Selbstbericht im Rahmen der Zwischenevaluation:

Juniorprofessur für Komposition und Musiktheorie in postdigitalen Bildungsräumen

BEGLEITDOKUMENTATION

Anlage 4d: Künstlerisches Werk eins

Jun.-Prof. Dr. Lawrence Wilde

Adolf-Reichwein-Straße 2
57068 Siegen

Selbstbericht

Begleitdokumentation – Anlage 4d: Künstlerisches Werk eins

Künstlerisches Werk eins: *Sekunden vor Zwölf* – für Streichquartett und Recurrent Audio Variational Autoencoder (RAVE) (2025)

Sekunden vor Zwölf ist ein Werk für Streichquartett und das neuronale Echtzeit-Synthesemodell RAVE (IRCAM) und untersucht kooperative Kreativität durch die Integration von Künstlicher Intelligenz als aktivem Performer. Die Komposition wurde vom Juilliard Center for Creative Technology in Auftrag gegeben und am 28.03.2025 beim Future Stages Festival in New York uraufgeführt. Sie thematisiert ethische Fragen zu Handlungsfähigkeit, Verantwortung und Risiko und fließt in meine Forschung zu Ästhetik, Mensch-Maschine-Interaktion und KI in der Musikpraxis ein.

- *In diesem Dokument enthalten sind Auszüge aus dem Konzertprogramm, Max/MSP-Patch, vollständige Partitur und Konzertfotos.*

- *Eine Audioaufnahme des Werks ist unter folgendem Link verfügbar:* https://www.researchcatalogue.net/view/3706631/3722812

Future Stages Festival 1.0

Juilliard

The Juilliard School
presents

Future Stages Festival 1.0
Emerging Art Forms and Technologies

Edward Bilous, Artistic Director

Produced by the Center for Creative Technology
Edward Bilous, Artistic Director

March 22, 27, and 28, 2025
Saturday, Thursday, and Friday at 7pm
Rosemary and Meredith Willson Theater

The Juilliard School celebrates 25 years of technology in performance with the launch of the Future Stages Festival, a series of performances of interactive, multimedia, and transdisciplinary works performed by Juilliard music, dance, and drama students and alumni.

The mission of the Future Stages Festival is to provide opportunities for students in all three of Juilliard's college divisions to explore new ways of creating, collaborating, and performing with emerging technologies.

Juilliard's Creative Enterprise programming, including the Creative Associates program, is generously sponsored by Jody and John Arnhold and the Arnhold Foundation.

Braille

Large Print

Please make certain that all electronic devices are turned off during the performance. The taking of photographs and the use of recording equipment are not permitted.

The Juilliard School
presents

Future Stages
Convergence

Friday, March 28, 2025, 7pm
Rosemary and Meredith Willson Theater

EDWARD BILOUS
(b. 1957)

Convergence, a multimedia work for solo voice, solo dancer, and interactive audio and video design (2001/2025)

Britt Hewitt, Vocalist (live and prerecorded)
Mio Ishikawa, Choreographer and Dancer (live and prerecorded)

David Scherker, Video Design
Kaelen Novak, Unreal Engine Design
Eric Mann, Videography

LAWRENCE IRVING WILDE
(b. 1991)

Sekunden vor Zwölf (Seconds to Midnight) for string quartet and Recurrent Audio Variational Autoencoder (RAVE) (2025)
Yiran Wang, Violin
Anthony Poon, Violin
Alison Wang, Viola
Gloria Lee, Cello

RAY LUSTIG
(b. 1972)

Clouds in Single File (2014)
Jessie Montgomery, Violin
Alison Wang, Viola

Performing Remotely:
Lauren Conroy, Violin
Yiran Wang, Violin
Airi Yoshikowa, Violin
(played in first Beyond the Machine performance)
Brian Jennings, Viola
Marco Sabatini, Viola
Kayla Williams, Viola

Pause

EMRE ŞENER (b. 2001)	*Sinking.Under* (2023) **Sooah Jeon,** Alto Flute
MARI KIMURA (b. 1962)	*Rossby Waving* (2017) **Anthony Poon,** Violin
ISABELA TANASHIAN (b. 1998)	*pipe dream* (2025) **Isabela Tanashian,** Voice
	Pause
STEVE REICH (b. 1936)	*Electric Counterpoint* for electric guitar and tape (1987) **David Rourke,** Electric Guitar
	Recorded Tracks **David Rourke,** Electric Guitar **Dan Chmielinski,** Bass Guitar
	David Scherker, Video Design **Kaelen Novak,** Unreal Engine Design **Eric Mann,** Videography

Performance time: approximately 1 hour and 30 minutes, without an intermission

Notes on the Program

Convergence

Convergence was my first work that featured musicians and dancers collaborating across disciplines with interactive technologies. The media, which includes prerecorded and electronic music, dance video, and animation, is processed in real time by both a vocalist and a dancer. The result is a transdisciplinary work in which the music, movement, and digital media blend to become an indivisible whole. *Convergence* was first performed to celebrate the opening of the Willson Theater and the coming together of artists, designers, and technologists. It has been updated to include AI generative technology to assist in audio and video processing. The musical score is based on excerpts from Cantata 45: *Es ist dir gesaft, Mensch,* by J.S. Bach. This performance of *Convergence* celebrates the coming together of artists, designers, and technologists at the Center for Creative Technology and the Future Stages Festival.—Edward Bilous

Sekunden vor Zwölf (Seconds to Midnight)

Sekunden vor Zwölf explores the intersection of human expression and artificial intelligence, bridging tradition and innovation through the pairing of a string quartet with RAVE (Recurrent Audio Variational Autoencoder), an advanced machine learning model developed at IRCAM (Institut de Recherche et Coordination Acoustique/Musique) in Paris. RAVE, designed for real-time sound synthesis and audio generation, serves as an "invisible fifth performer"—an entity that listens, responds, and transforms the quartet's music in real time. Throughout the composition, the string quartet acts as both catalyst and collaborator, generating a rich tapestry of evolving motifs and gestures. RAVE, in turn, functions as a digital counterpart, processing, transforming, and reinterpreting these sounds, creating an ever-evolving dialogue between the acoustic and the synthetic. The interaction between the quartet and the AI system is fluid and reciprocal—neither fully dominates, yet each influences the other, illustrating a symbiotic relationship between human creativity and machine intelligence. Beyond its sonic innovations, *Sekunden vor Zwölf* engages with broader philosophical and existential themes. The title alludes to the Doomsday Clock, maintained by the Bulletin of the Atomic Scientists, which as of January stands at a perilous 89 seconds to midnight—the closest humanity has ever been to global catastrophe. AI now joins nuclear threats, climate change, and geopolitical conflicts as one of the primary existential risks facing civilization. Through this work, listeners are invited to contemplate the duality of technology—its immense power to create and to destroy. While RAVE serves as a creative partner in this piece, its presence also reminds us of the profound responsibility humanity bears in shaping the future of such powerful tools. The music unfolds as an exploration of this delicate balance as we stand on the threshold of an era where the line between human and machine becomes increasingly blurred.—Lawrence Irving Wilde

Clouds in Single File

Clouds in Single File is the second of two works conceived to be played by musicians in different places simultaneously over internet connection, for which the ethos was to embrace technology's imperfections and limits—and even to make them the centerpiece. The first work, *Latency Canons* (2013), is for an orchestra playing with four different string quartets in different places. It uses the unpredictable and unstable delays—latency—of telecommunication technology as the time interval of imitative canons, with the intent to express the poignancy of the imperfections of all human communication. *Clouds in Single File,* written about a year later, was meant as a chamber music expression of this process. It has only two lines of music, each played by several instruments, but all in different places. The musicians try to synchronize with the already-delayed sounds they are hearing, and the tiny differences add up, creating a feathering of the phrases in time.—Ray Lustig

Yiran Wang (March 28)

Born in Danyang, China, Yiran Wang started his violin study at age 4 and started attending the Middle School Attached to the Shanghai Conservatory of Music at age 14. He is now pursuing his bachelor's at Juilliard under the tutelage of Laurie Smukler. Wang was a finalist in the 2022 Juilliard Concerto Competition, and he has performed all over the world at music festivals including the Baroque Music Festival of Mainz, Meadowmount School of Music, Verbier Music Festival, Music Academy of the West, Thy Chamber Music Festival, Cleveland Chamber Music Intensive, and Kneisel Hall Chamber Music Festival. At the Music Academy of the West, he was accepted into the string quartet seminar program, studying under the Takács Quartet. Wang is a substitute violinist in the Shanghai Philharmonic Orchestra.

Kerry Warren (March 27)

Kerry Warren (Group 42, drama) is a New York-based actor, teaching artist, and poet who last year was a recipient of the Next Generation Award from the National Guild of Community Arts Education. Her theater credits include *The River* with Hugh Jackman on Broadway; *Life Sucks* (Theatre Row), *This Is How It Ends* (59E59), and *Much Ado About Nothing* (Mobile Unit, the Public Theater), Off-Broadway; and *Private Lives* (Repertory Theatre of St. Louis), *The Tempest* (Pittsburgh Public), *Romeo and Juliet* (Dallas Theater Center), *Office Hour* (Berkeley Rep and Long Wharf), *The Originalist* (Arena Stage), *Twelfth Night* and *The Book of Will* (Hudson Valley Shakespeare Festival), and *Vanya, Sonia, Masha, and Spike* (Baltimore Center Stage). Her television and film credits include *Our Son, Broad City, New Amsterdam,* and *Law & Order: SVU*. Warren is excited to return to the Willson Theater as both a director and performer for the Future Stages Festival.

Lawrence Irving Wilde (March 28)

Lawrence Irving Wilde (BM '14, composition) is a researcher, educator, and composer of choral, chamber, orchestral, and electronic music whose works have been commissioned and performed by ensembles including the Kronos Quartet, Eighth Blackbird, JACK Quartet, Sō Percussion, Tesla Quartet, Ensemble Mise-En, and ÆON Ensemble. Wilde has held composition fellowships at the Tanglewood Music Festival, Aspen Music Festival, Bang on a Can Festival, and others. His works have been presented internationally at festivals and venues including Carnegie Hall, Lincoln Center Out of Doors, and Cabrillo Festival of Contemporary Music. A junior professor of composition and music theory in postdigital educational spaces at the University of Siegen in Germany, Wilde earned his MFA and PhD in music composition at Princeton and his bachelor's at Juilliard.

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Performance Instructions:

Use the Max Patch during the following sections of the string quartet:

- Prelude (m.m. 1-45)
- Interlude (m.m. 209-256)
- Postlude (m.m. 608-657)

Disengage the Max Patch during all other sections.

Additional Notes:

The gain~ objects in the Max patch can be adjusted dynamically to shape the desired level of processing.

adc~ 1 2 3 4

Pre-processing levels of individual instruments (ordered from left to right: Violin I, Violin II, Viola, and Cello)

Levels of each instrument (unproccessed)

Rave model: "voice_vocalset_b2048_r48000_z16"

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Post-processing levels of individual instruments (ordered from left to right: Violin I, Violin II, Viola, and Cello)

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Panning of processed instruments

Panning of unprocessed instruments

Level of entire quartet (processed using RAVE) (levels may be adjusted in real time to achieve a desirable balance)

Level of entire quartet (unprocessed) (may or may not be utilized in concert depending on the space)

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Reverb may be added depending on the acoustics of the space.

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Processed Level

Level of unprocessed mix
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Reverb

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Level of the entire mix (processed and unprocessed), or acts as a second gain~ for the processed signal if the live, unprocessed quartet signal is not fed through Max)

Full Mix Level

autopattr @autoname 1

dac~ 1 2

References:

1. Intelligent Instruments Lab (2023). rave-models (Revision ad15daf). Hugging Face. https://huggingface.co/Intelligent-Instruments-Lab/rave-models. https://doi.org/10.57967/hf/1235.

2. IRCAM (n.d.). *RAVE: Real-time Audio-to-Video Synthesis*. IRCAM Forum. Retrieved March 9, 2025, from https://forum.ircam.fr/projects/detail/rave/

Lawrence Wilde

Seconds to Midnight

for String Quartet and RAVE AI Software
(2025)

SoundInk Publishing

Dedicated to The Juilliard School's Center for Creative Technology.

Instrumentation:

Violin I
Violin II
Viola
Cello
+
Laptop running Max/MSP with Realtime Audio Variational autoEncoder (RAVE)

duration: c.15'

Wilde, Lawrence. *Transverse Lines*.
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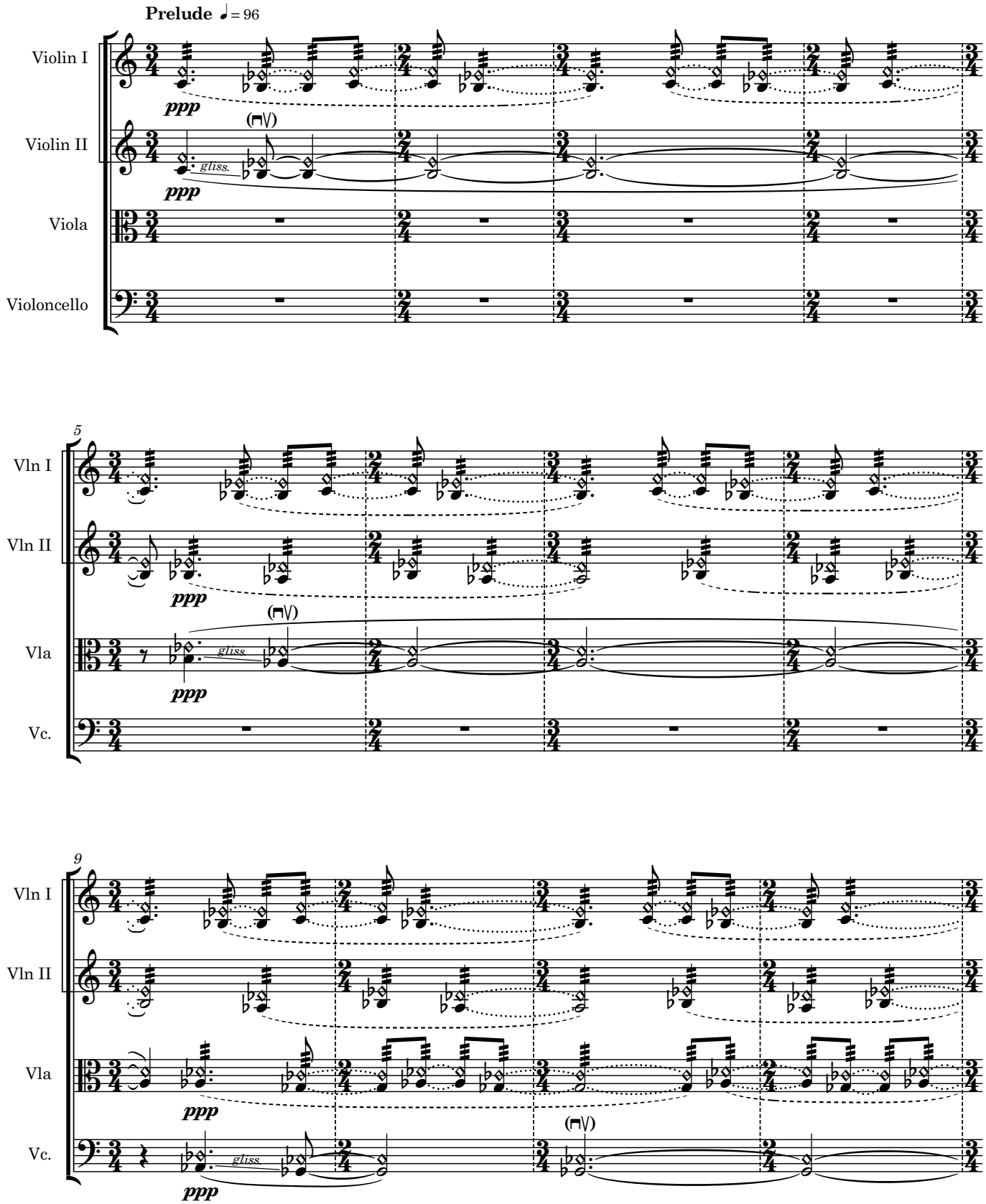
www.lawrencewilde.com

Dedicated to The Juilliard School's Center for Creative Technology

Seconds to Midnight

Lawrence Wilde

for String Quartet and RAVE AI Software



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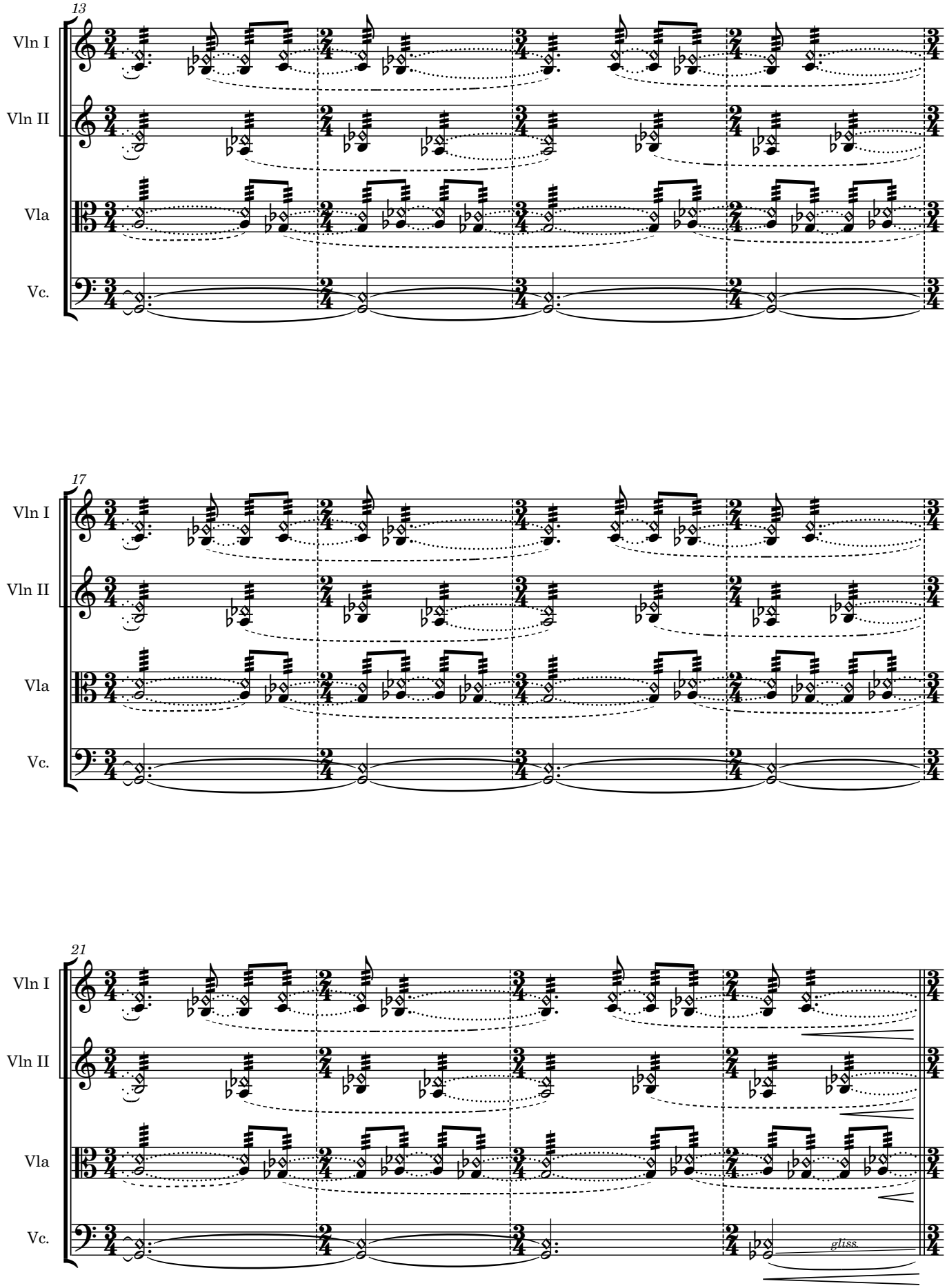
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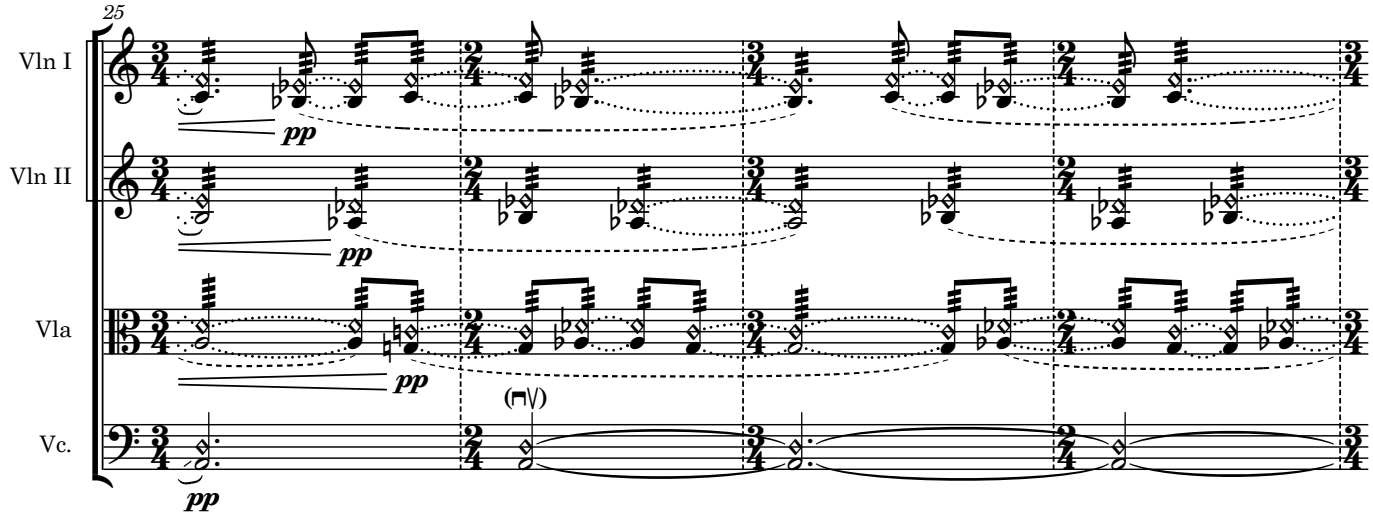
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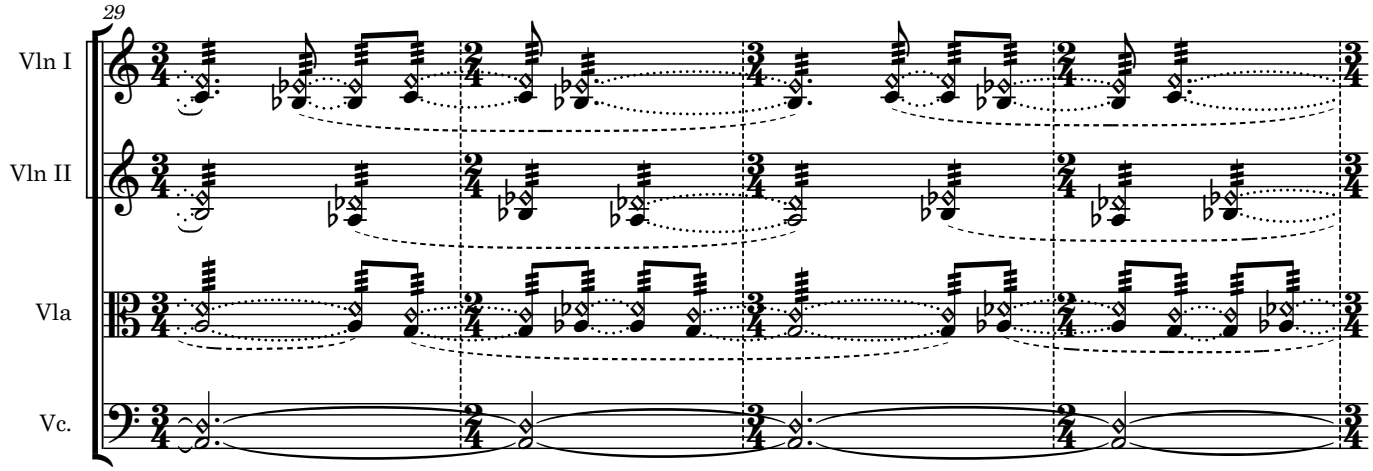
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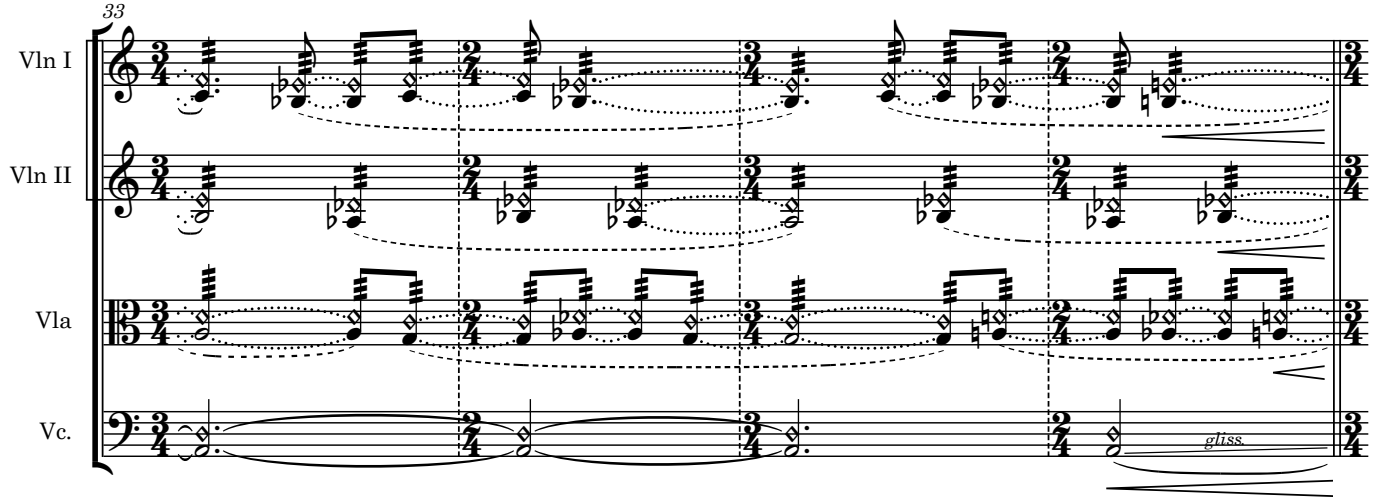
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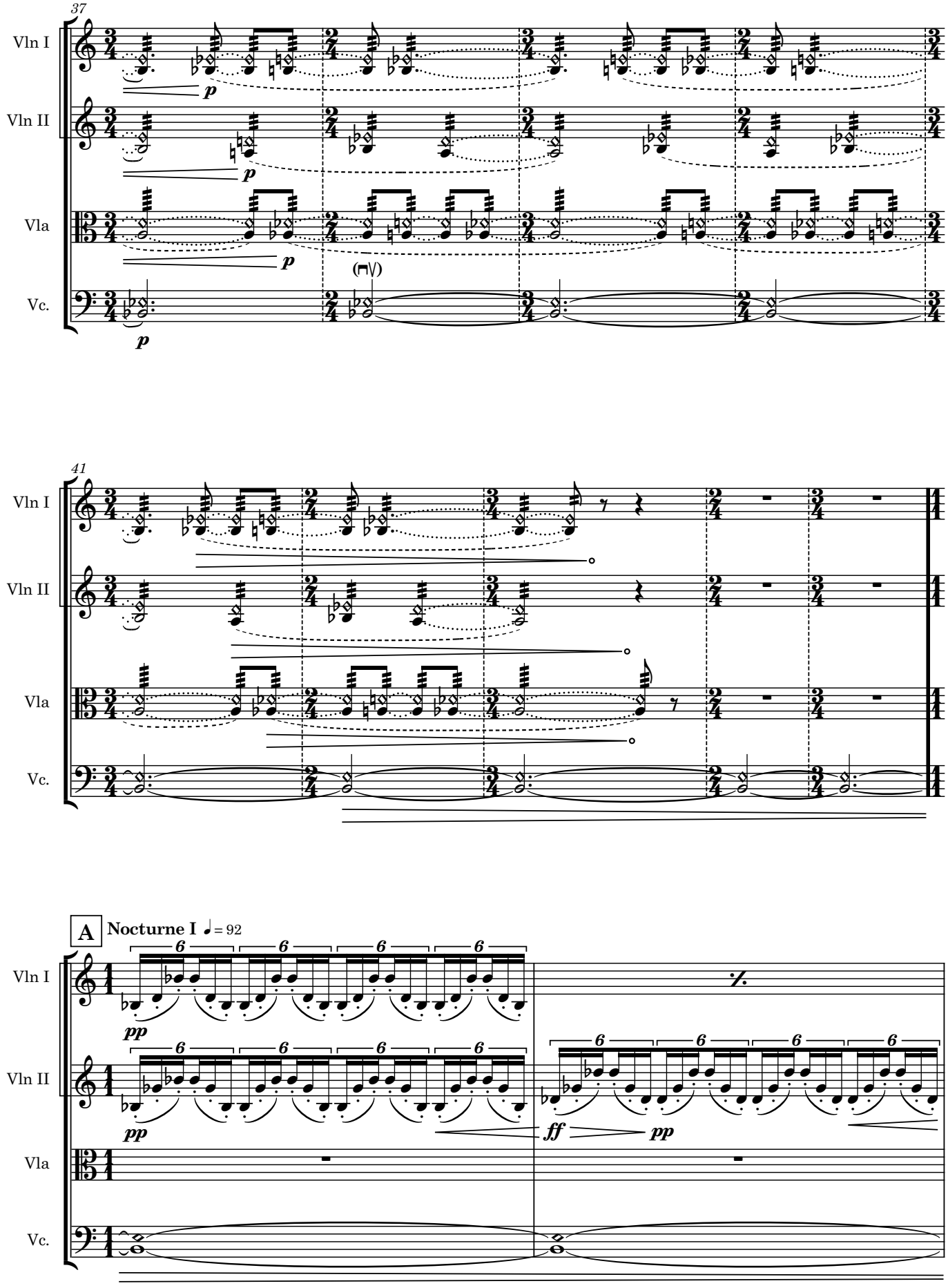
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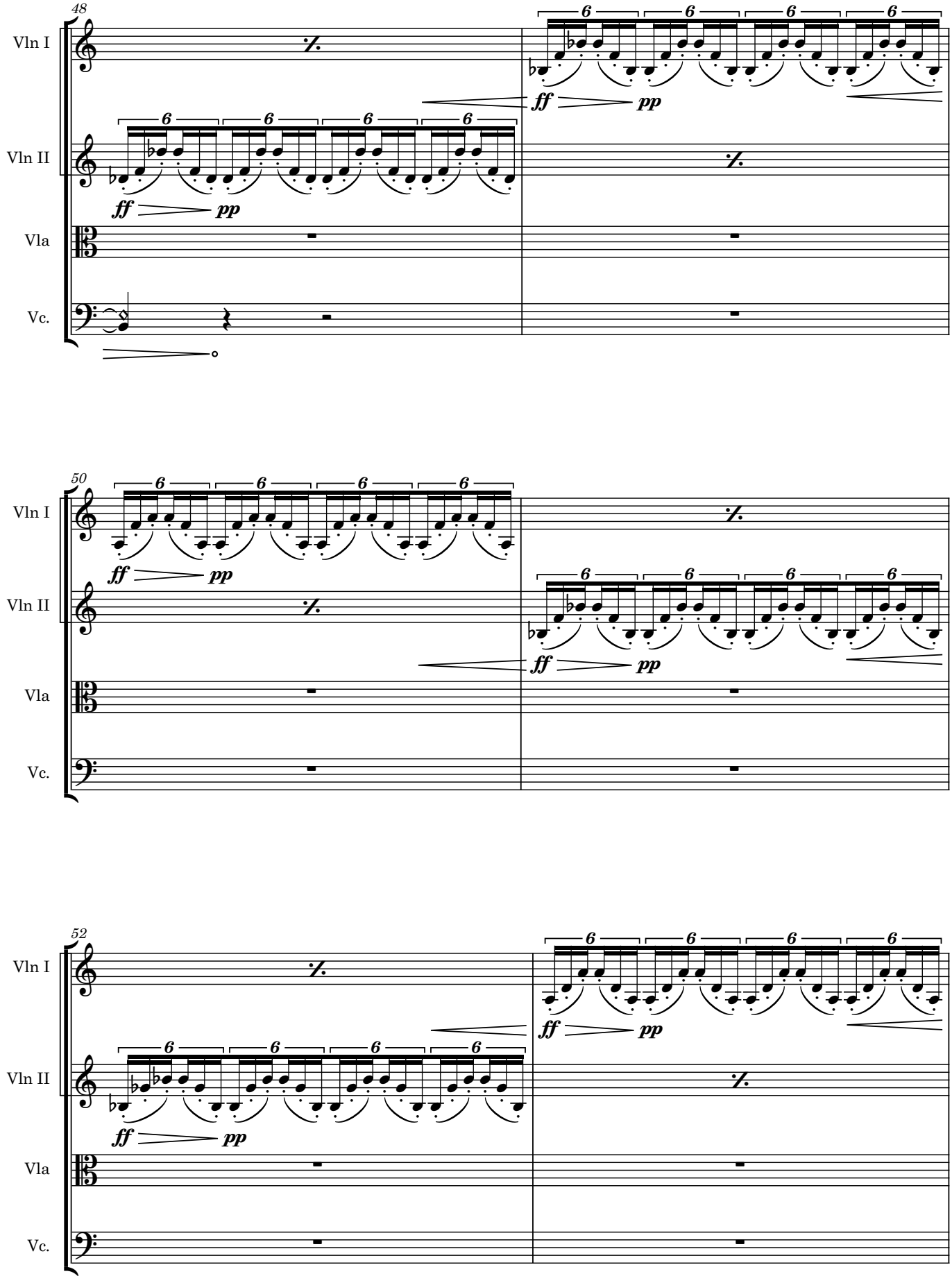
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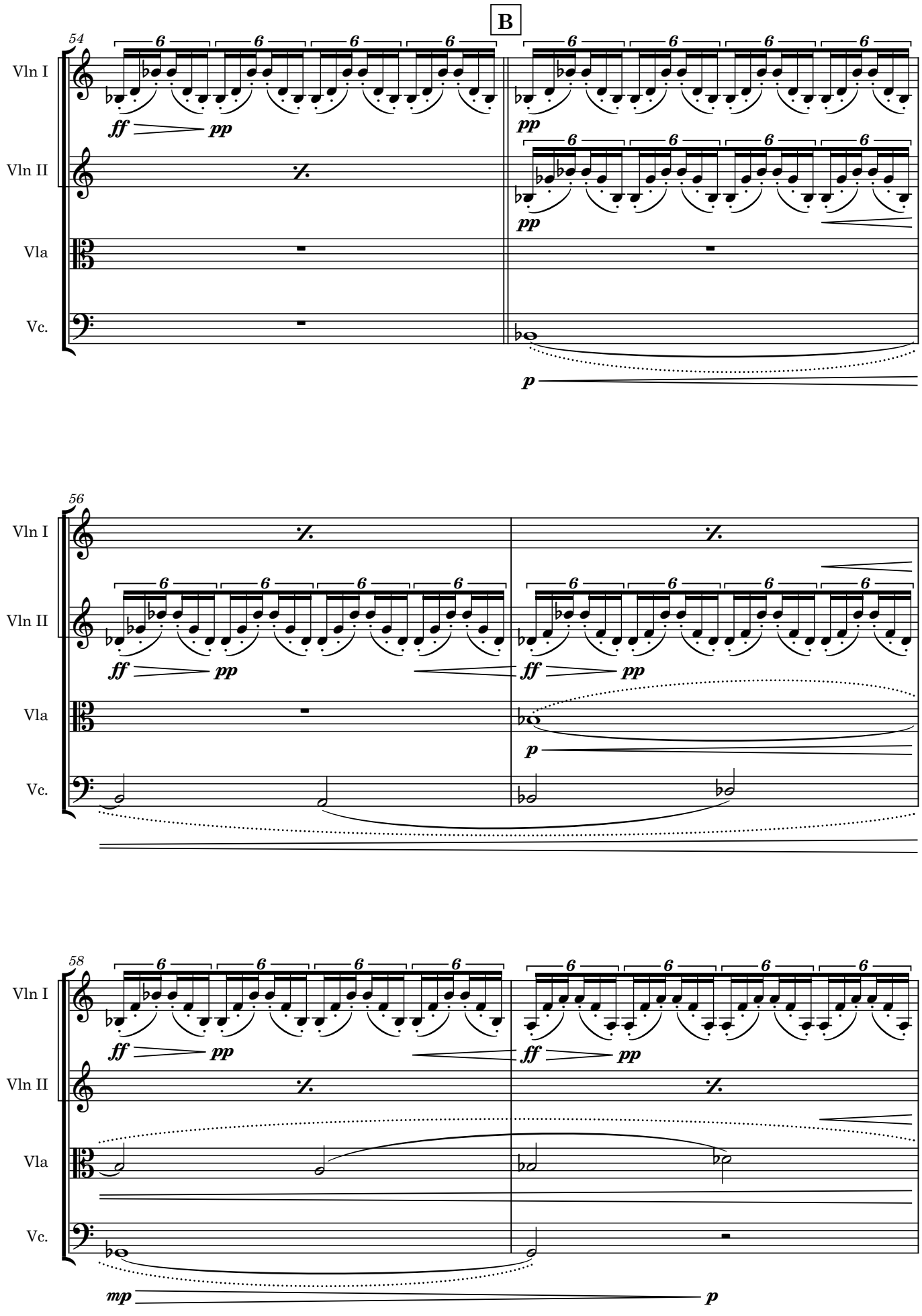
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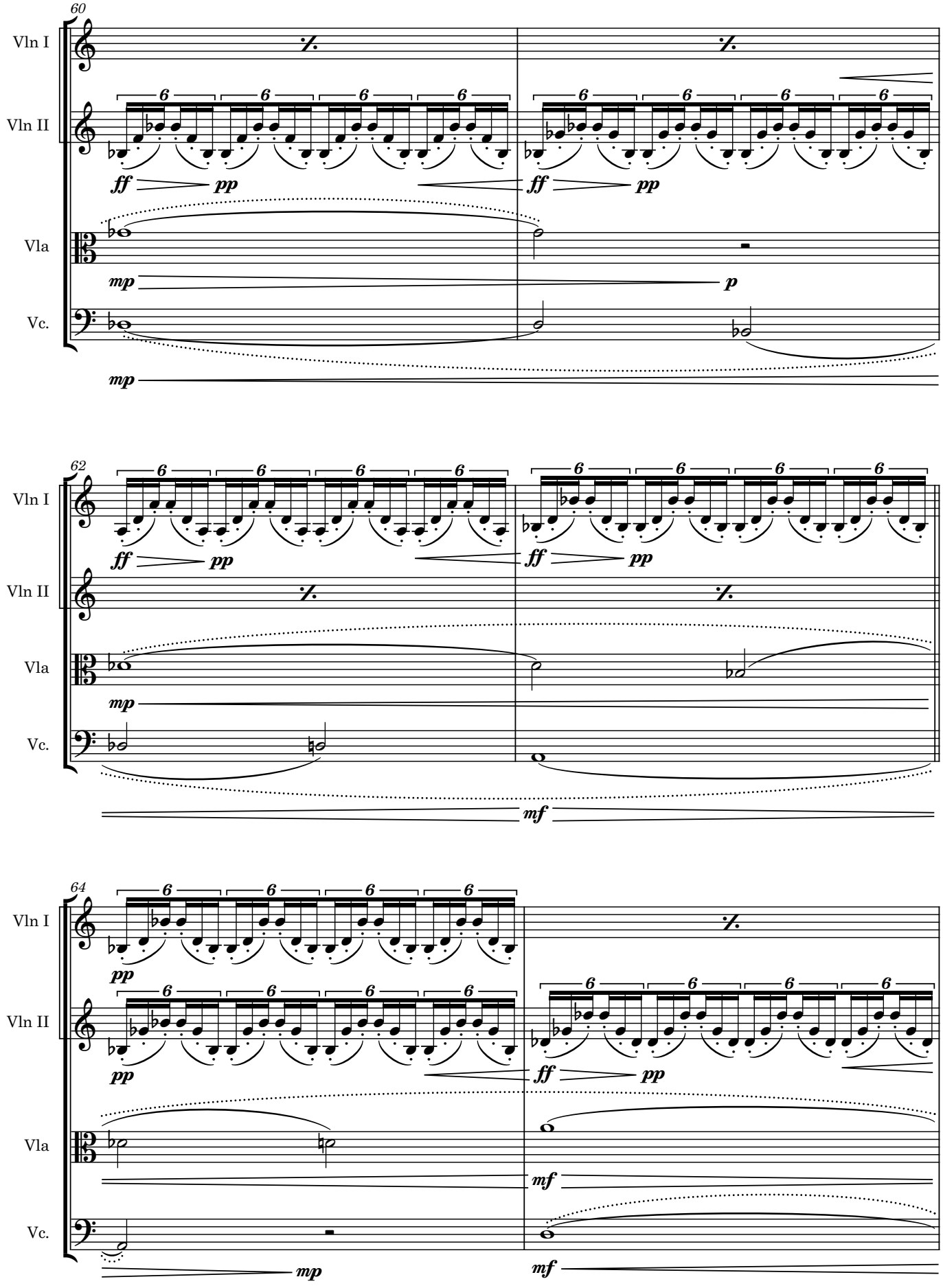
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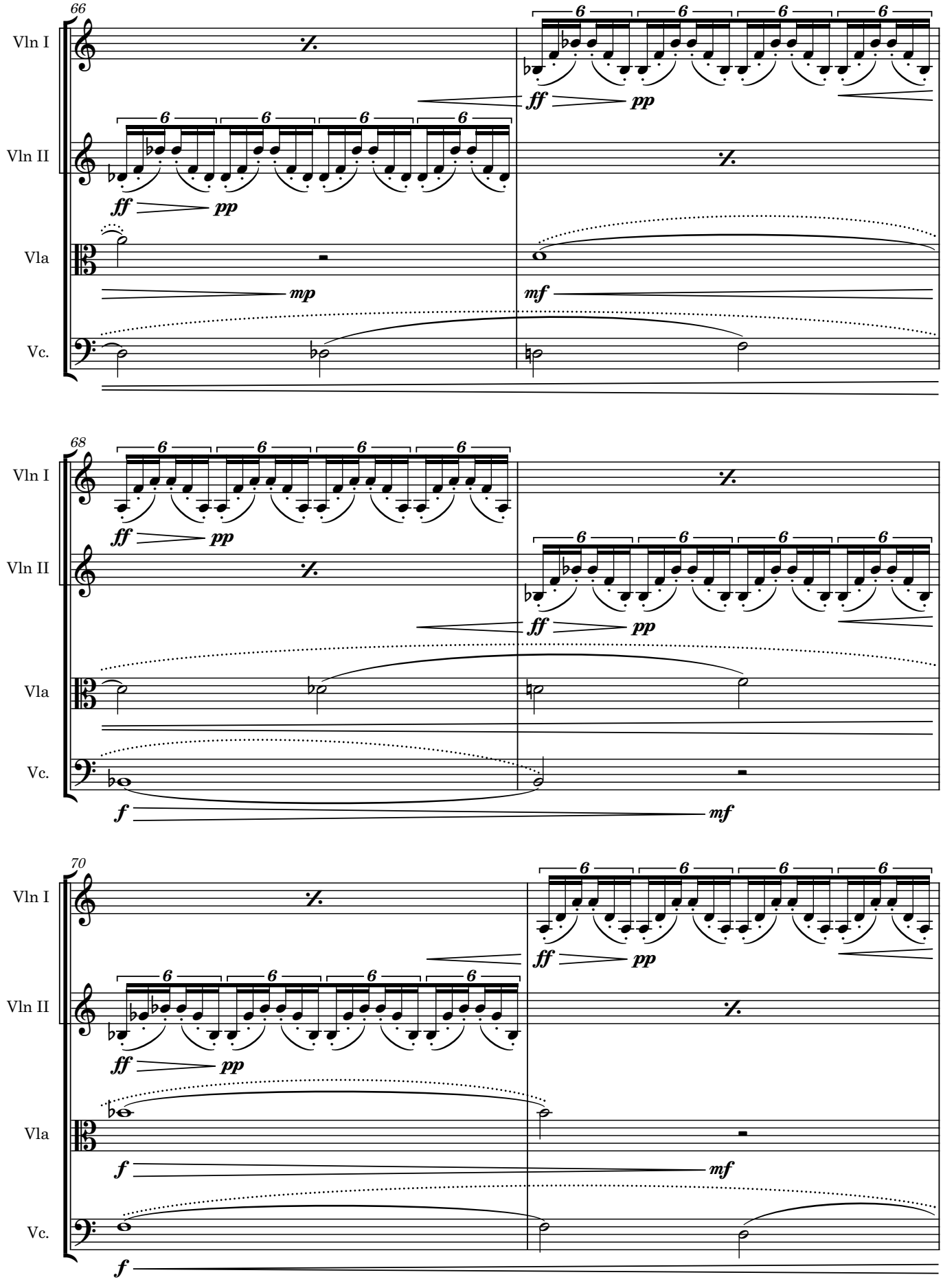
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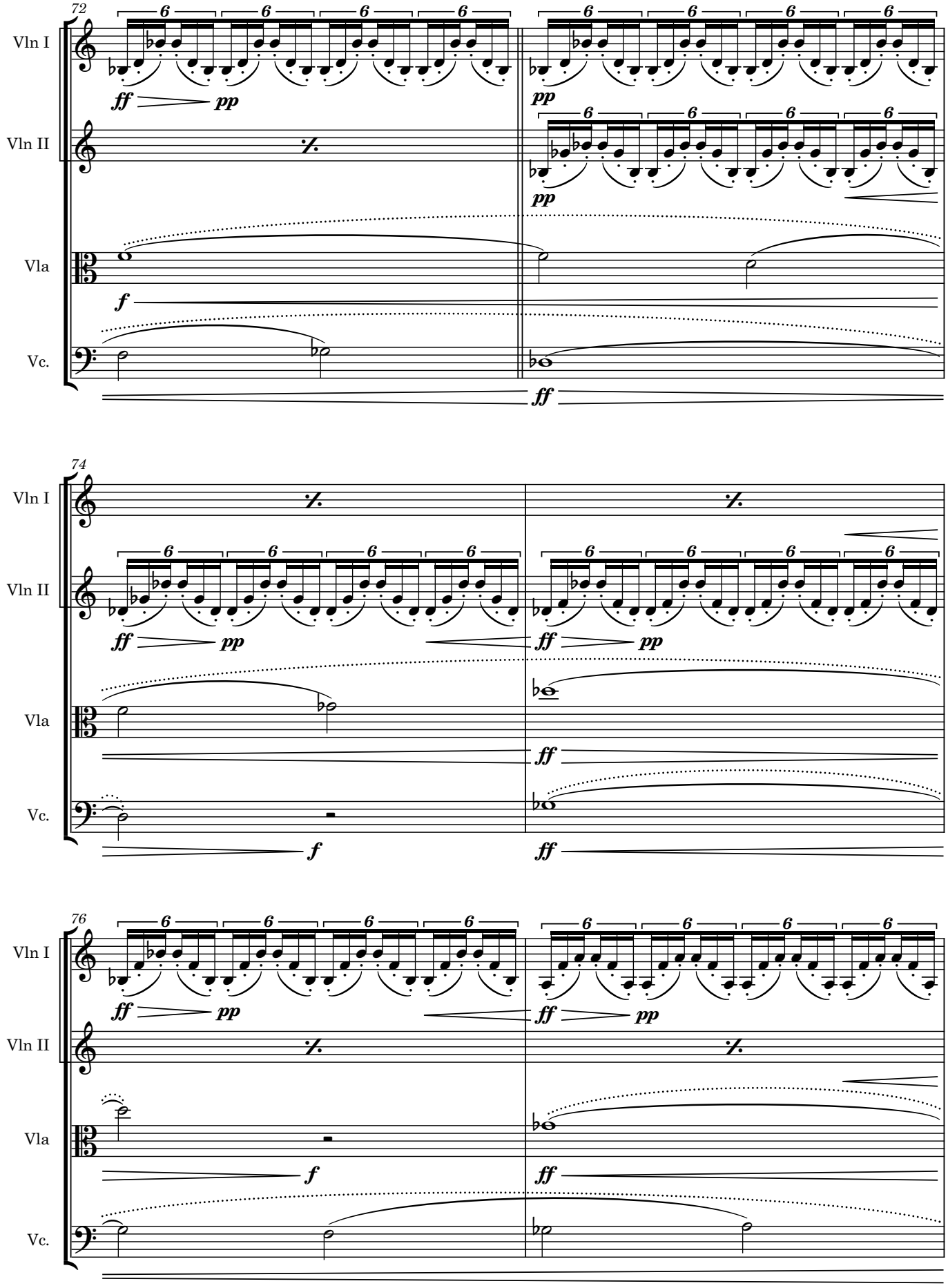
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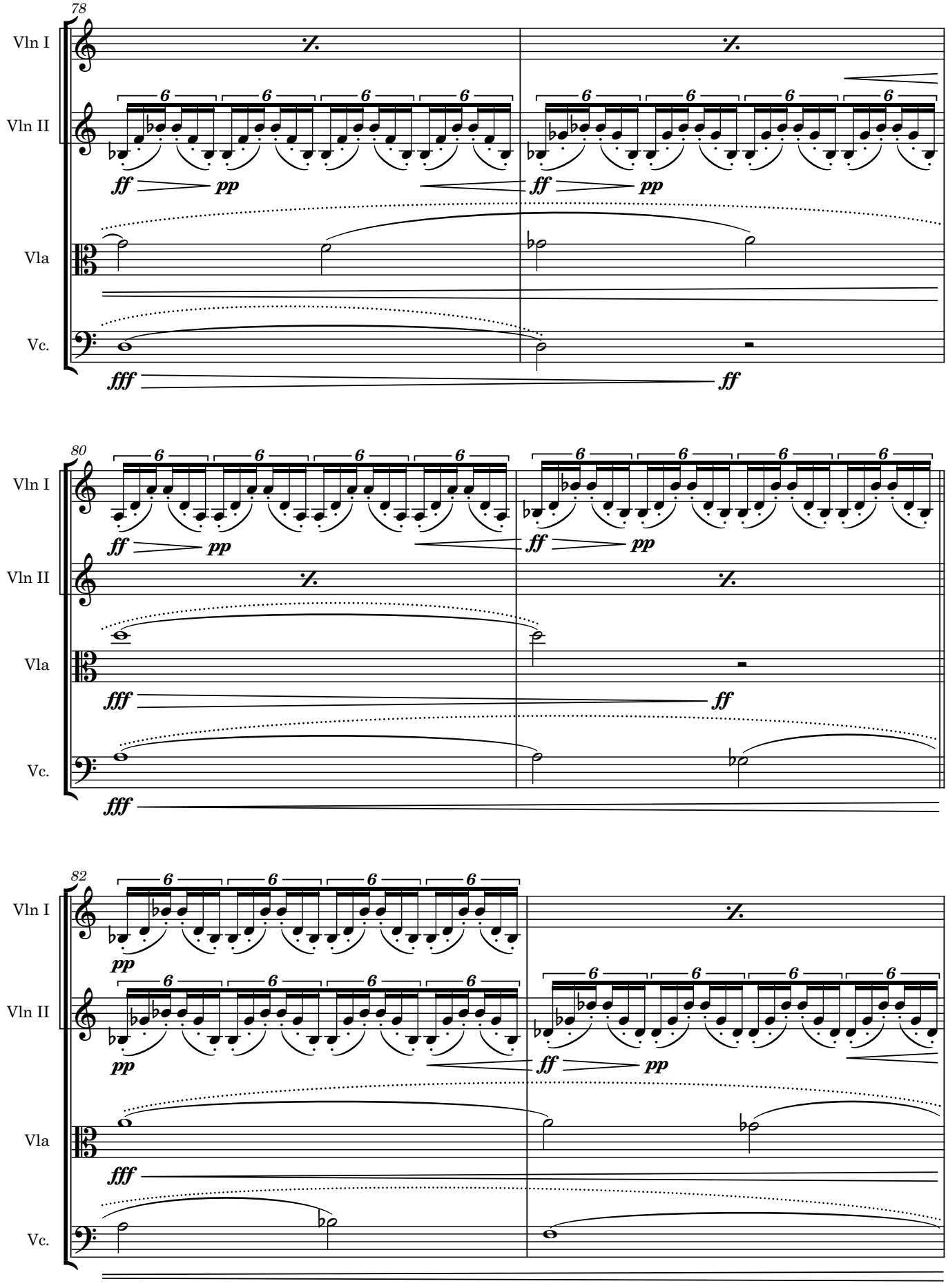
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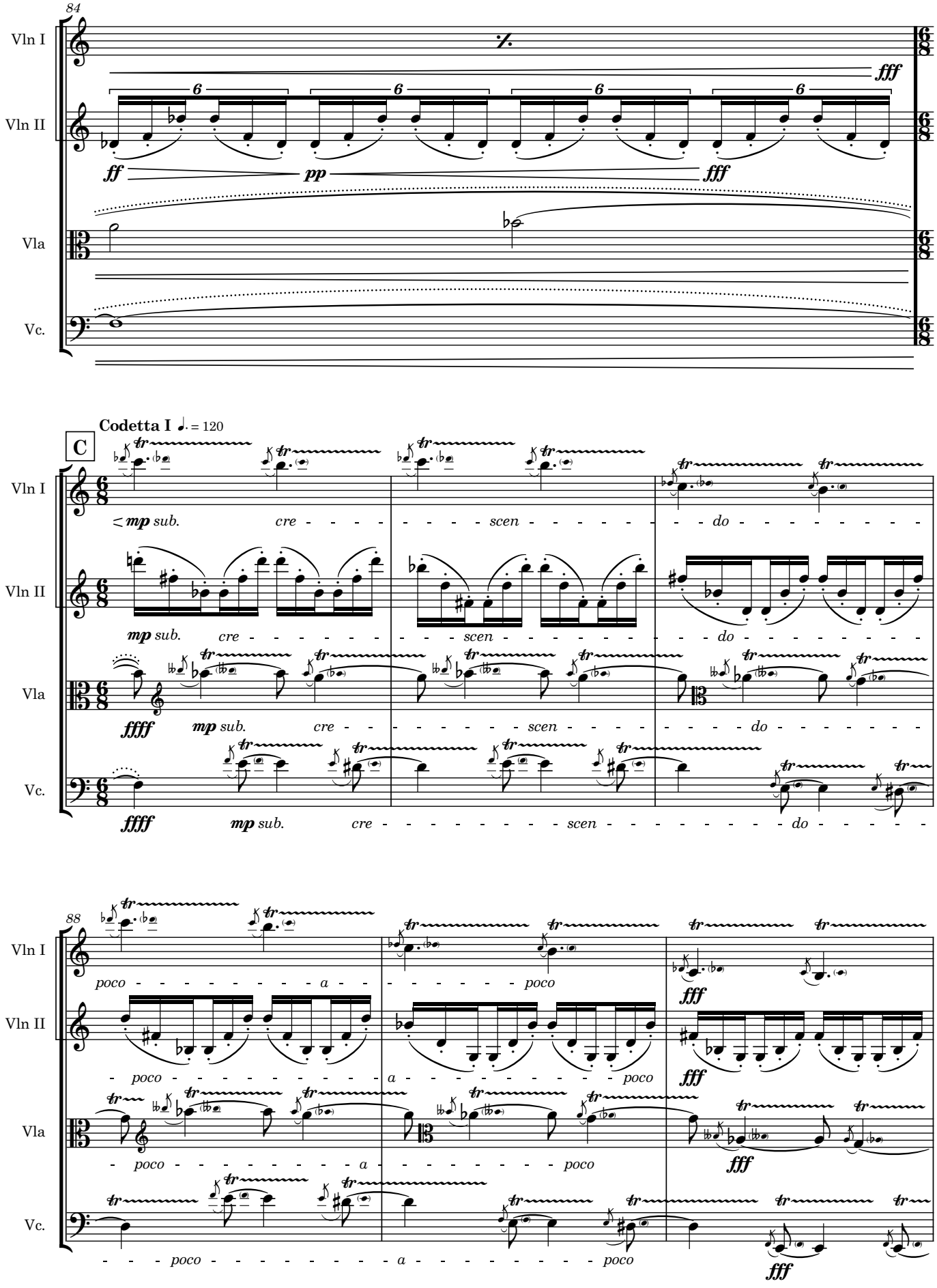
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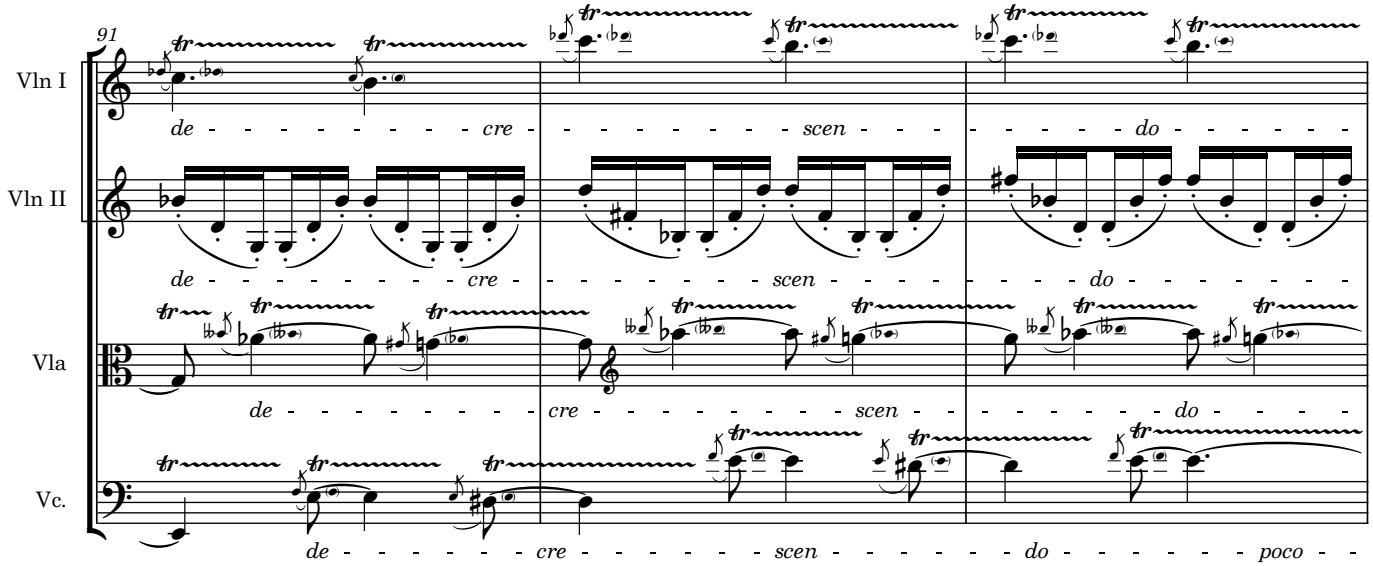
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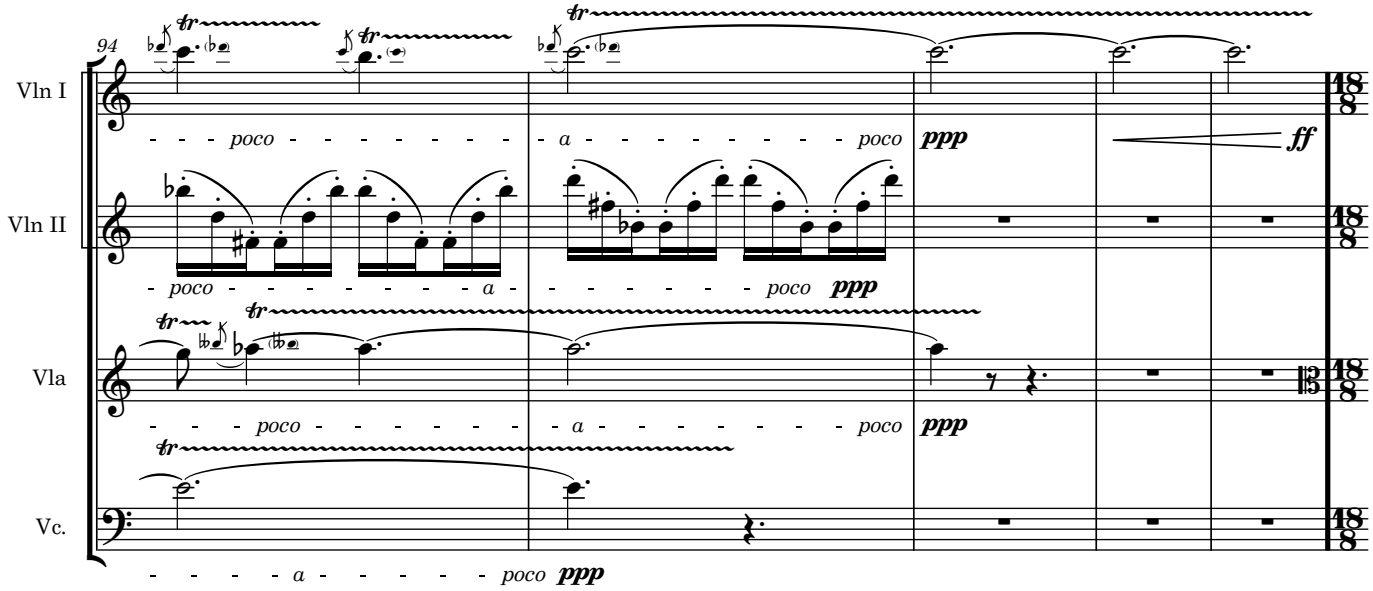
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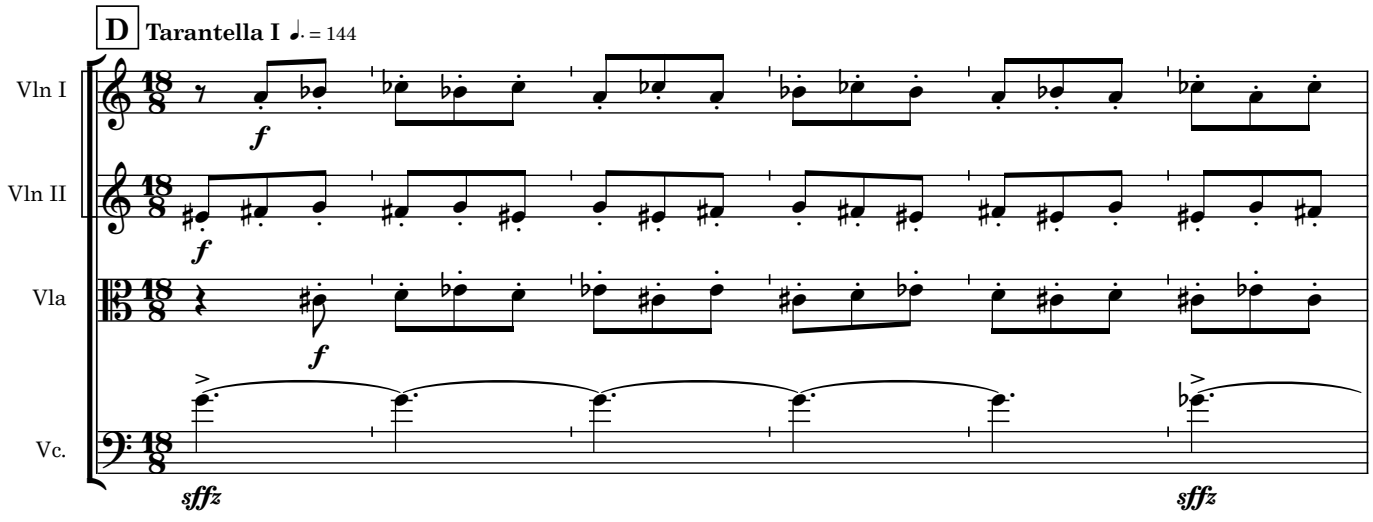
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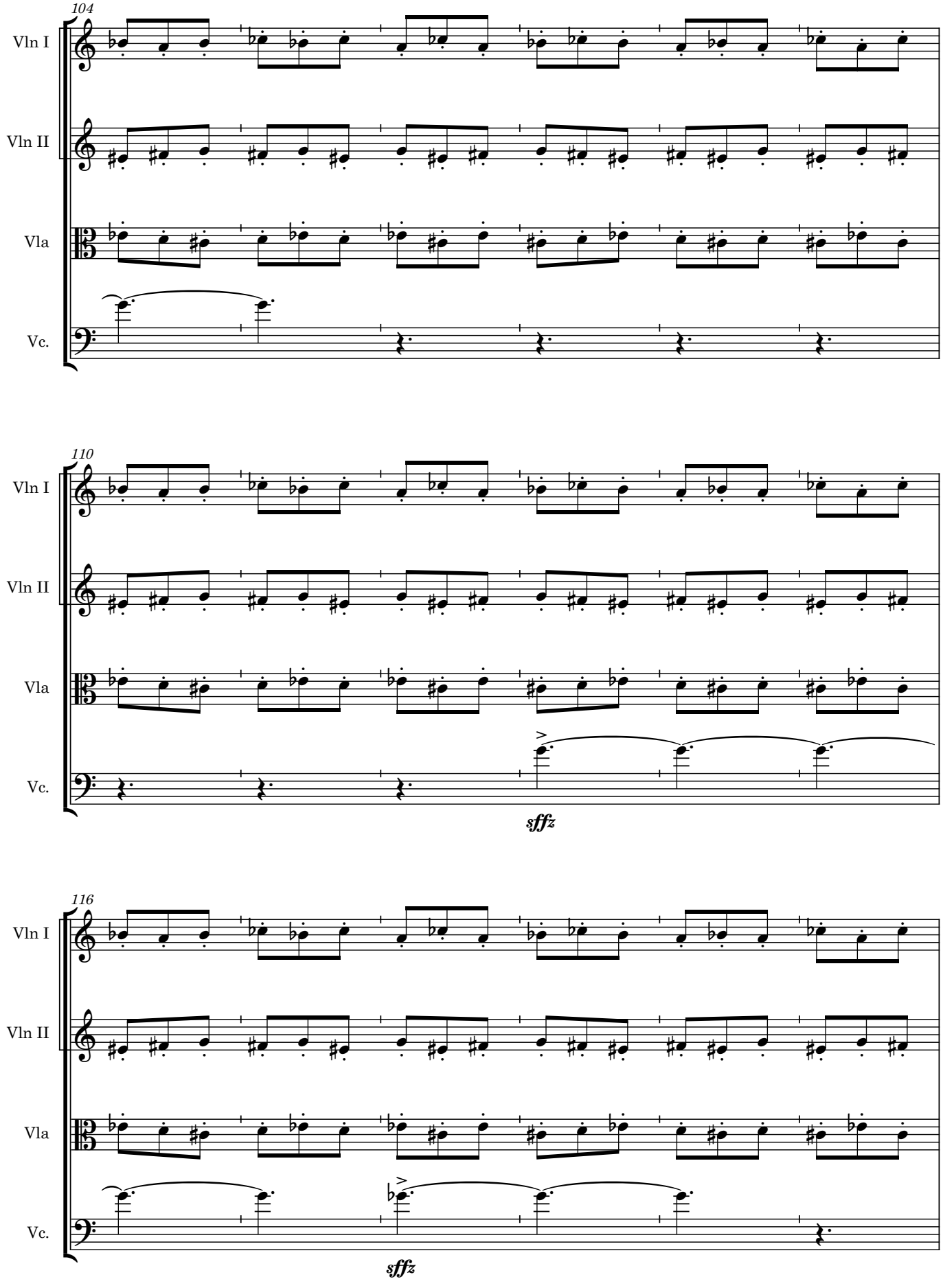
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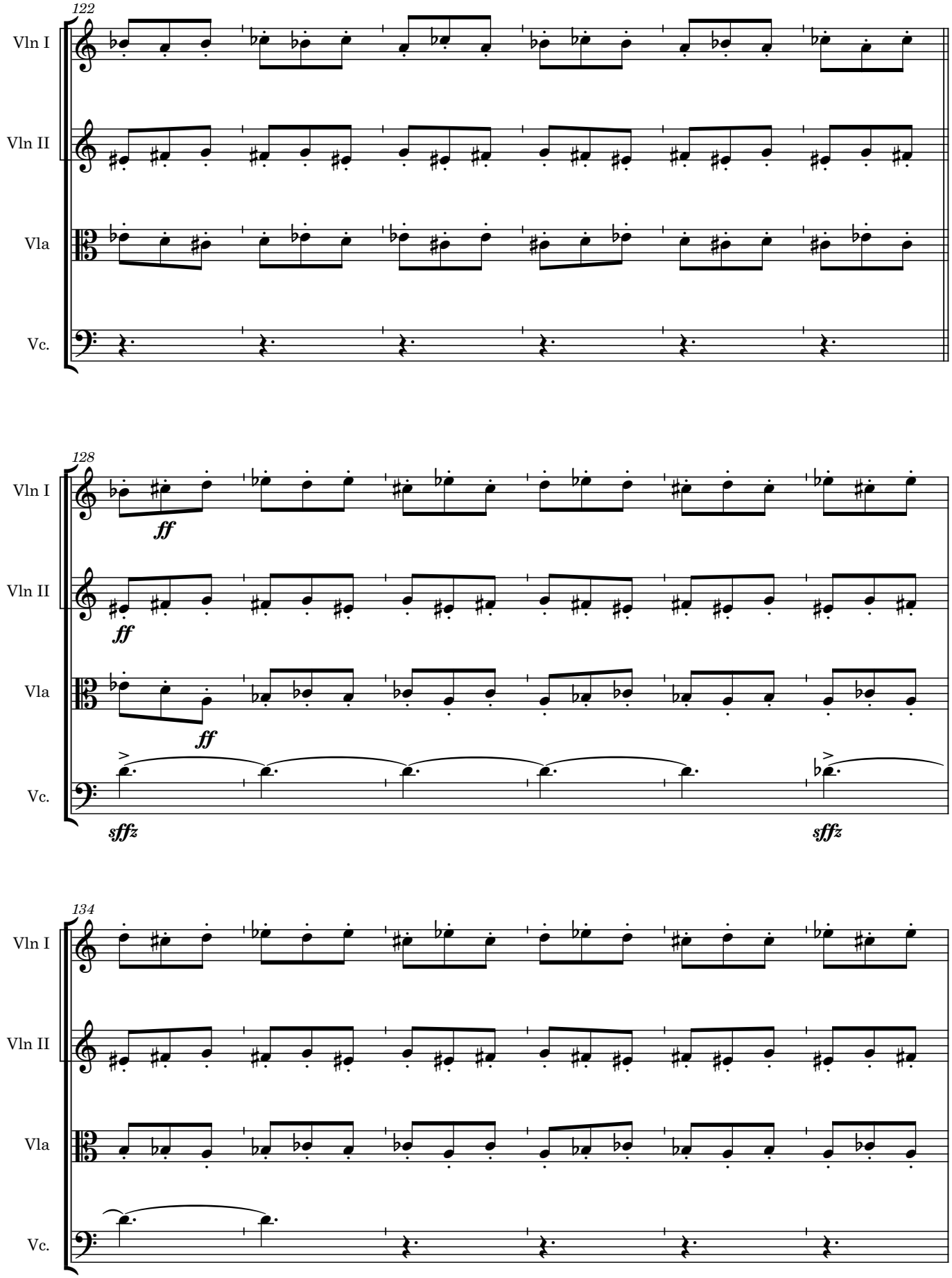
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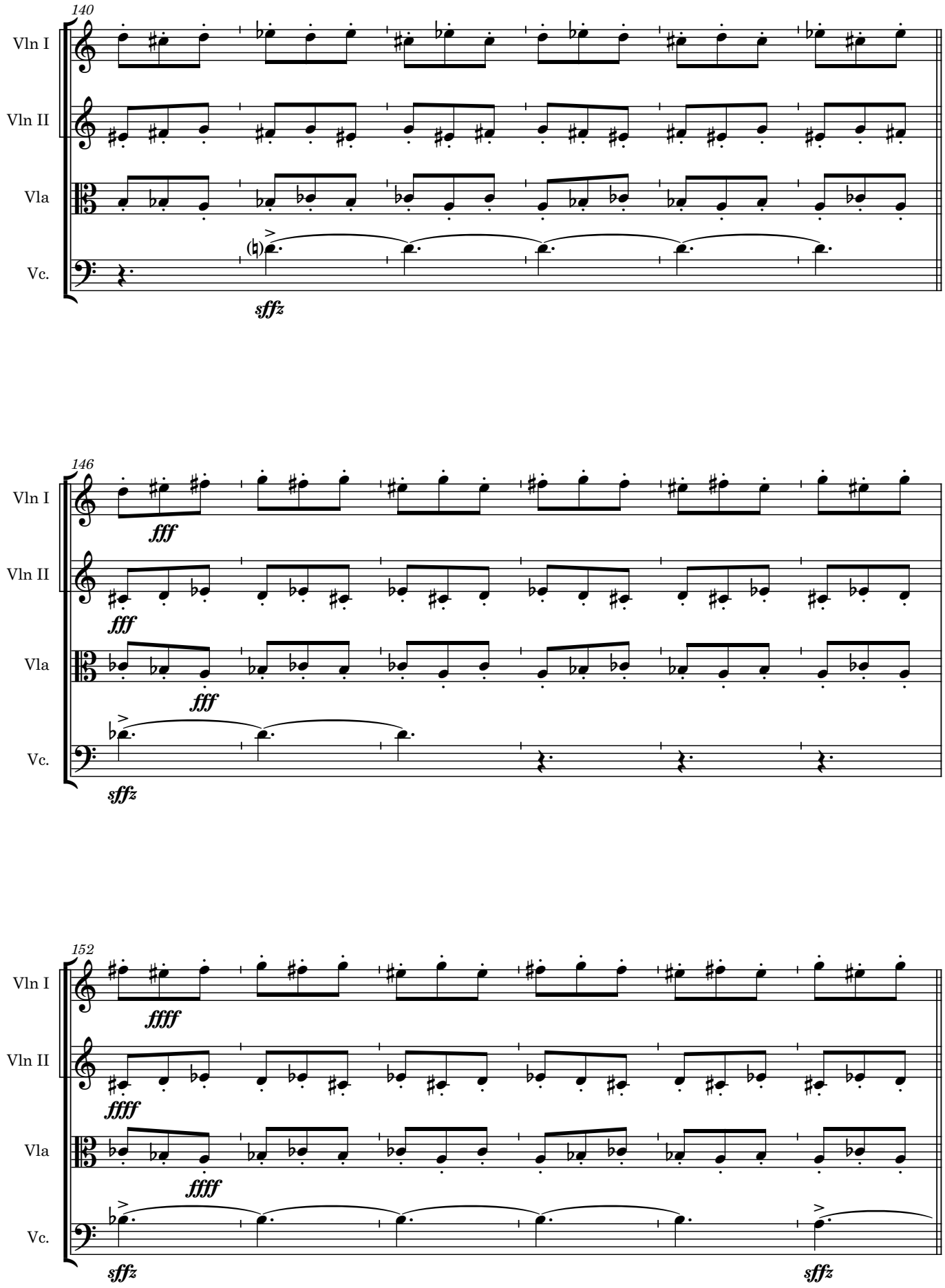
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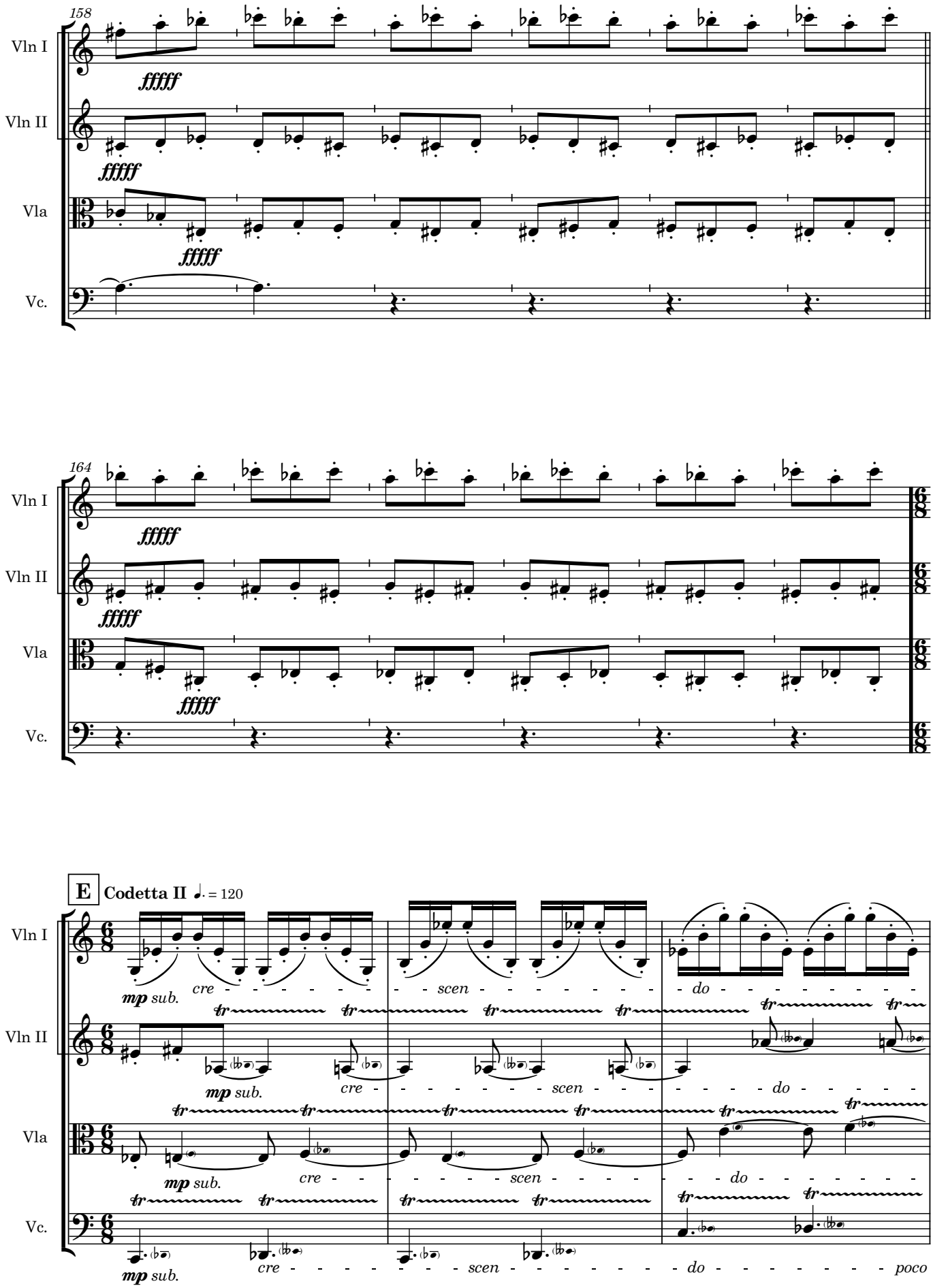
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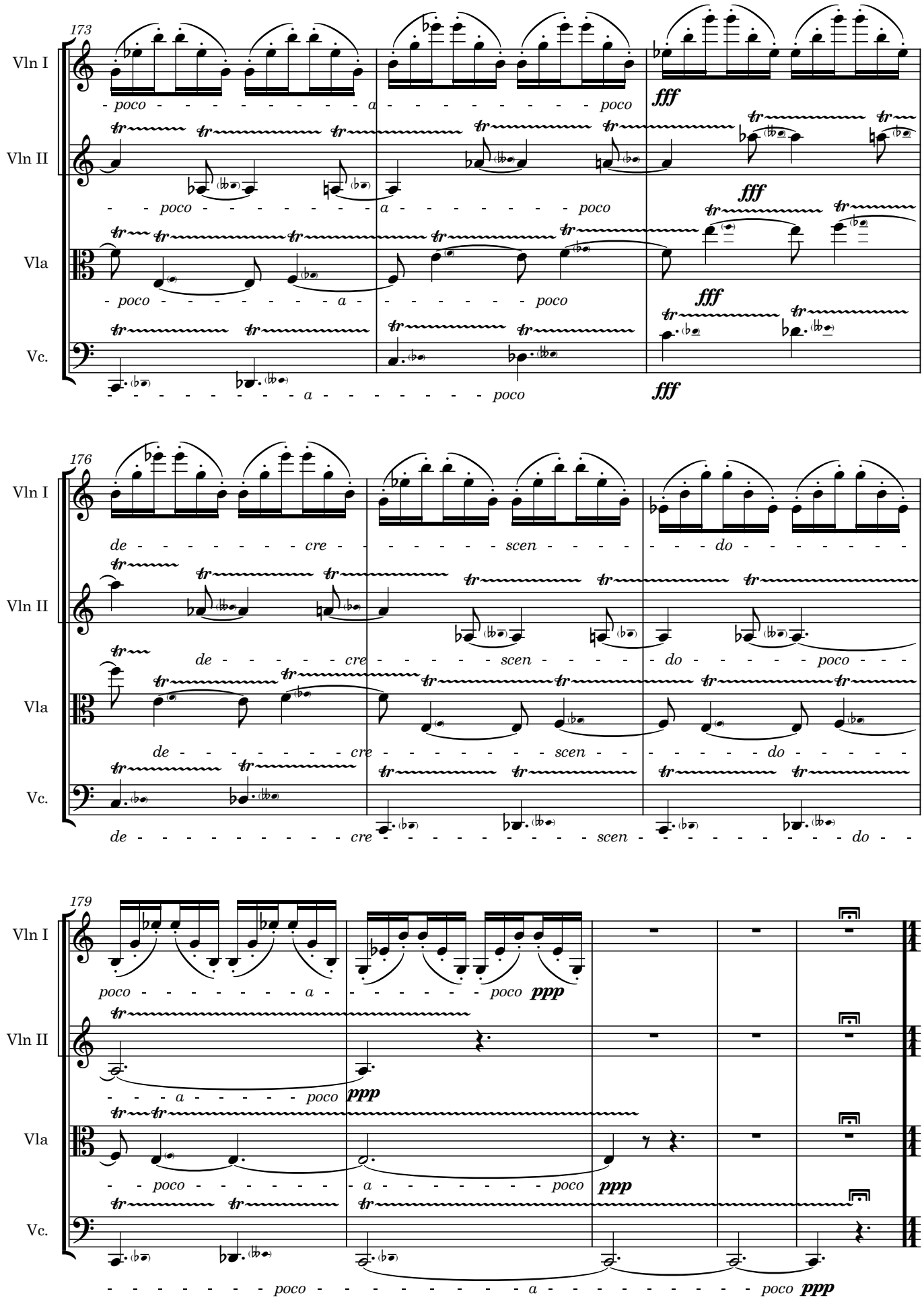
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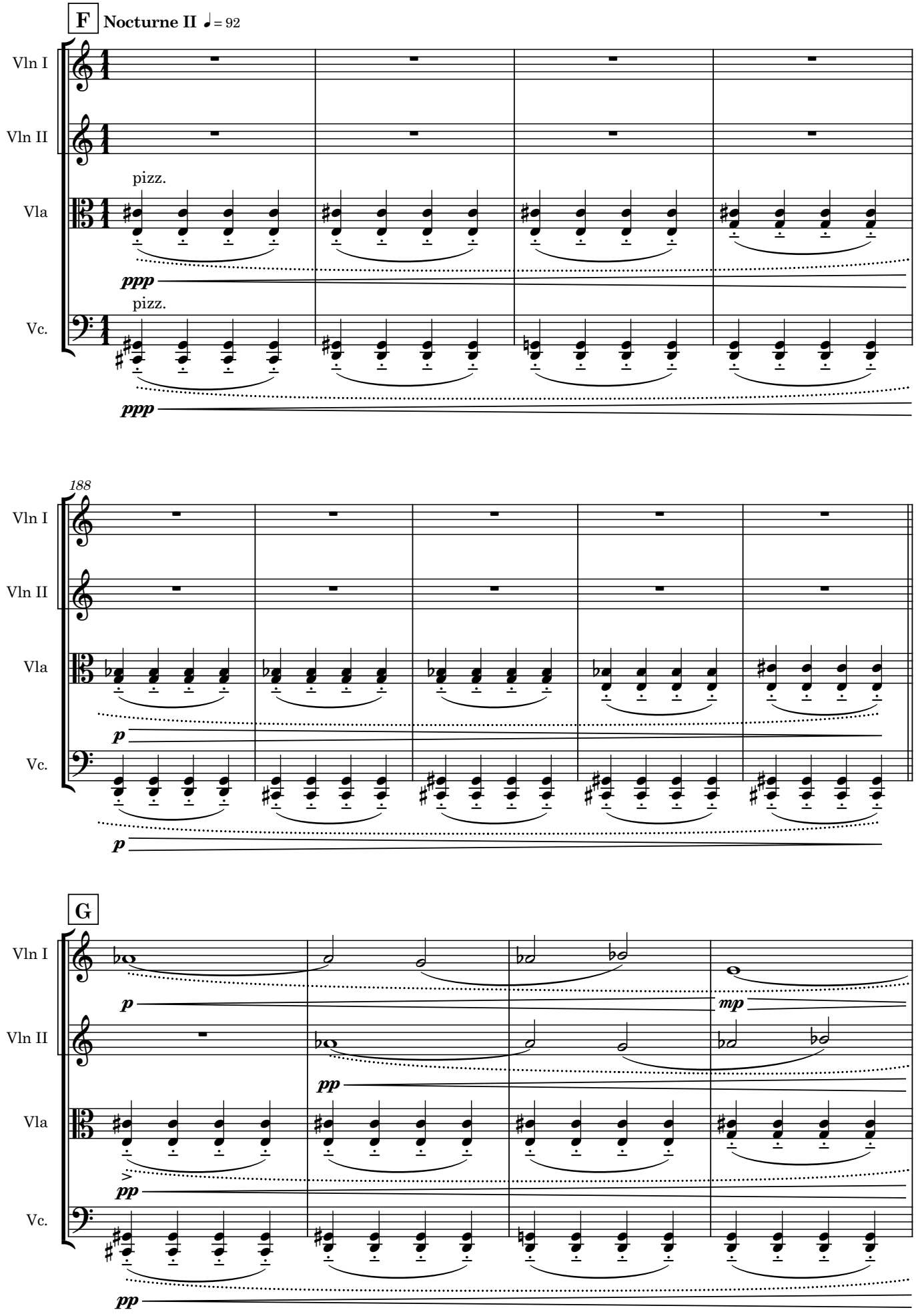
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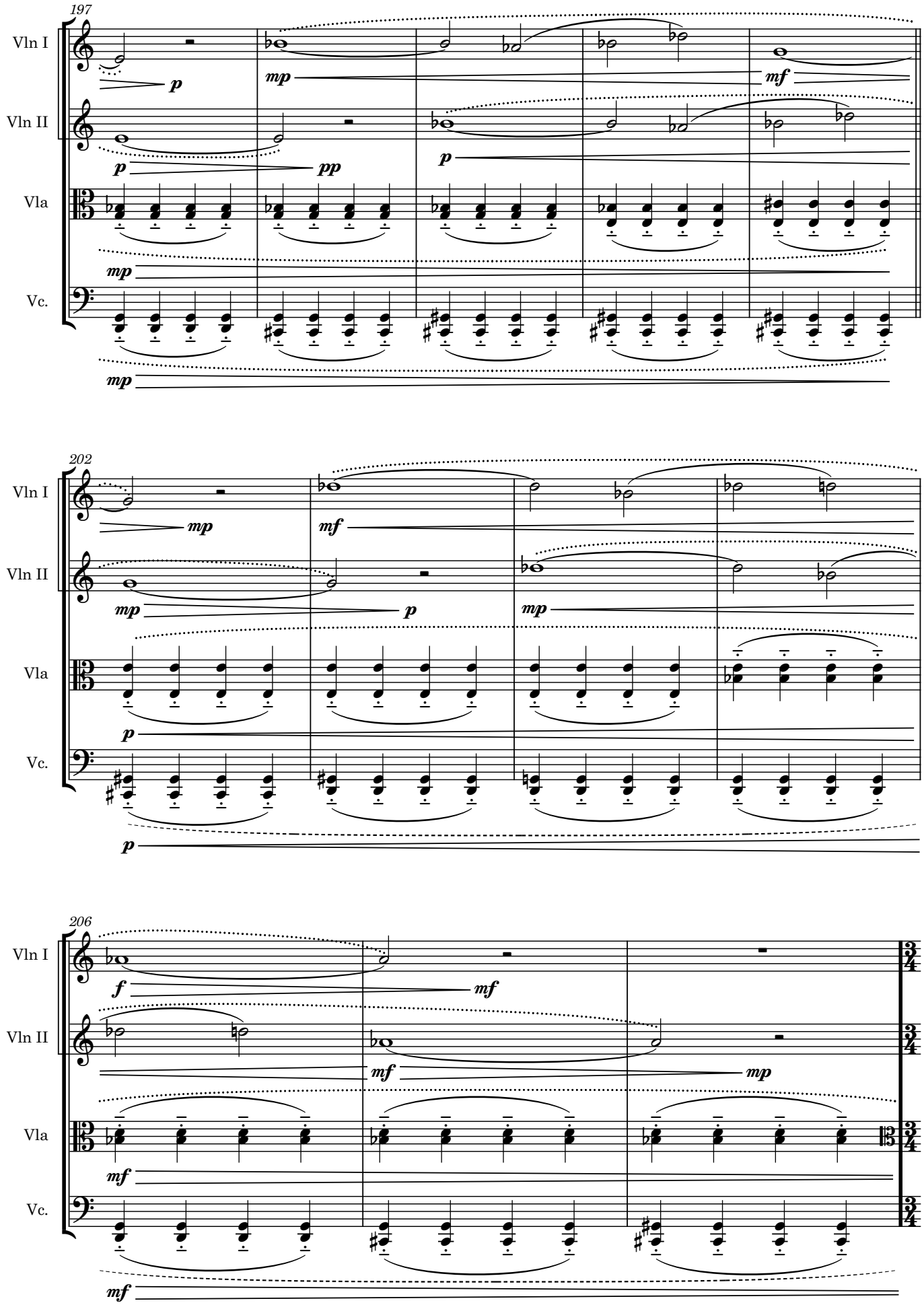
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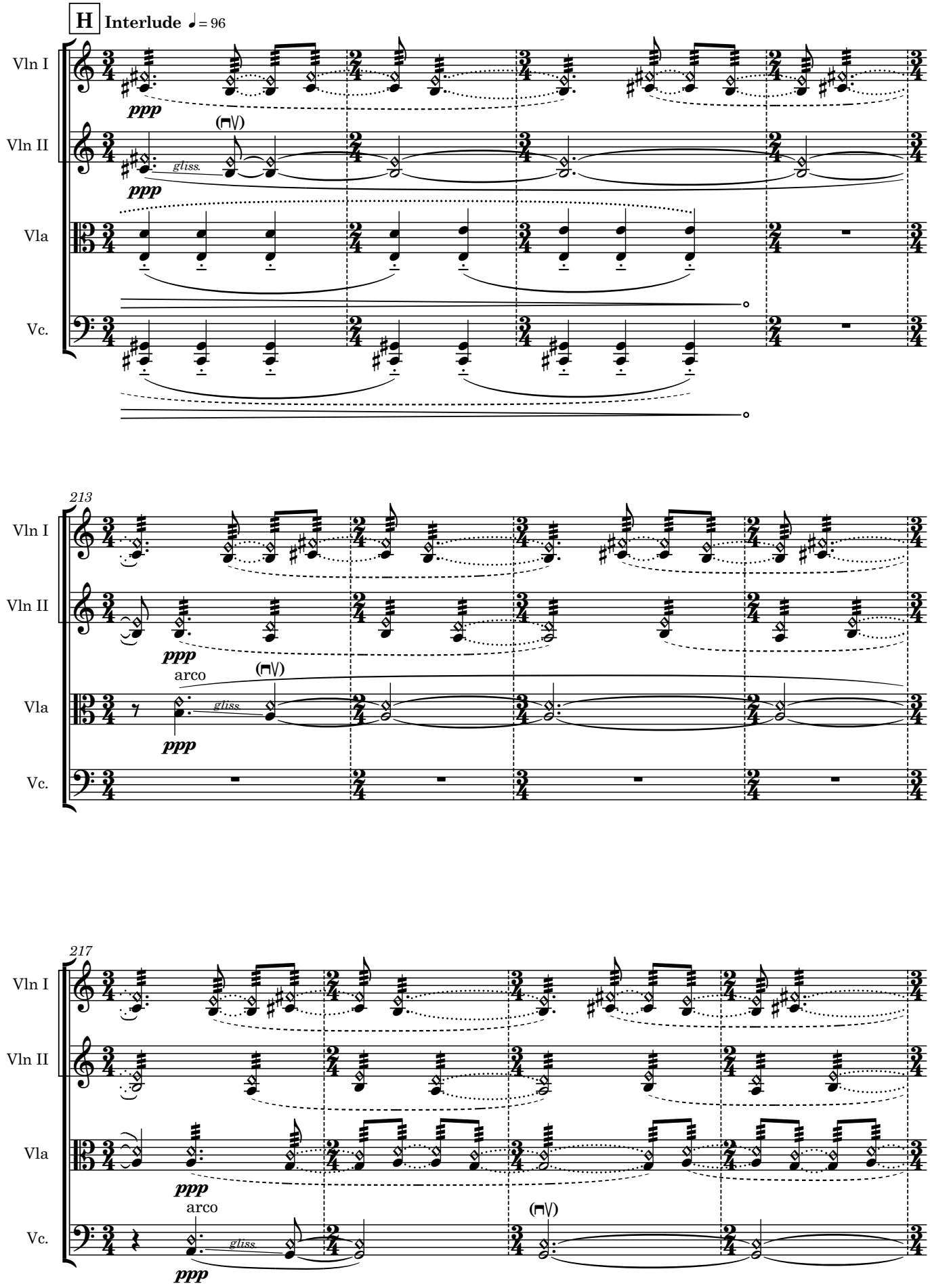
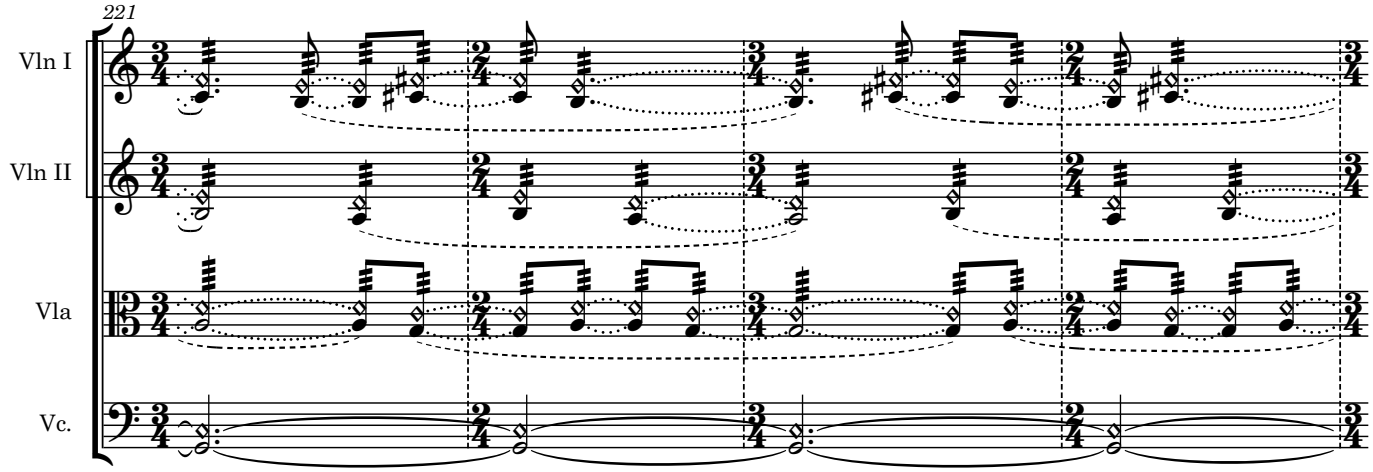
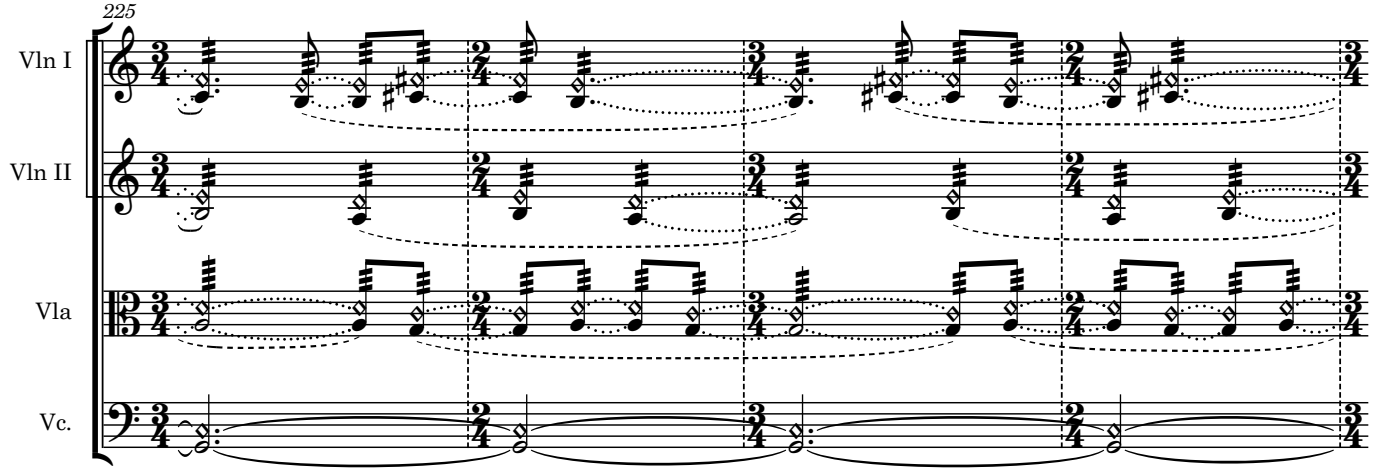
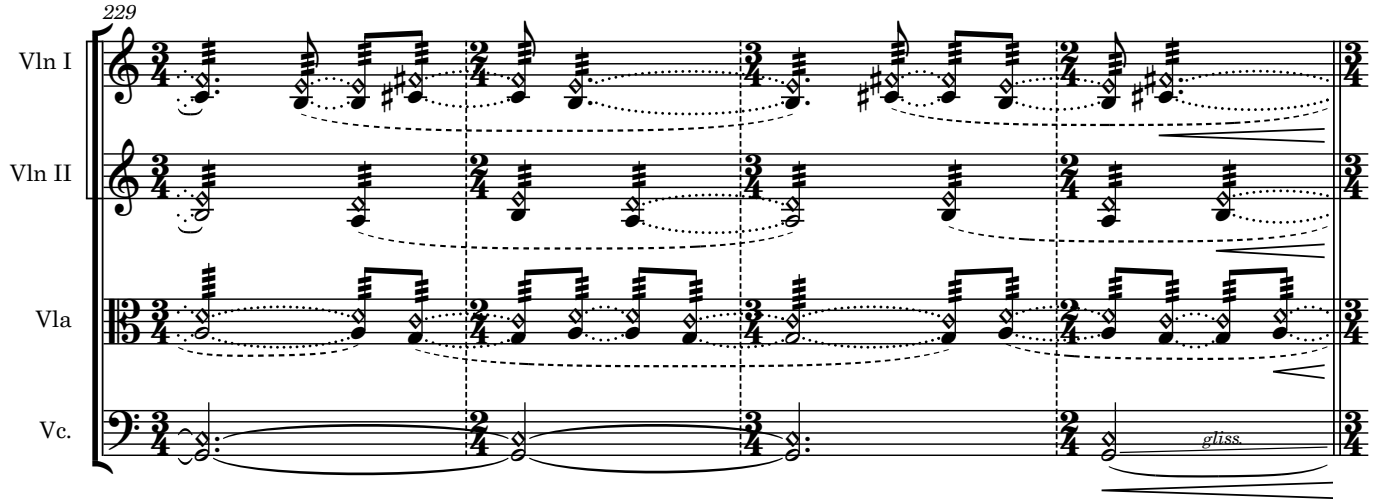
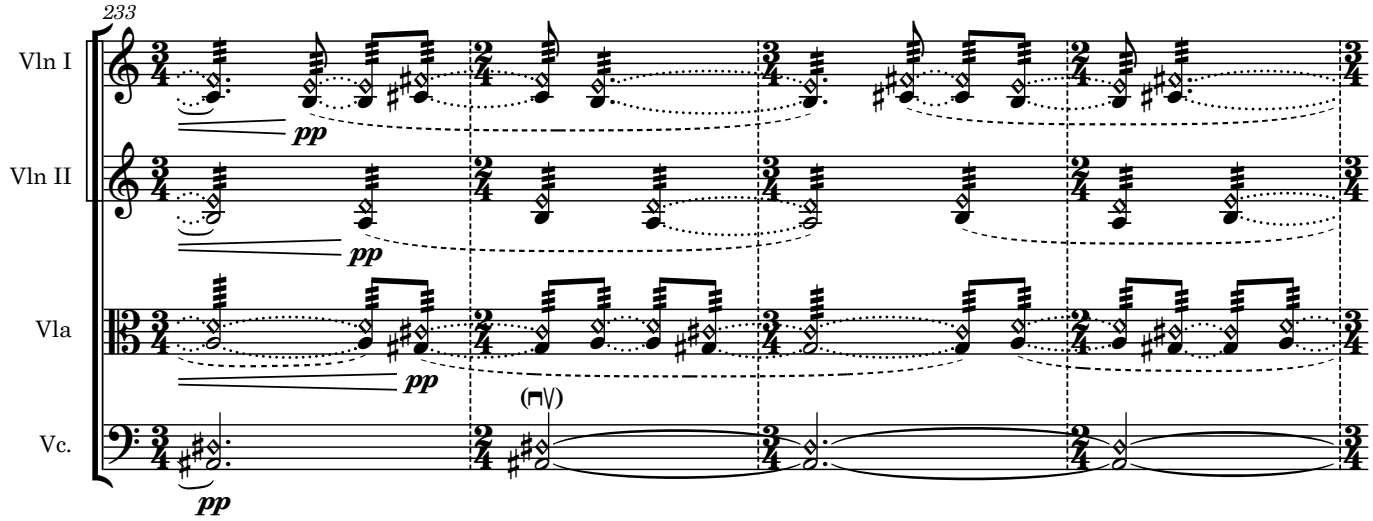
Vln I
Vln II
Vla
Vc.
p
mp
mf
pp
202
206
f

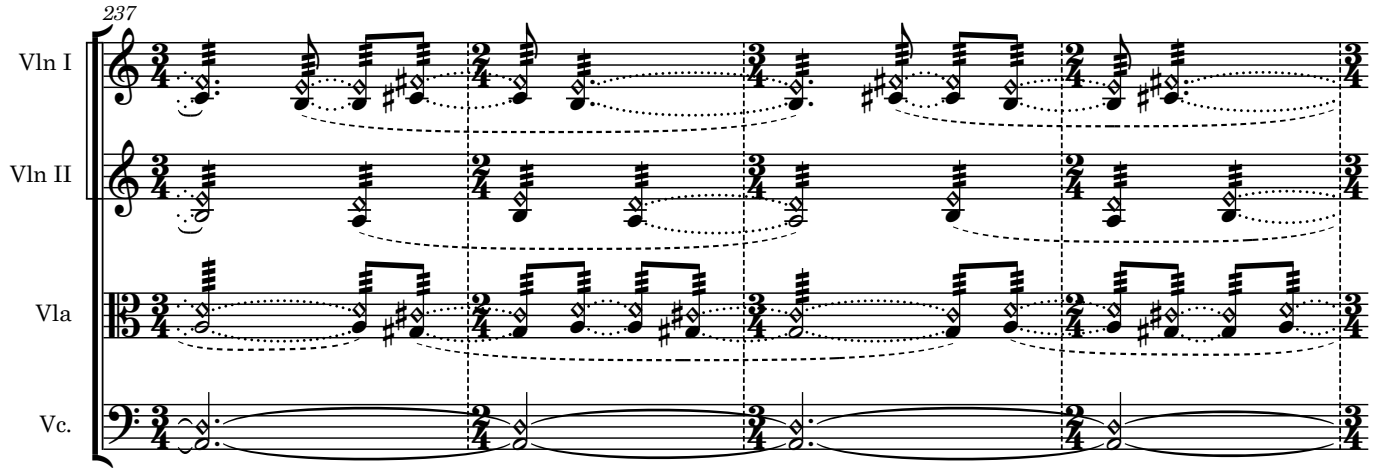

H
Interlude ♩= 96
Vln I
Vln II
Vla
Vc.
ppp
gliss.
213
arco
217

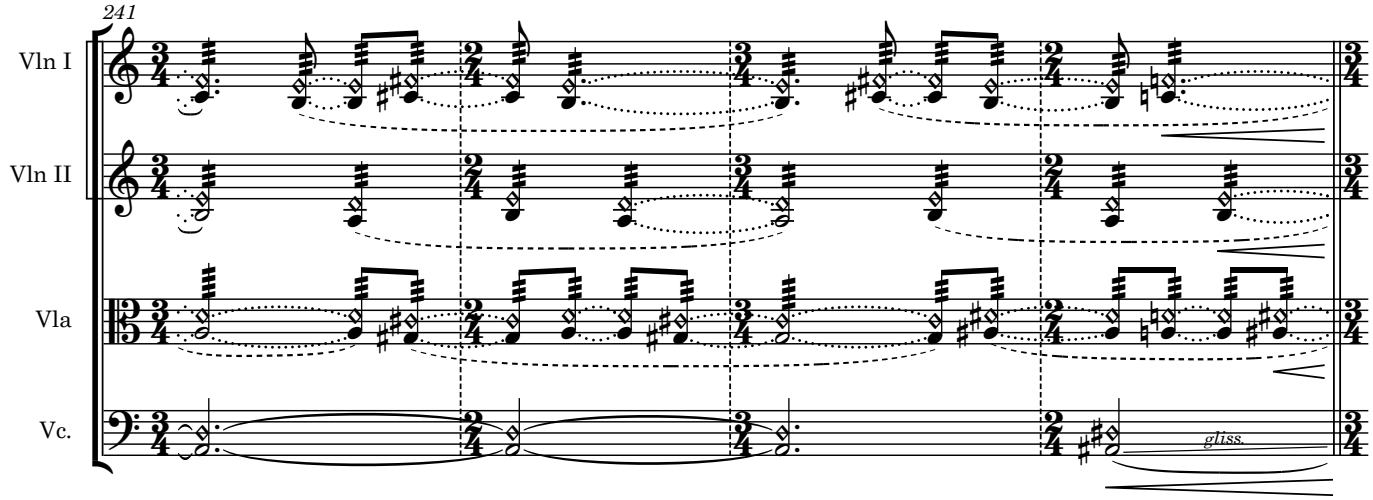

221
Vln I
Vln II
Vla
Vc.

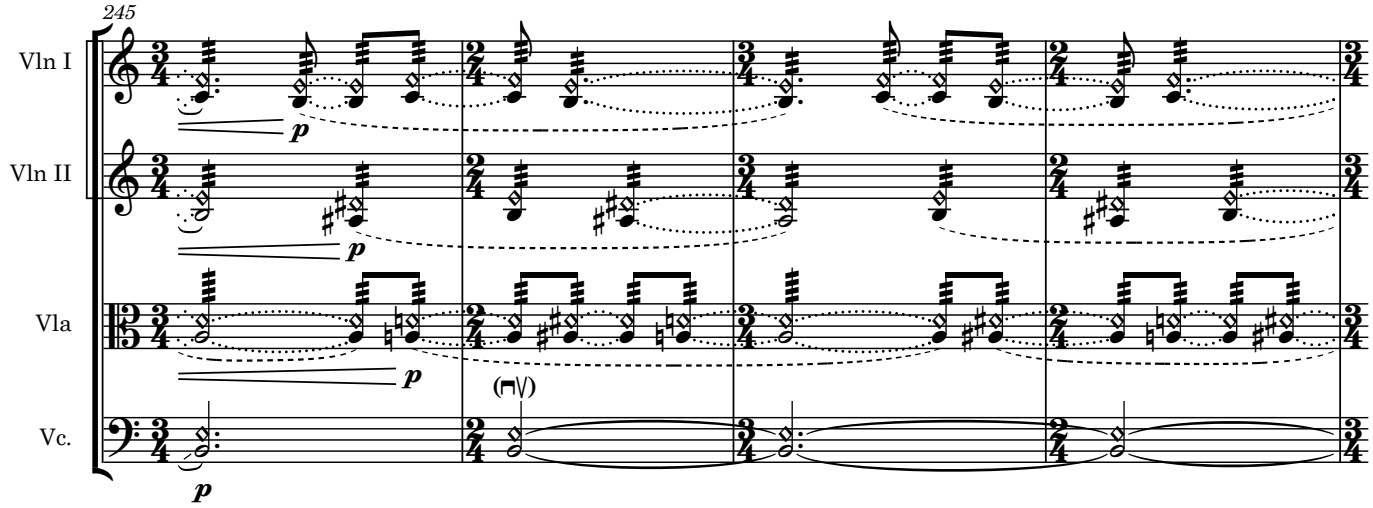

225
Vln I
Vln II
Vla
Vc.

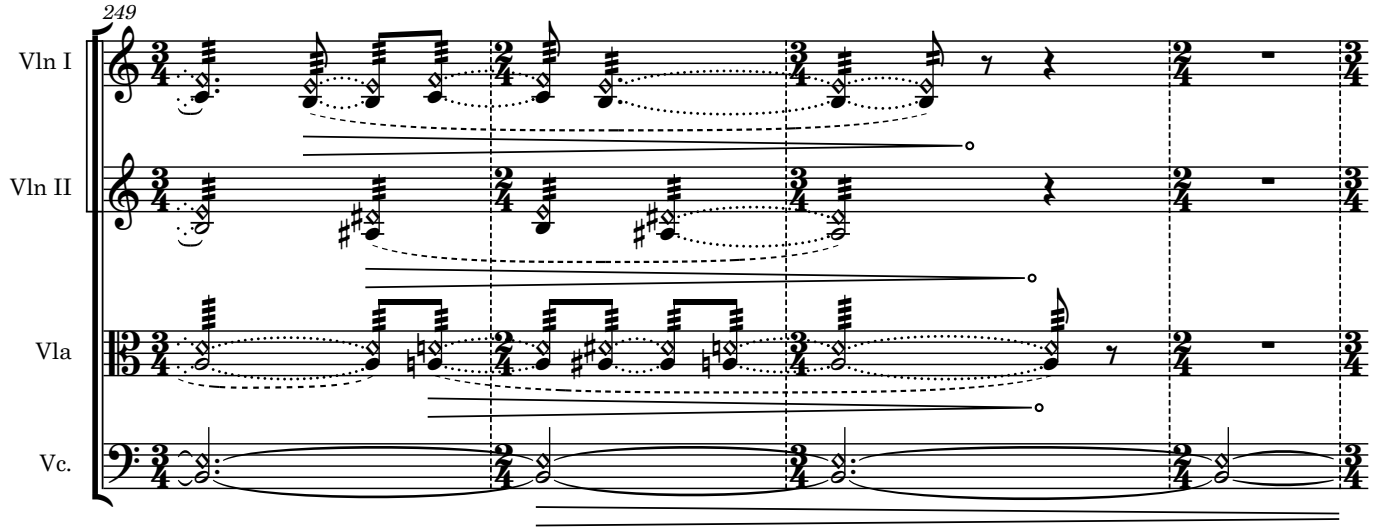

229
Vln I
Vln II
Vla
Vc.
gliss.

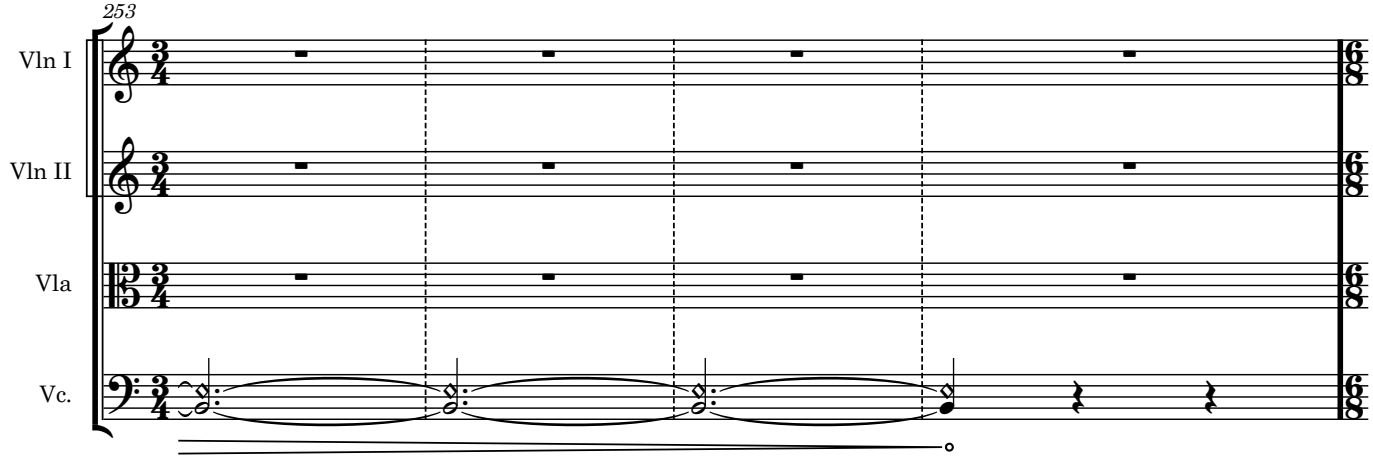

233
Vln I
Vln II
Vla
Vc.
pp
pp
pp
pp

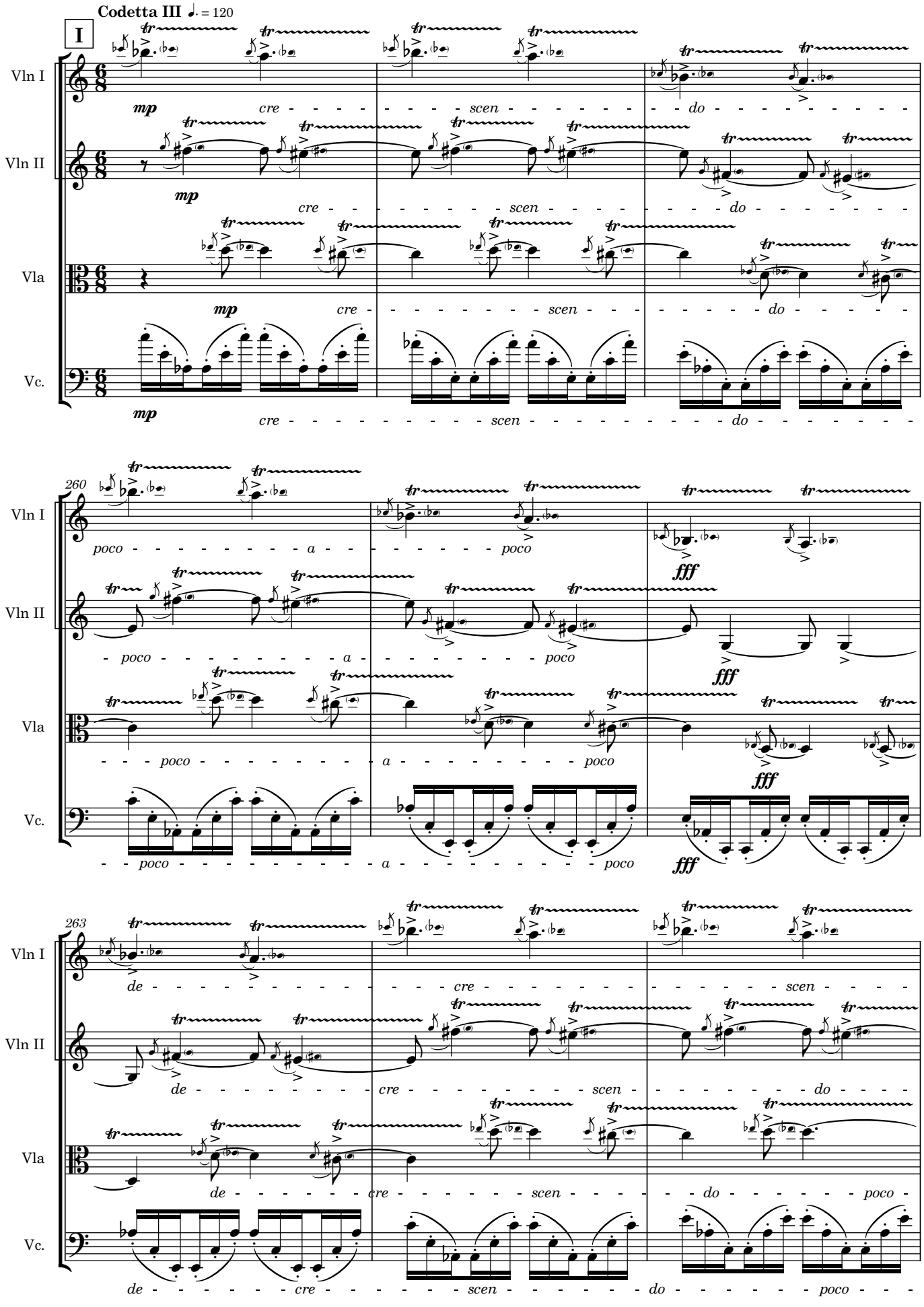

237
Vln I
Vln II
Vla
Vc.

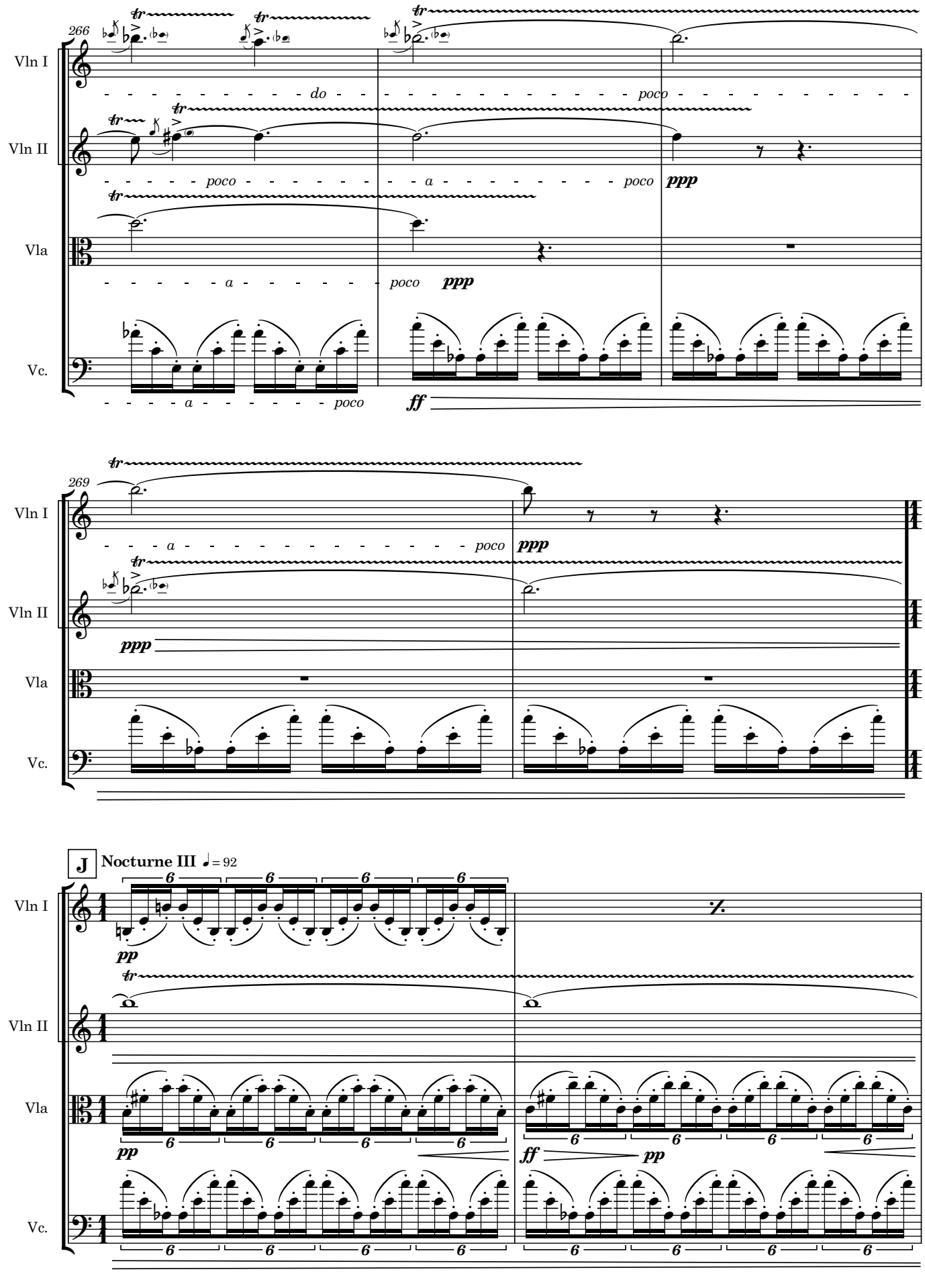

241
Vln I
Vln II
Vla
Vc.
gliss.

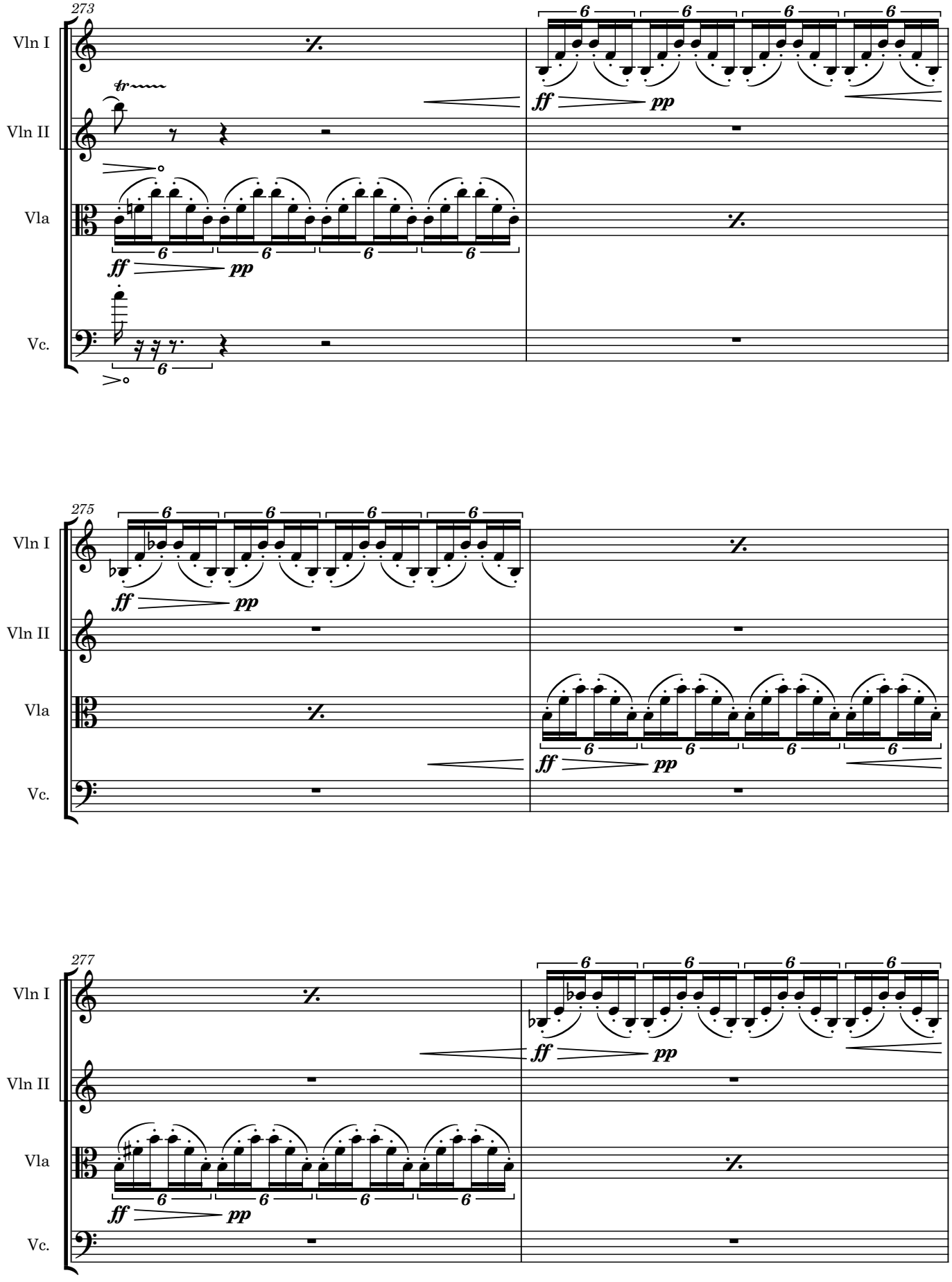

245
Vln I
Vln II
Vla
Vc.
p
p
p
p
(⊓∨)

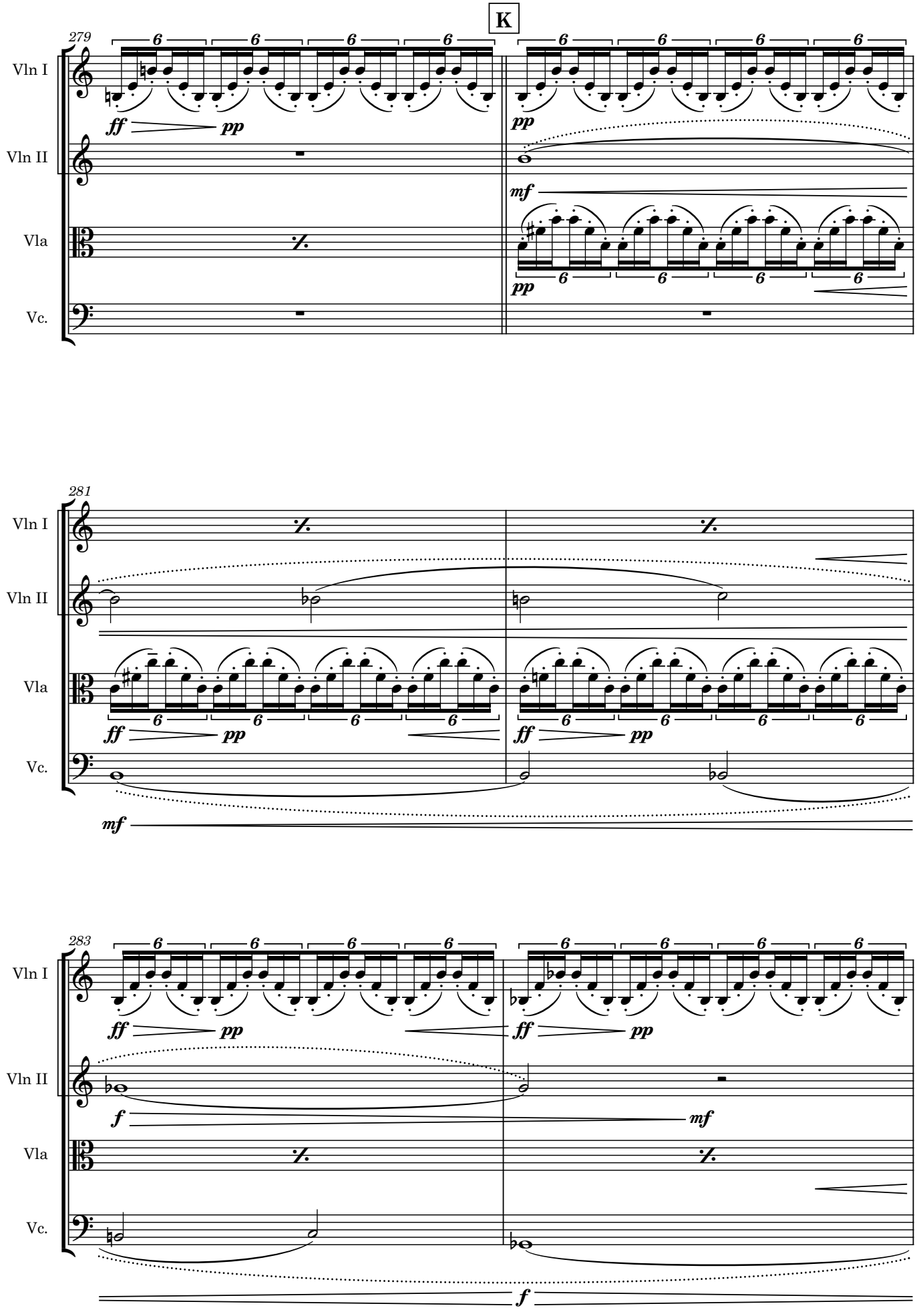

249
Vln I
Vln II
Vla
Vc.

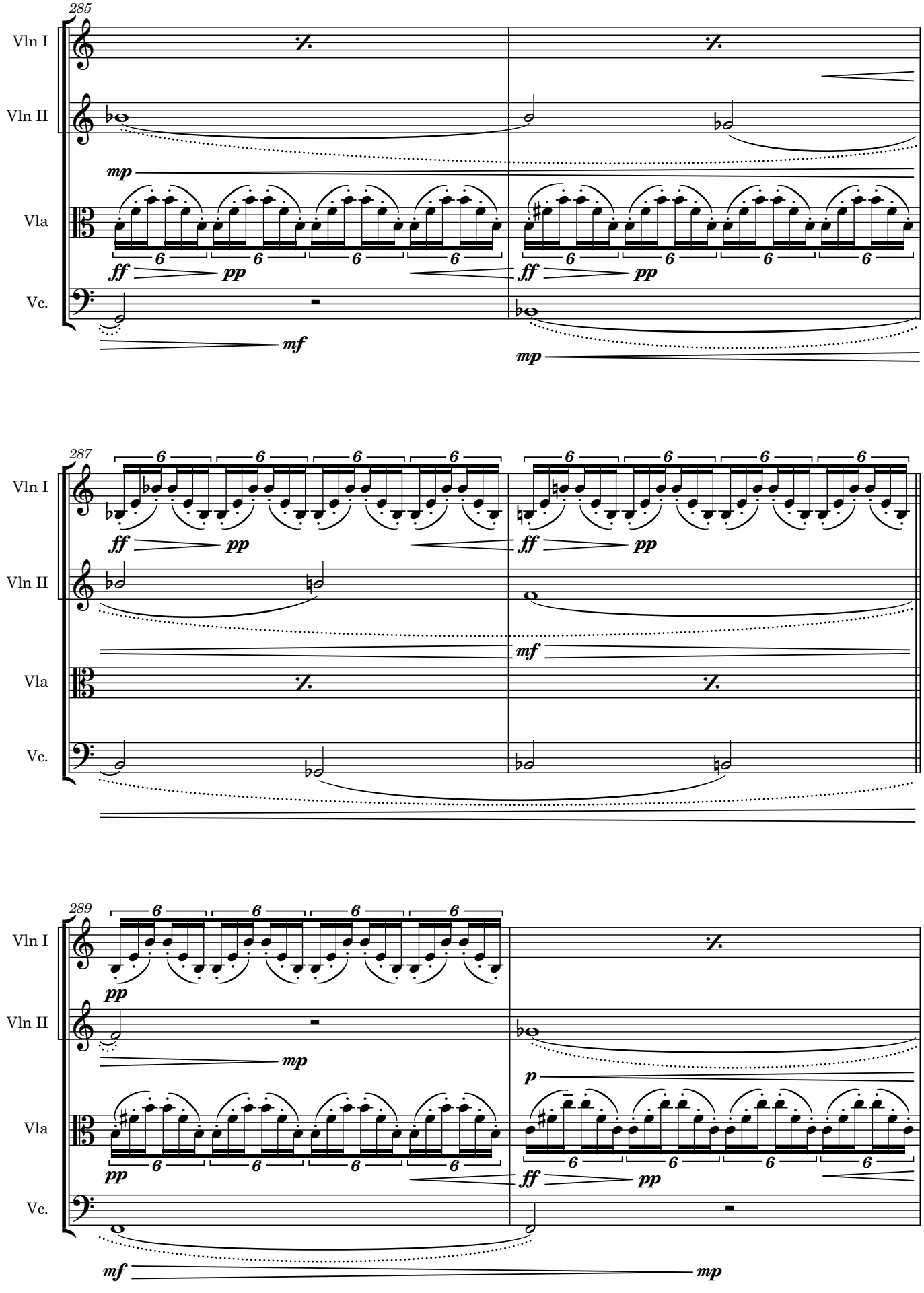

253
Vln I
Vln II
Vla
Vc.

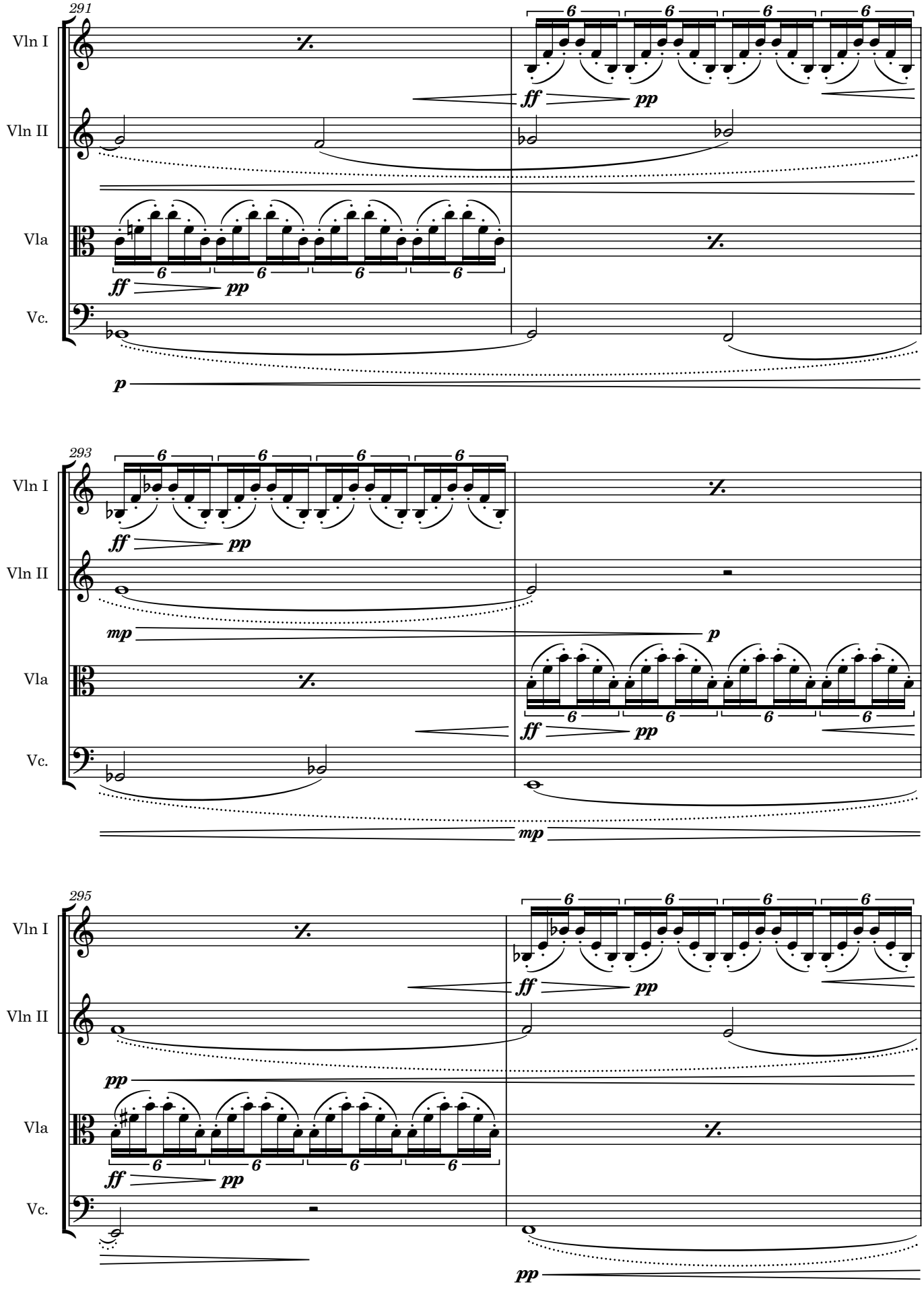

Codetta III ♩. = 120
I
Vln I
Vln II
Vla
Vc.
mp
cre - - - - - scen - - - - - do
260
poco - - - - - a - - - - - poco
fff
263
de - - - - - cre - - - - - scen - - - - - do - - - - - poco

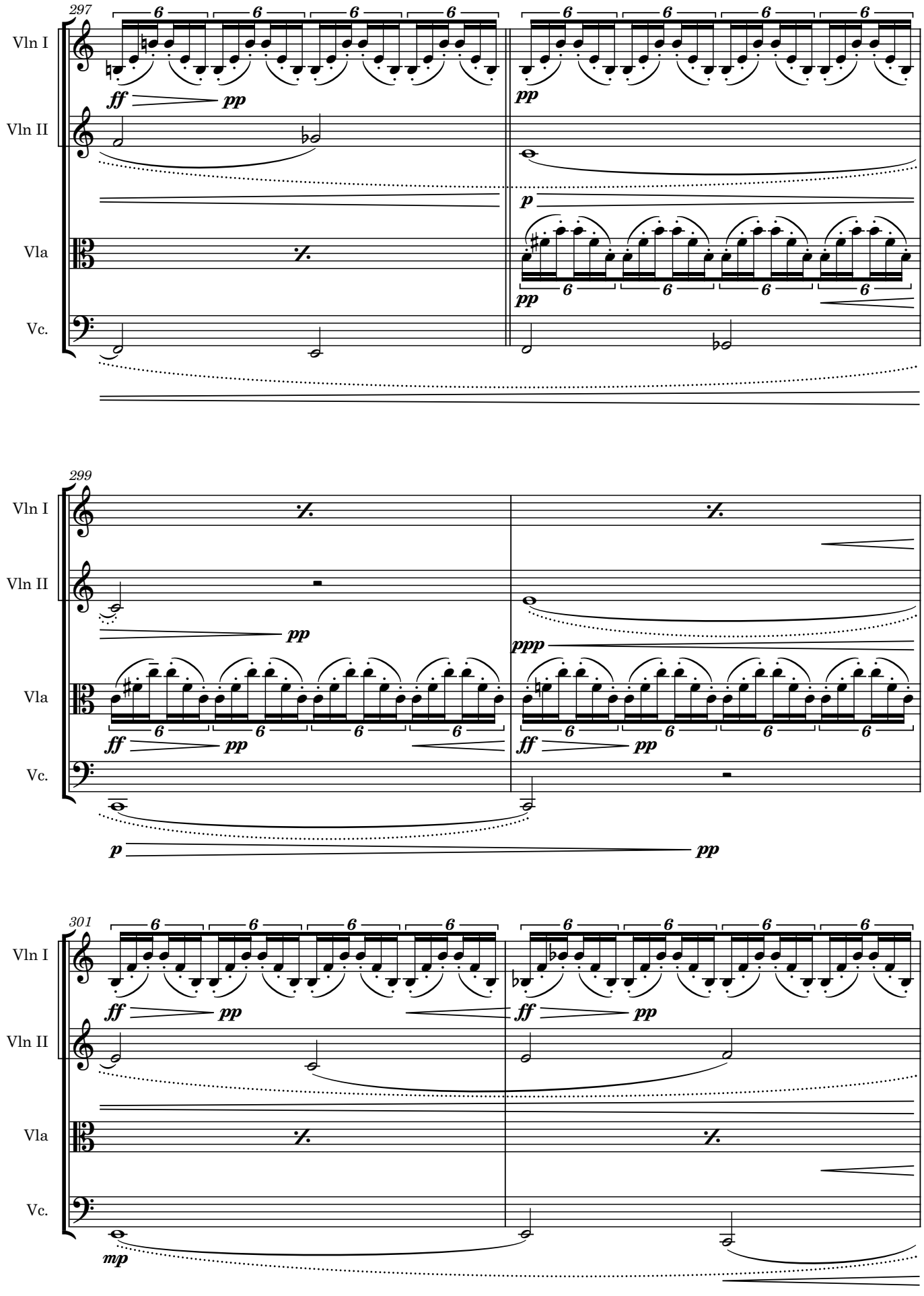

266
Vln I
Vln II
Vla
Vc.
do
poco
a
poco
ppp
ff
269
J
Nocturne III ♩= 92
pp
ff

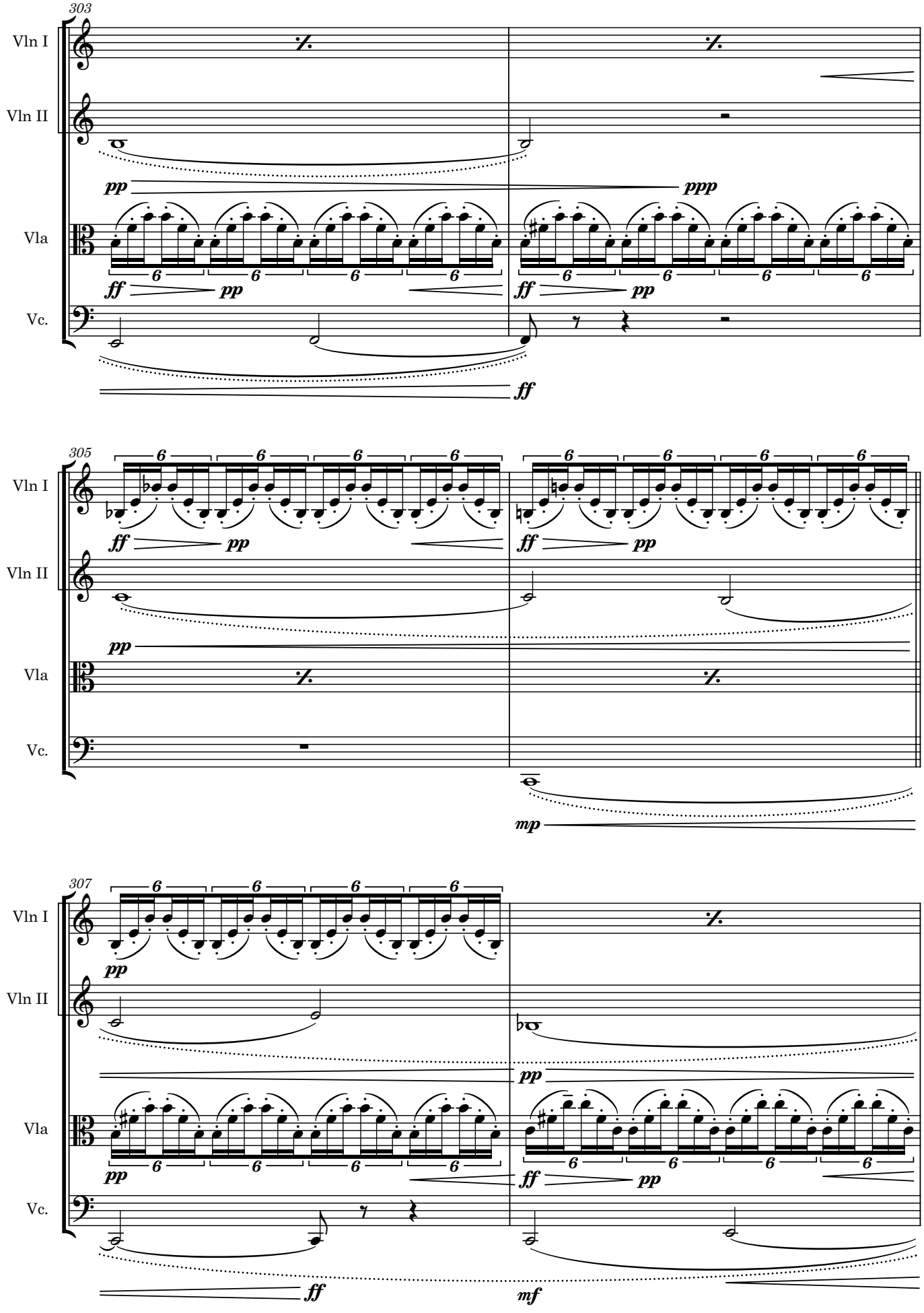

273
Vln I
Vln II
Vla
Vc.
tr
ff
pp
6
275
277

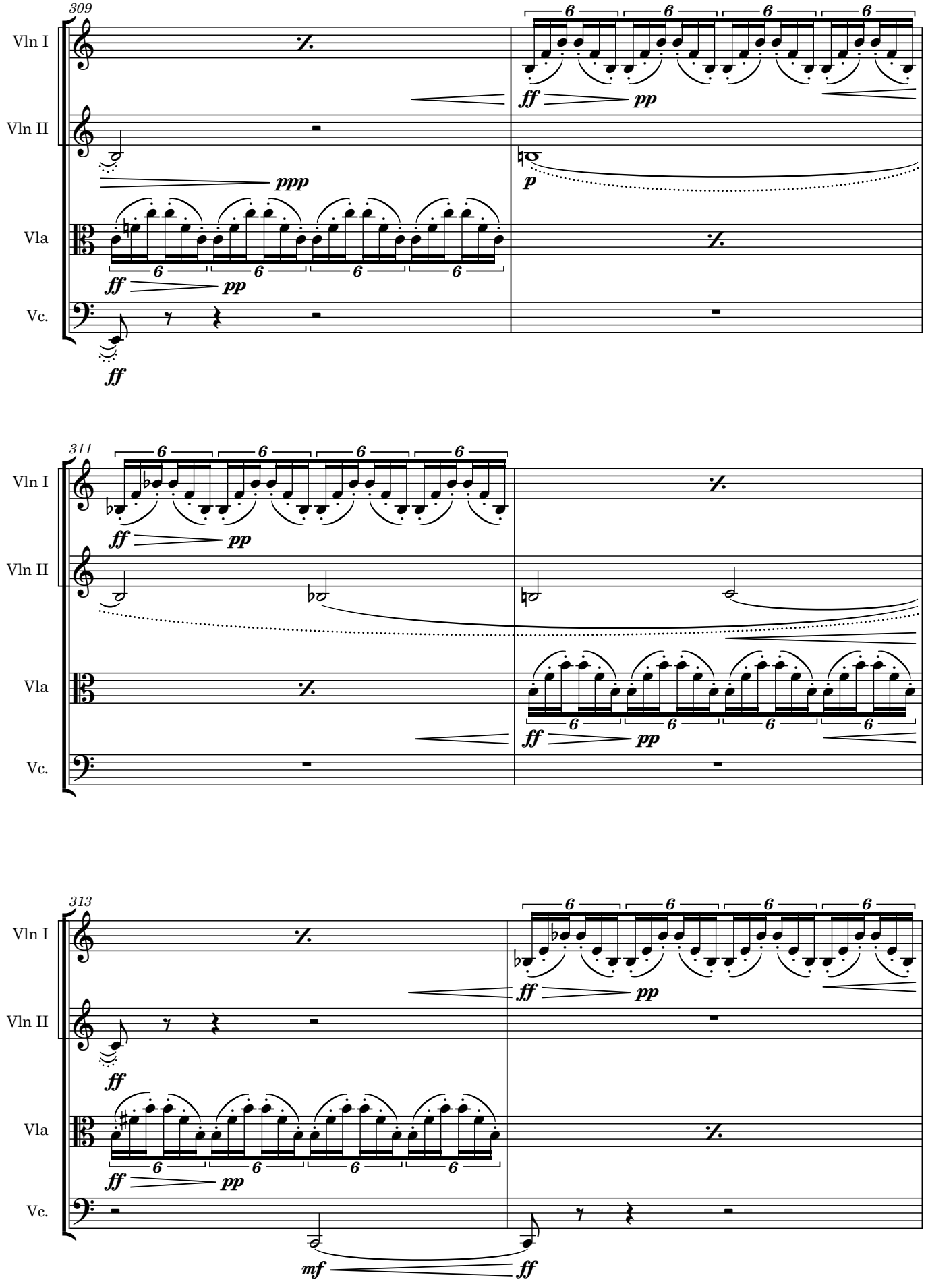

K
279
Vln I
Vln II
Vla
Vc.
ff
pp
mf
281
283
f

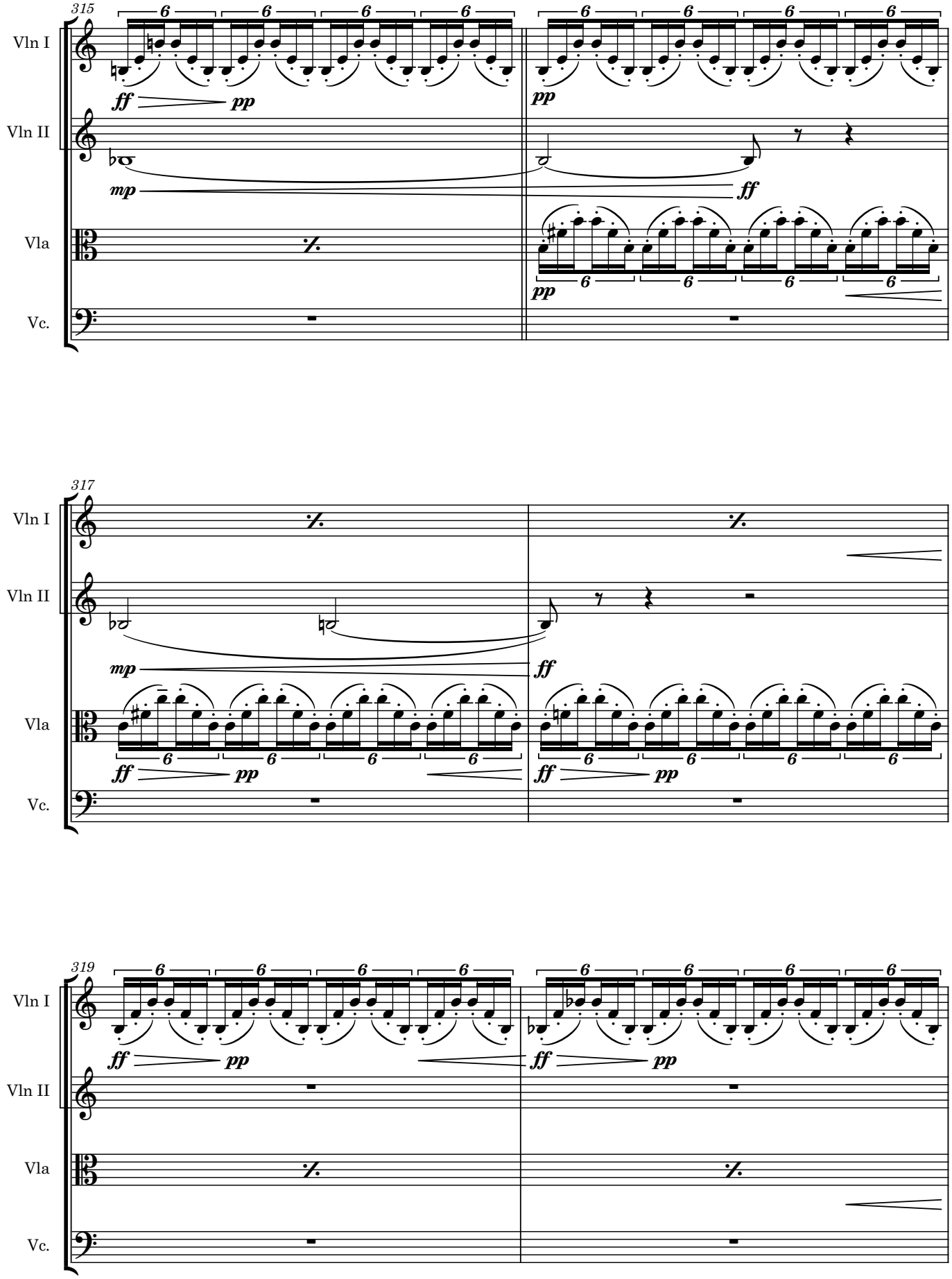

285
Vln I
Vln II
Vla
Vc.
mp
ff
pp
mf
287
289
p

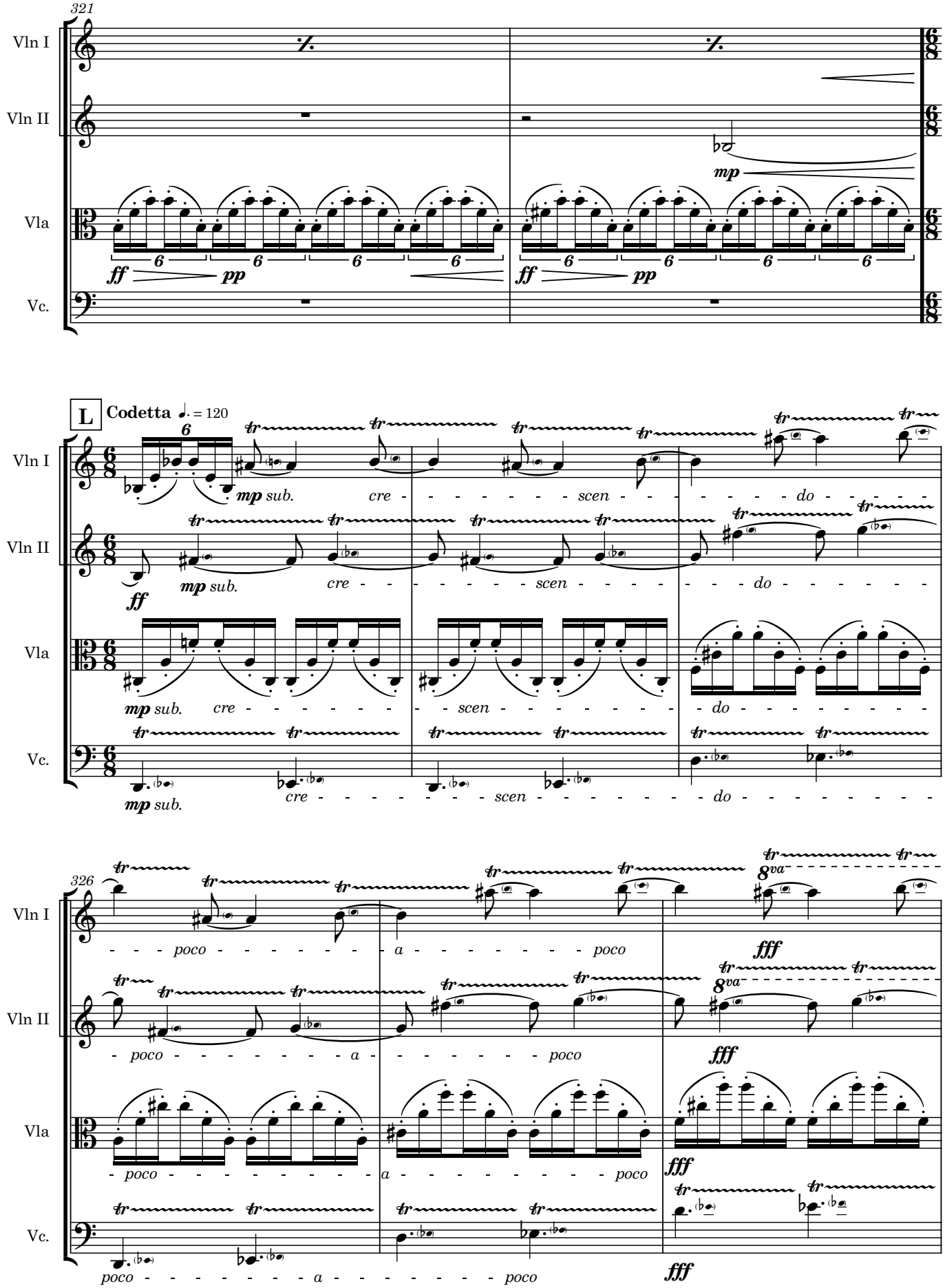

291
Vln I
Vln II
Vla
Vc.
293
295

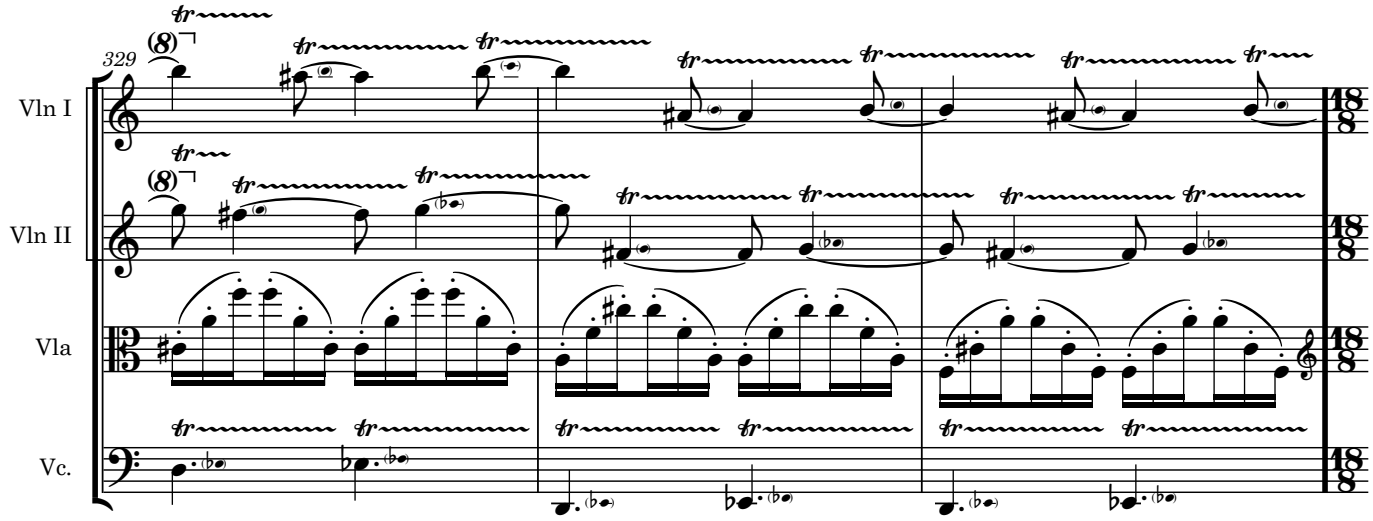

297
Vln I
Vln II
Vla
Vc.
ff
pp
p
299
301
mp

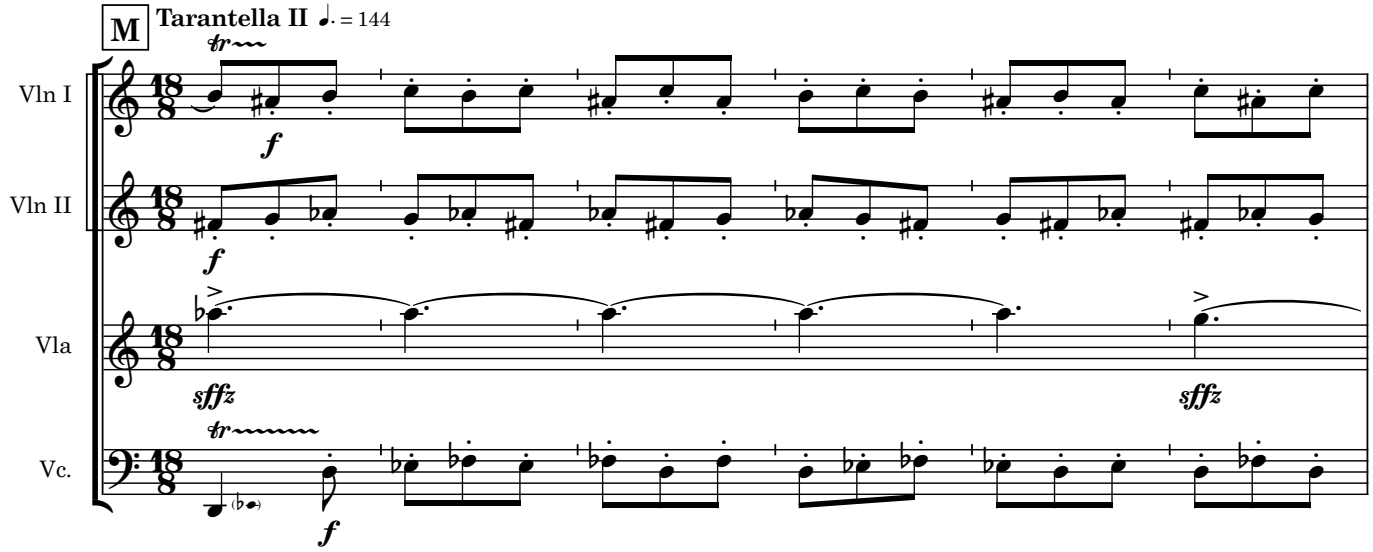

303
Vln I
Vln II
Vla
Vc.
pp
ppp
ff
pp
ff
305
mp
307
mf

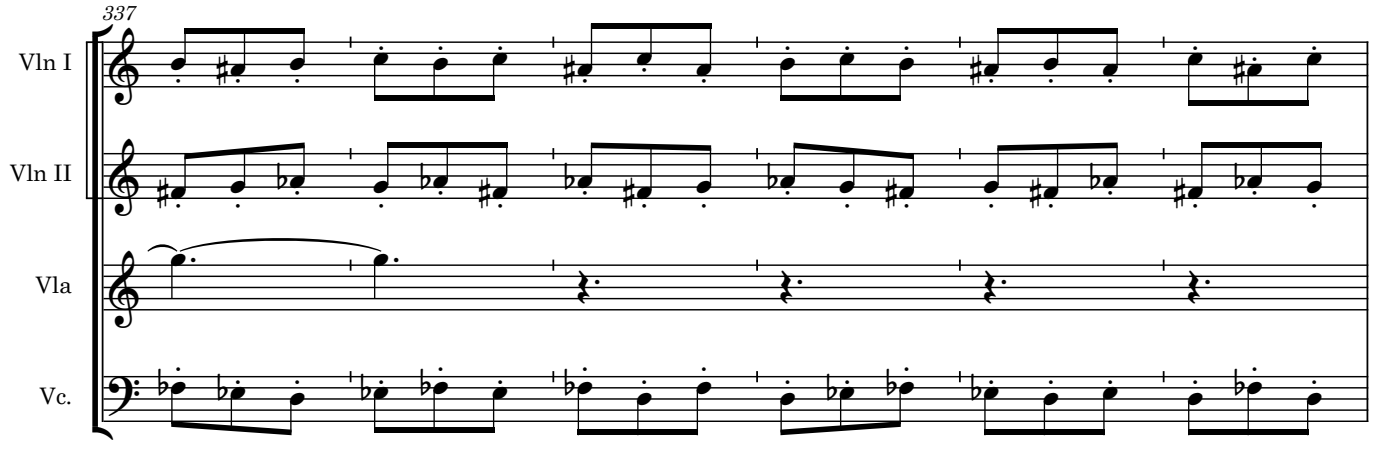

309
Vln I
Vln II
Vla
Vc.
311
313

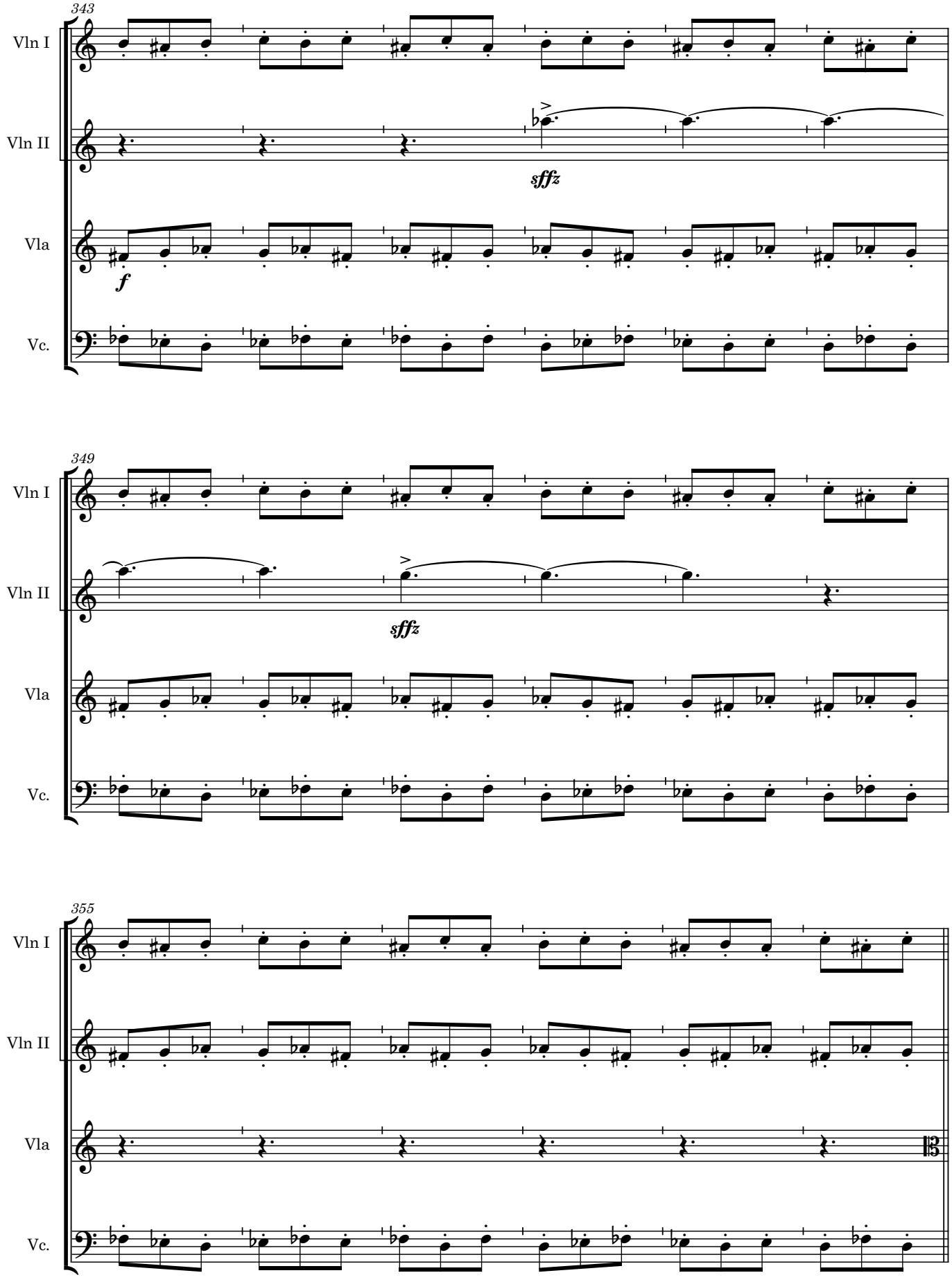

315
Vln I
Vln II
Vla
Vc.
317
319

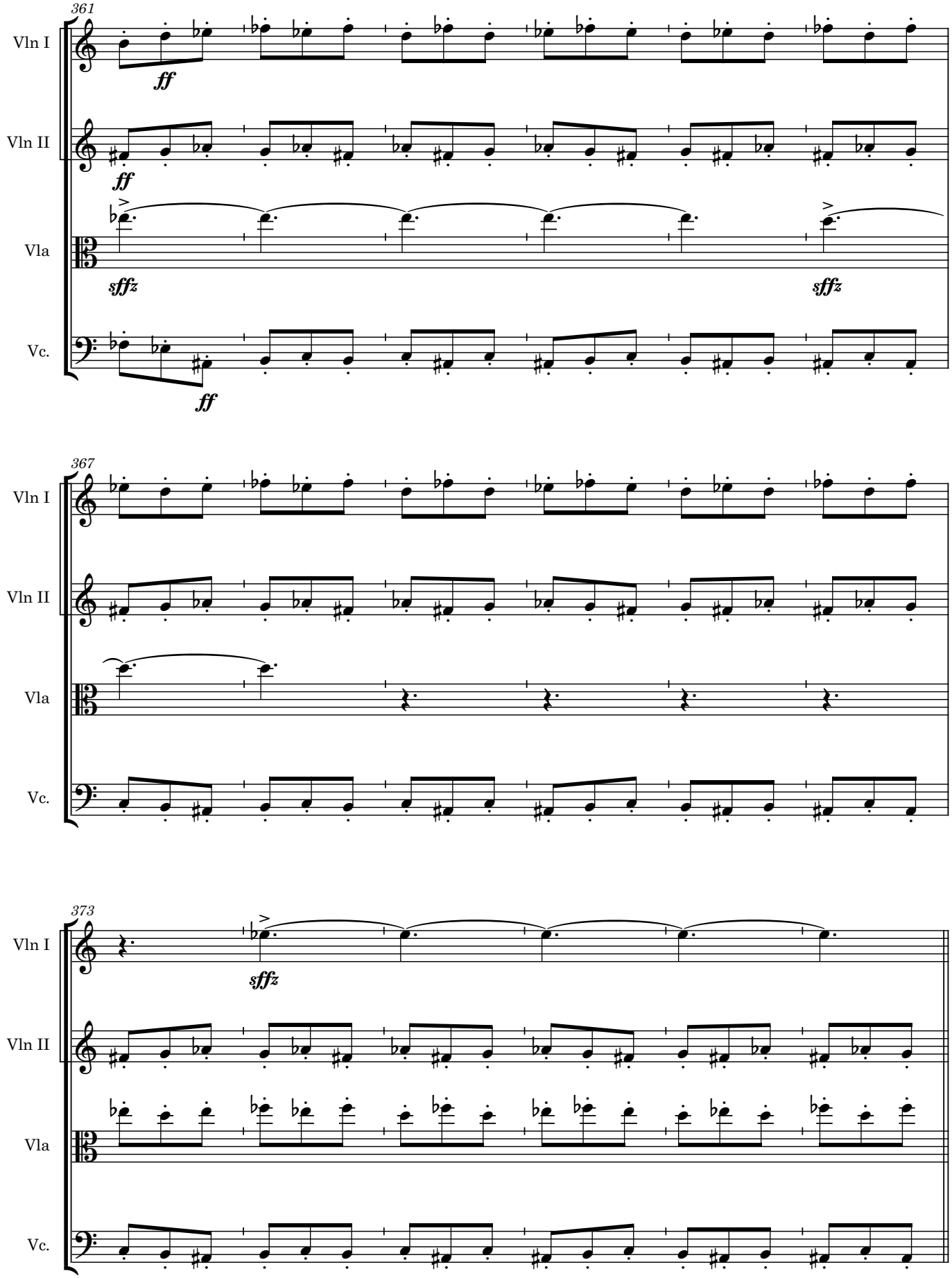

321
Vln I
Vln II
Vla
Vc.
mp
ff
pp
L
Codetta ♩. = 120
mp sub.
cre - scen - do
326
poco - a - poco
8va
fff

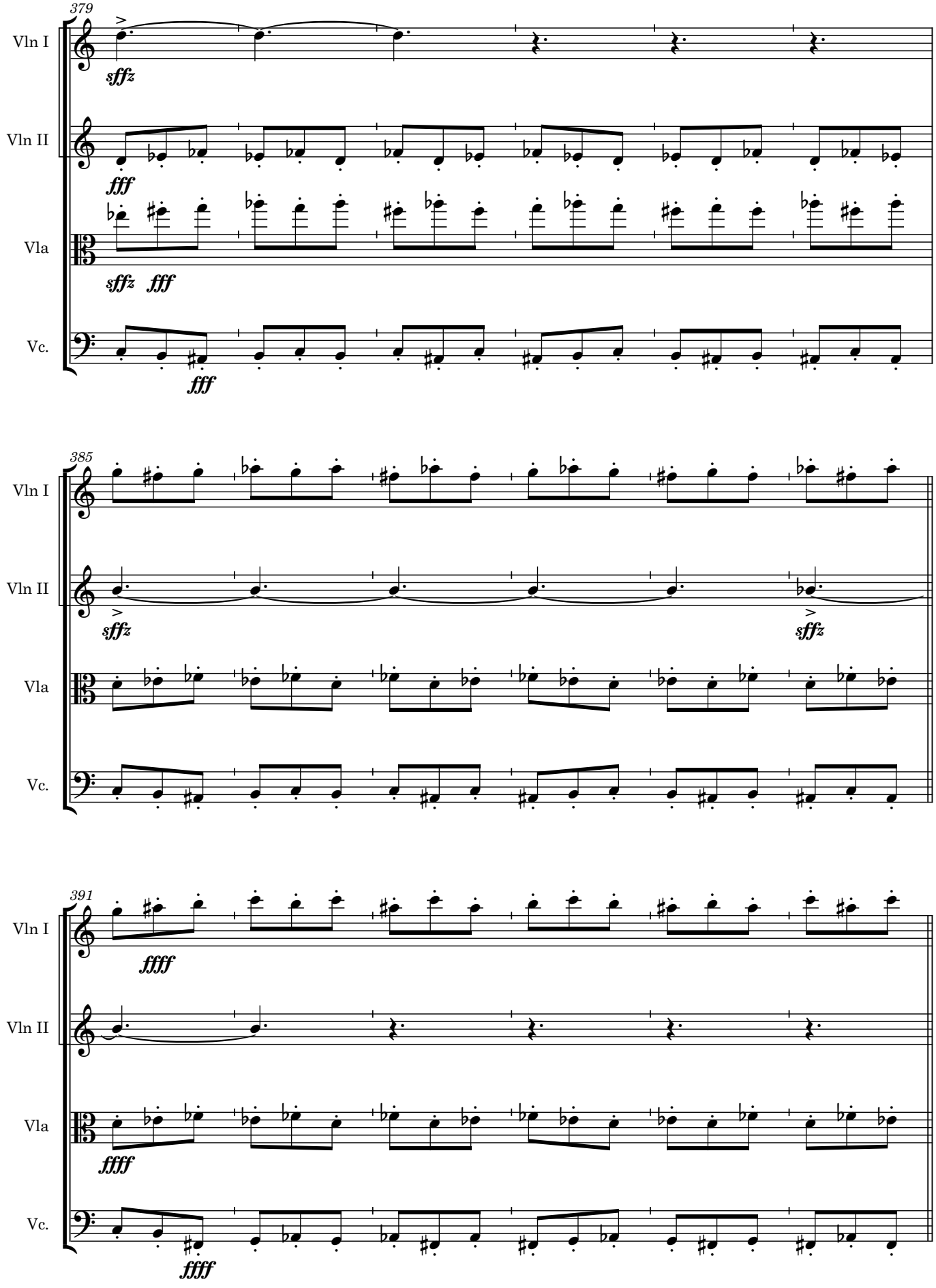

329
Vln I
Vln II
Vla
Vc.

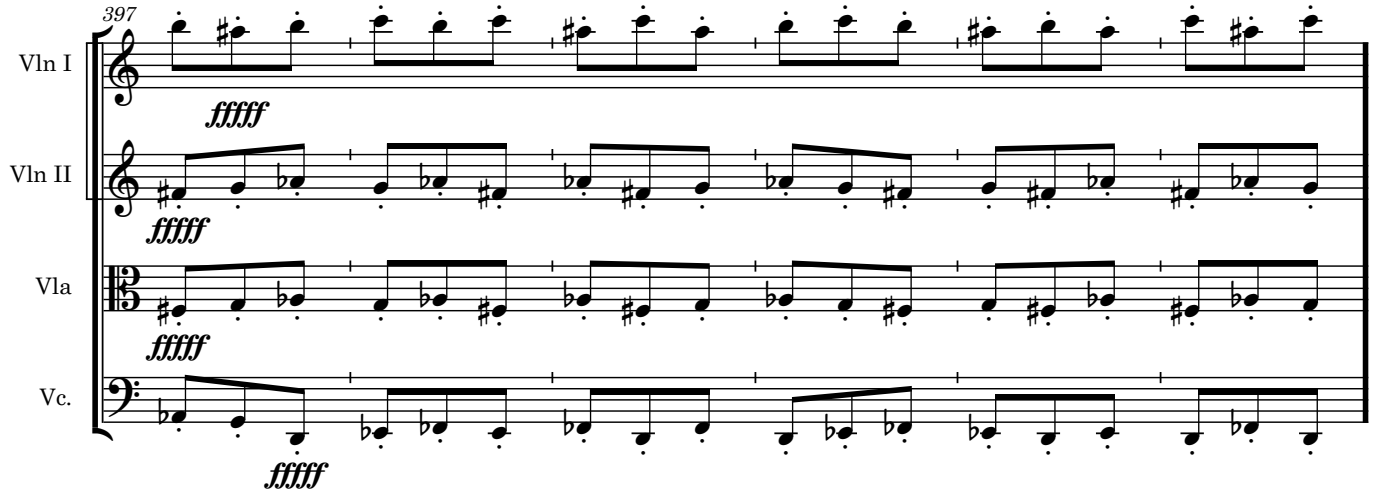

M
Tarantella II ♩. = 144
Vln I
Vln II
Vla
Vc.
f
sffz

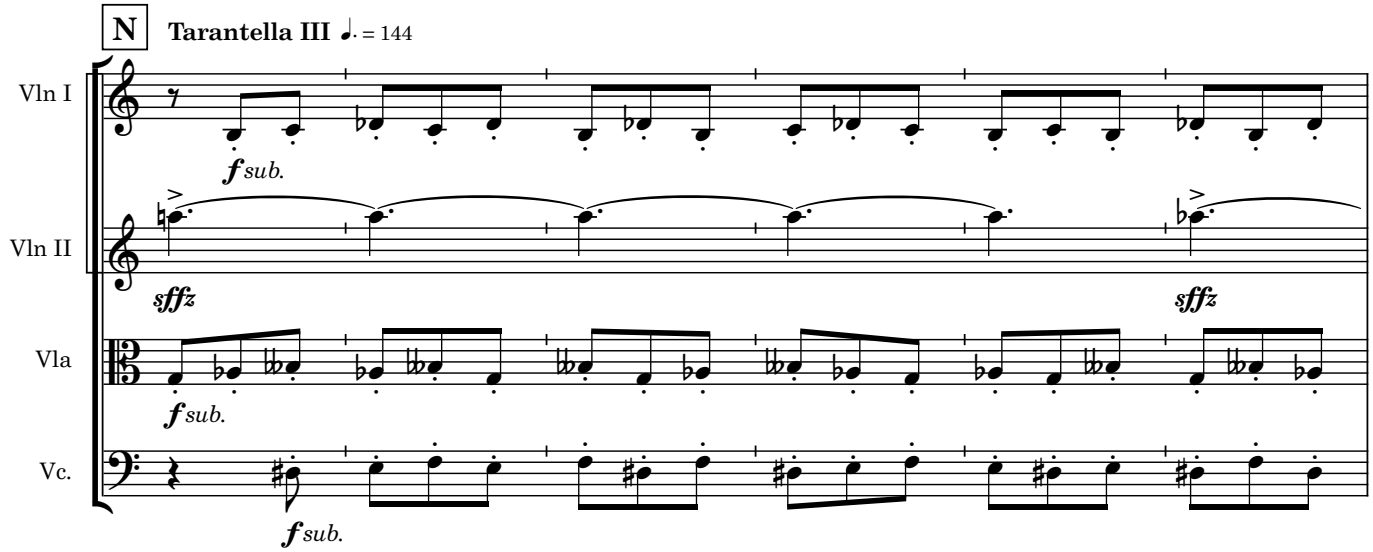

337
Vln I
Vln II
Vla
Vc.

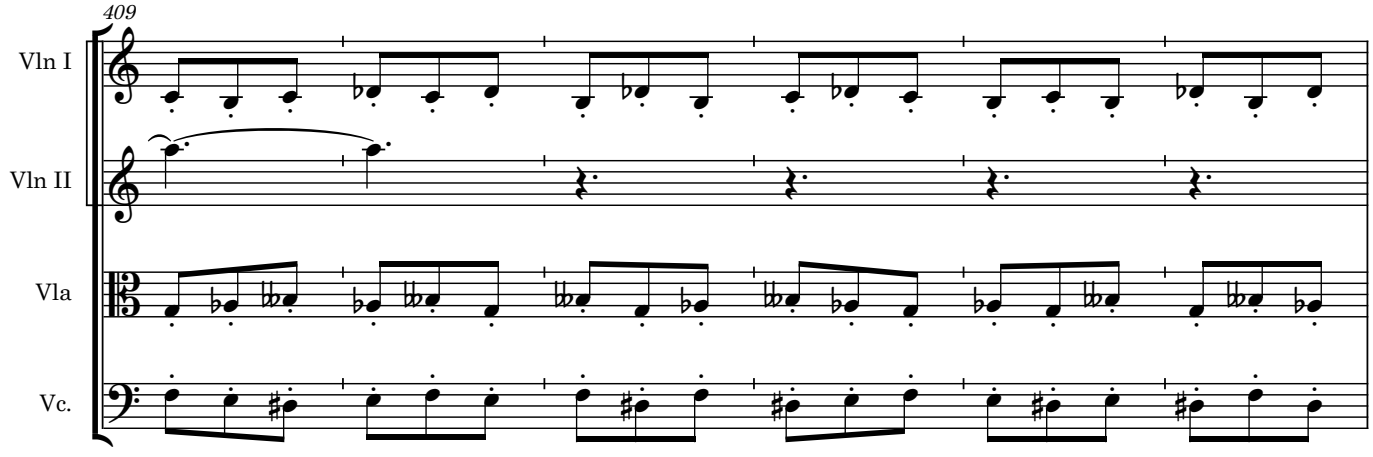

343
Vln I
Vln II
Vla
Vc.
sffz
f
349
Vln I
Vln II
Vla
Vc.
sffz
355
Vln I
Vln II
Vla
Vc.
13

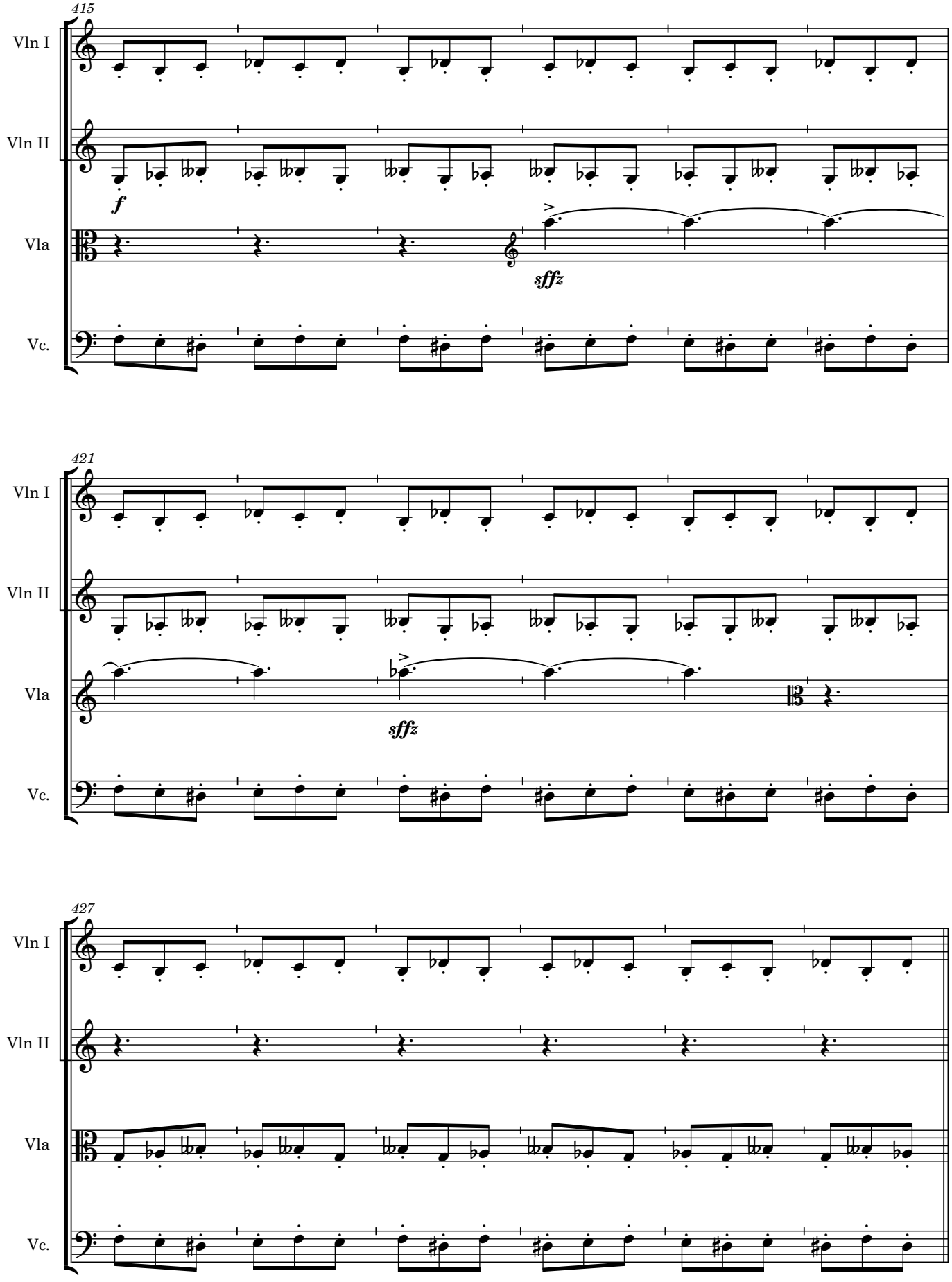

361
Vln I
Vln II
Vla
Vc.
ff
ff
sffz
sffz
ff
367
Vln I
Vln II
Vla
Vc.
373
Vln I
Vln II
Vla
Vc.
sffz

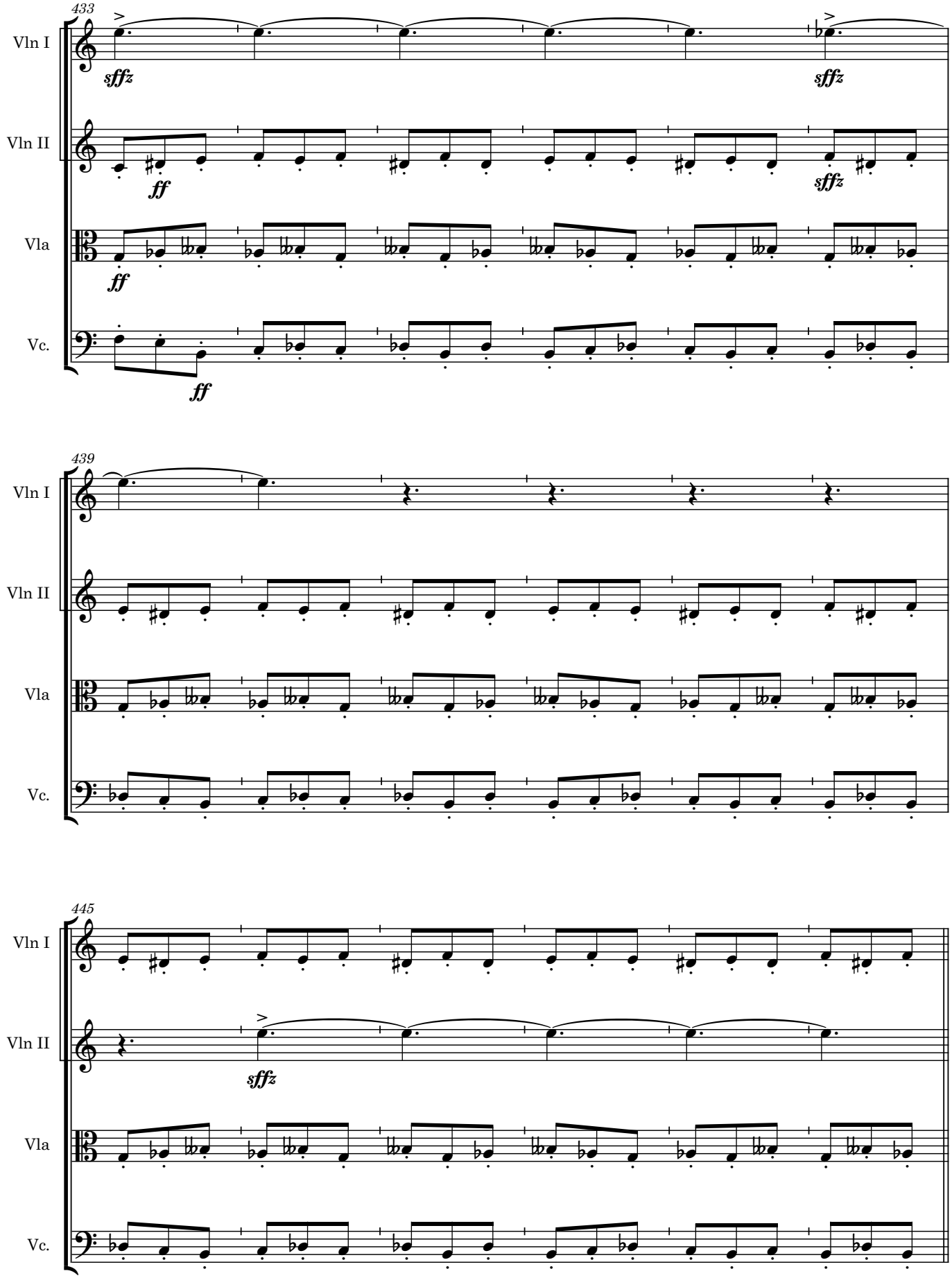

379
Vln I
Vln II
Vla
Vc.
sffz
fff
385
391
ffff

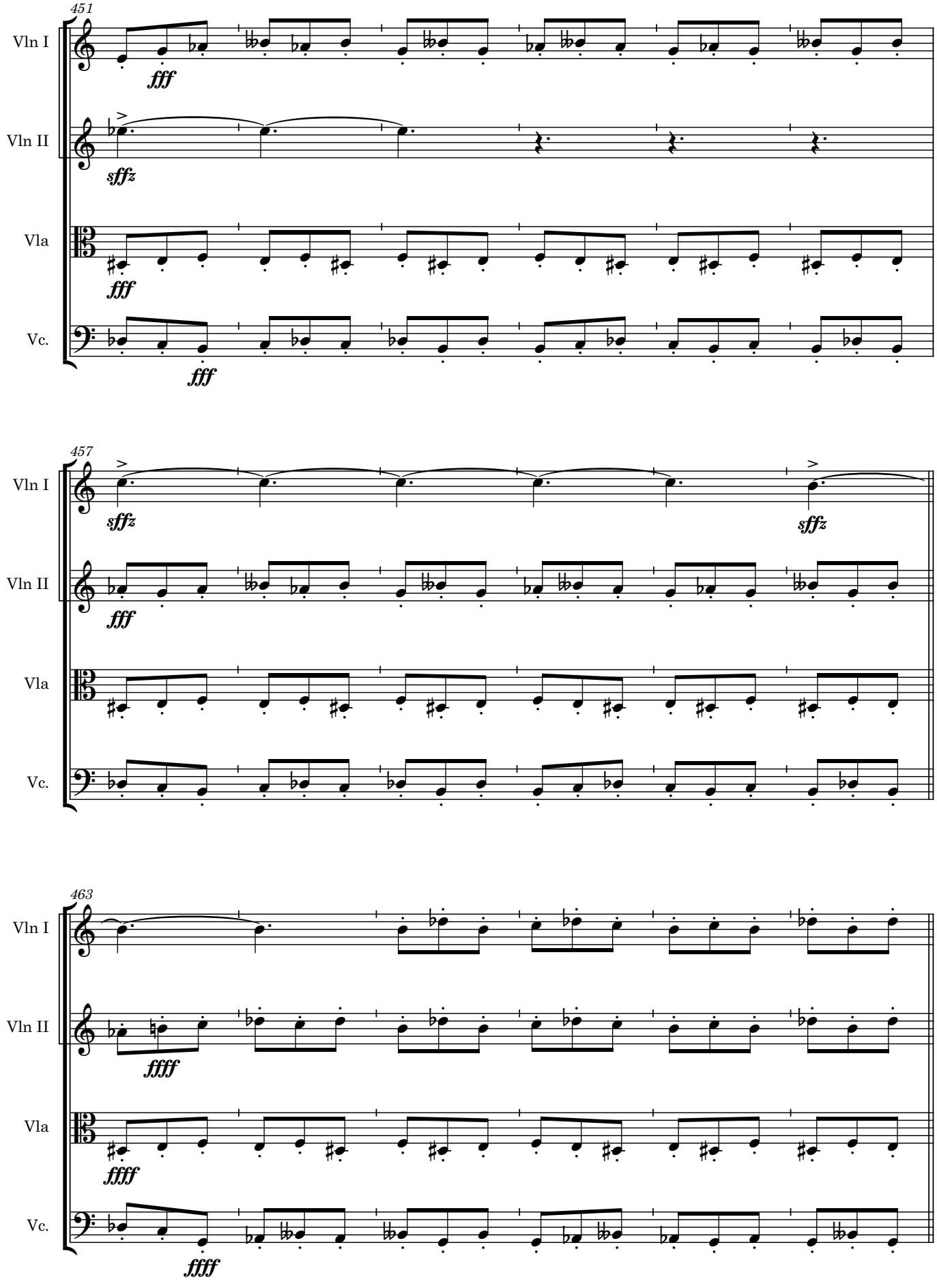

397
Vln I
Vln II
Vla
Vc.
fffff
fffff
fffff
fffff

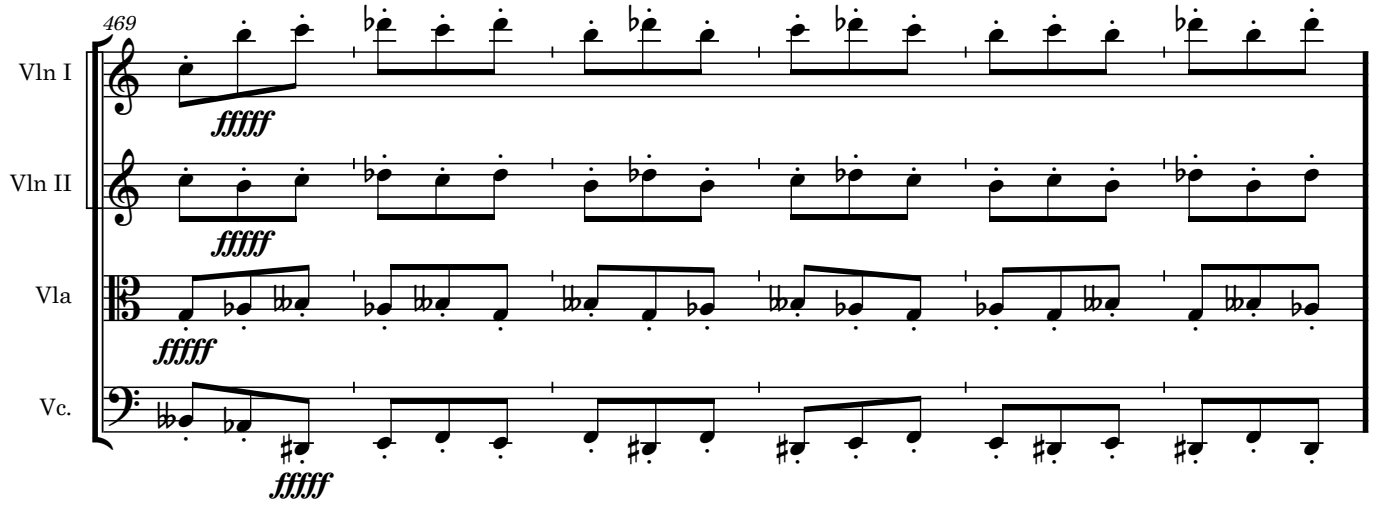

N
Tarantella III ♩. = 144
Vln I
Vln II
Vla
Vc.
f sub.
sffz
sffz
f sub.
f sub.

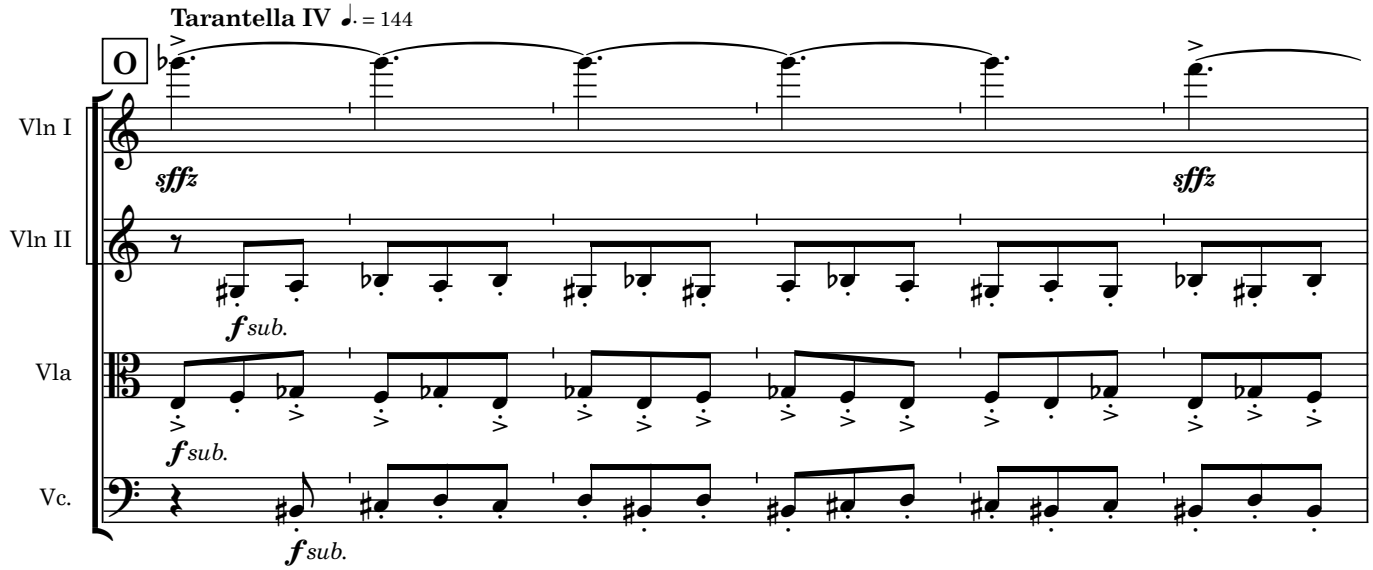

409
Vln I
Vln II
Vla
Vc.

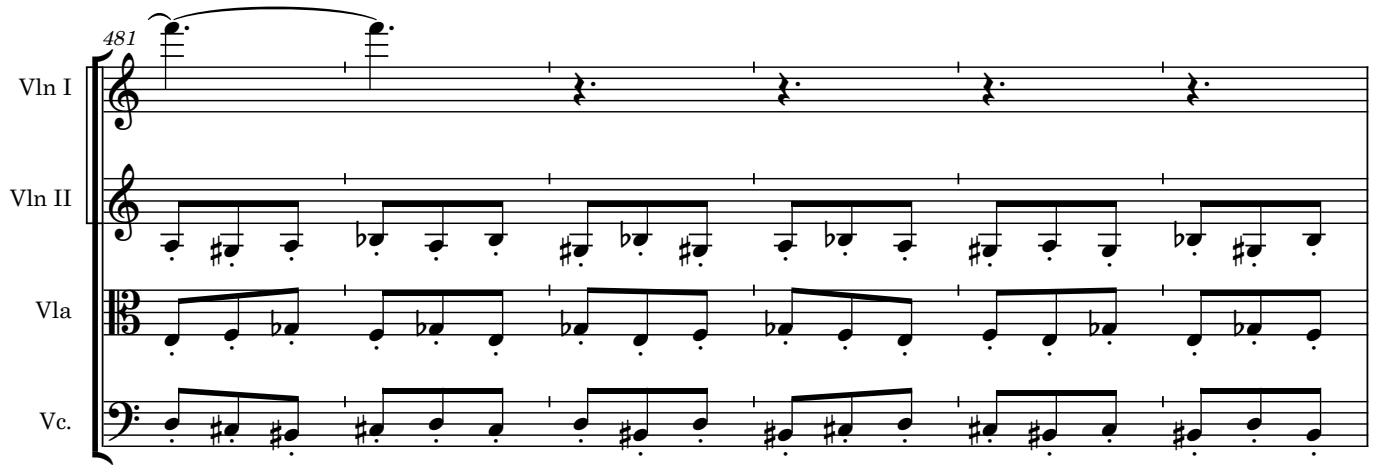

415
Vln I
Vln II
Vla
Vc.
f
sffz
421
Vln I
Vln II
Vla
Vc.
sffz
427
Vln I
Vln II
Vla
Vc.

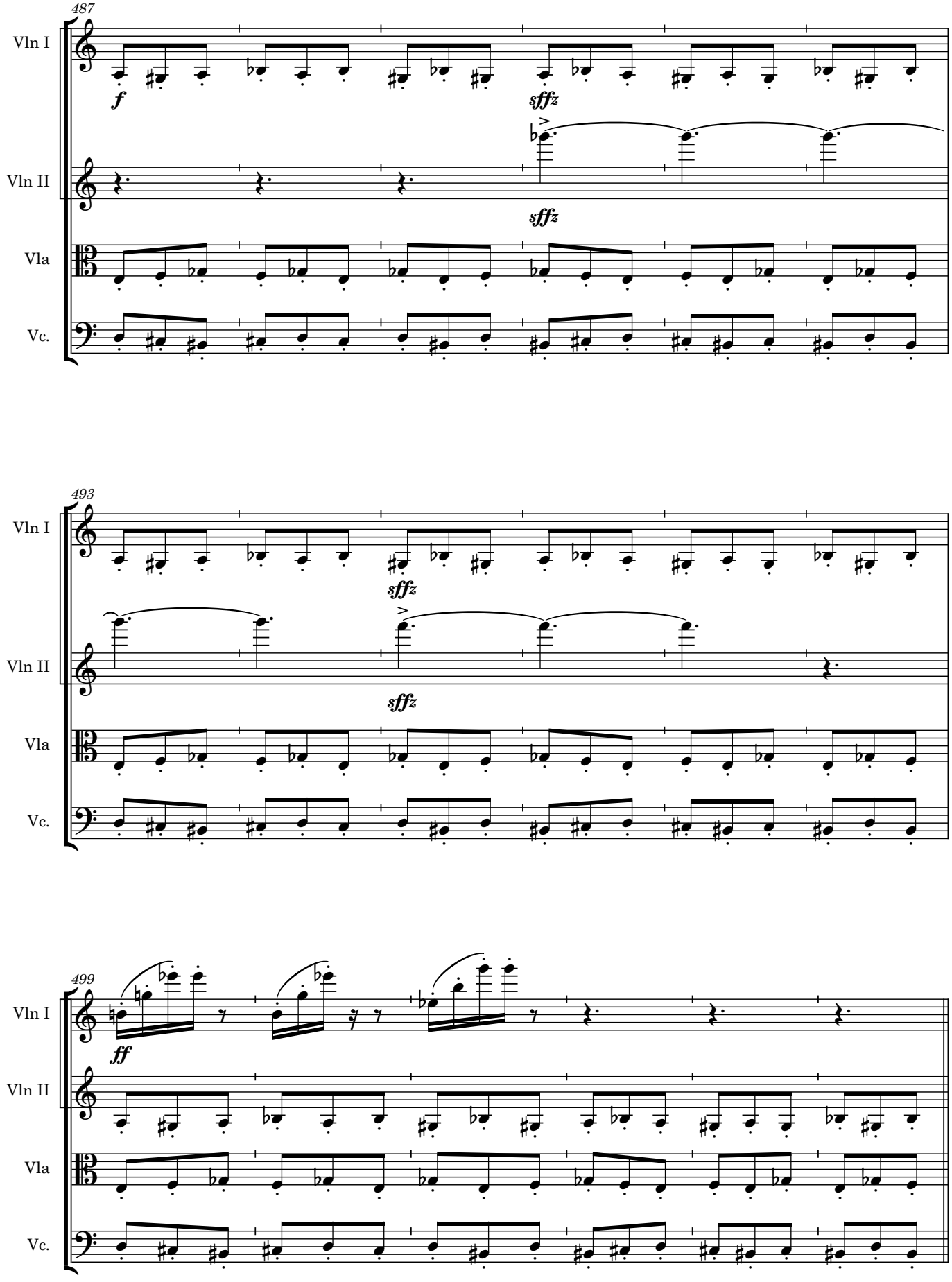

433
Vln I
Vln II
Vla
Vc.
sffz
ff
439
445

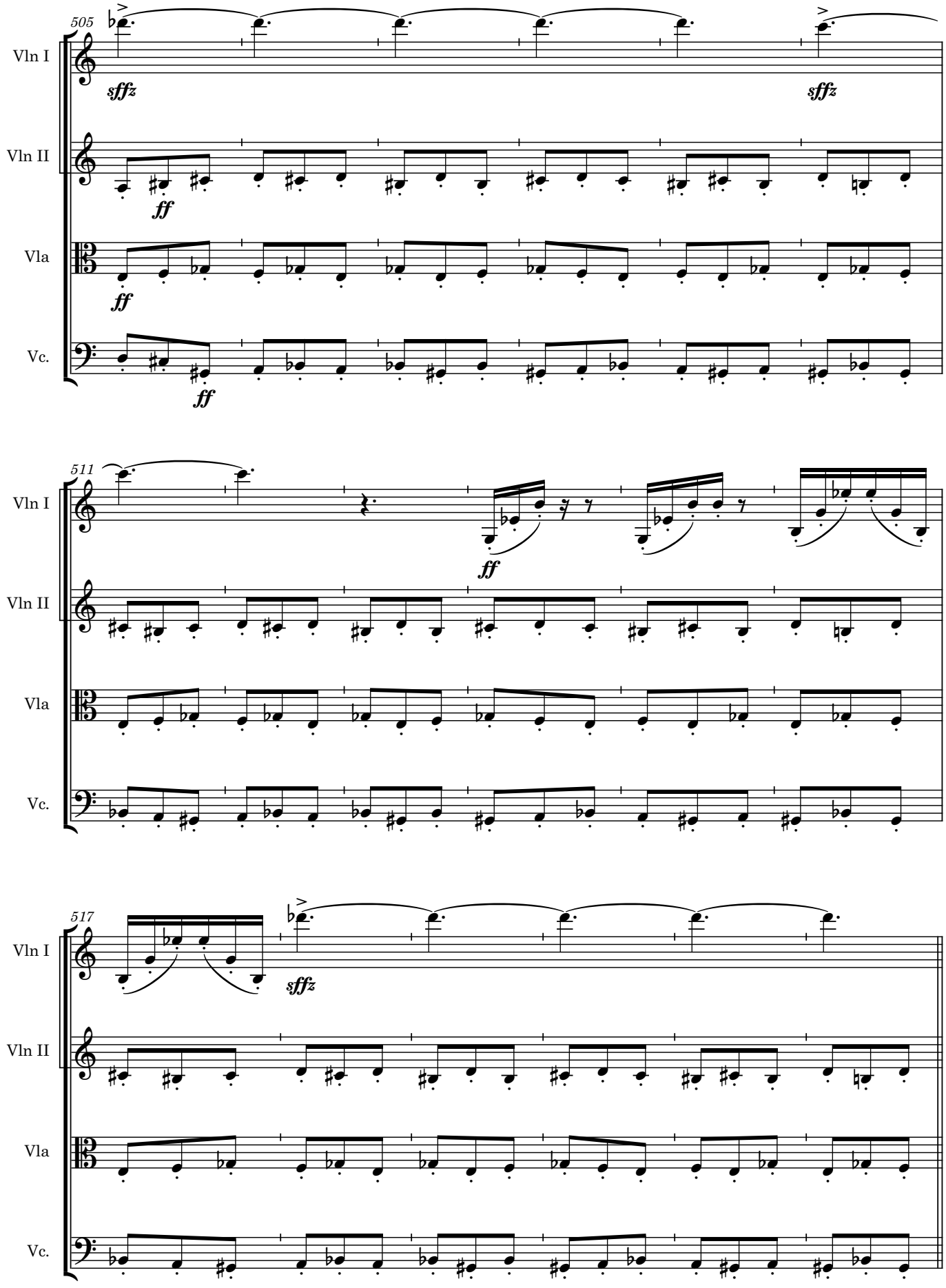

451
Vln I
Vln II
Vla
Vc.
fff
sffz
457
463
ffff

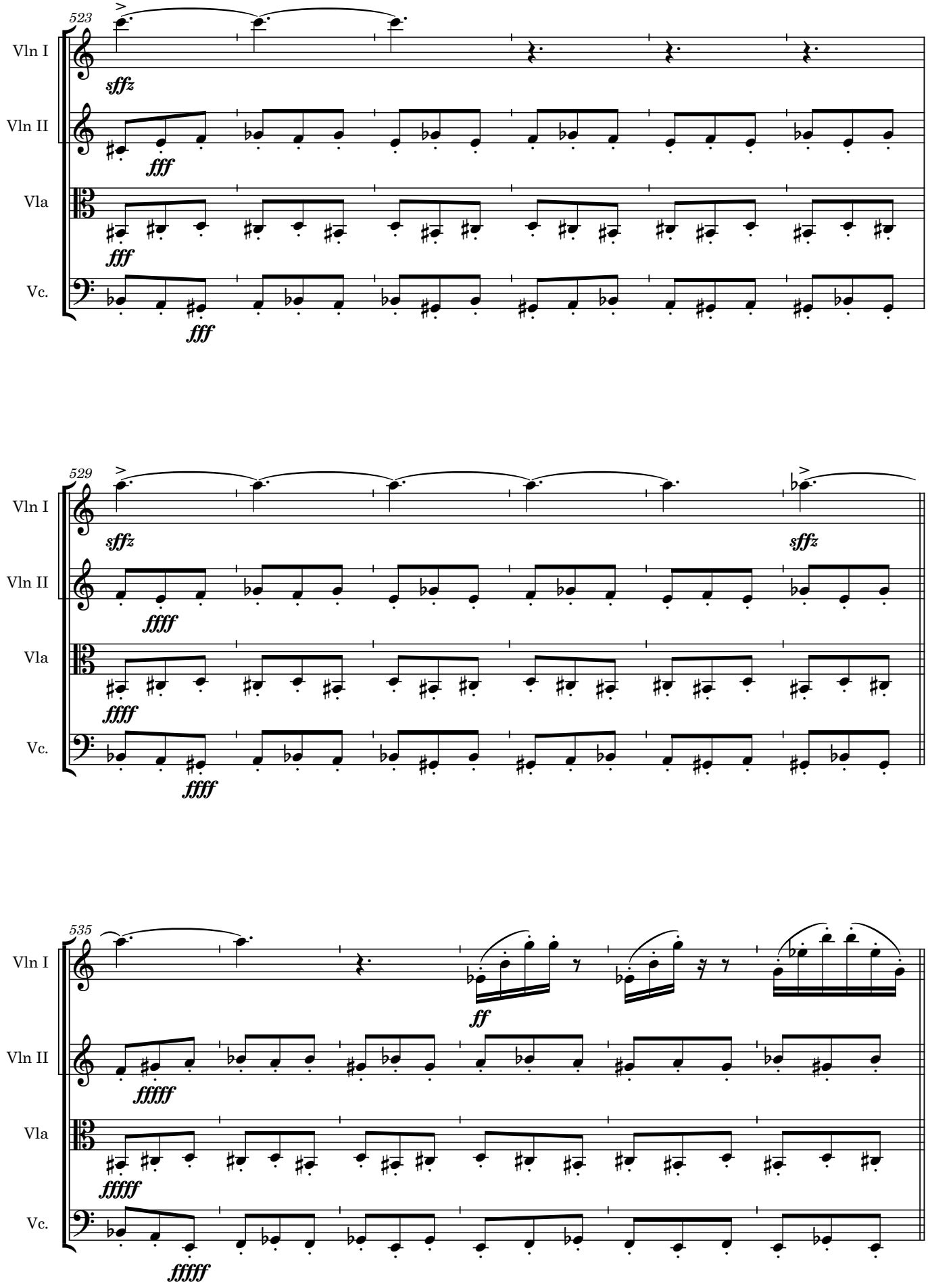

469
Vln I
Vln II
Vla
Vc.
fffff
fffff
fffff
fffff

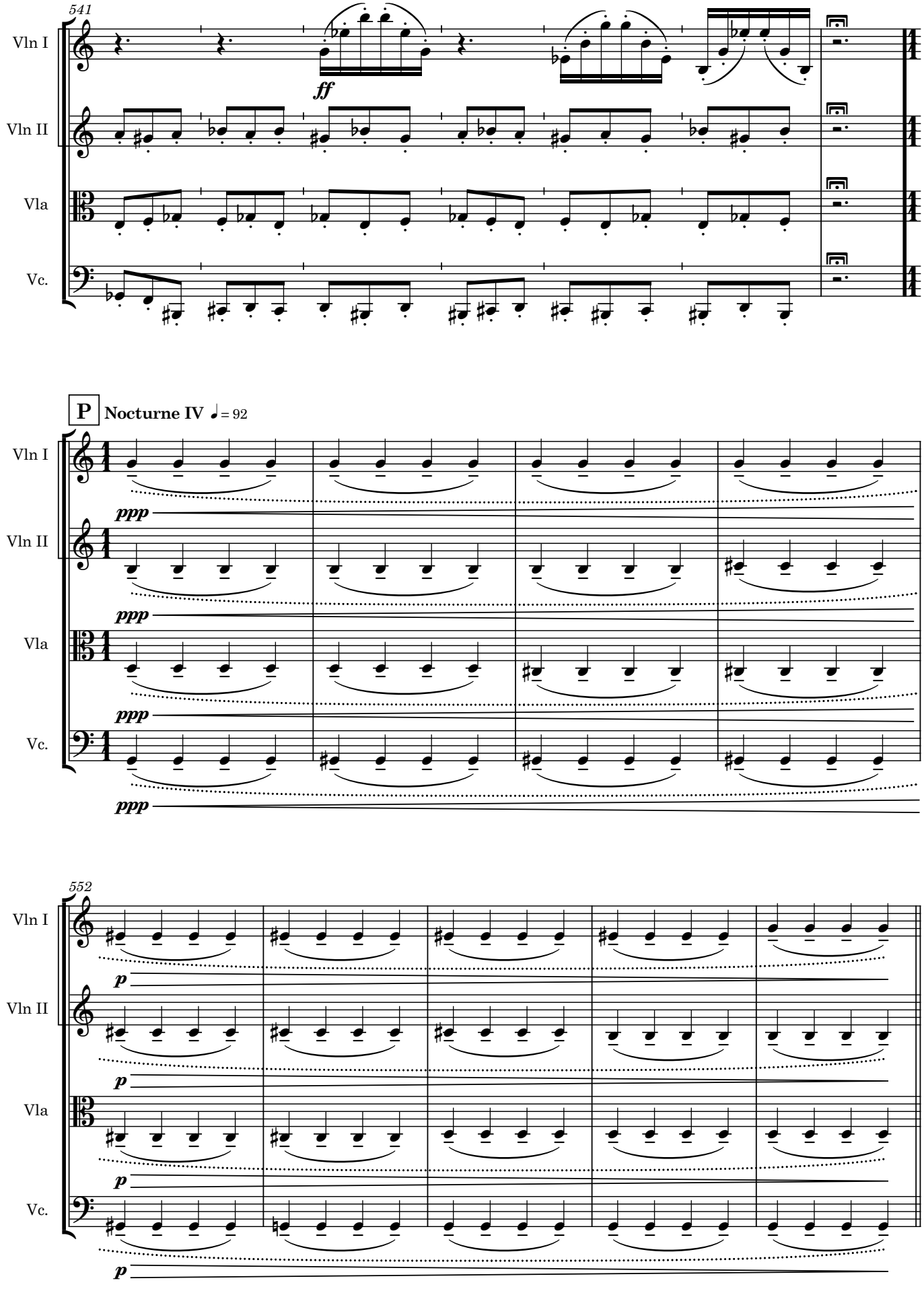

Tarantella IV ♩. = 144
O
Vln I
Vln II
Vla
Vc.
sffz
sffz
f sub.
f sub.
f sub.

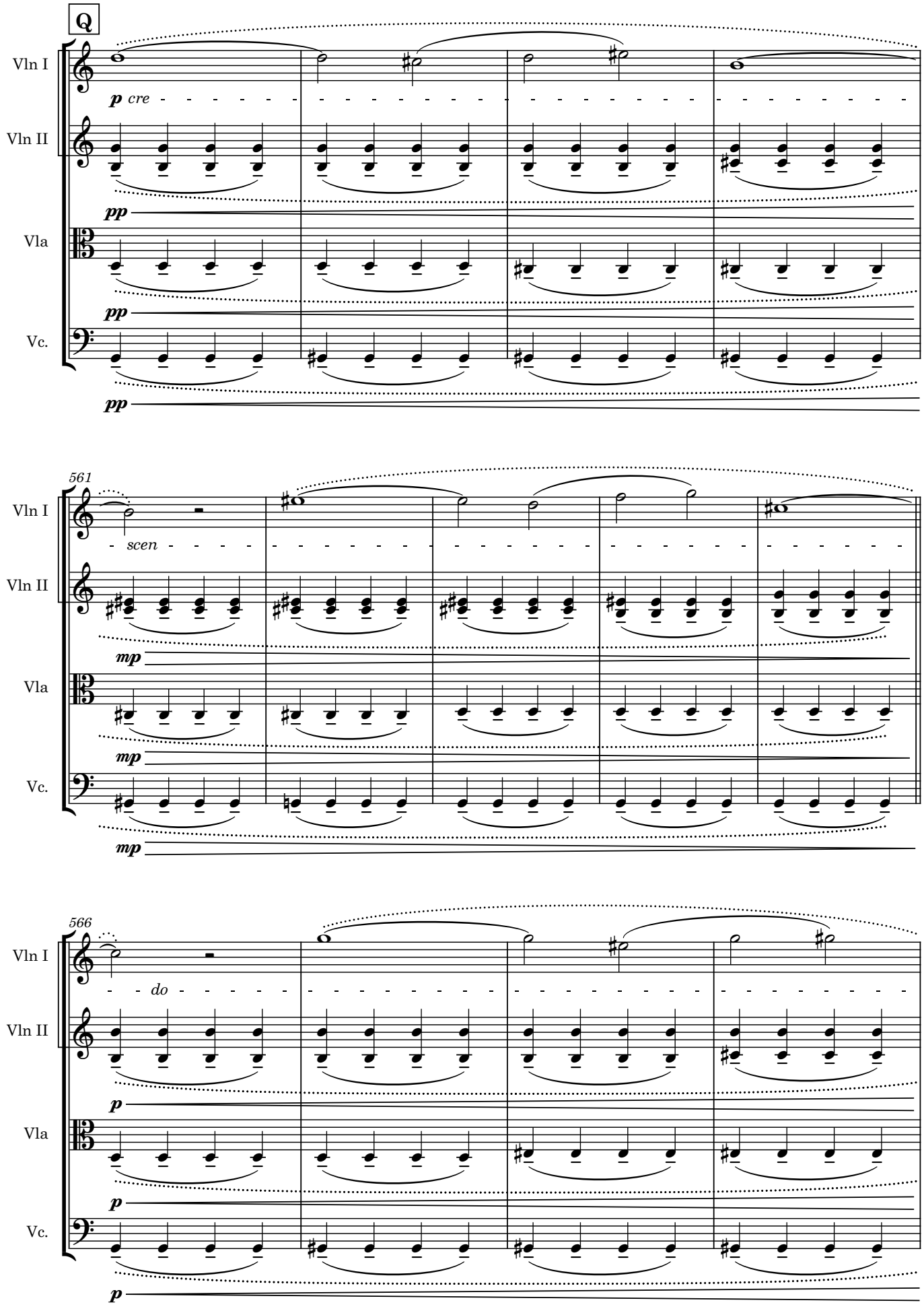

481
Vln I
Vln II
Vla
Vc.

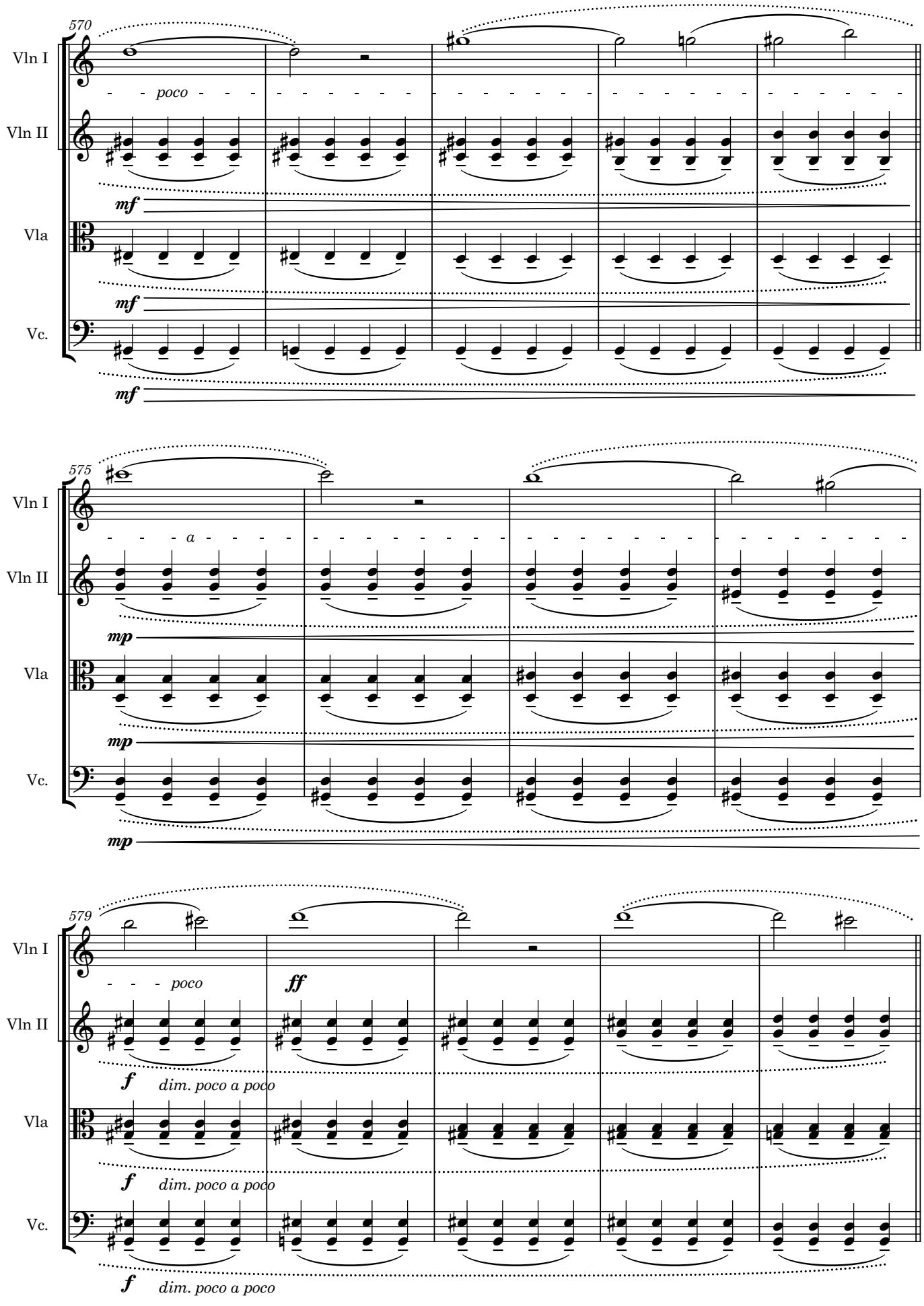

487
Vln I
Vln II
Vla
Vc.
f
sffz
sffz
493
Vln I
Vln II
Vla
Vc.
sffz
sffz
499
Vln I
Vln II
Vla
Vc.
ff

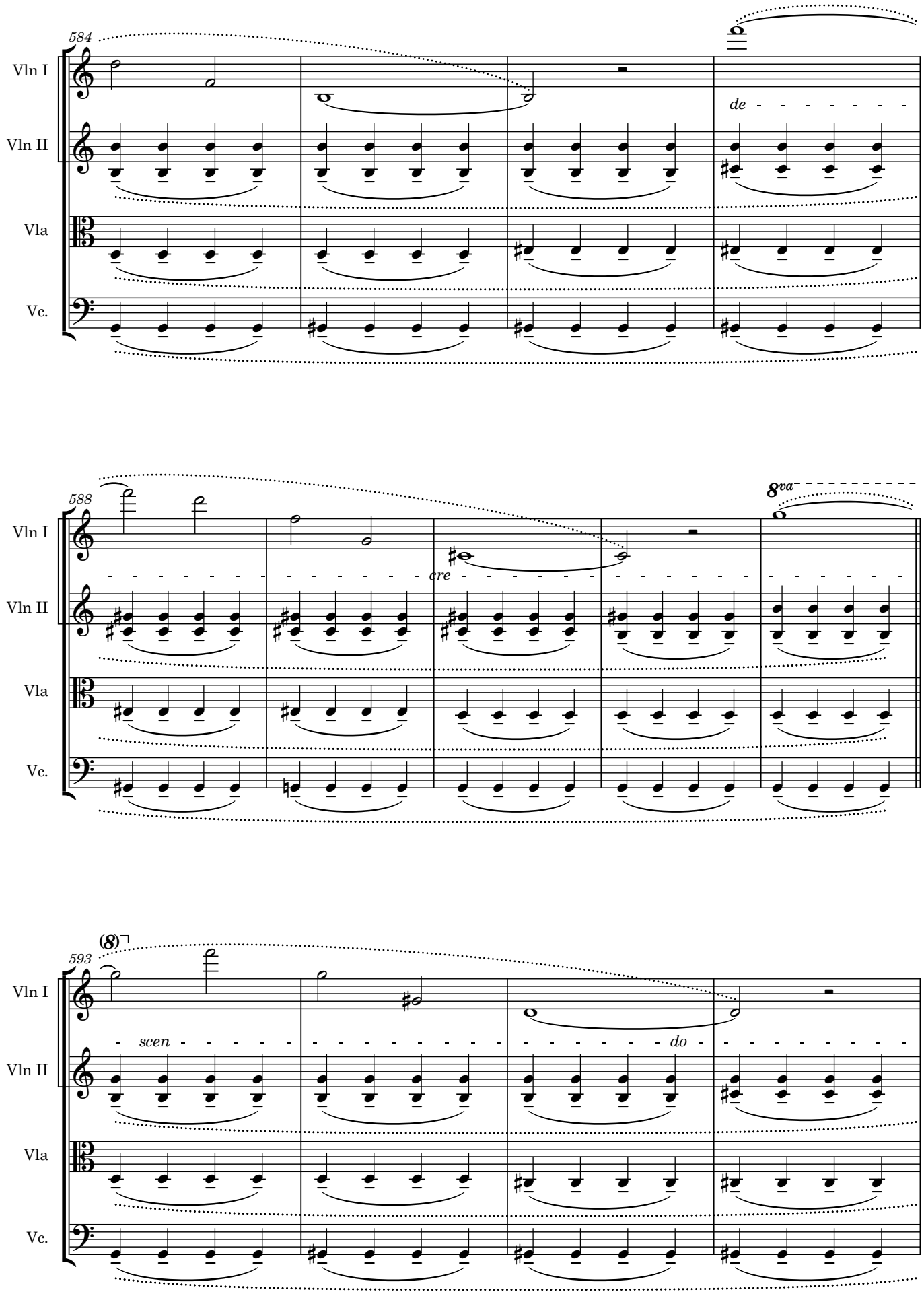

505
Vln I
Vln II
Vla
Vc.
sffz
ff
511
517

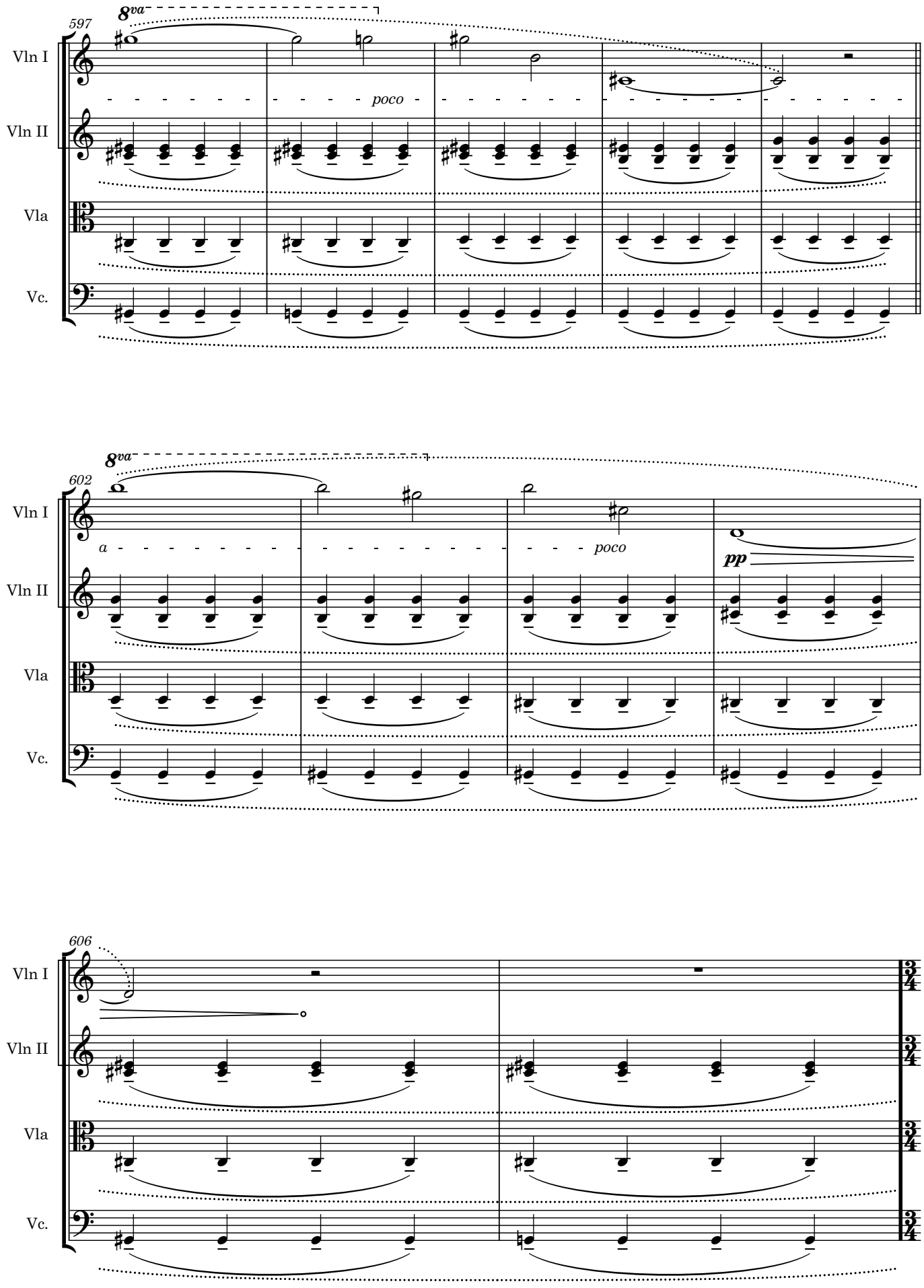

523
Vln I
Vln II
Vla
Vc.
sffz
fff
529
ffff
535
ff
fffff

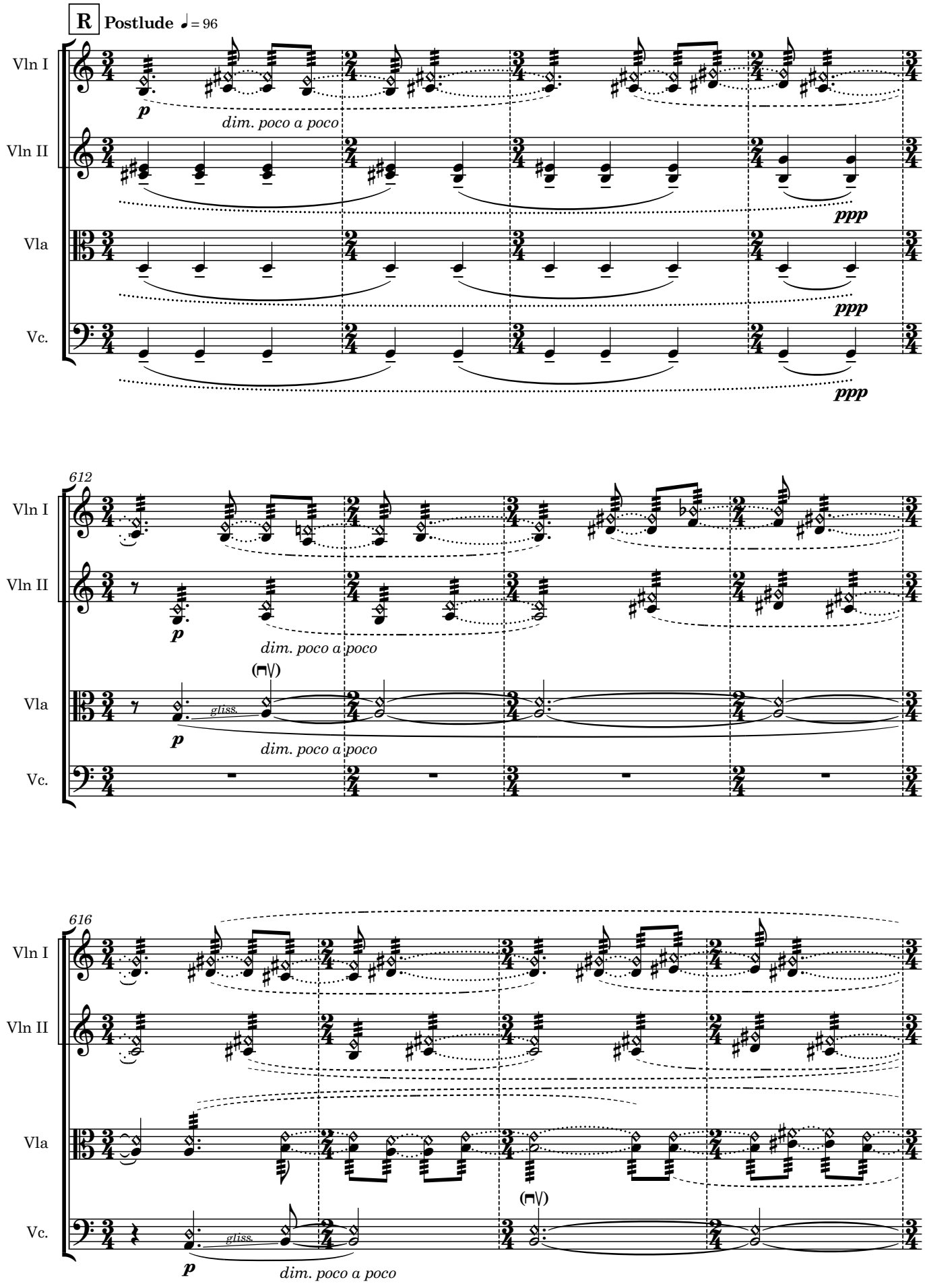

541
Vln I
Vln II
Vla
Vc.
ff
P
Nocturne IV ♩= 92
ppp
552
p

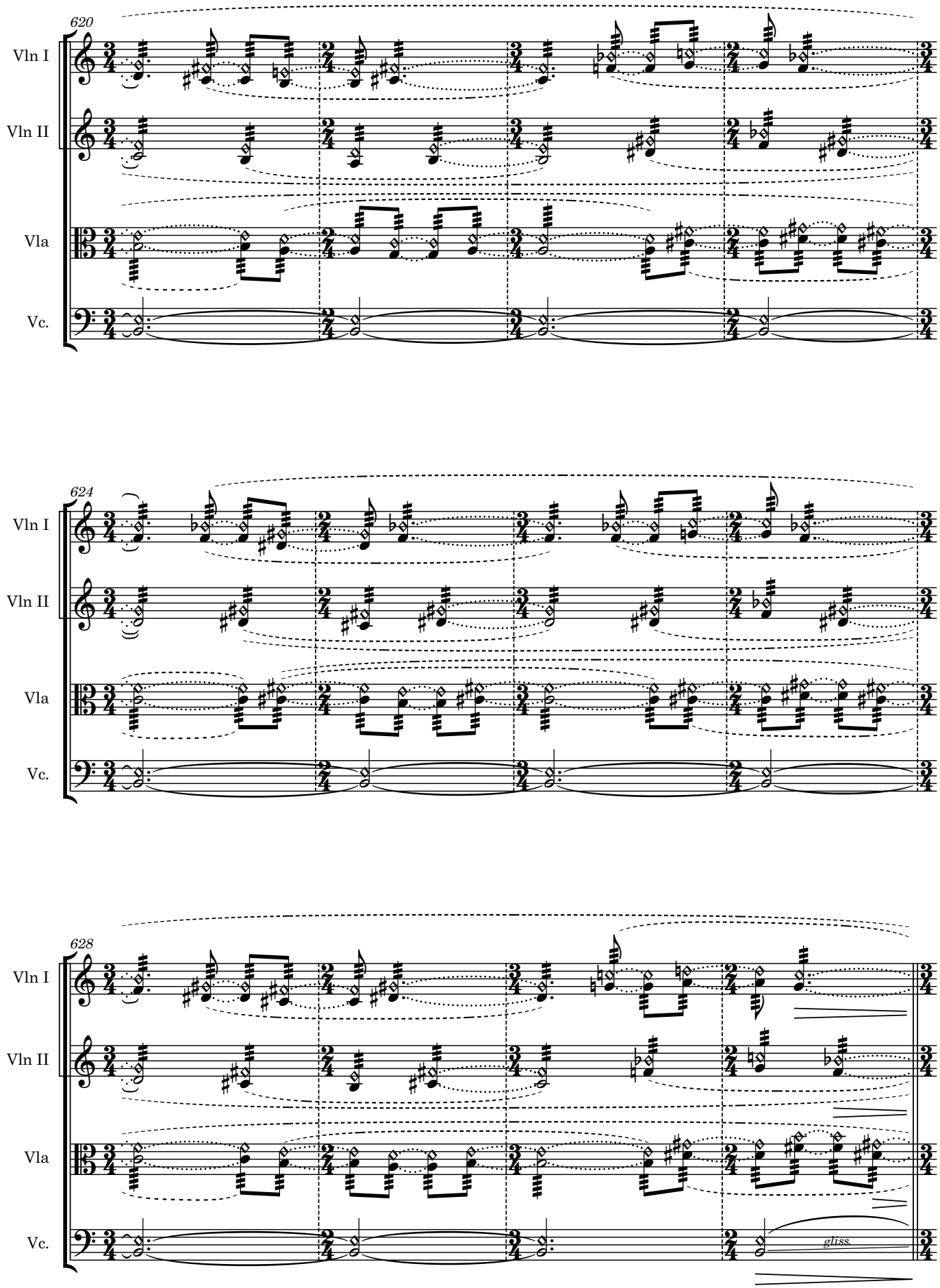

Q
Vln I
Vln II
Vla
Vc.
p cre
pp
pp
pp
561
scen
mp
mp
mp
566
do
p
p
p

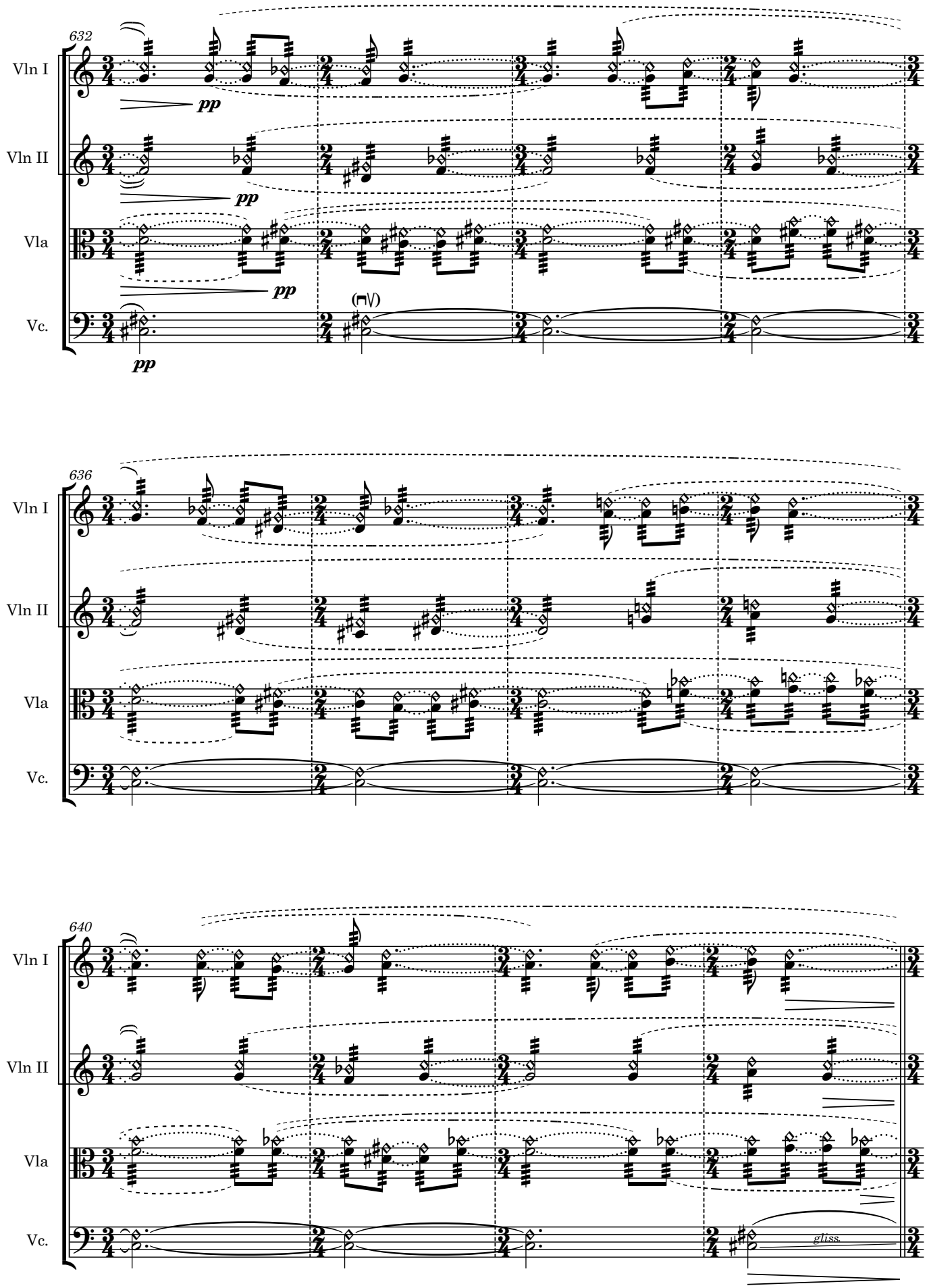

570
Vln I
poco
Vln II
mf
Vla
mf
Vc.
mf
575
Vln I
a
Vln II
mp
Vla
mp
Vc.
mp
579
Vln I
poco
ff
Vln II
f
dim. poco a poco
Vla
f
dim. poco a poco
Vc.
f
dim. poco a poco

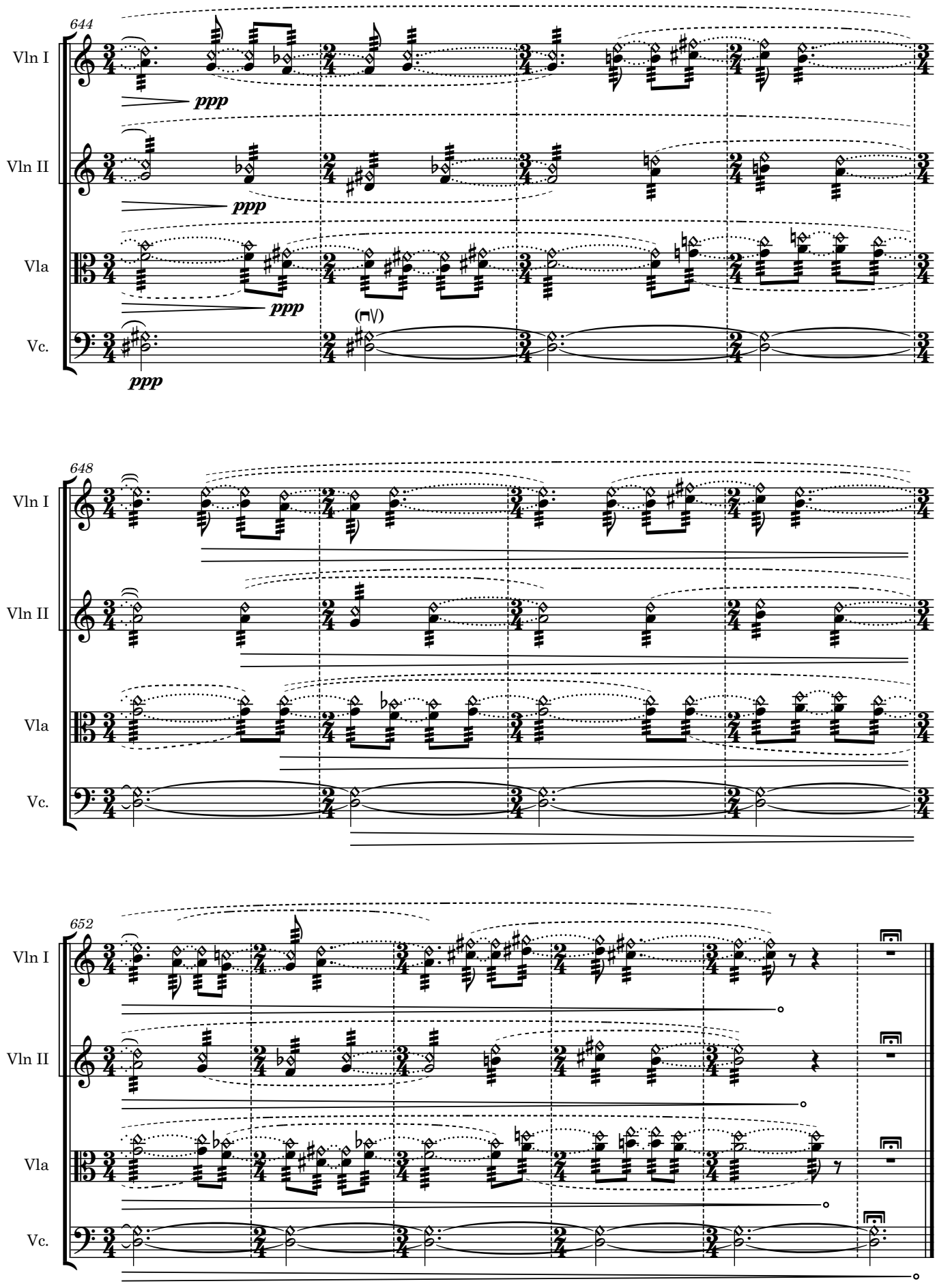

584
Vln I
Vln II
Vla
Vc.
de
588
8va
cre
593
(8)
scen
do


597
8va
Vln I
Vln II
Vla
Vc.
poco
602
8va
Vln I
Vln II
Vla
Vc.
a
poco
pp
606
Vln I
Vln II
Vla
Vc.
3/4


R
Postlude
♩= 96
Vln I
Vln II
Vla
Vc.
p
dim. poco a poco
ppp
612
gliss.
(⊓\/)
616


620
Vln I
Vln II
Vla
Vc.
624
Vln I
Vln II
Vla
Vc.
628
Vln I
Vln II
Vla
Vc.
gliss.


632
Vln I
Vln II
Vla
Vc.
pp
pp
pp
pp
636
Vln I
Vln II
Vla
Vc.
640
Vln I
Vln II
Vla
Vc.
gliss.


644
Vln I
Vln II
Vla
Vc.
ppp
ppp
ppp
ppp
(𝄽)
648
Vln I
Vln II
Vla
Vc.
652
Vln I
Vln II
Vla
Vc.