodes:

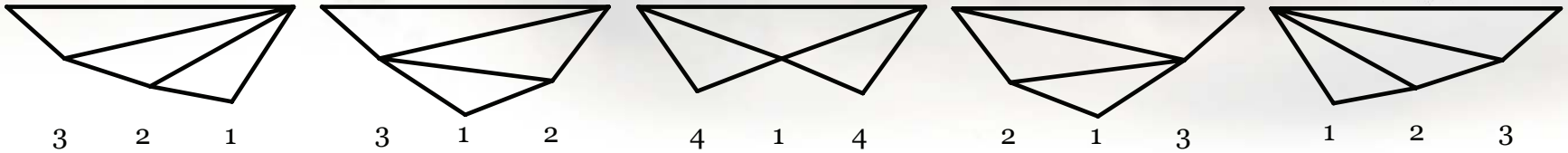


These lie on a plane
$(a + b + c = 6)$



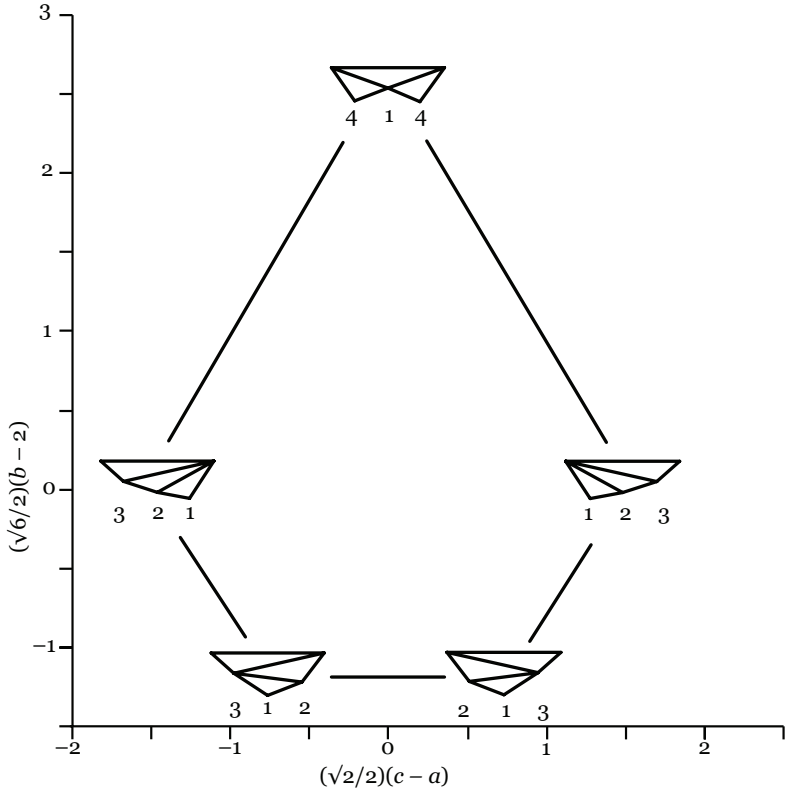
The 3-associahedron

Coordinates for all structures with 3 internal nodes:



The points make a convex 2-d polygon (an irregular pentagon)

Connected vertices are related by a "flip"

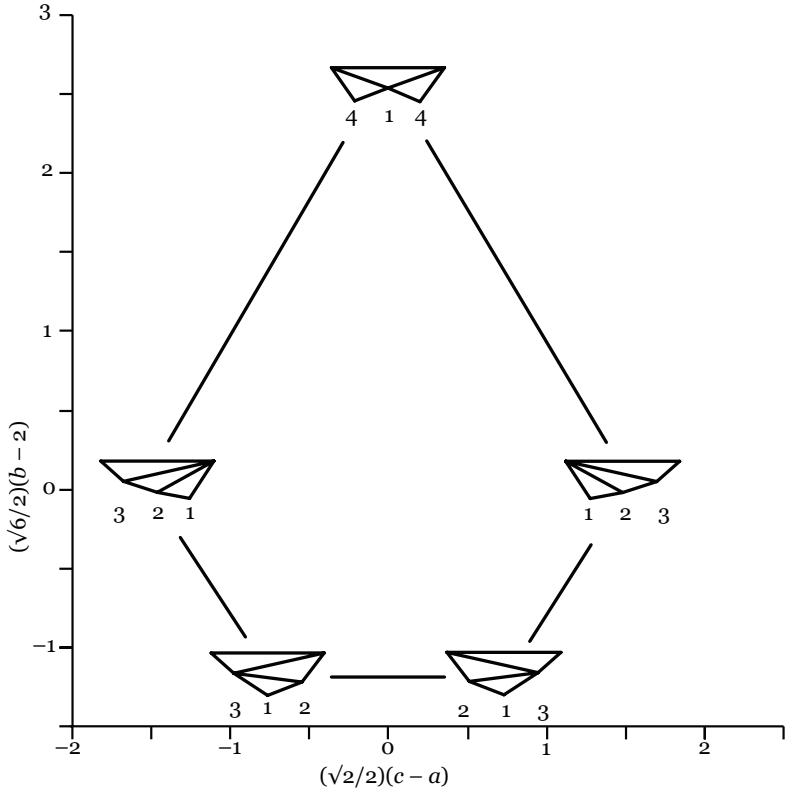


The 3-associahedron

"Flip" (left → right):

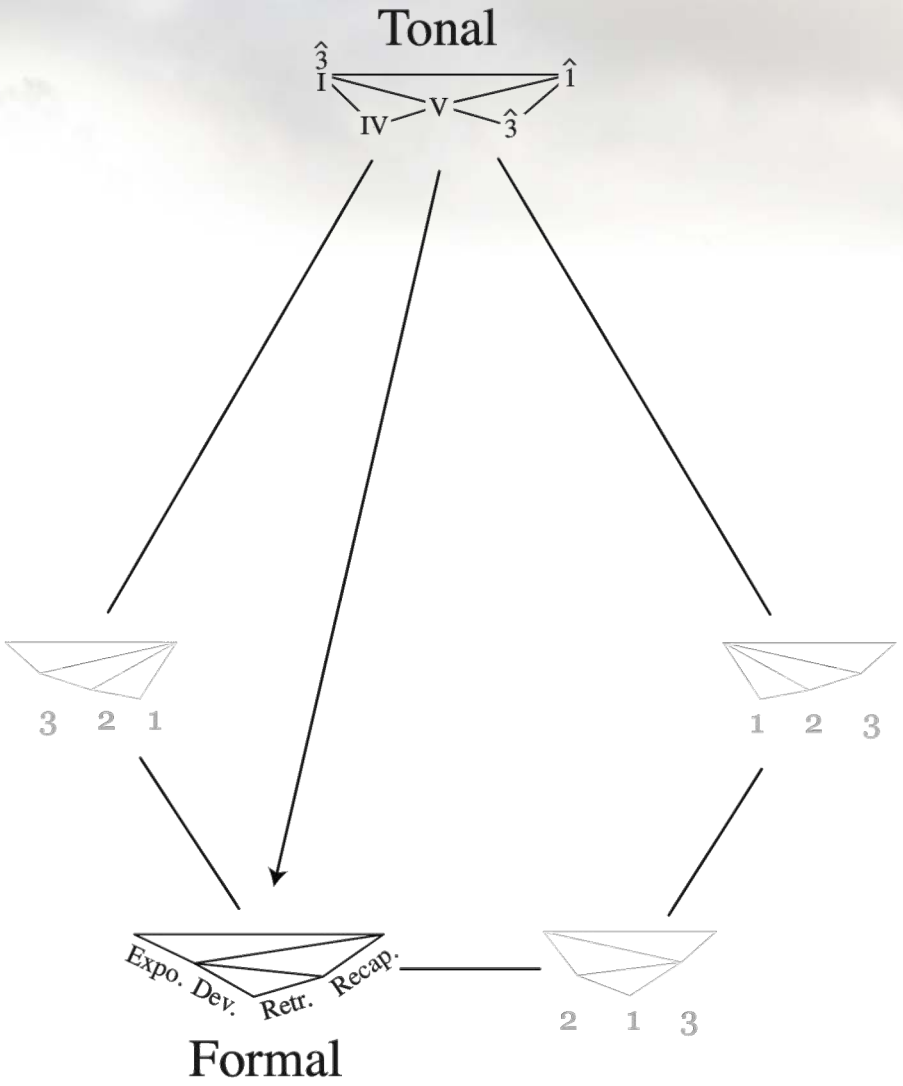
The points make a convex 2-d polygon (an irregular pentagon)

Connected vertices are related by a "flip"



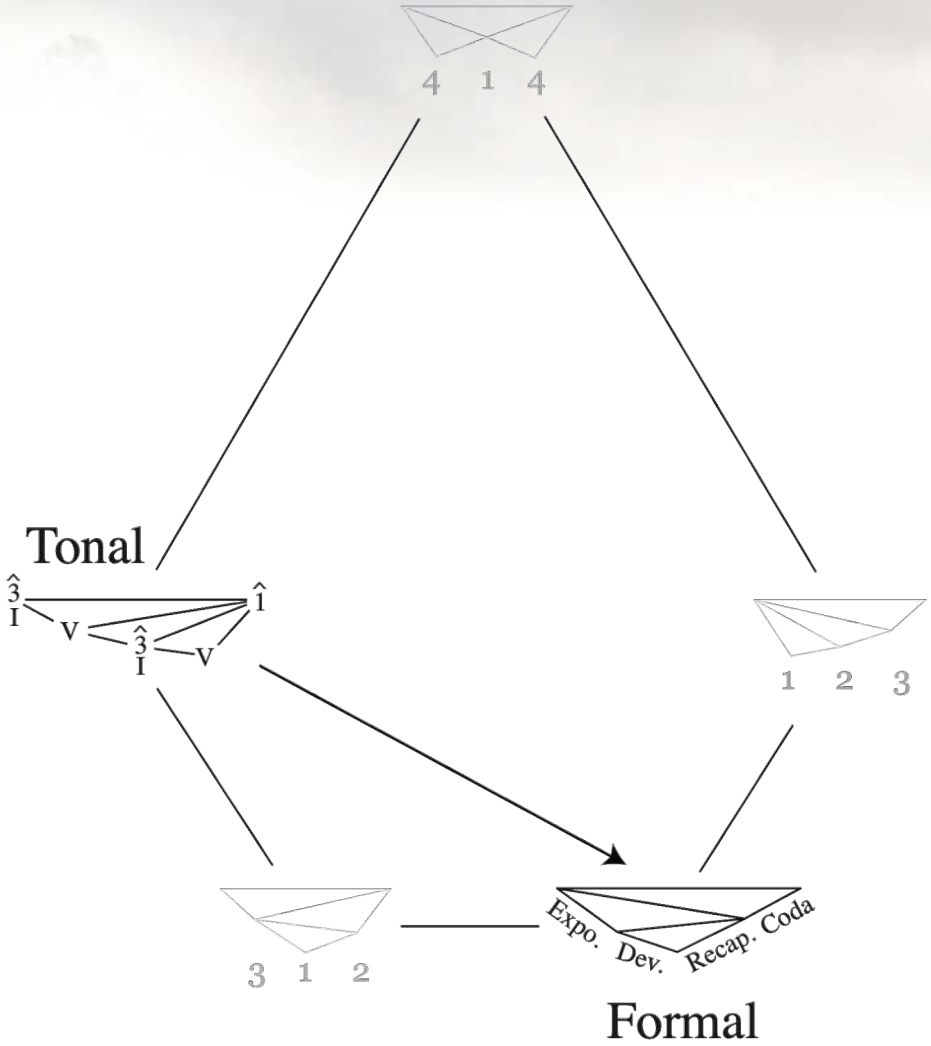
Tonal-formal disjunction on the 3-associahedron

Beethoven Op. 29, mvt. 1



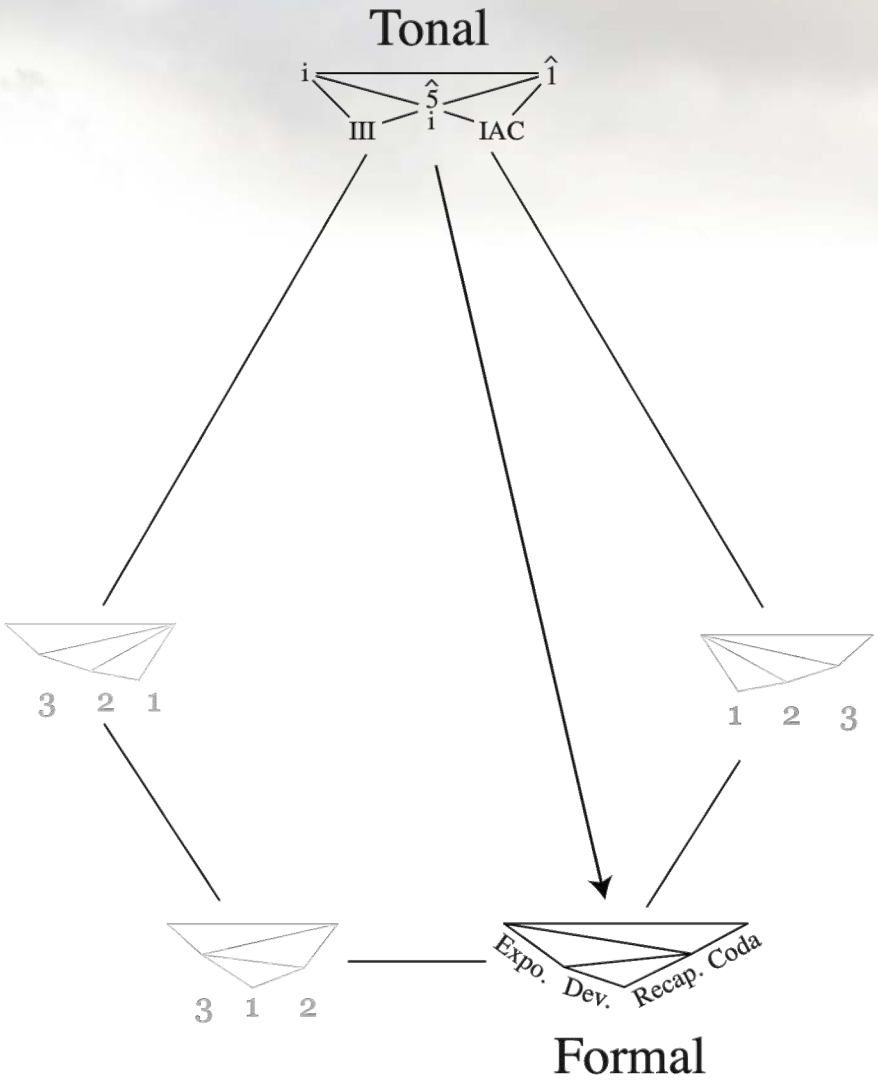
Tonal-formal disjunction on the 3-associahedron

Haydn Symphony 101, mvt. 1



Tonal-formal disjunction on the 3-associahedron

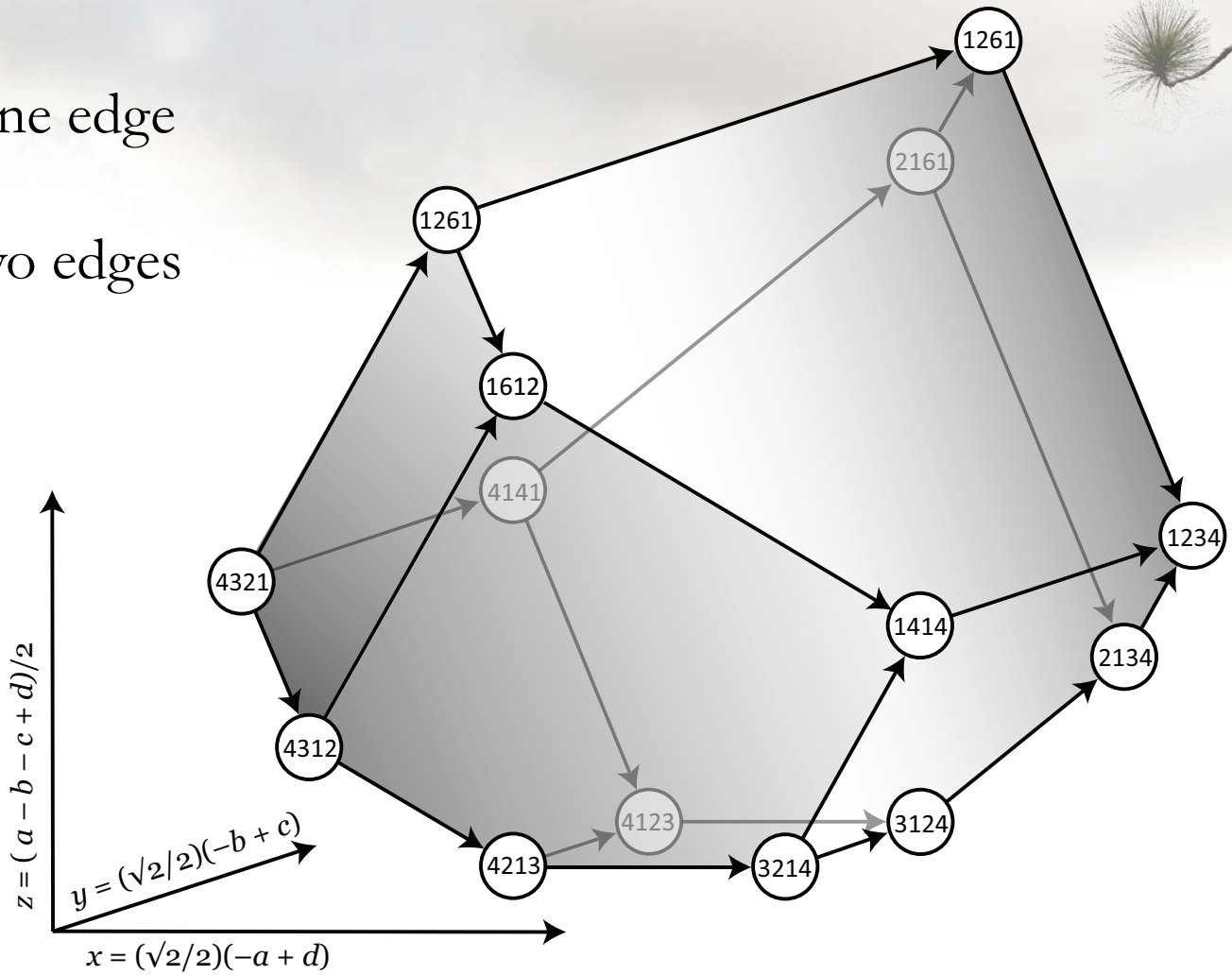
Beethoven Op. 59/2, mvt. 1



The 4-associahedron

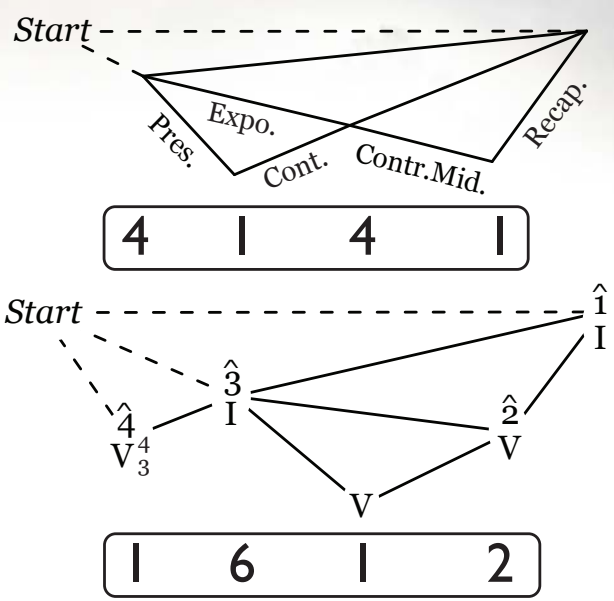
Edges: Flip one edge

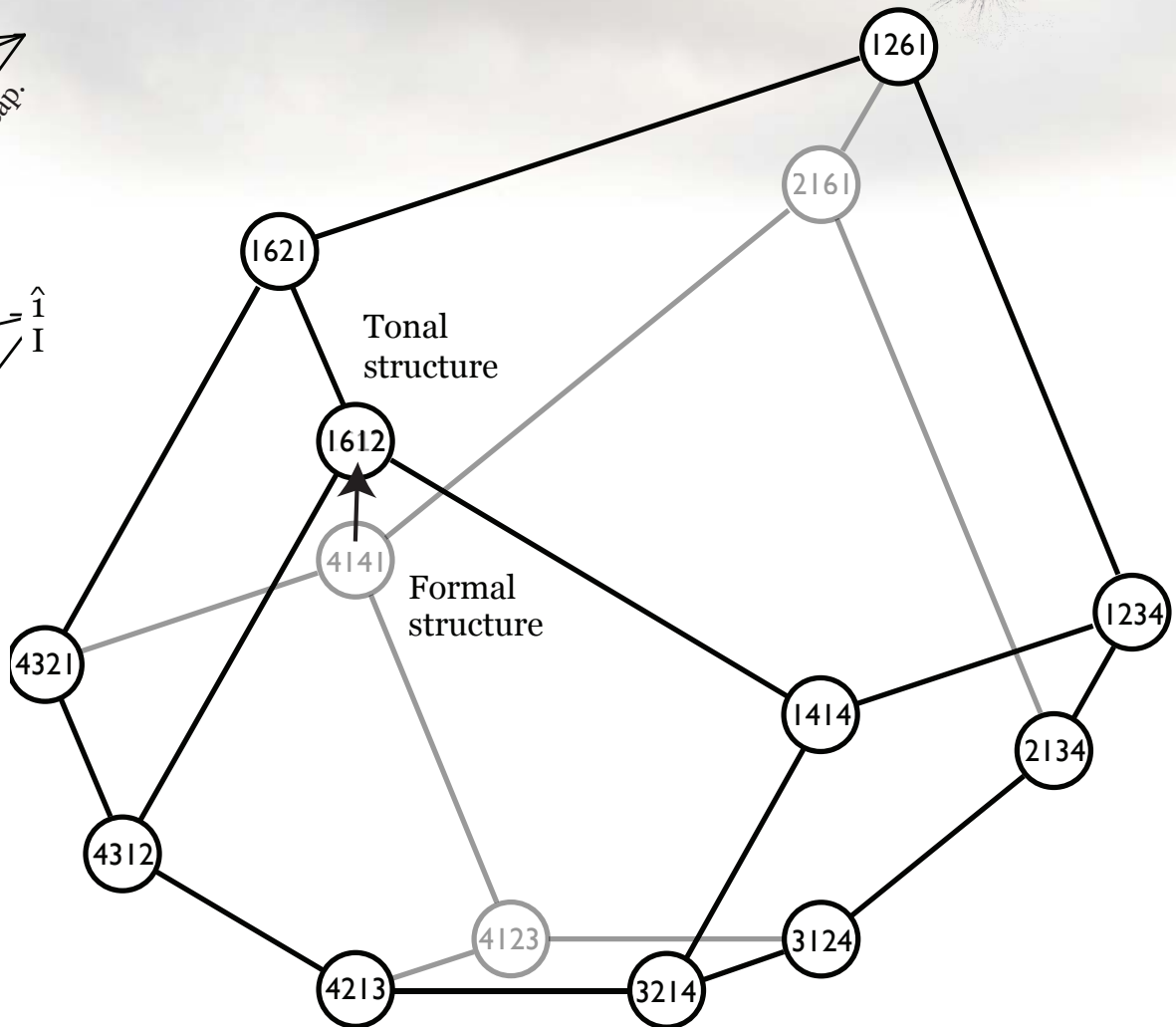
Faces: Flip two edges



Tonal-formal disjunction on the 4-associahedron

Beethoven Op. 9/1 scherzo





Summary

- A common model of **temporal structure** applies independently to rhythm, form, and tonality, allowing analysts to observe how structure is coordinated between modalities.
- Hypermetric elision, a method of *delaying* expositional closure in Haydn, becomes a method of **denying expositional closure** altogether in Beethoven, leading to more radical denial of closure in the middle-period works.
- The denial of closure in recapitulations leads to an early large-scale disjunctive technique, the **disjunctive coda**.
- Beethoven developed additional methods of large-scale tonal-formal disjunction in his middle period: **off-tonic recapitulations** and **non-standard subordinate keys.**
- Disjunctions can be understood as paths in the asssociahedron.

Hypermeter and Form as Temporal Structure, and Beethoven's Formal Innovations

Presentation to the McGill Music Research Doctoral Colloquium Series

Jason Yust, Boston University

http:/people.bu.edu/jyust

jason.yust@gmail.com

Organized Time:
Temporal Structure in the Musical Domains of Rhythm, Tonality, and Form

- Independence of three domains (rhythm, tonality, and form)
- Common model of temporal structure across domains
- Coordination and disjunction