seeds and ledgers 1–3

for string quartet

dedicated to lucie, cat, and ira, respectively

michael winter
(berlin and cdmx; 2023–2024)

notes **1**

seeds and ledgers 1 . . . . . **3**

seeds and ledgers 2 . . . . . **14**

seeds and ledgers 3 . . . . . **20**

Description (which can optionally be used as a program note)

Tuning

These pieces explore an extended just-intonation with no fixed fundamental. Within a part, from note-to-note, the melodic movement may be very complex. However, each note is always a relatively simple interval from a note that has recently terminated or is currently sounding in one of the other parts.

Each written note indicates the closest pitch in twelve-tone equal temperament with a cent-deviation (100th of a tempered semitone) provided above.

A Roman numeral with an Arabic superscript followed by an up or down arrow is most often provided below each note. The Roman numeral indicates the reference part against which the current note (which will be called the *referencing note* from here on) can be tuned by a relatively simple interval from a recently or currently sounding pitch in the reference part (which will be called the *reference pitch* from here on). The Arabic superscript and the corresponding arrow indicate the exact interval, up or down, of the referencing note from the reference pitch. Generally, the reference pitch is initiated prior and continues to sound when it is referenced. Occasionally, the reference pitch terminates in the beat prior to the initiation of the referencing note. As a courtesy, this is indicated by a '<' preceding the Roman Numeral below the referencing note.

No indication below a note means that it is the same pitch as the prior note within the respective part.

A Roman numeral with superscript of 1 below a referencing note means that it is an octave equivalent of the reference pitch.

A Roman Numeral with a superscript of 3, 5, 7, 11, or 13 followed by an up arrow indicates that the pitch of the referencing note is a frequency ratio of a 3/2, 5/4, 7/4, 11/8 or 13/8, respectively, from the reference pitch if the reference pitch were transposed to the nearest octave *below* the pitch of the referencing note.

A Roman Numeral with a superscript of 3, 5, 7, 11, or 13 followed by a down arrow indicates that the pitch of the referencing note is a frequency ratio of a 2/3, 4/5, 4/7, 8/11 or 8/13, respectively, from the reference pitch if the reference pitch were transposed to the nearest octave *above* the pitch of the referencing note. That is, the down arrow is the inversion of an up arrow and it could alternatively be understood that the referencing note is a frequency ratio of 4/3, 8/5, 8/7, 16/11, or 16/13, respectively, from the reference pitch if the reference pitch were transposed to the nearest octave *below* the pitch of the referencing note.

Tempo and Duration

Pieces 1 and 2 are written with a 2/2 time signature and should be played at a tempo such that a half note is approximately 60 beats per minute (2 seconds per measure).

A fermata with a number directly below is a suggestion for the number of seconds the notes in that measure can be held. It is actually the exact number of seconds that the computer program that generated the piece assigned to the measure, but maybe interpreted more freely by the ensemble.

Piece 3 is much more open. Note durations are not provided until measure 105. Durations between the initiation of one note to the next among the parts should generally be 1 to 2 seconds. However, that is more of a lower limit. The

performer initiating the next note has discretion to maintain the current chord for (potentially much) longer such that the more consonant the chord subjectively, the longer it sounds. Within a part, each tone should generally be held until the next tone, but the given performer can also fade out and rest a moment before initiating the next tone.

A time signatures and note durations are only provided for the end of piece 3 (measures 105 to 114) and an optional coda (starting at measure 115). Like pieces 1 and 2, the ending and the coda of piece 3 should be interpreted with a tempo such that a half note is approximately 60 beats per minute.

Optional Coda of Piece 3

Given that the coda of piece 3 starting at measure 115 is exceedingly difficult, it is optional. Good luck to any group that attempts it and congratulations in advance to any group who successfully executes it!

Generating programs

These pieces were generated using custom software written in SuperCollider with a front-end user interface written in Javascript called Open Stage Control. These programs can also be used to audition the piece and each part. The most recent version of the code along with any utilities that are developed are downloadable from a git repository at: `https://unboundedpress.org/code/mwinter/seeds_and_ledgers`

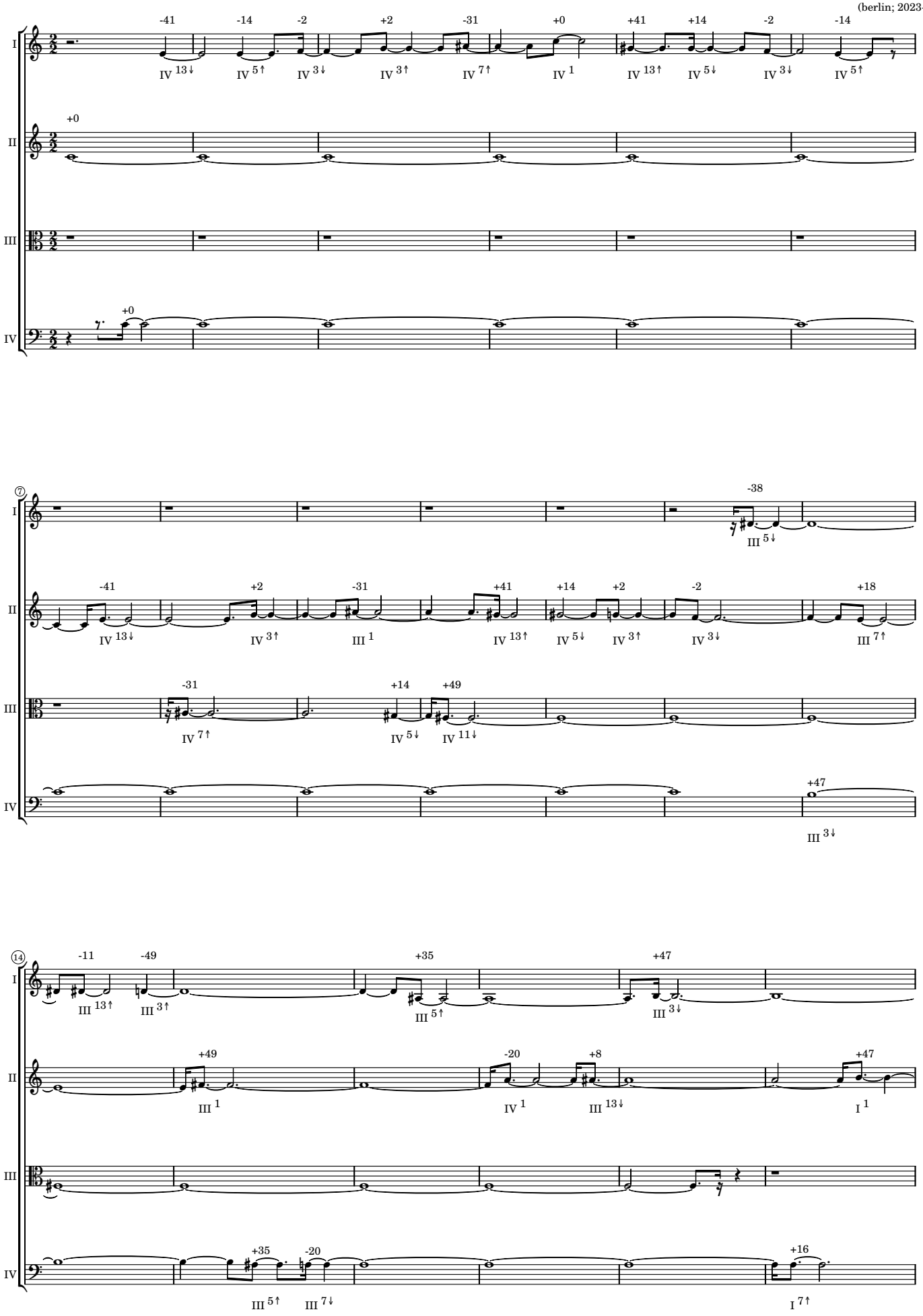
The generation of this document (using LaTex) contains a version date at the bottom of this page in order to help track changes and the git repository will also detail commit changes. The piece was last generated using SuperCollider version 3.13 and Lilypond version 2.24.1.

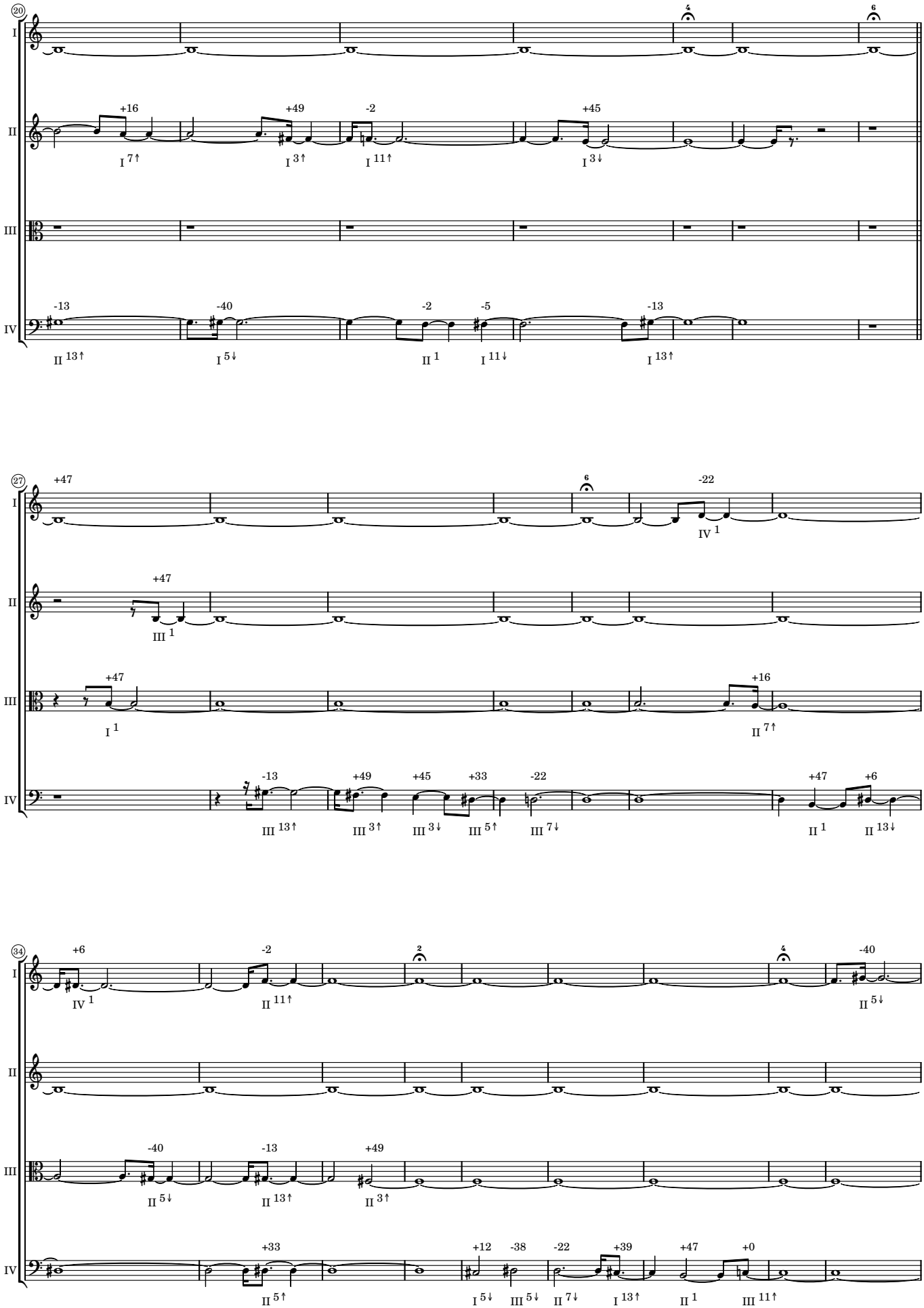
version generated: 2024.03.07

seeds and ledgers 1

for lucie nezri

michael winter
(berlin; 2023-24)

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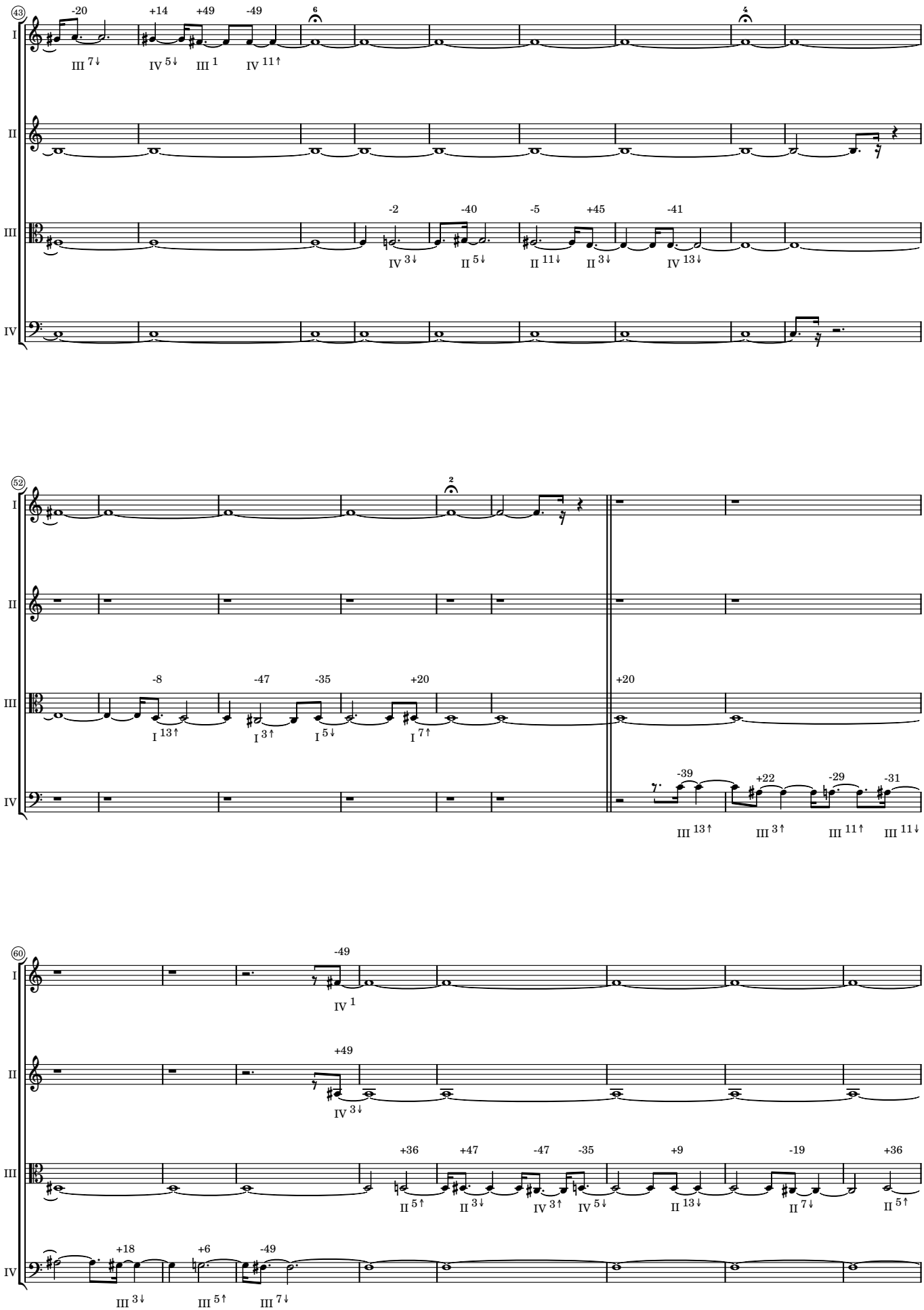
I
II
III
IV
+16
+49
-2
+45
-13
-40
-2
-5
-13
27
+47
-22
+47
+16
+47
-13
+49
+45
+33
-22
+47
+6
34
+6
-2
-40
-40
-13
+49
+33
+12
-38
-22
+39
+47
+0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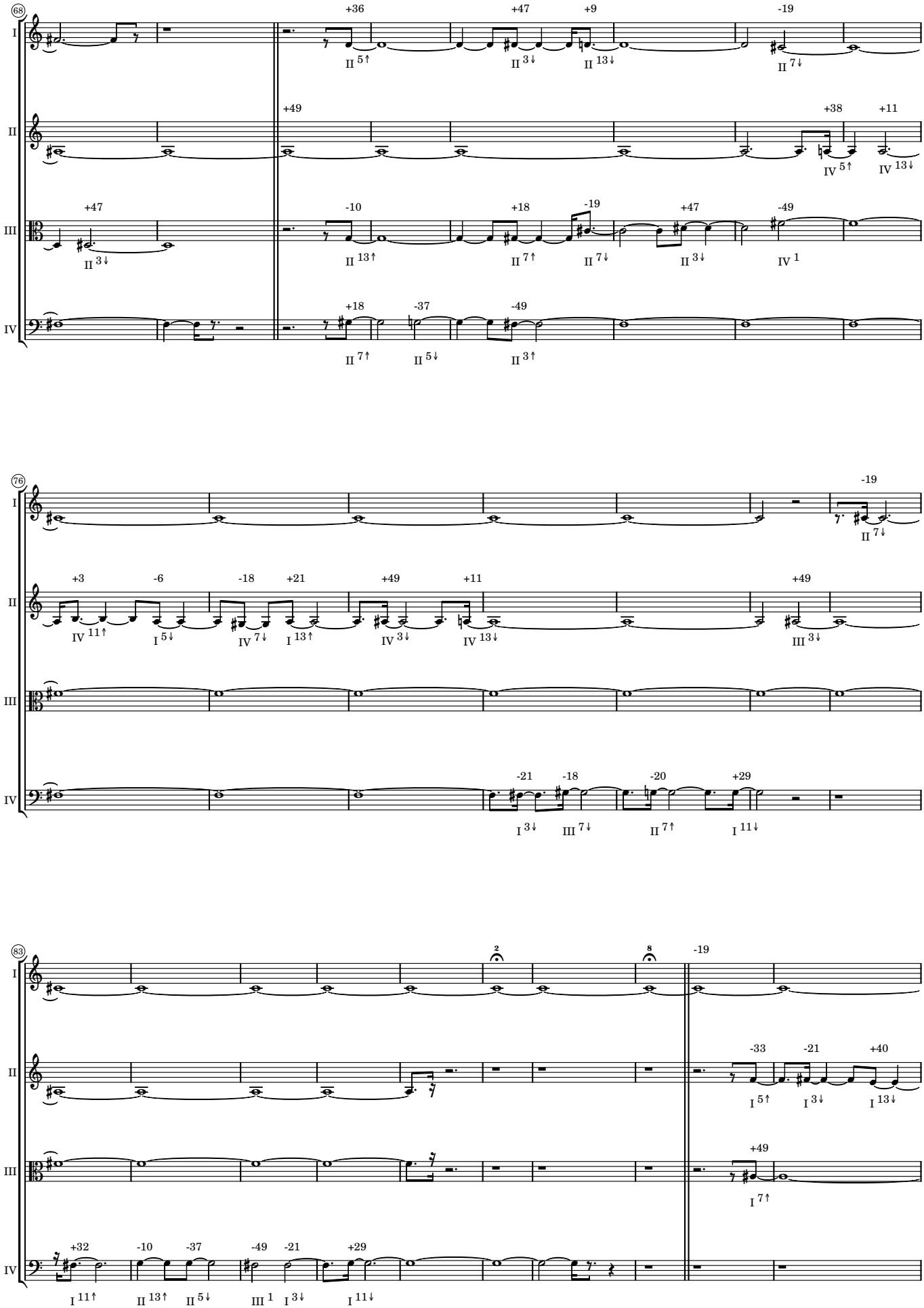
II
III
IV
-20
+14
+49
-49
6
4
III 7↓
IV 5↓
III 1
IV 11↑
-2
-40
-5
+45
-41
IV 3↓
II 5↓
II 11↓
II 3↓
IV 13↓
52
2
-8
-47
-35
+20
+20
I 13↑
I 3↑
I 5↓
I 7↑
-39
+22
-29
-31
III 13↑
III 3↑
III 11↑
III 11↓
60
-49
IV 1
+49
IV 3↓
+36
+47
-47
-35
+9
-19
+36
II 5↑
II 3↓
IV 3↑
IV 5↓
II 13↓
II 7↓
II 5↑
+18
+6
-49
III 3↓
III 5↑
III 7↓


68
I
II
III
IV
+36
+47
+9
-19
+49
+38
+11
+47
-10
+18
-19
+47
-49
+18
-37
-49
76
-19
+3
-6
-18
+21
+49
+11
+49
-21
-18
-20
+29
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8
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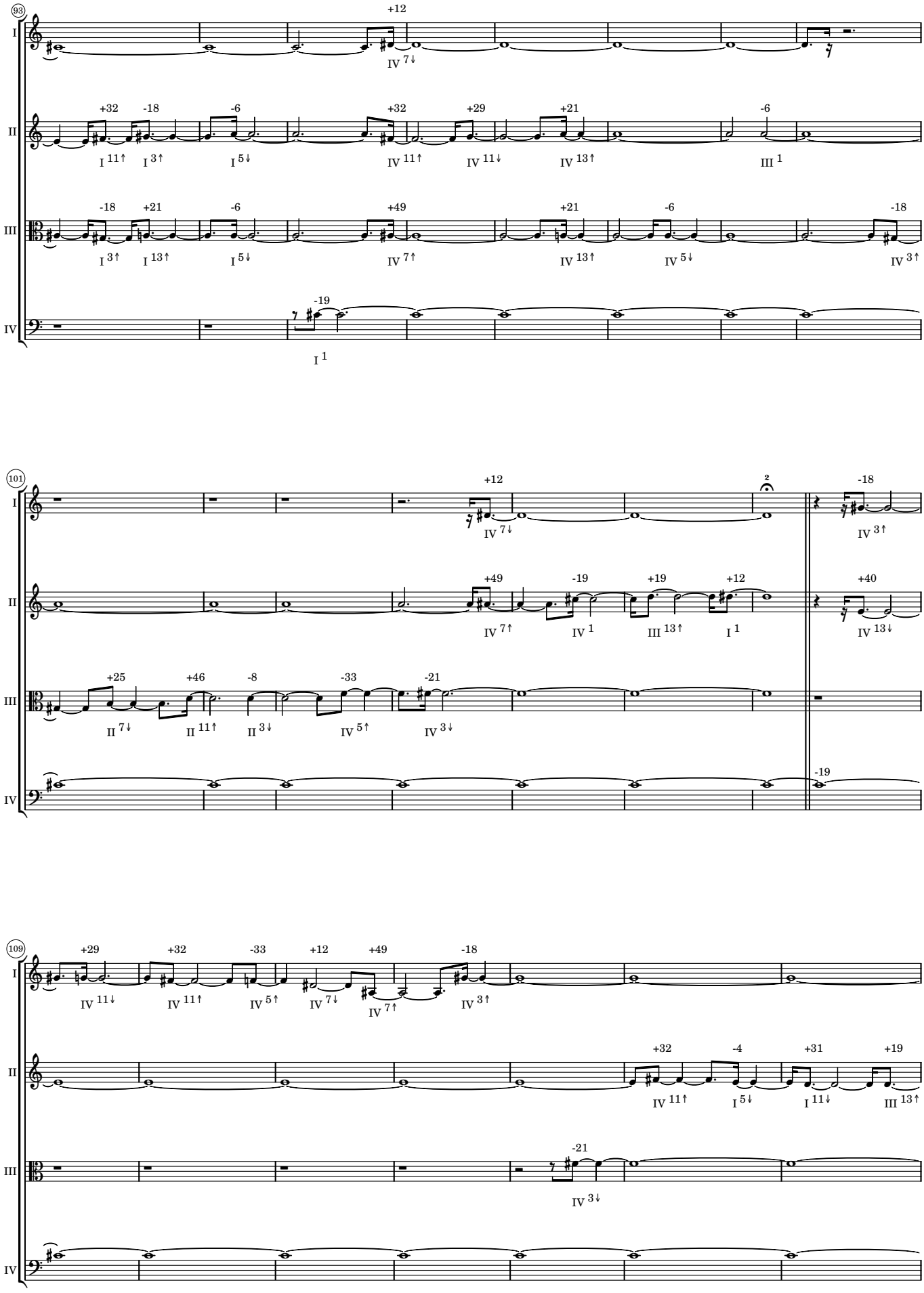
+40
+49
+32
-10
-37
-49
-21
+29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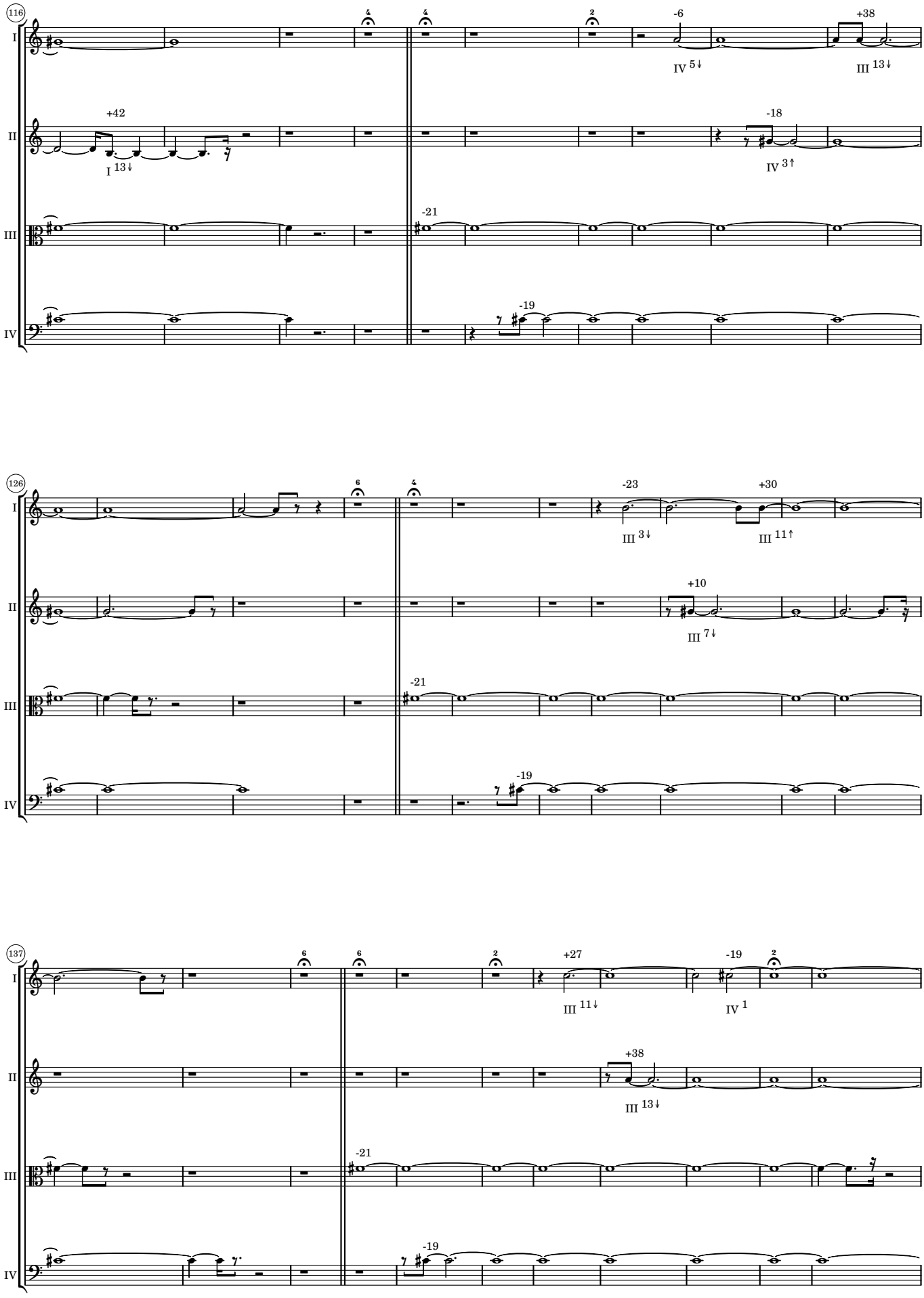
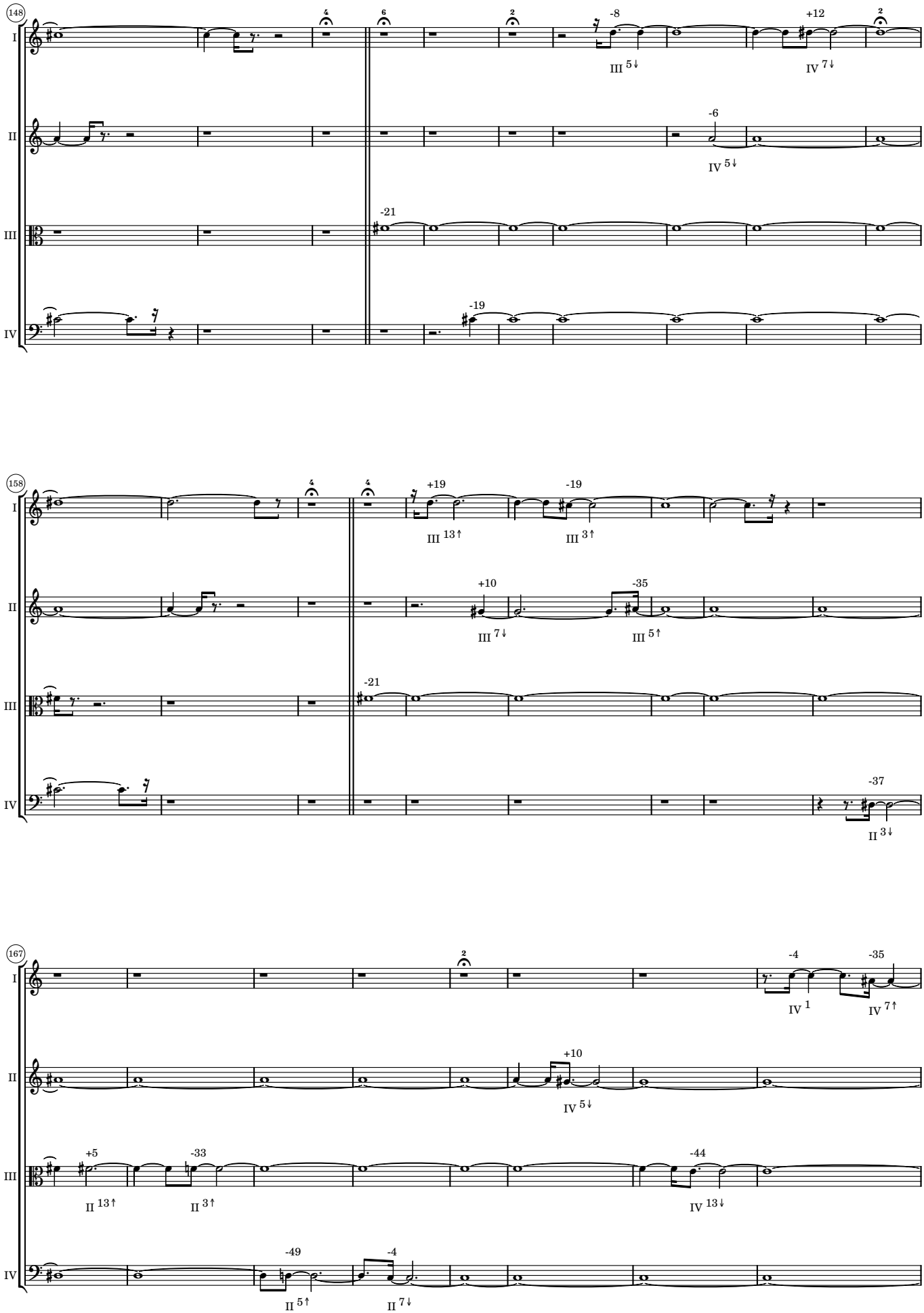
I
II
III
IV
+12
IV 7↓
+32
-18
-6
+32
+29
+21
-6
I 11↑
I 3↑
I 5↓
IV 11↑
IV 11↓
IV 13↑
III 1
-18
+21
-6
+49
+21
-6
-18
I 3↑
I 13↑
I 5↓
IV 7↑
IV 13↑
IV 5↓
IV 3↑
-19
I 1
101
+12
IV 7↓
-18
IV 3↑
+49
-19
+19
+12
+40
IV 7↑
IV 1
III 13↑
I 1
IV 13↓
+25
+46
-8
-33
-21
II 7↓
II 11↑
II 3↓
IV 5↑
IV 3↓
-19
109
+29
+32
-33
+12
+49
-18
IV 11↓
IV 11↑
IV 5↑
IV 7↓
IV 7↑
IV 3↑
+32
-4
+31
+19
IV 11↑
I 5↓
I 11↓
III 13↑
-21
IV 3↓


116
I
II
III
IV
+42
I 13↓
-6
IV 5↓
+38
III 13↓
-18
IV 3↑
-21
-19
126
-23
III 3↓
+30
III 11↑
+10
III 7↓
-21
-19
137
+27
III 11↓
-19
IV 1
+38
III 13↓
-21
-19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I
II
III
IV
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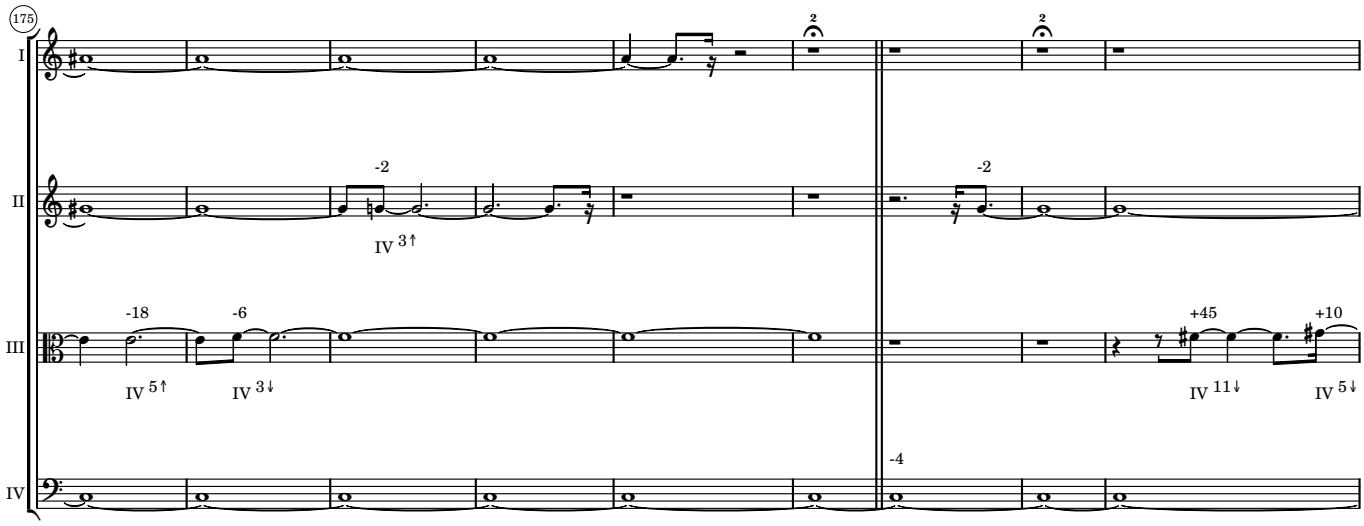
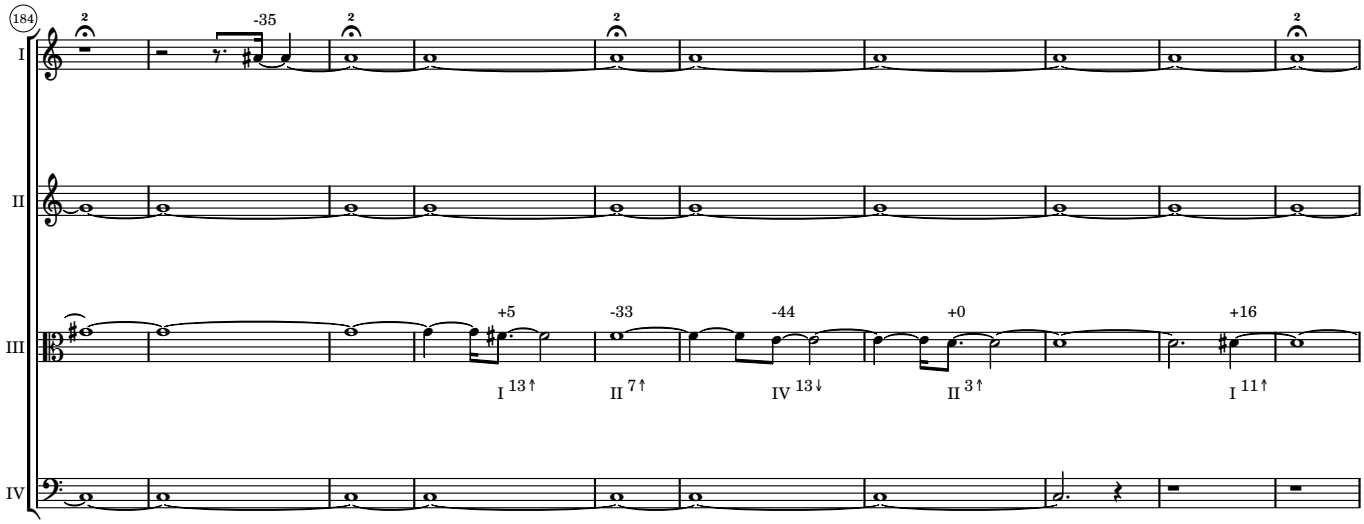
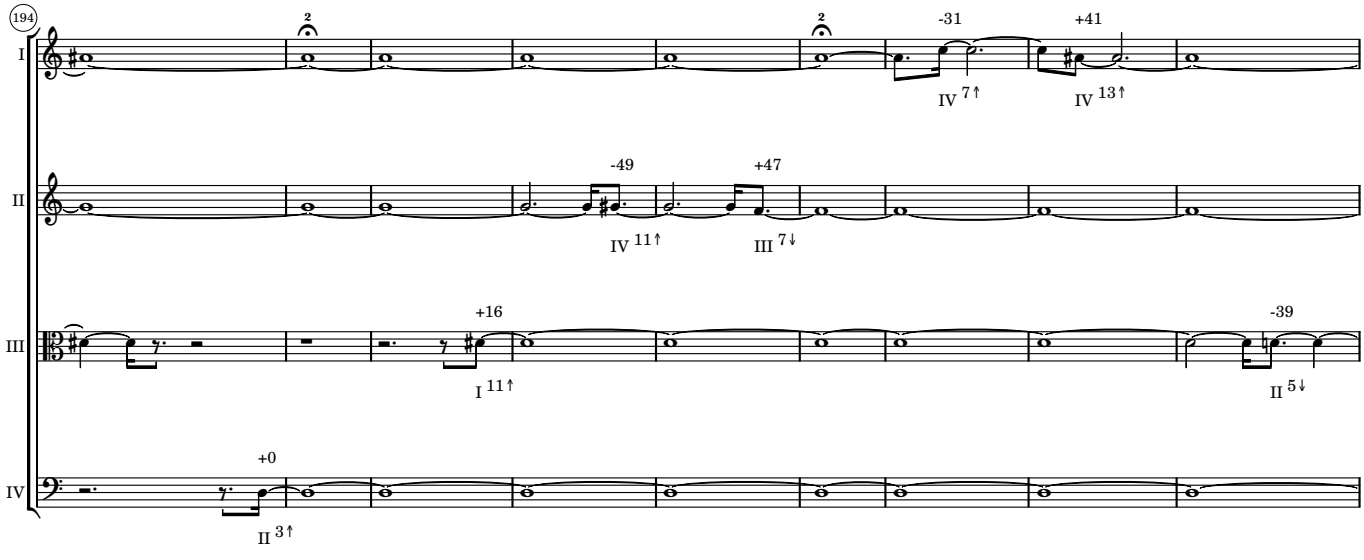
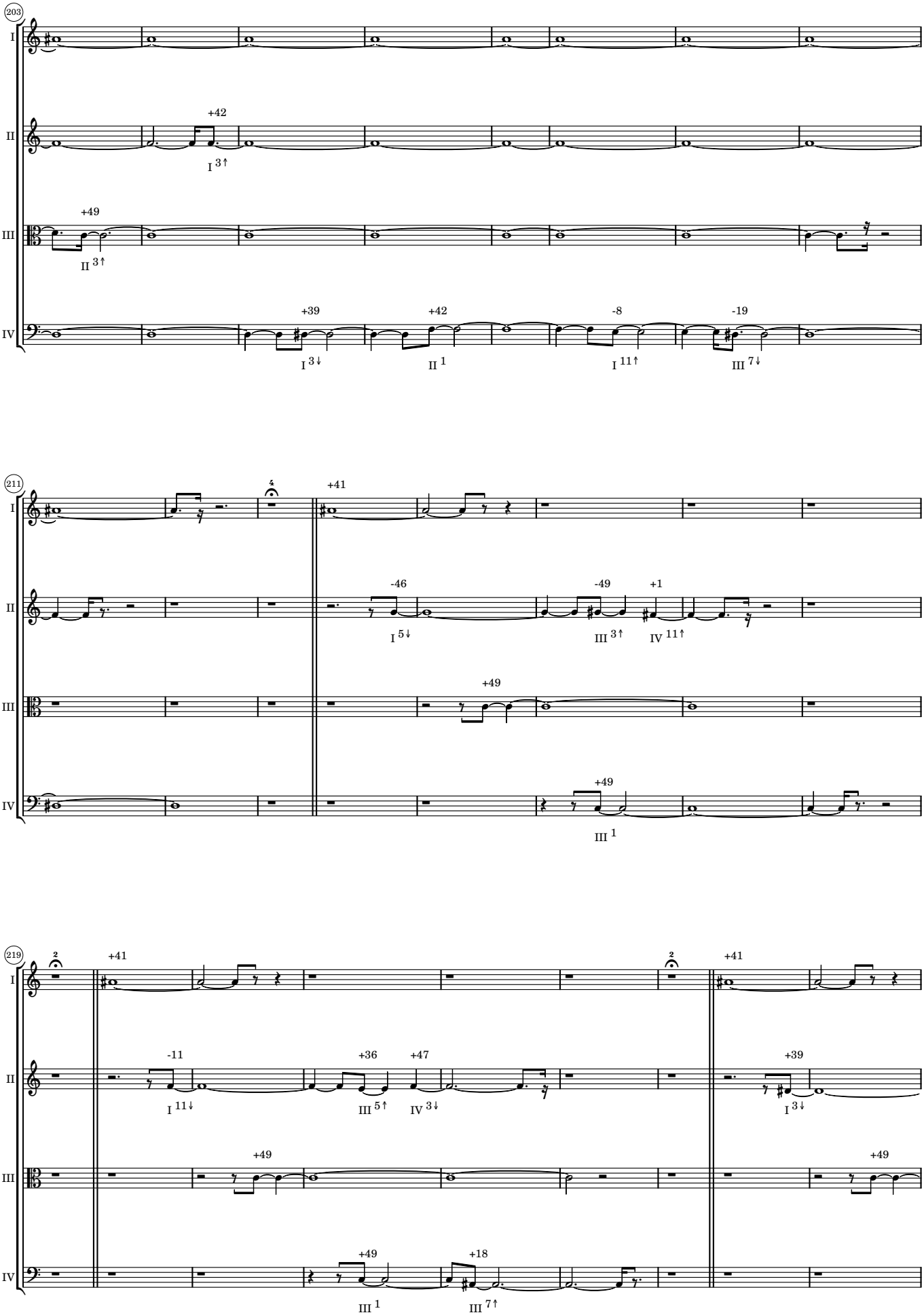
+12
IV 7↓
-6
IV 5↓
-21
-19
158
+19
III 13↑
-19
III 3↑
+10
III 7↓
-35
III 5↑
-21
-37
II 3↓
167
-4
IV 1
-35
IV 7↑
+10
IV 5↓
+5
II 13↑
-33
II 3↑
-44
IV 13↓
-49
II 5↑
-4
II 7↓


175
I
II
III
IV
-2
IV 3↑
-18
-6
IV 5↑
IV 3↓
-2
+45
+10
IV 11↓
IV 5↓
-4


184
I
II
III
IV
-35
+5
-33
-44
+0
+16
I 13↑
II 7↑
IV 13↓
II 3↑
I 11↑


194
I
II
III
IV
-31
+41
IV 7↑
IV 13↑
-49
+47
IV 11↑
III 7↓
+16
-39
I 11↑
II 5↓
+0
II 3↑


203
I
II
III
IV
+42
I 3↑
+49
II 3↑
+39
I 3↓
+42
II 1
-8
I 11↑
-19
III 7↓
211
4
+41
-46
I 5↓
-49
III 3↑
+1
IV 11↑
+49
III 1
219
2
+41
-11
I 11↓
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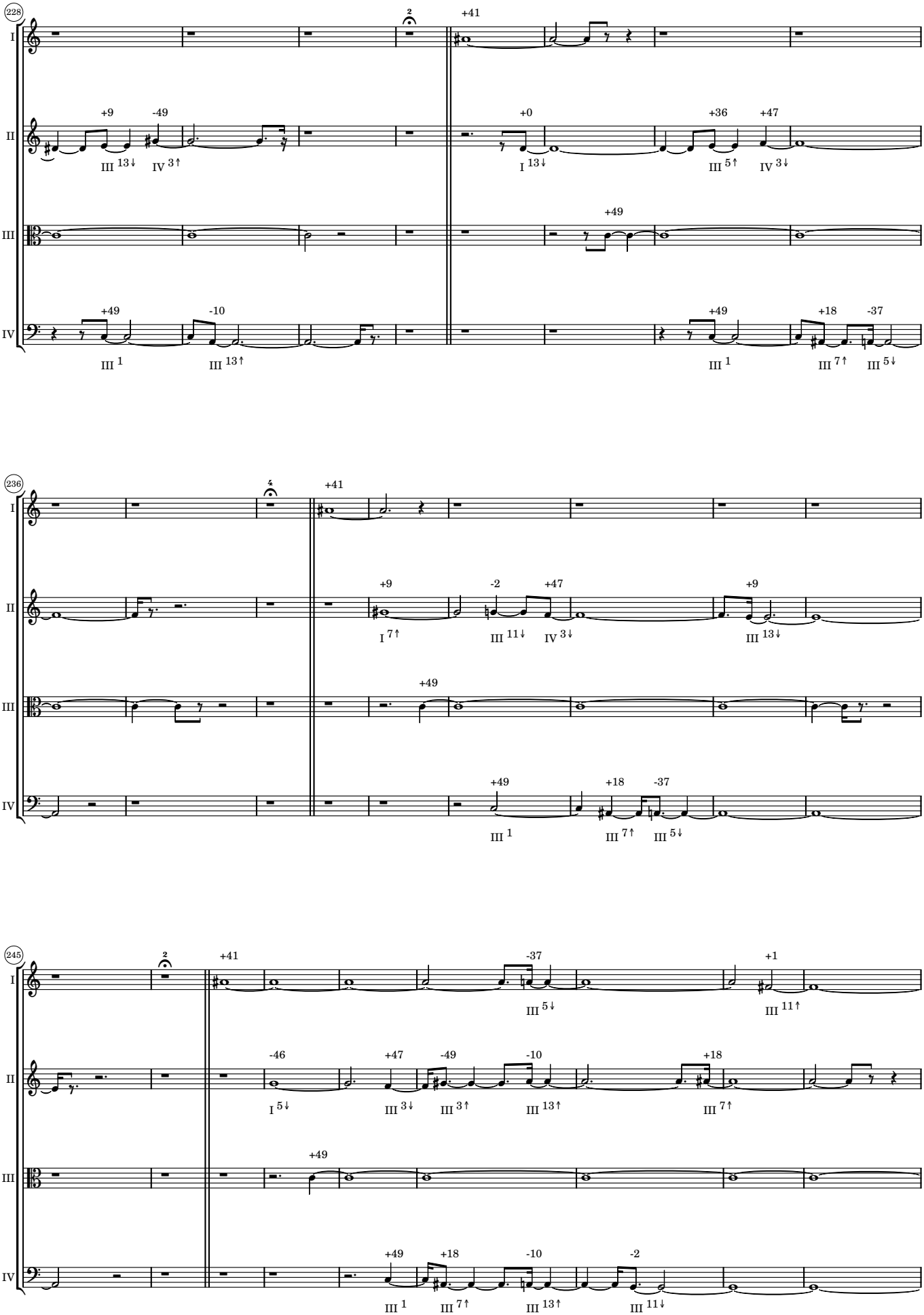
+49
+49
III 1
+18
III 7↑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III
IV
2
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+9
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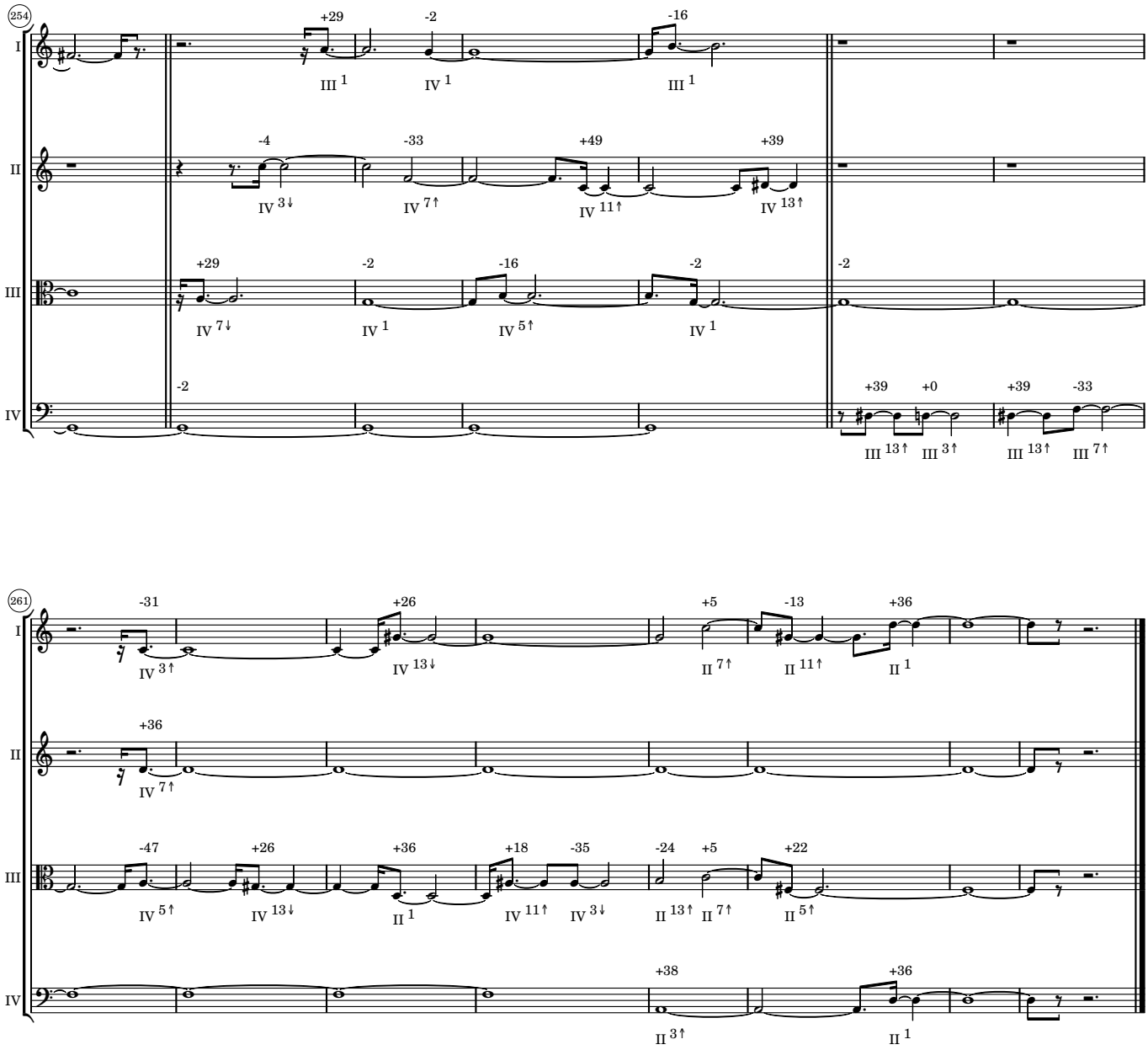
+0
+36
+47
+49
+49
-10
+49
+18
-37
III 13↓
IV 3↑
I 13↓
III 5↑
IV 3↓
III 1
III 13↑
III 1
III 7↑
III 5↓
236
4
+41
+9
-2
+47
+9
+49
+49
+18
-37
I 7↑
III 11↓
IV 3↓
III 13↓
III 1
III 7↑
III 5↓
245
2
+41
-37
+1
-46
+47
-49
-10
+18
+49
+49
+18
-10
-2
III 5↓
III 11↑
I 5↓
III 3↓
III 3↑
III 13↑
III 7↑
III 1
III 7↑
III 13↑
III 11↓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IV
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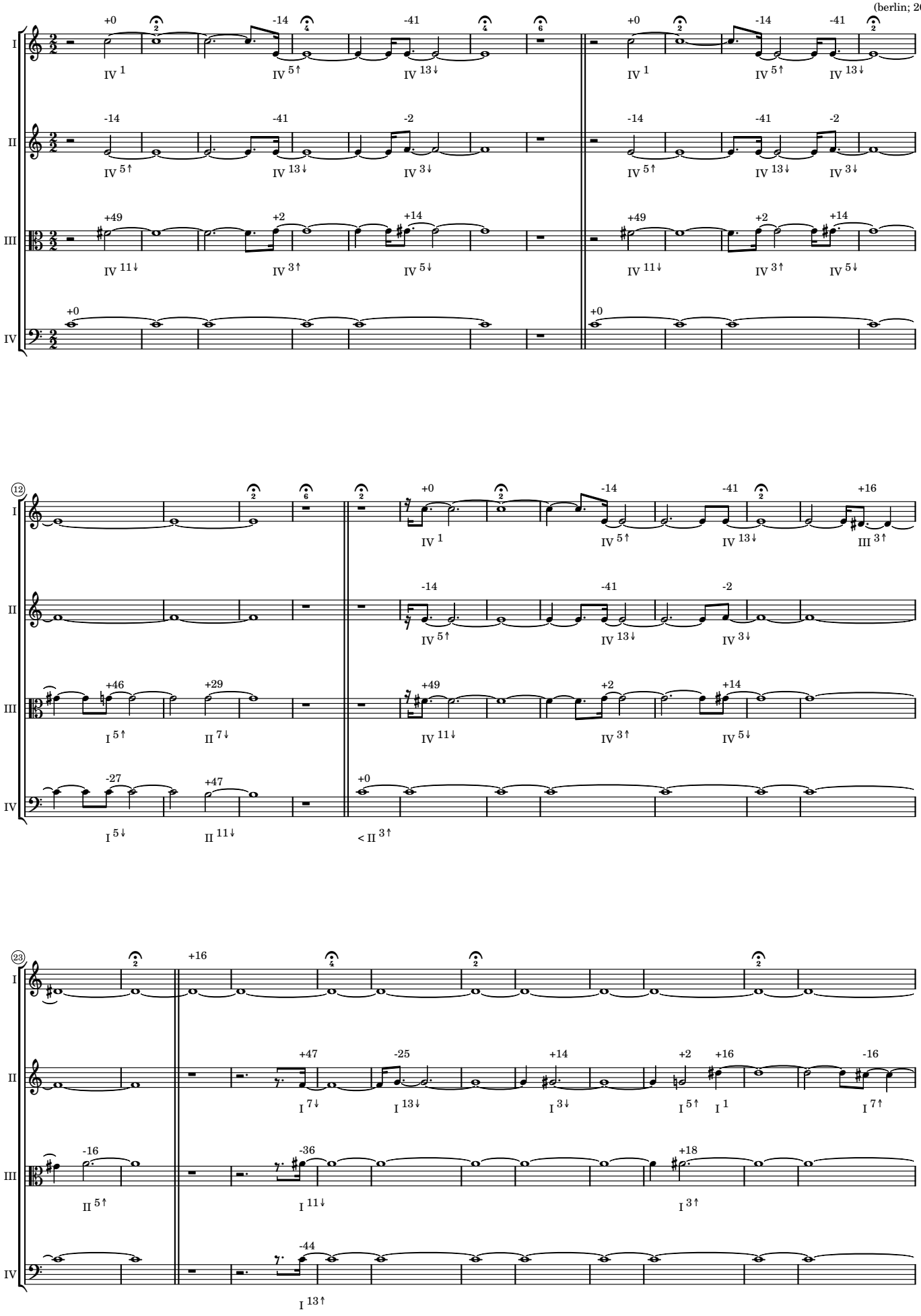
IV 1
III 1
-4
-33
+49
+39
IV 3↓
IV 7↑
IV 11↑
IV 13↑
+29
-2
-16
-2
-2
IV 7↓
IV 1
IV 5↑
IV 1
-2
+39
+0
+39
-33
III 13↑
III 3↑
III 13↑
III 7↑

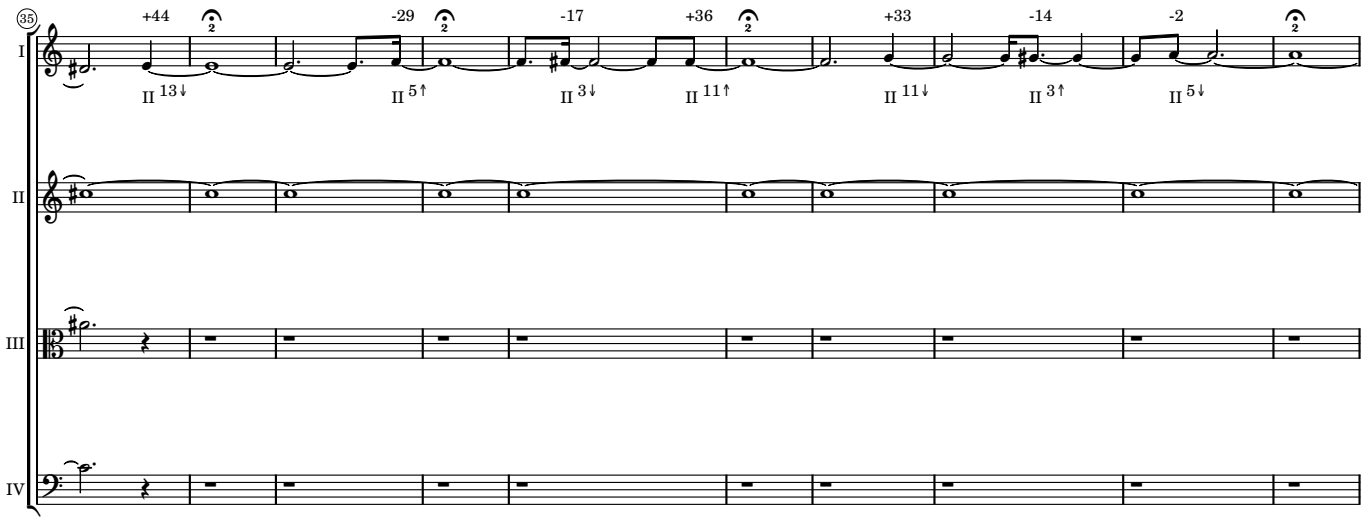
261
I
II
III
IV
-31
+26
+5
-13
+36
IV 3↑
IV 13↓
II 7↑
II 11↑
II 1
+36
IV 7↑
-47
+26
+36
+18
-35
-24
+5
+22
IV 5↑
IV 13↓
II 1
IV 11↑
IV 3↓
II 13↑
II 7↑
II 5↑
+38
+36
II 3↑
II 1

seeds and ledgers 2

for cat lamb

michael winter
(berlin; 2023)

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I
II
III
IV
+44
-29
-17
+36
+33
-14
-2
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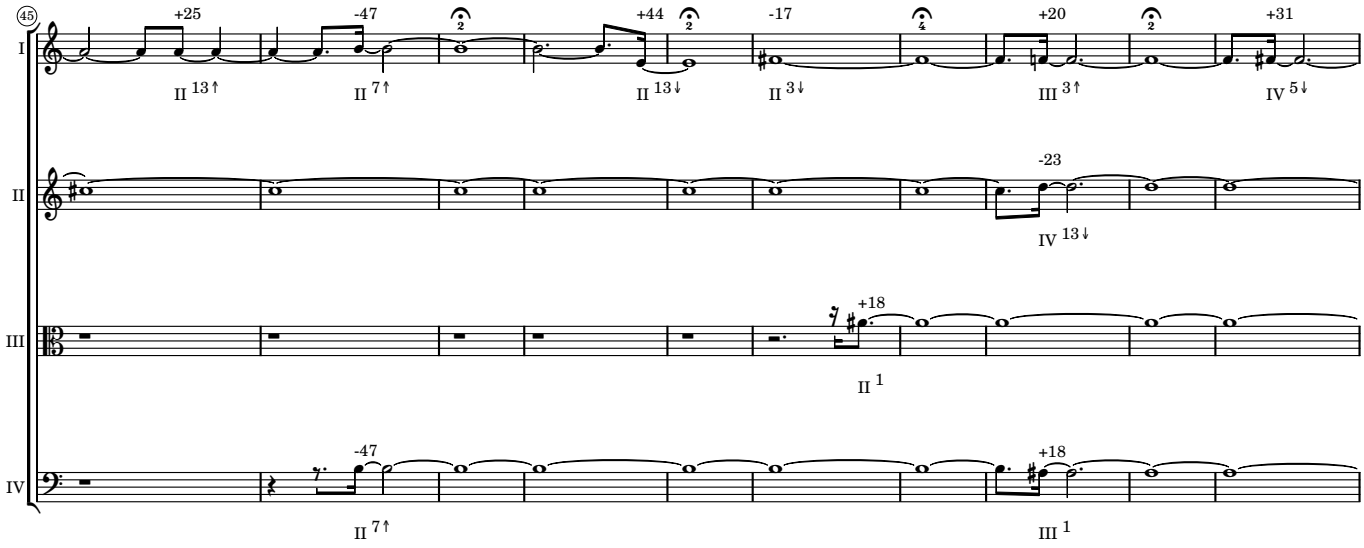
II 5↑
II 3↓
II 11↑
II 11↓
II 3↑
II 5↓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I
II
III
IV
+25
-47
+44
-17
+20
+31
-23
+18
-47
+18
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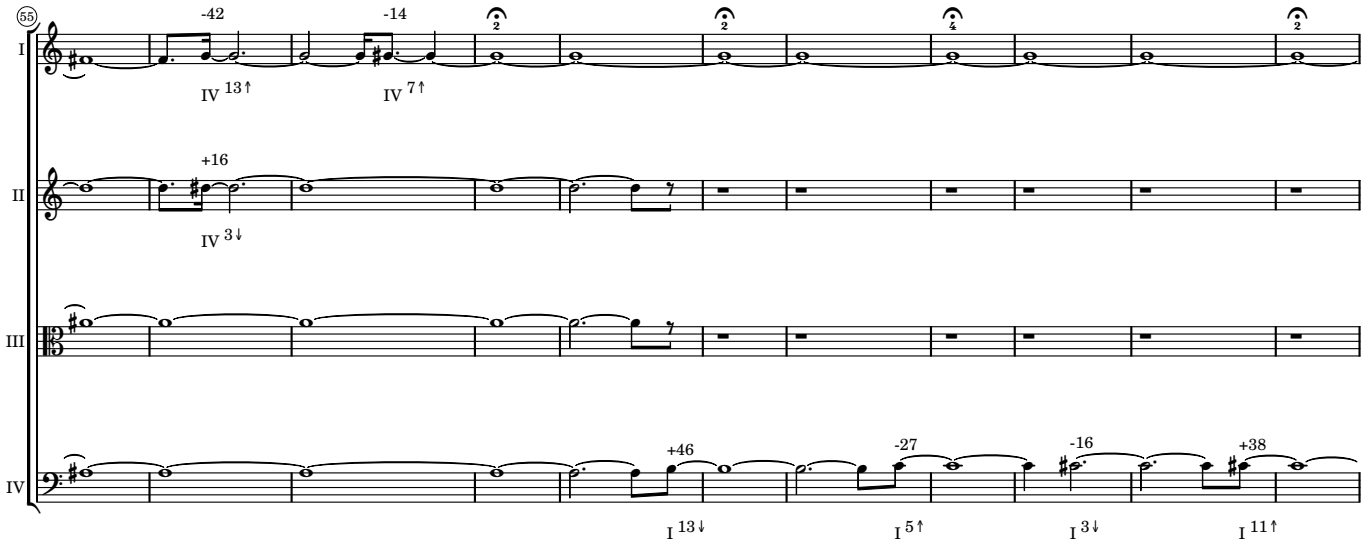
II 7↑
II 13↓
II 3↓
III 3↑
IV 5↓
IV 13↓
II 1
II 7↑
III 1


55
I
II
III
IV
-42
-14
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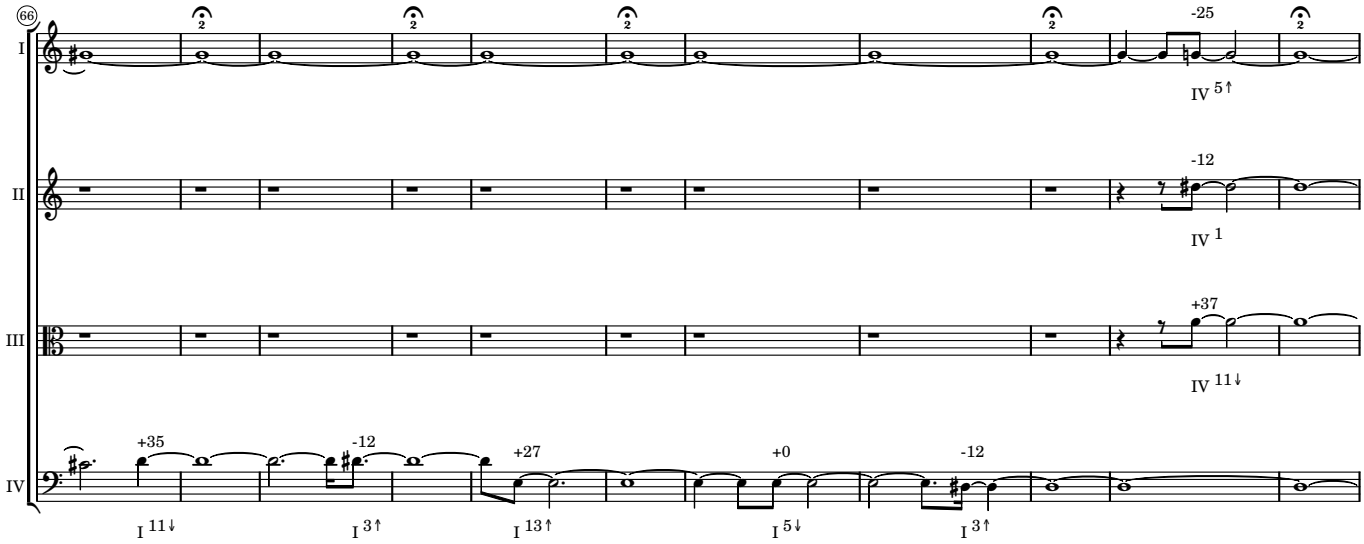
+46
-27
-16
+38
IV 13↑
IV 7↑
IV 3↓
I 13↓
I 5↑
I 3↓
I 11↑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II
III
IV
-25
IV 5↑
-12
IV 1
+37
IV 11↓
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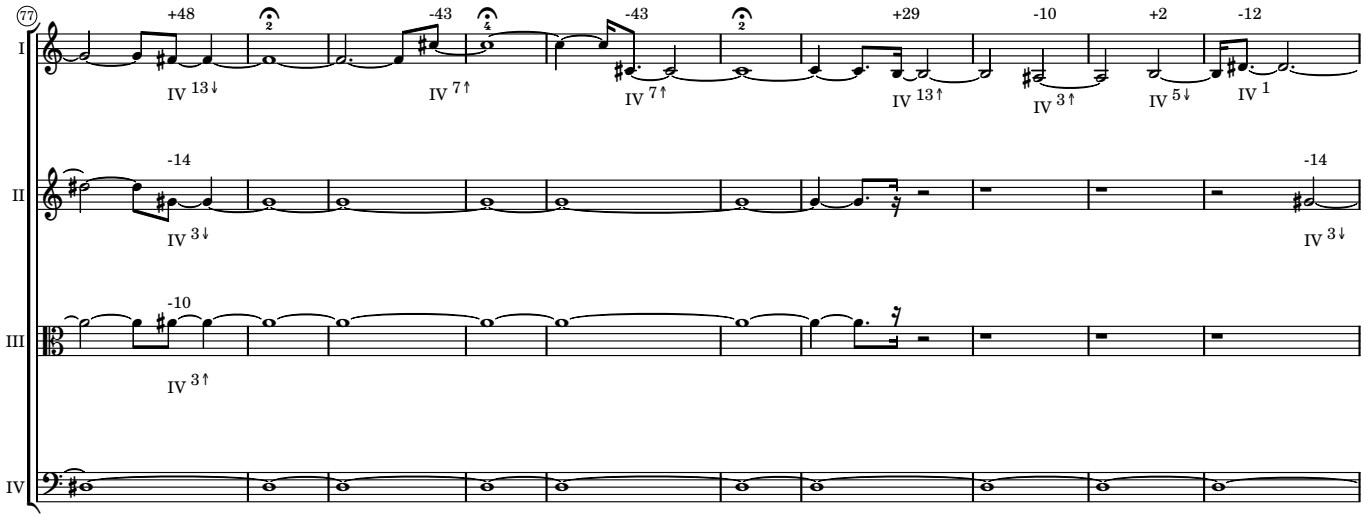
I 11↓
-12
I 3↑
+27
I 13↑
+0
I 5↓
-12
I 3↑


77
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III
IV
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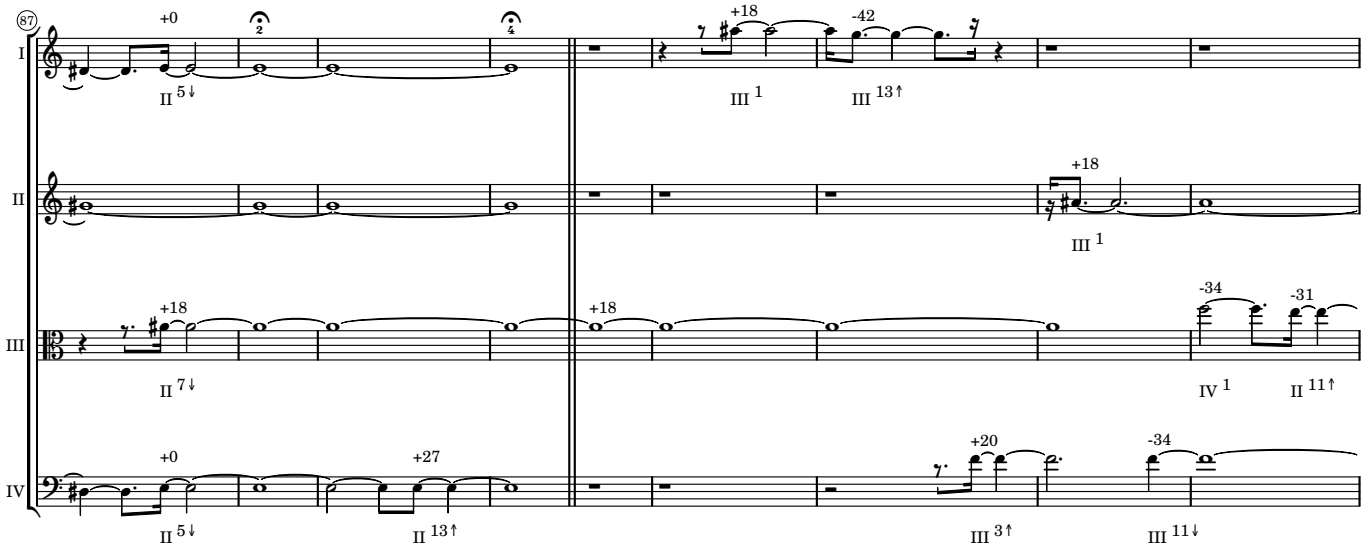
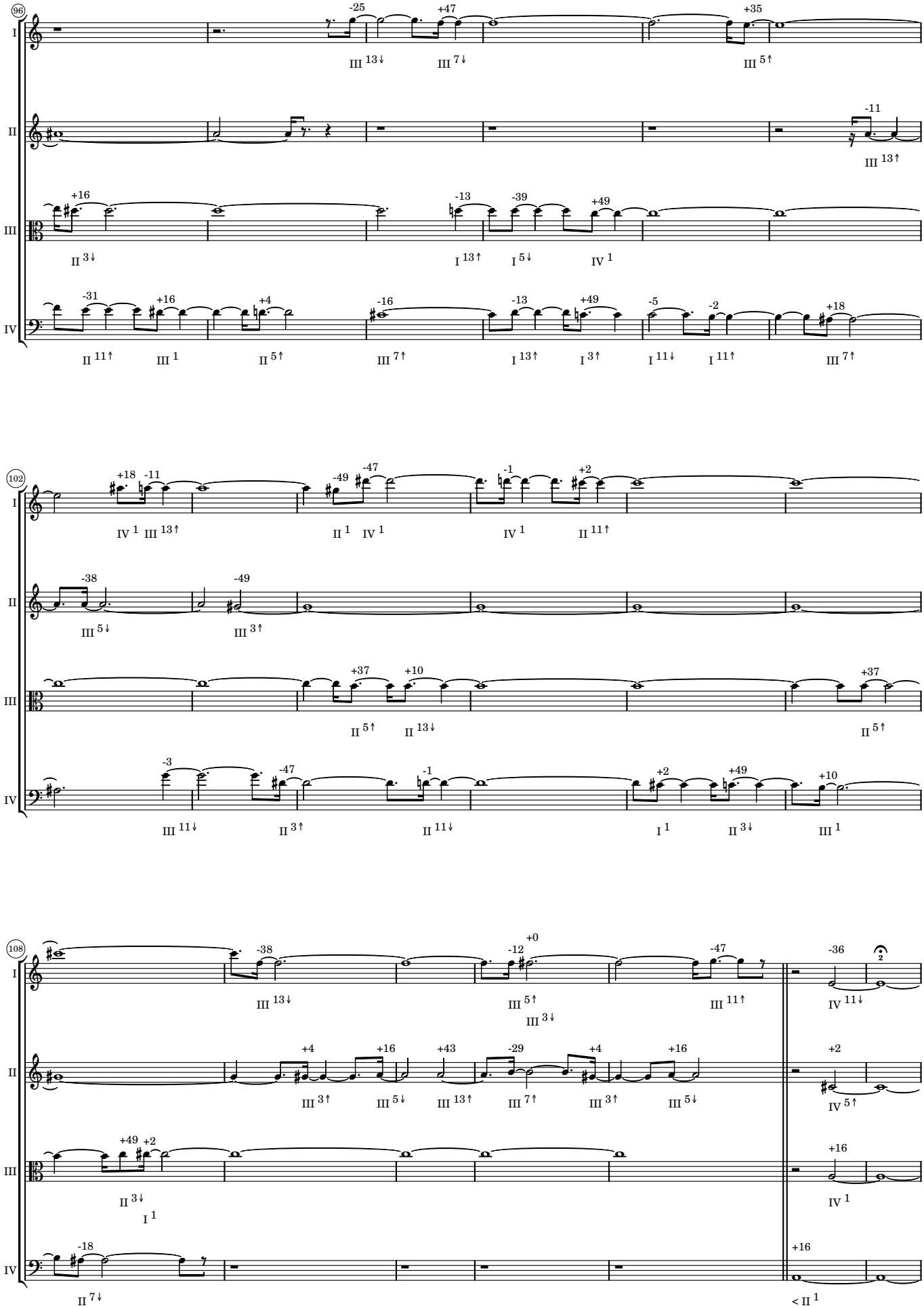
IV 13↓
-43
IV 7↑
-43
IV 7↑
+29
IV 13↑
-10
IV 3↑
+2
IV 5↓
-12
IV 1
-14
IV 3↓
-14
IV 3↓
-10
IV 3↑


87
I
II
III
IV
+0
II 5↓
+18
III 1
-42
III 13↑
+18
III 1
+18
II 7↓
+18
-34
-31
IV 1
II 11↑
+0
II 5↓
+27
II 13↑
+20
III 3↑
-34
III 11↓


96
I
II
III
IV
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-11
+16
-13
-39
+49
-31
+16
+4
-16
-13
+49
-5
-2
+18
102
+18
-11
-49
-47
-1
+2
-38
-49
+37
+10
+37
-3
-47
-1
+2
+49
+10
108
-38
+0
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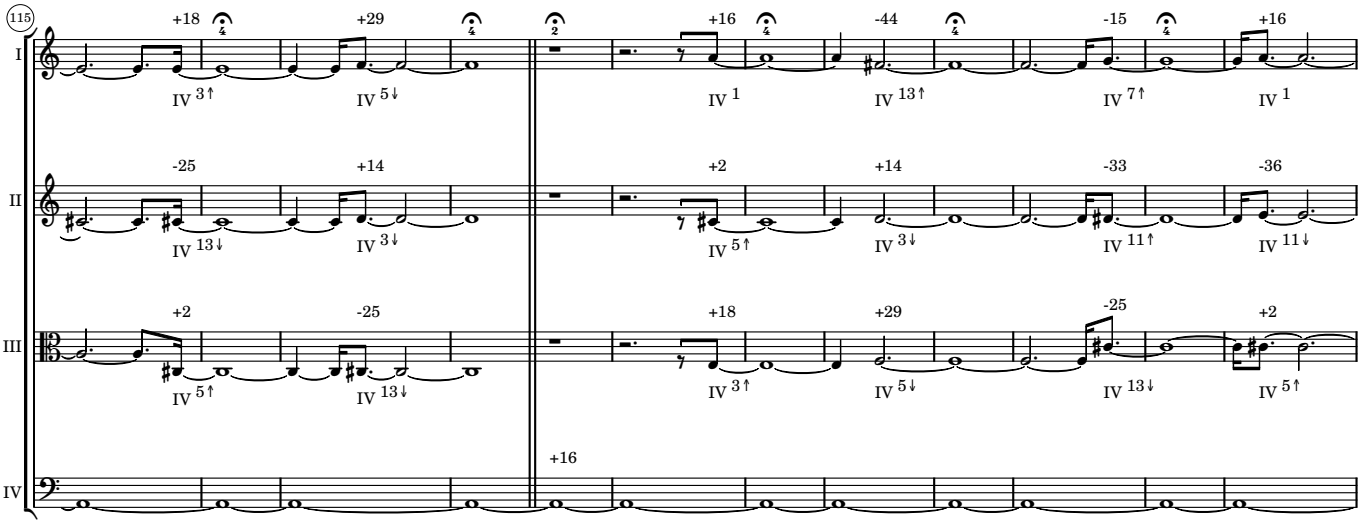
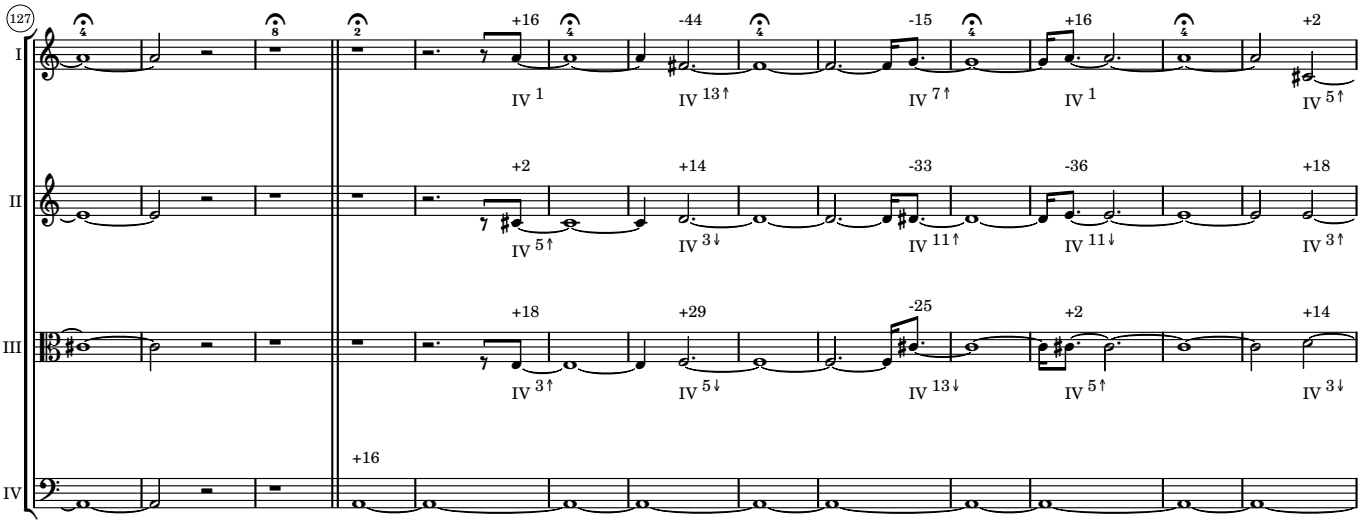
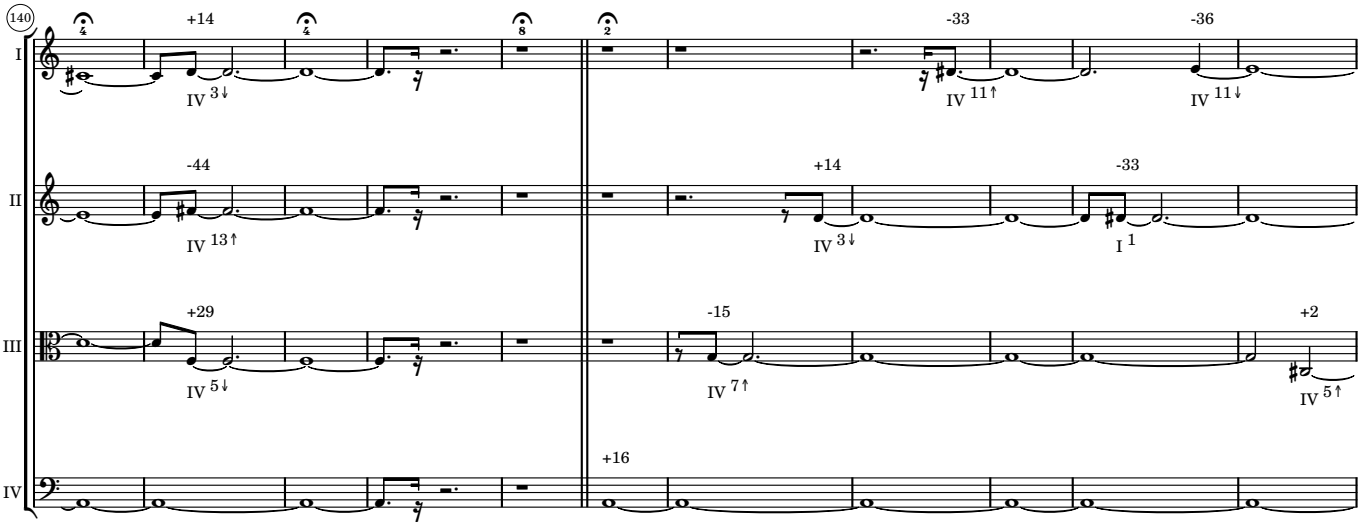
+16
+2
+49
+2
+16
-18
+16


115
I
II
III
IV
+18
+29
+16
-44
-15
+16
IV 3↑
IV 5↓
IV 1
IV 13↑
IV 7↑
IV 1
-25
+14
+2
+14
-33
-36
IV 13↓
IV 3↓
IV 5↑
IV 3↓
IV 11↑
IV 11↓
+2
-25
+18
+29
-25
+2
IV 5↑
IV 13↓
IV 3↑
IV 5↓
IV 13↓
IV 5↑
+16


127
I
II
III
IV
+16
-44
-15
+16
+2
IV 1
IV 13↑
IV 7↑
IV 1
IV 5↑
+2
+14
-33
-36
+18
IV 5↑
IV 3↓
IV 11↑
IV 11↓
IV 3↑
+18
+29
-25
+2
+14
IV 3↑
IV 5↓
IV 13↓
IV 5↑
IV 3↓
+16


140
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II
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-33
-36
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IV 11↑
IV 11↓
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I 1
+29
-15
+2
IV 5↓
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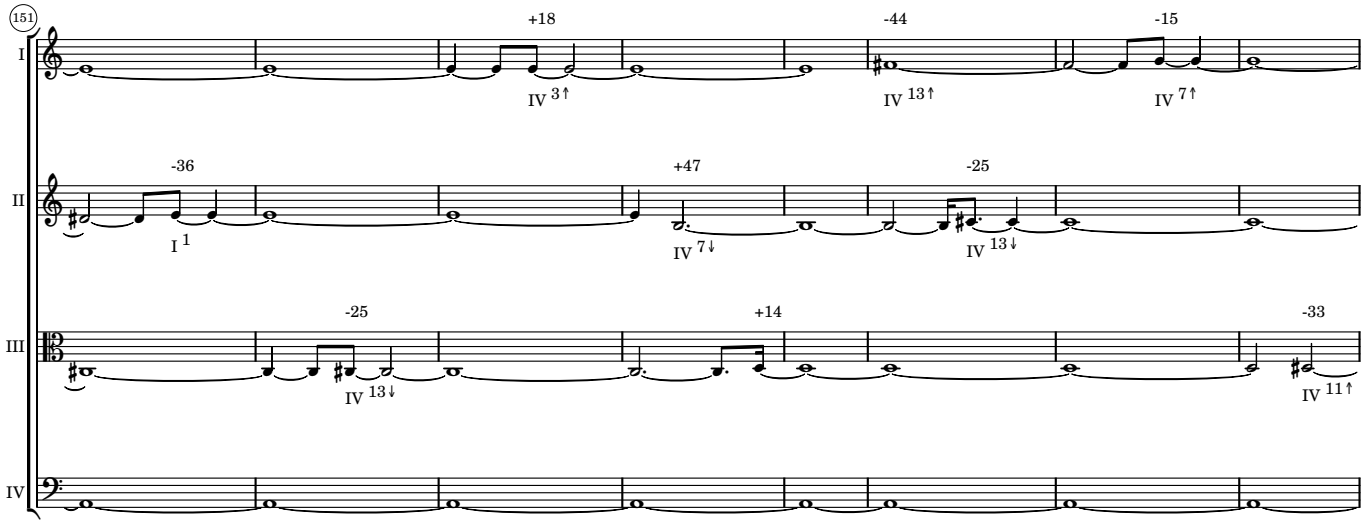
+16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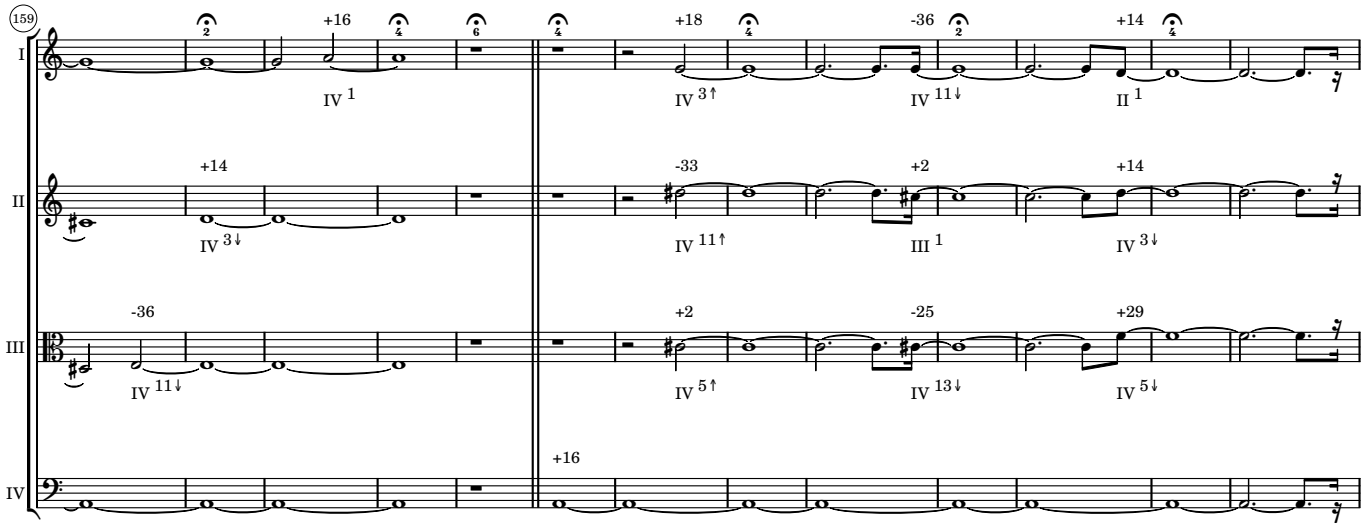
-25
IV 13↓
-25
IV 13↓
+14
-33
IV 11↑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IV 11↓
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-33
IV 11↑
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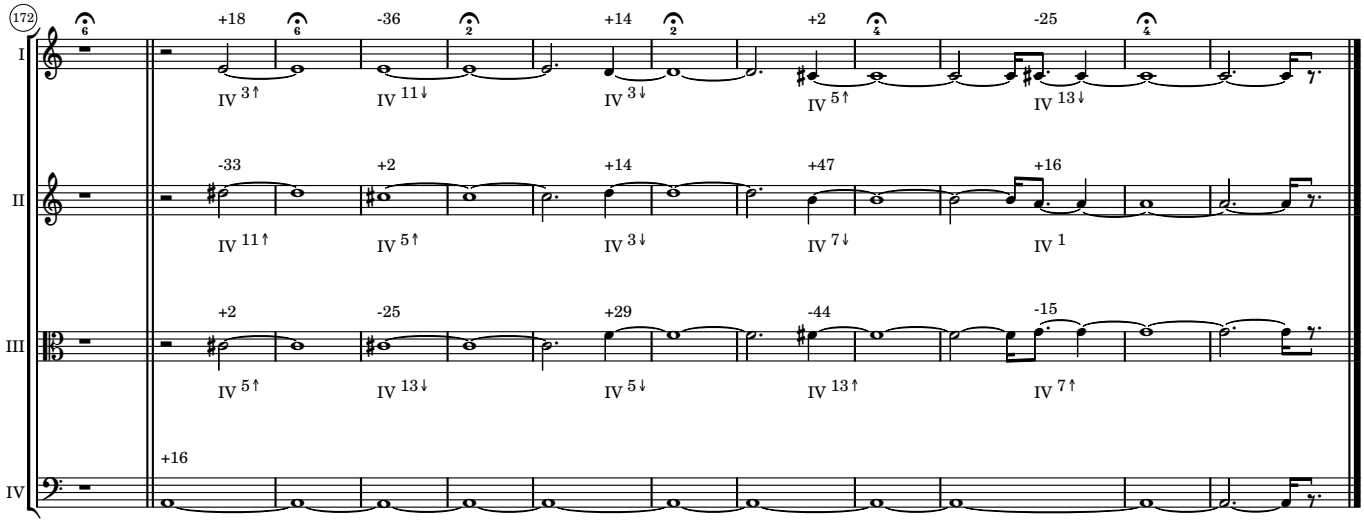
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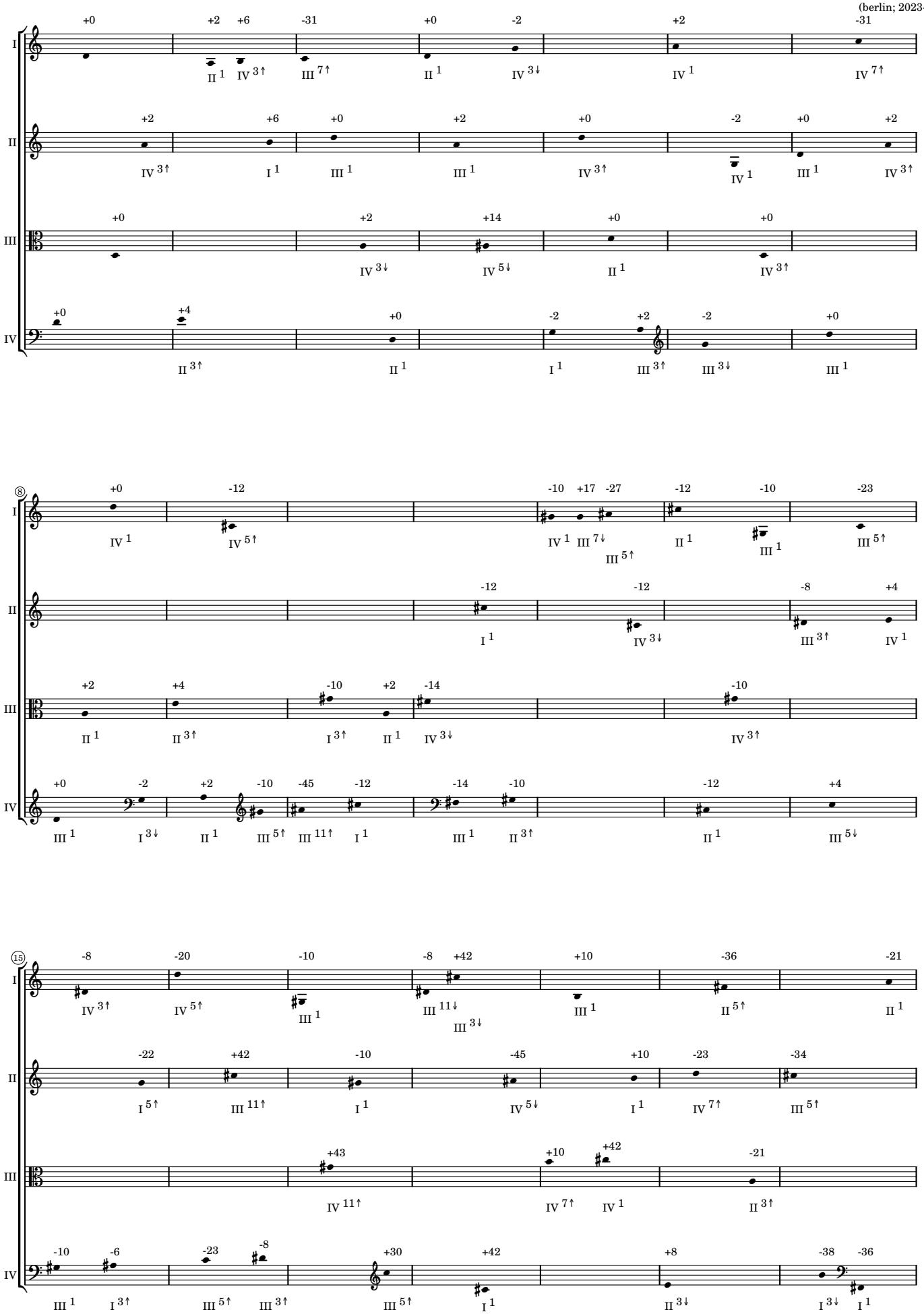
IV 11↑
+2
IV 5↑
+14
IV 3↓
+47
IV 7↓
+16
IV 1
+2
IV 5↑
-25
IV 13↓
+29
IV 5↓
-44
IV 13↑
-15
IV 7↑
+16

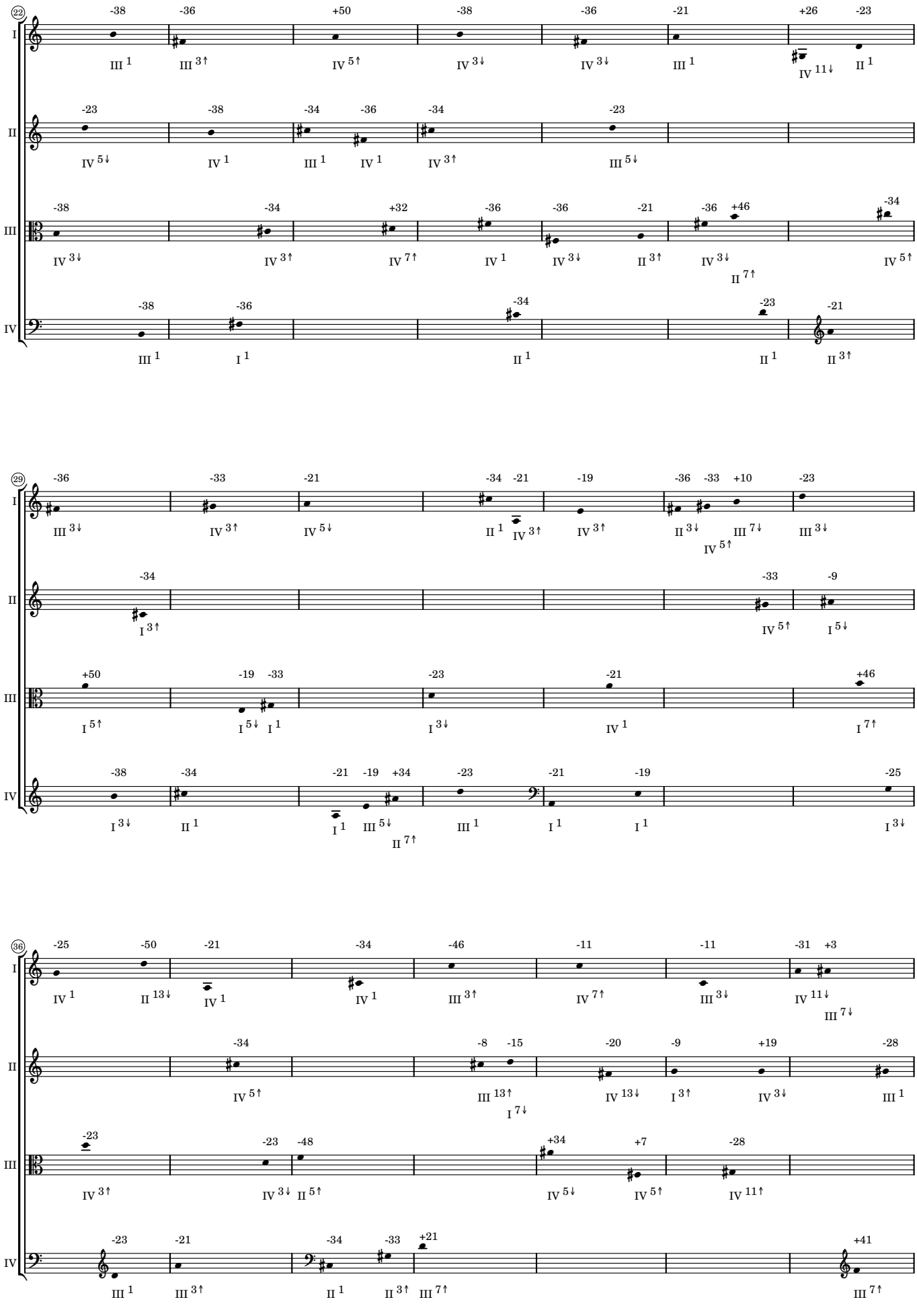
seeds and ledgers 3

for irasema fernandez

michael winter

(berlin; 2023-24)

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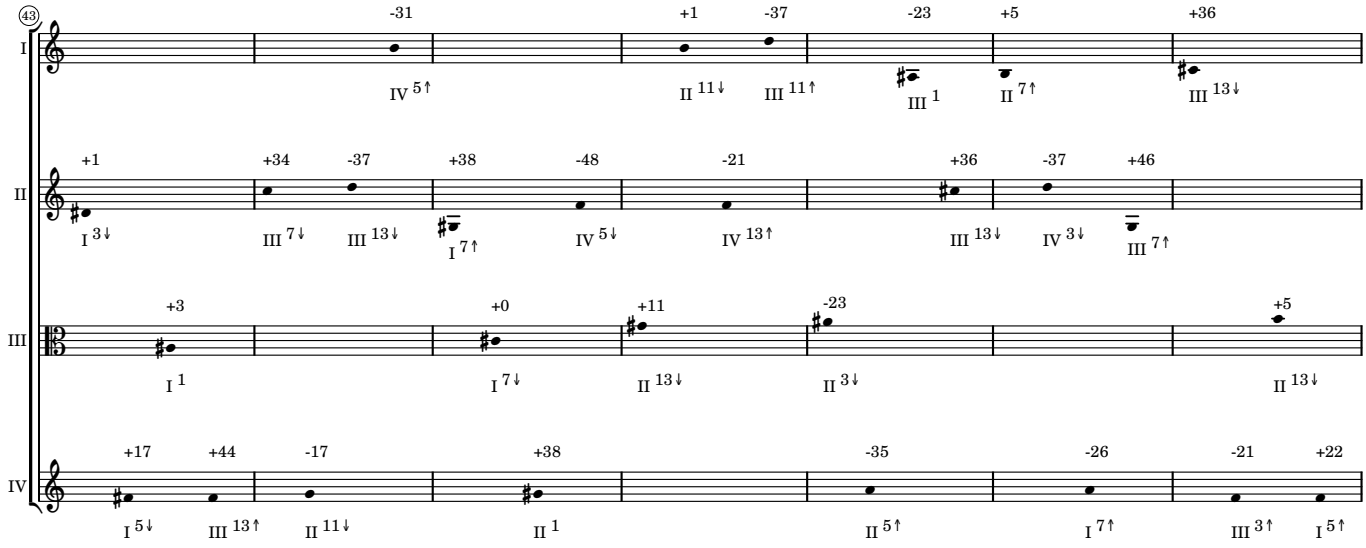
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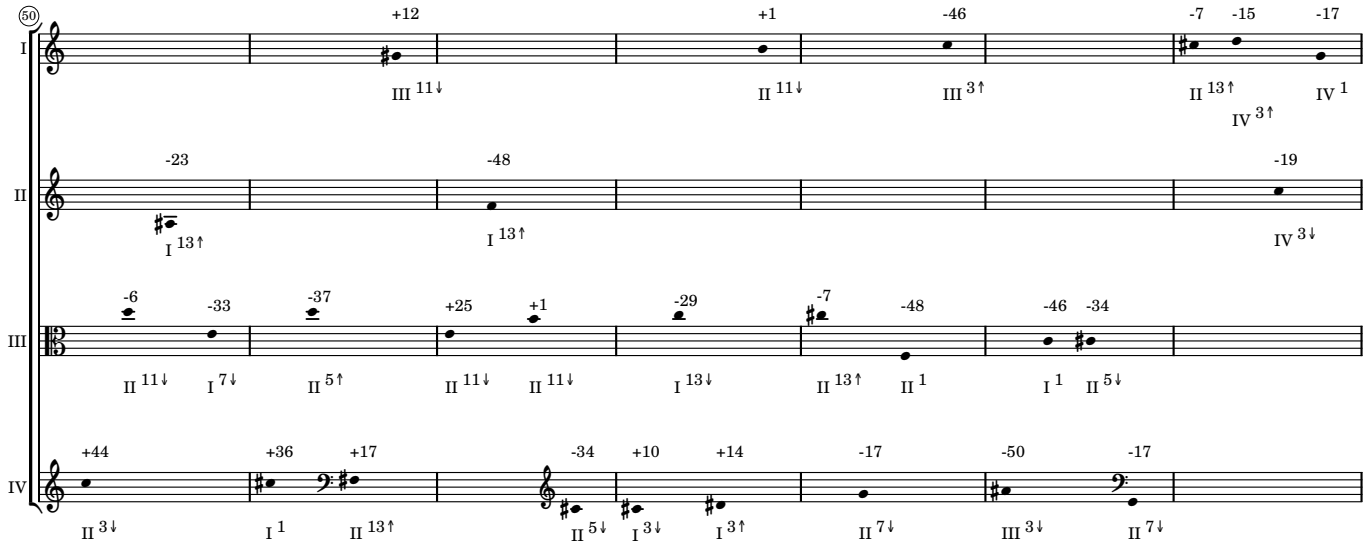
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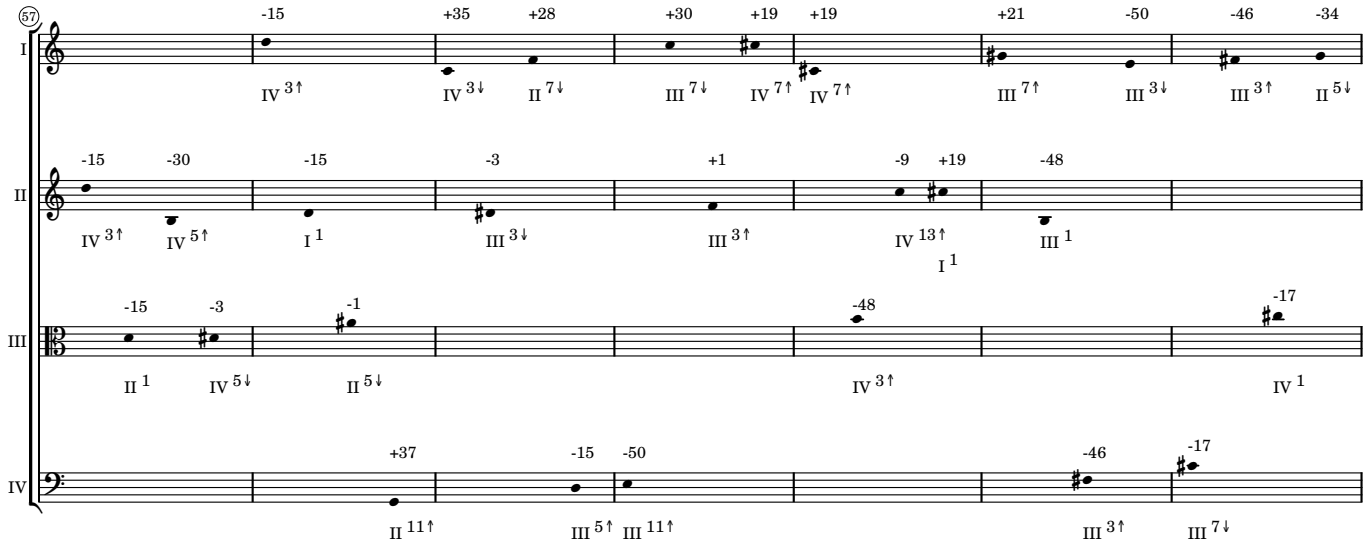
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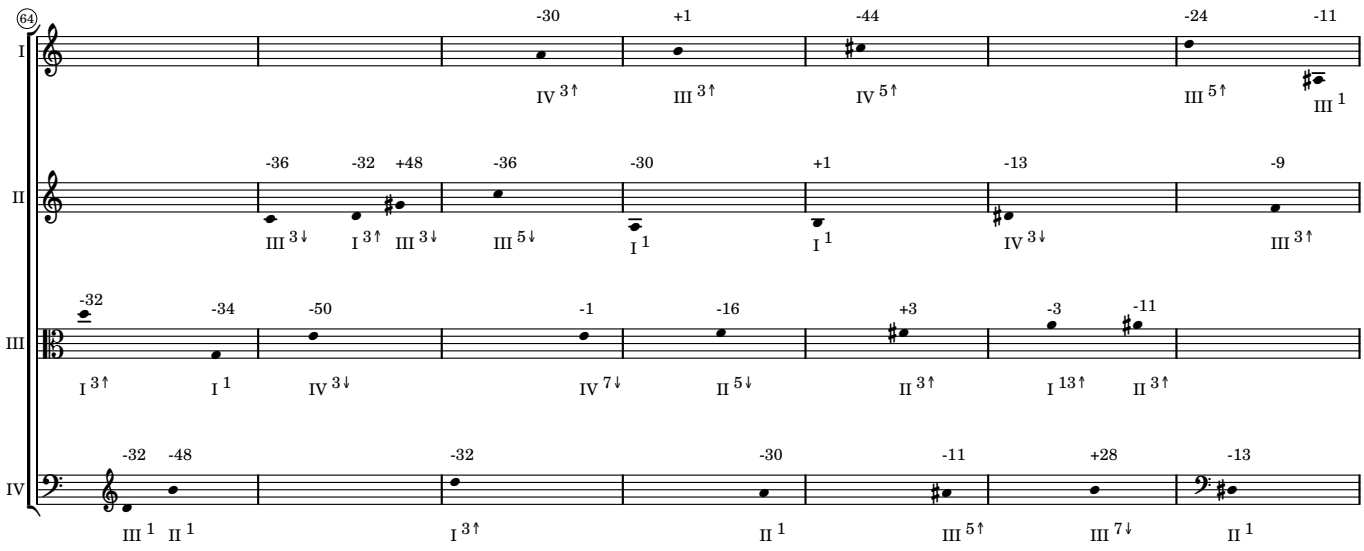
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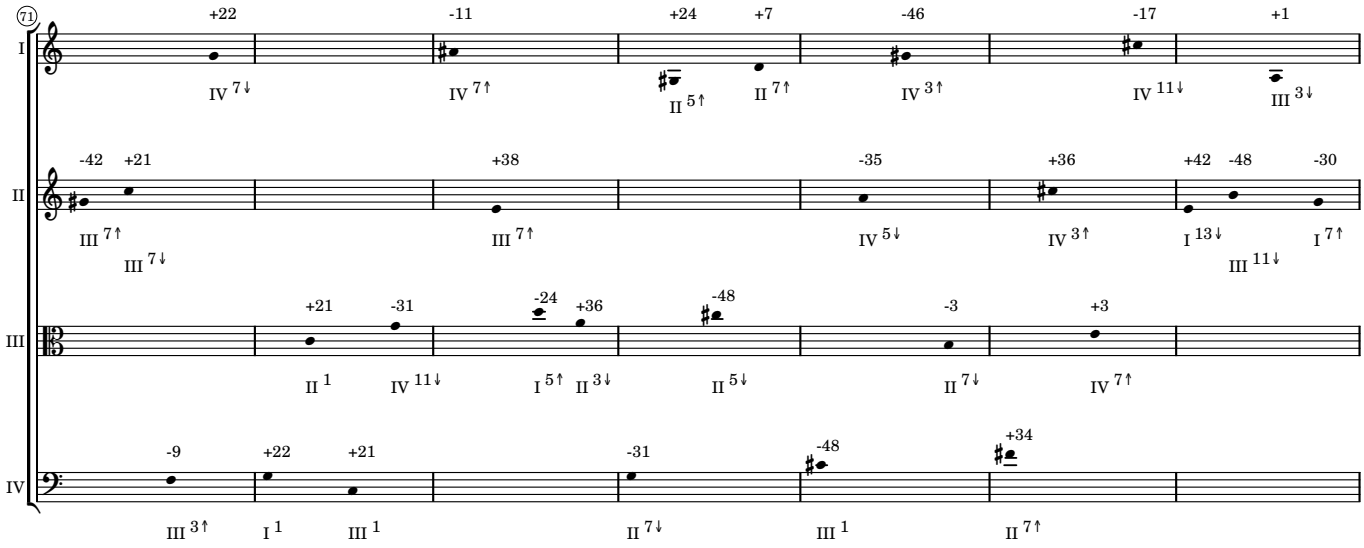
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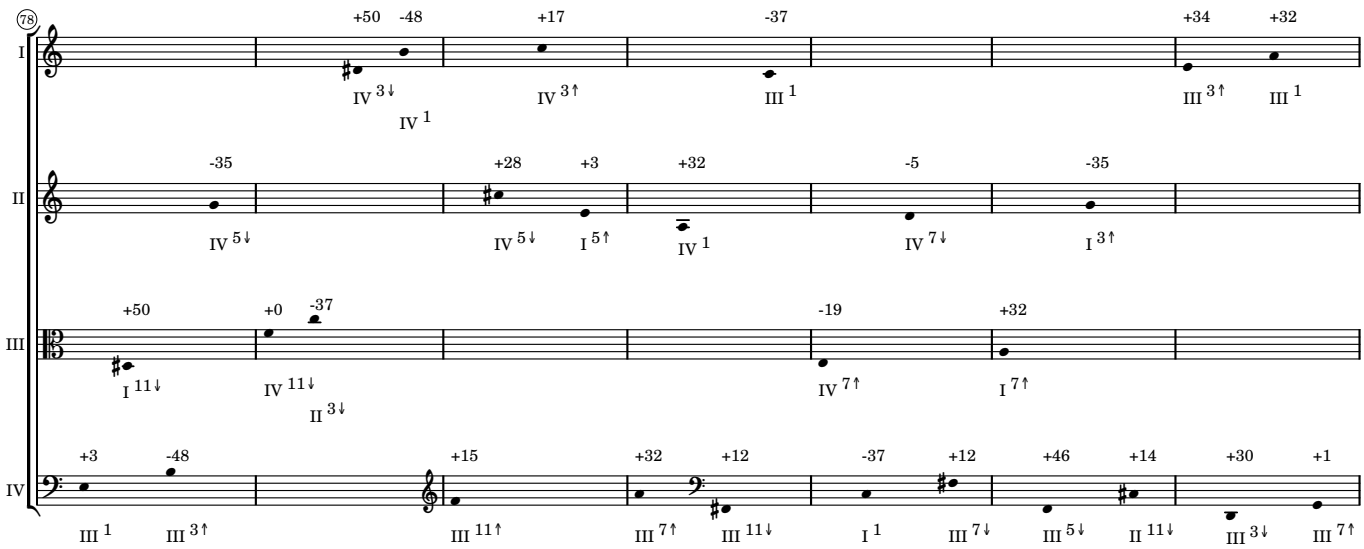
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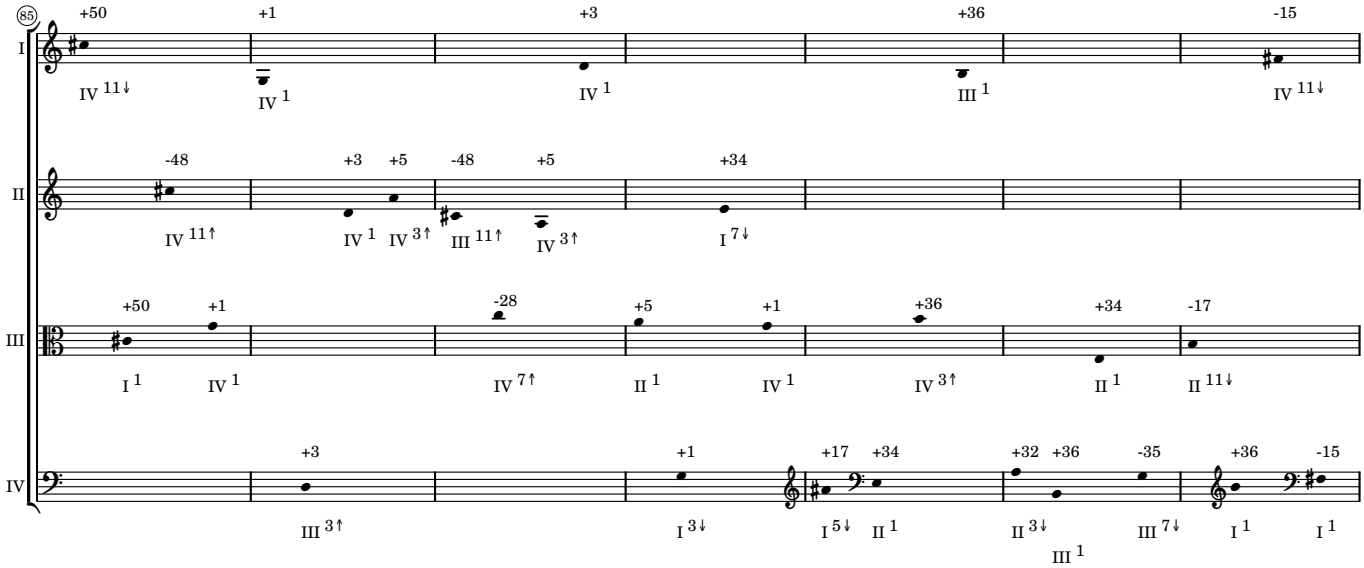
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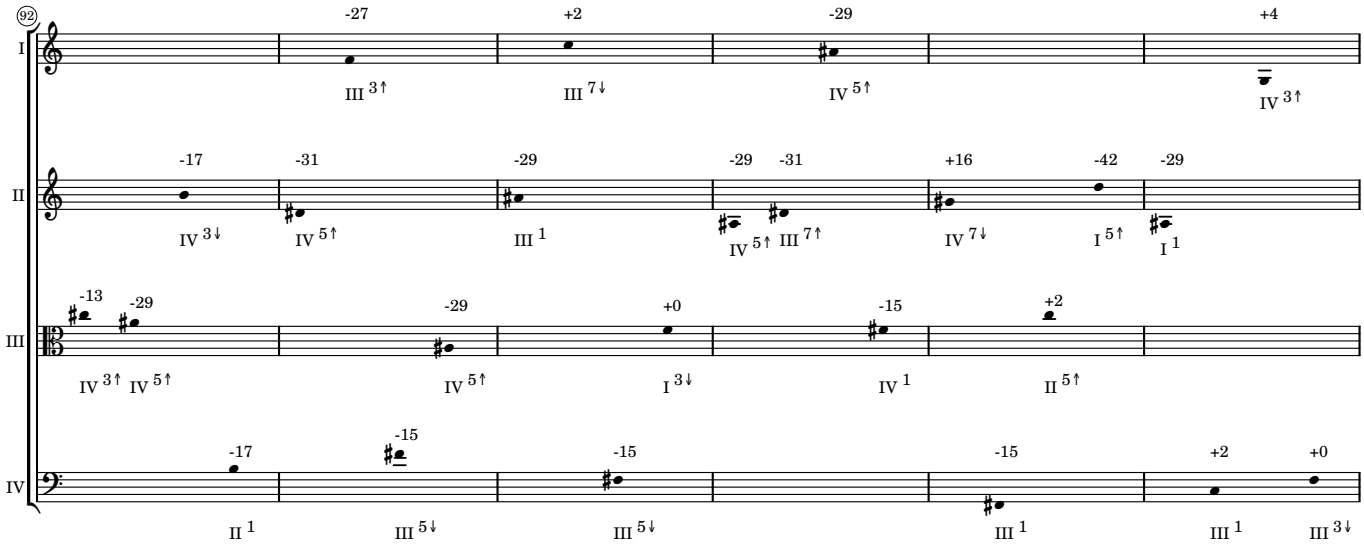
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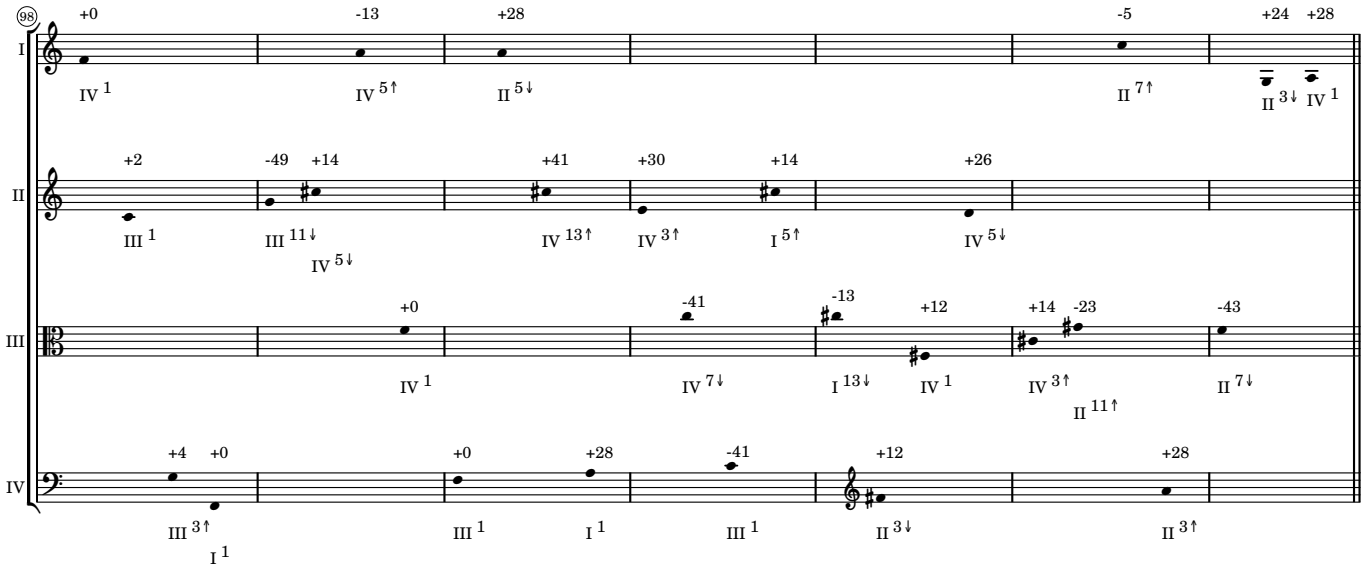
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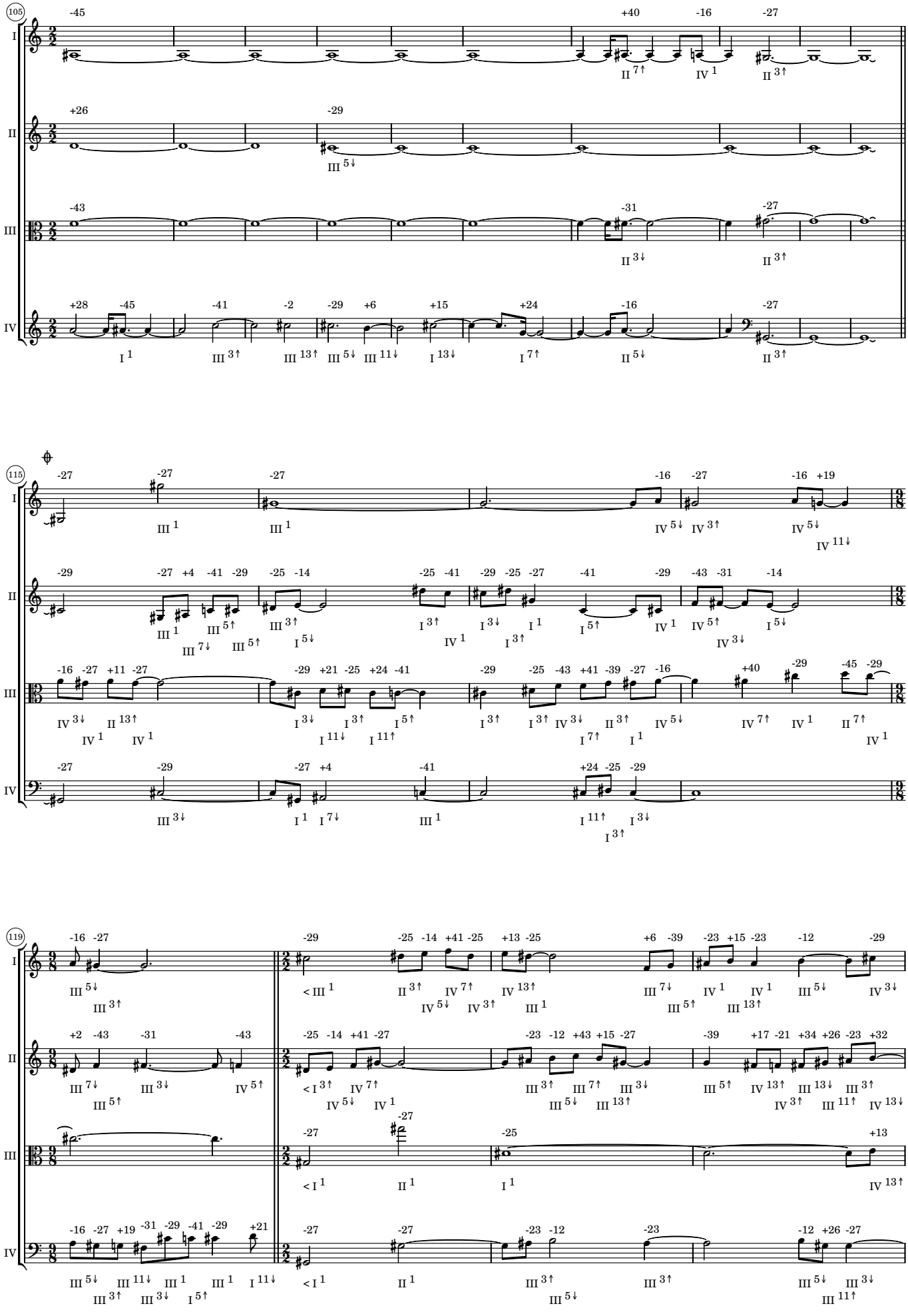
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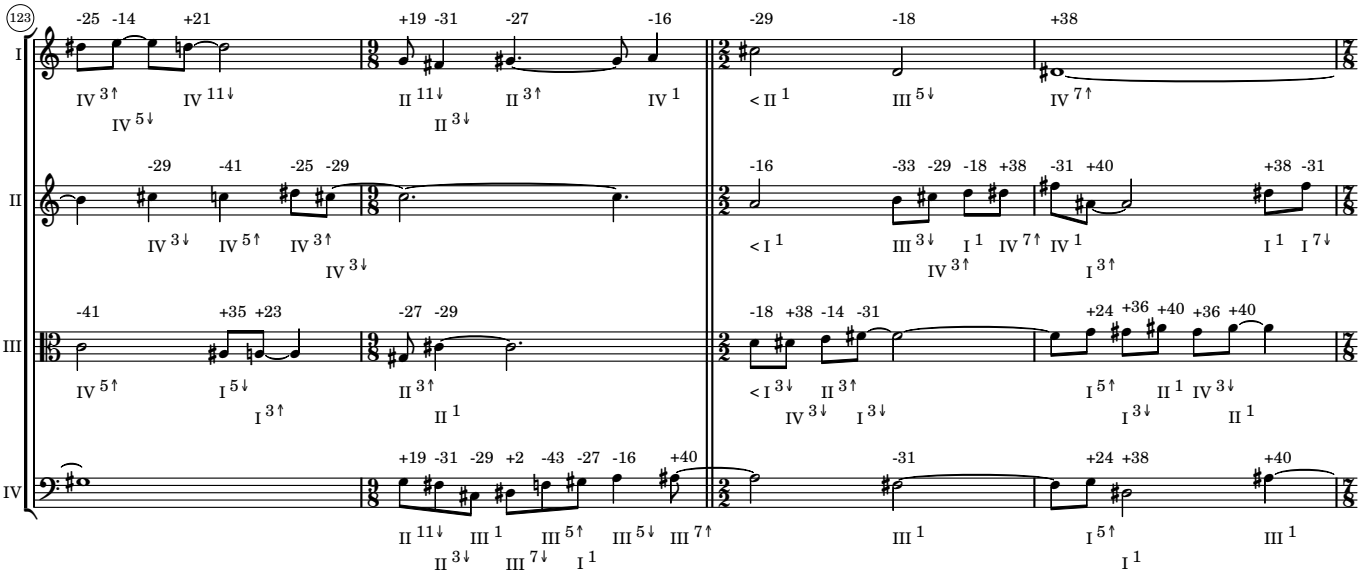
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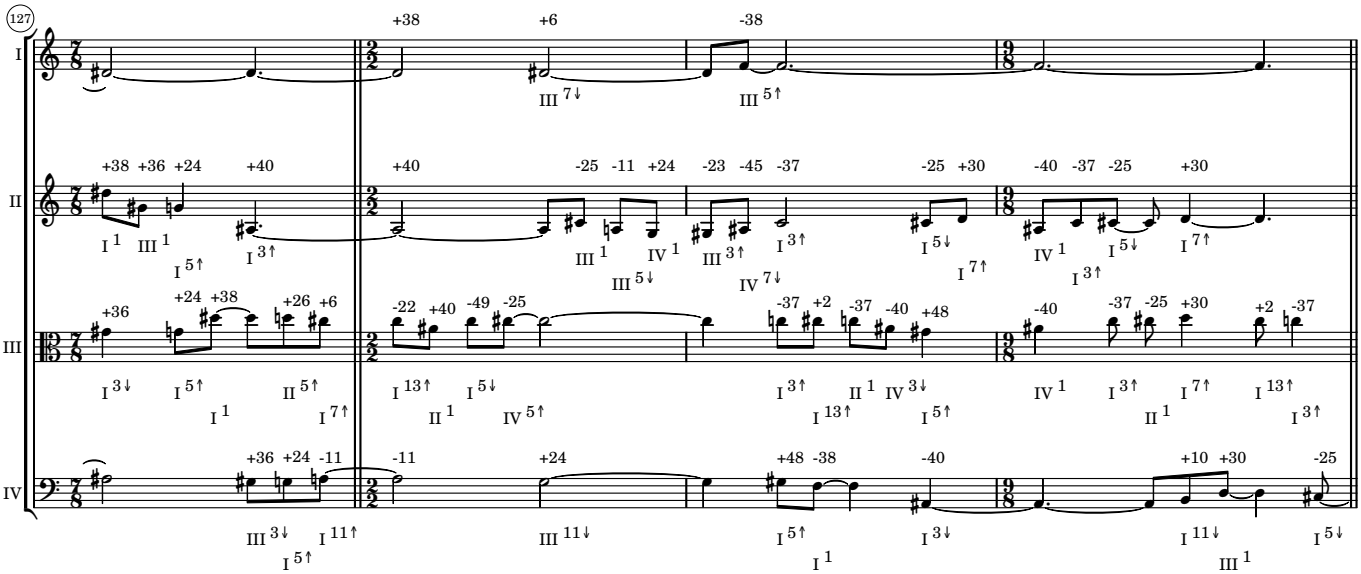
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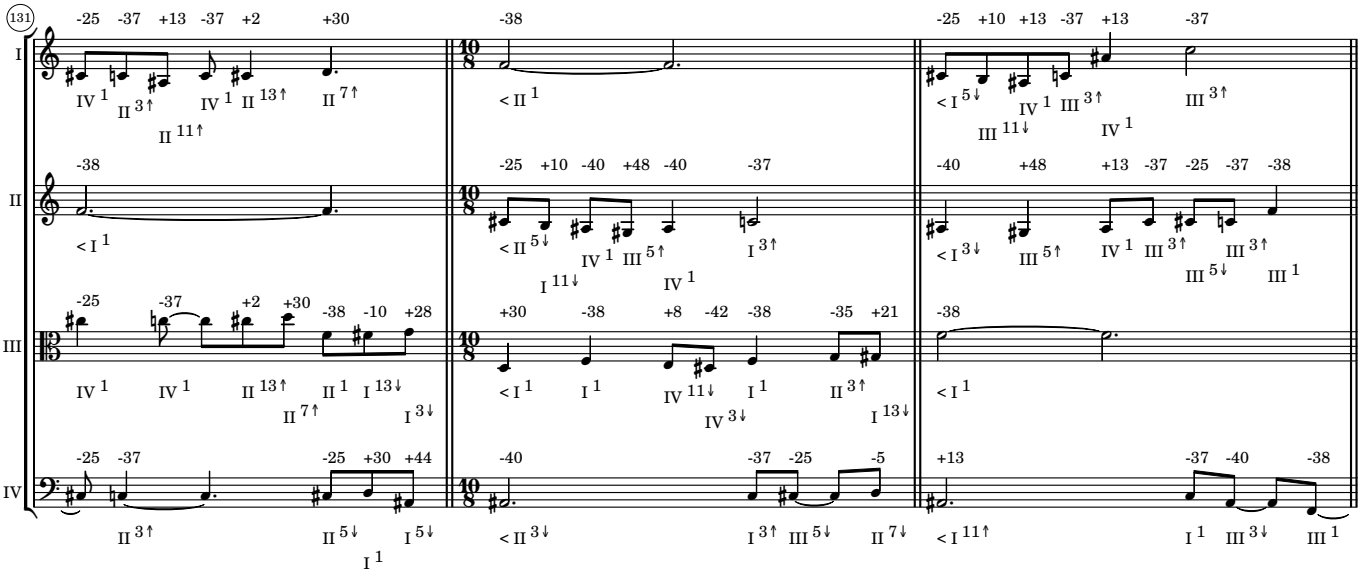
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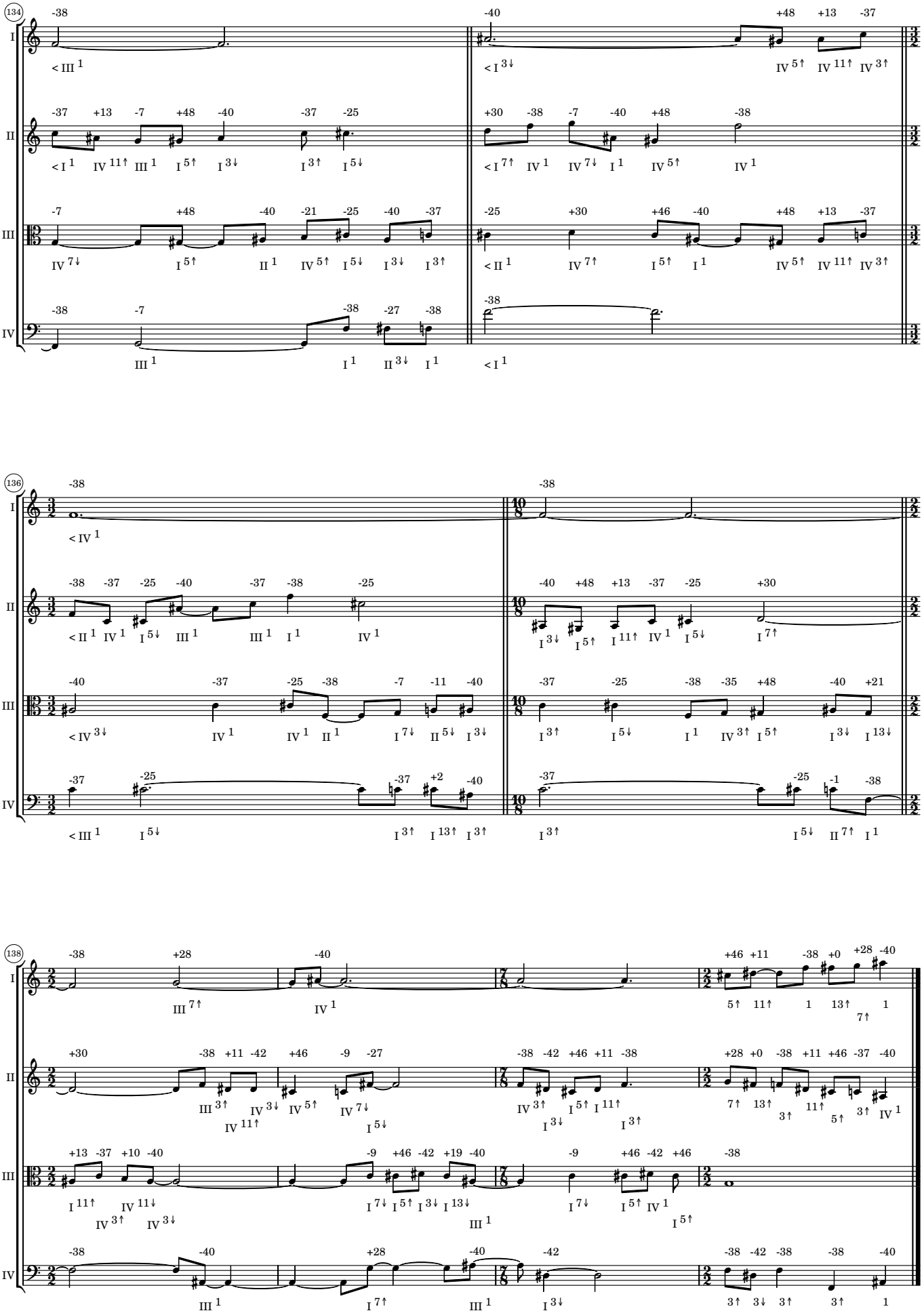
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