# Report

## Project: 1958_Augusto Camacho/Adeus a Coimbra

Key (Global - All Beats): ('gb', 'min')
Key (Section 2 Only): ('gb', 'min')
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Computed median BPM: 61.29
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Beat-Synchronized HCF:
Pearson Correlation Coefficient (R): 0.5350
R-squared (R^2): 0.2862
P-value: 0.0000
---
Frame-Level HCF:
Pearson Correlation Coefficient (R): 0.0420
R-squared (R^2): 0.0018
P-value: 0.0000
---
Beat-Synchronized Chroma Comparison:
Pearson Correlation Coefficient (R): 0.6004
R-squared (R^2): 0.3604
P-value: 0.0000
Sum of Absolute Differences: 472.0319
Sum of Squared Differences: 239.7695
---
Sensory Dissonance and Tonal Dissonance:
Pearson Correlation Coefficient (R): 0.0679
R-squared (R^2): 0.0046
P-value: 0.3933
---
Tonal Dispersion (Audio vs. Ground Truth):
Pearson Correlation Coefficient (R): 0.5374
R-squared (R^2): 0.2888
P-value: 0.0000
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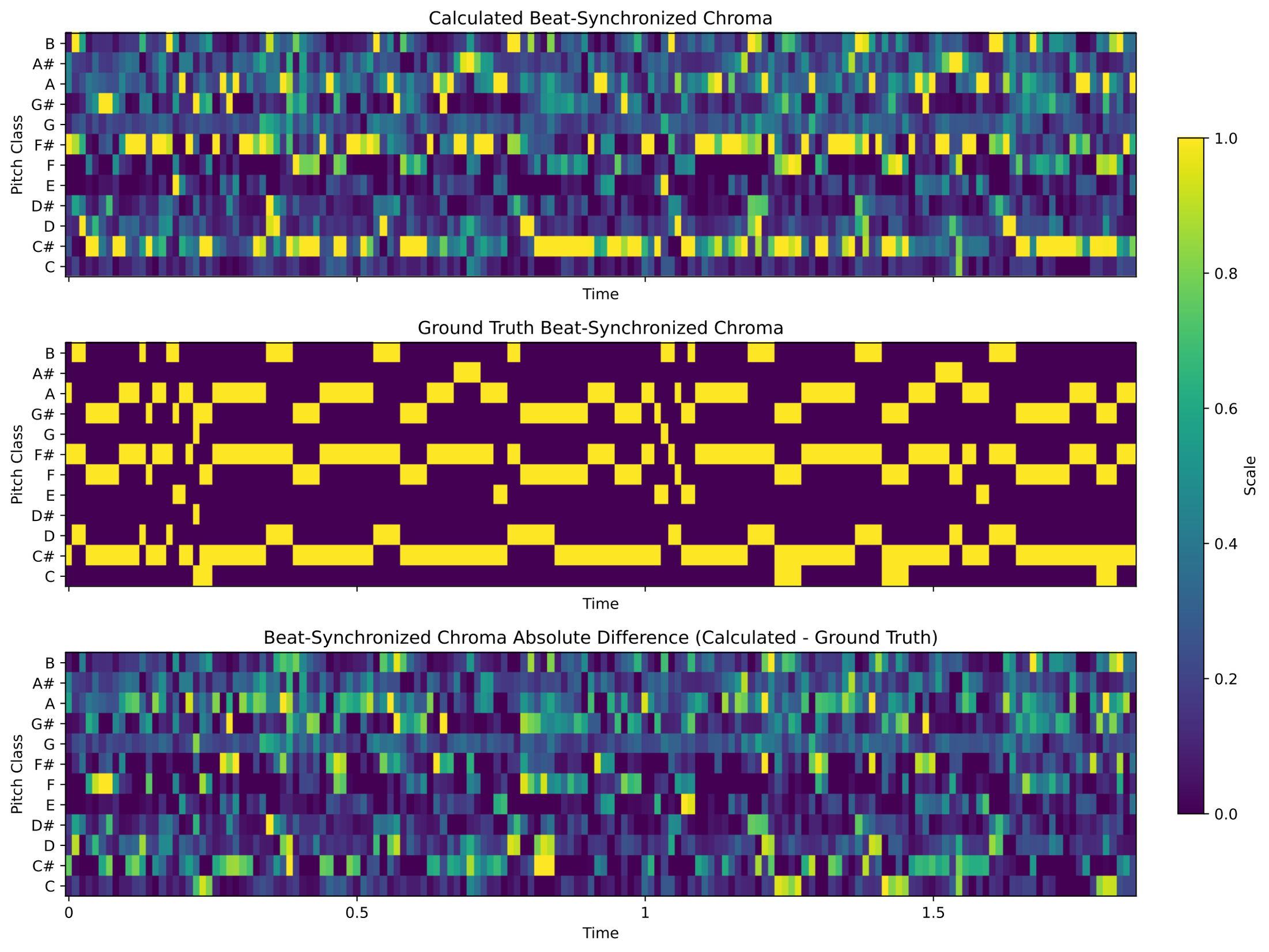
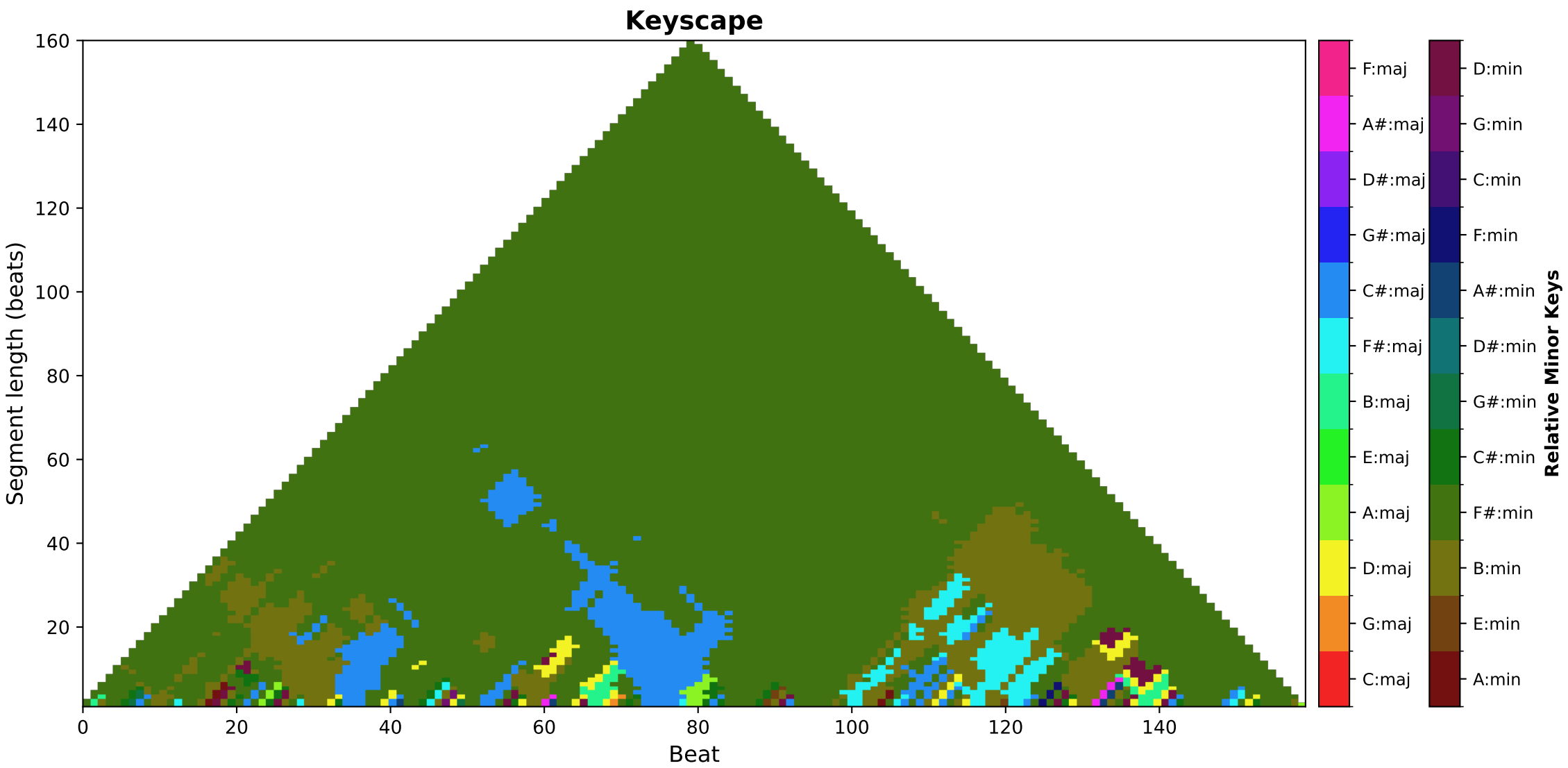
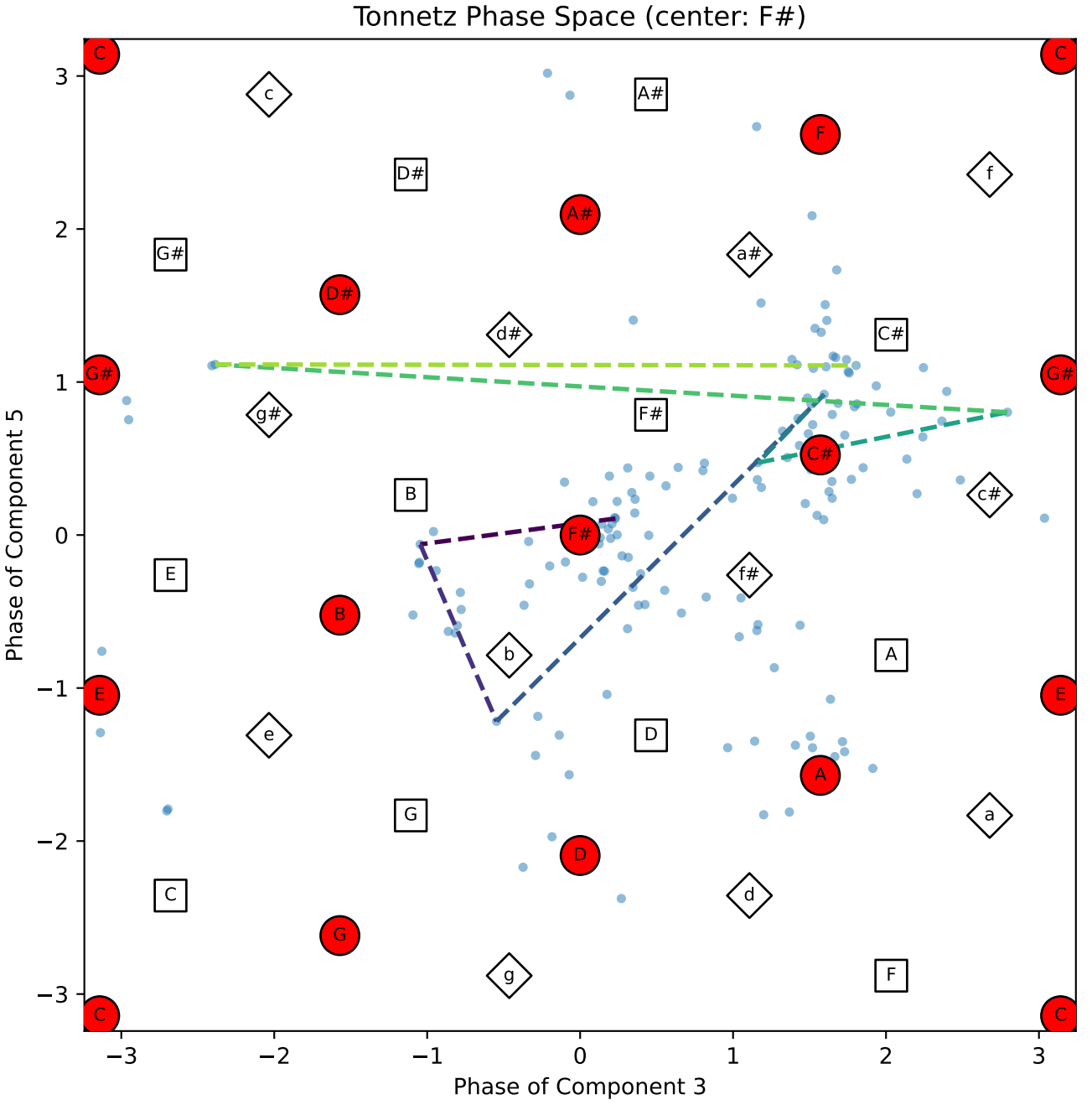
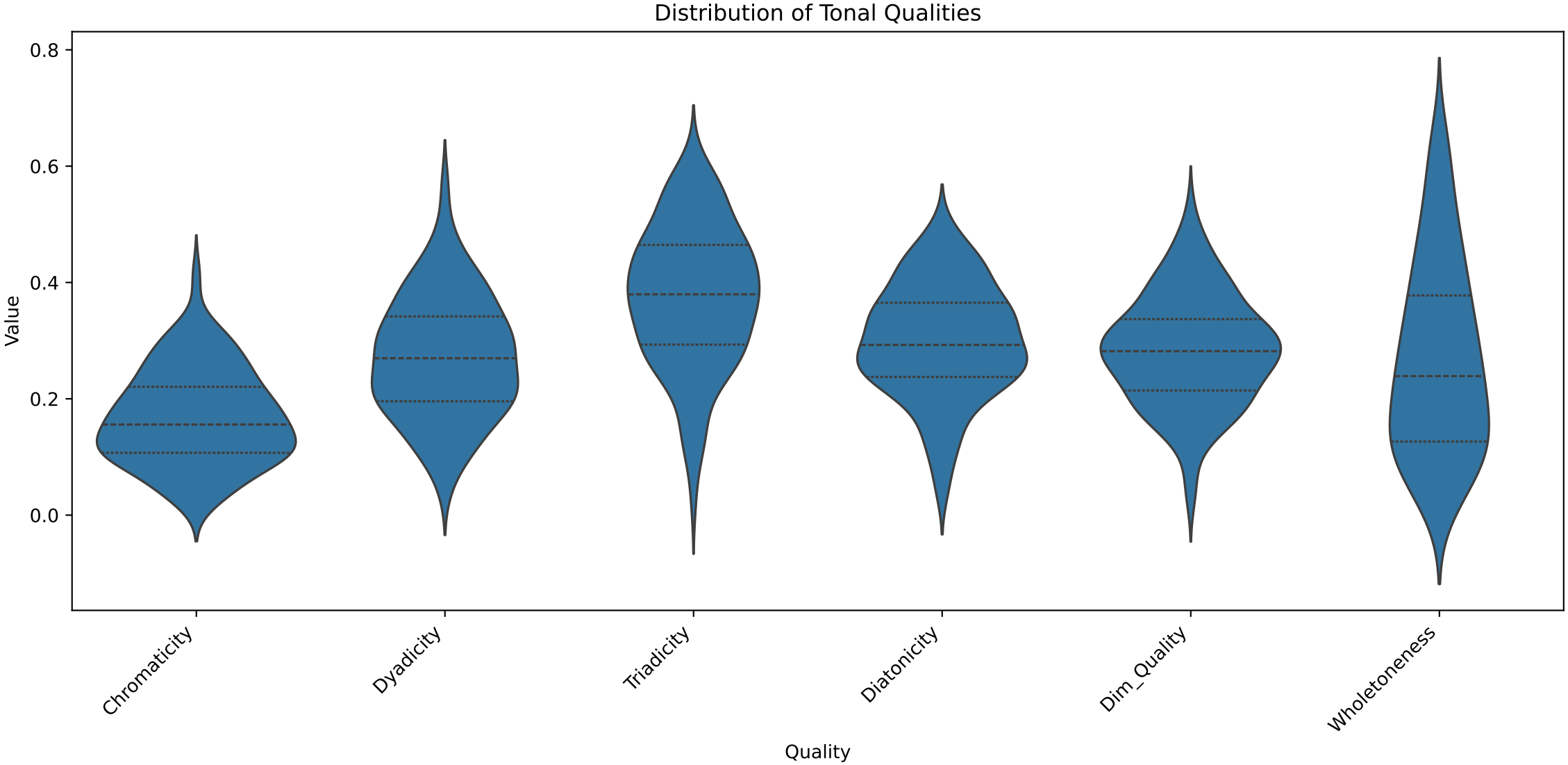
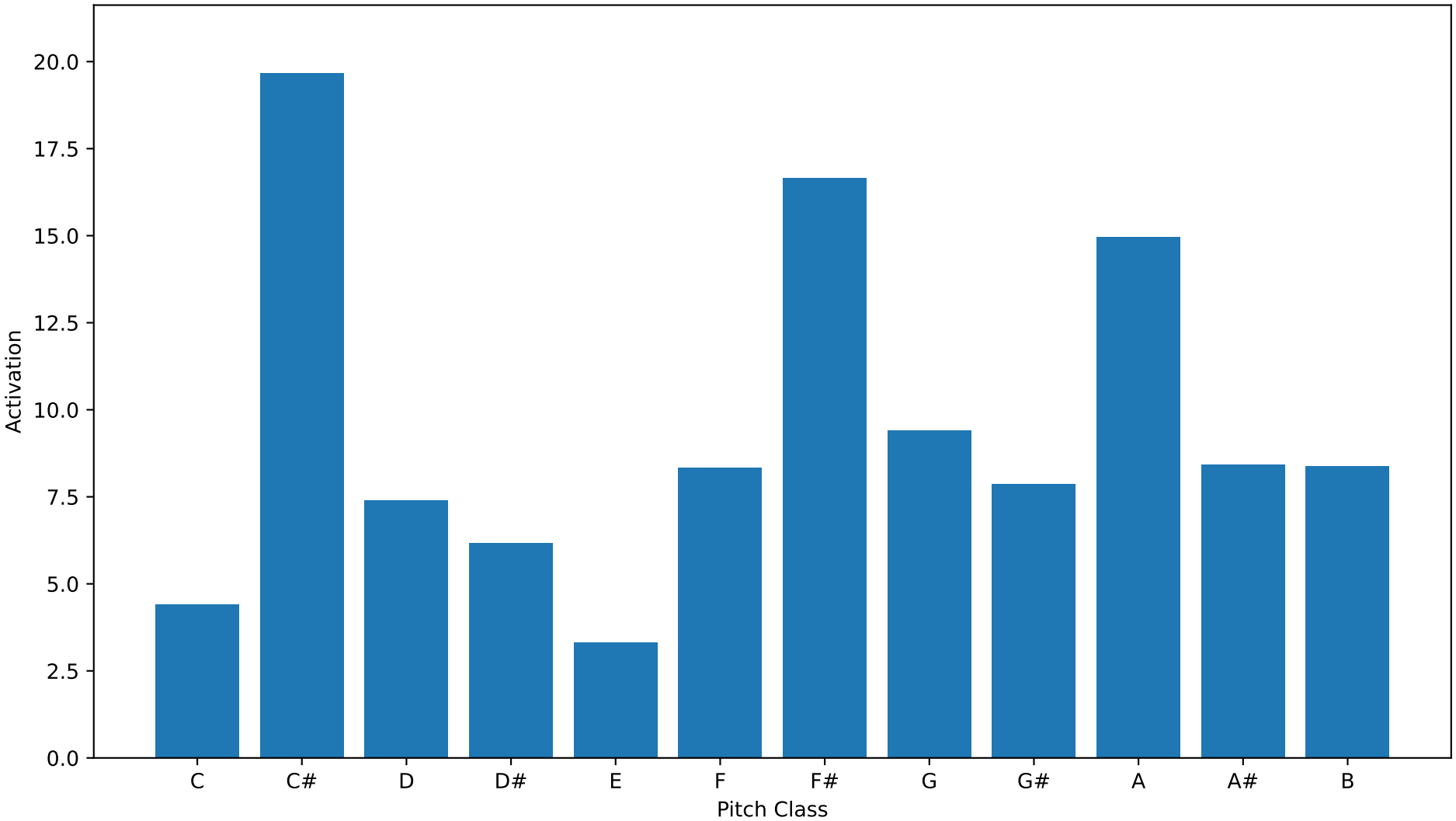

Calculated Beat-Synchronized Chroma
Ground Truth Beat-Synchronized Chroma
Beat-Synchronized Chroma Absolute Difference (Calculated - Ground Truth)
Pitch Class
B
A#
A
G#
G
F#
F
E
D#
D
C#
C
Time
0
0.5
1
1.5
Scale
1.0
0.8
0.6
0.4
0.2
0.0

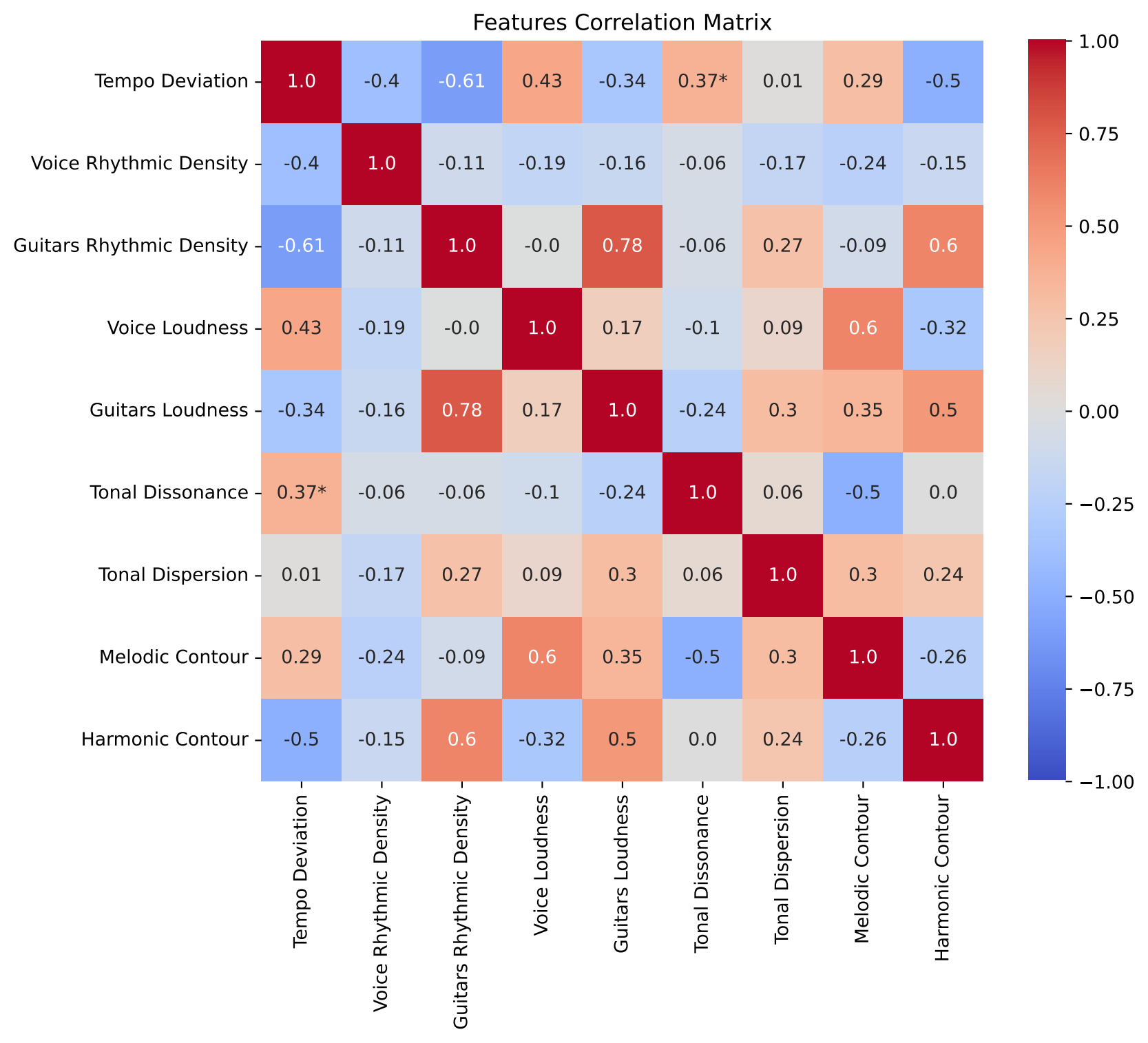

Keyscape
Segment length (beats)
160
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
Beat
F:maj
A#:maj
D#:maj
G#:maj
C#:maj
F#:maj
B:maj
E:maj
A:maj
D:maj
G:maj
C:maj
D:min
G:min
C:min
F:min
A#:min
D#:min
G#:min
C#:min
F#:min
B:min
E:min
A:min
Relative Minor Keys

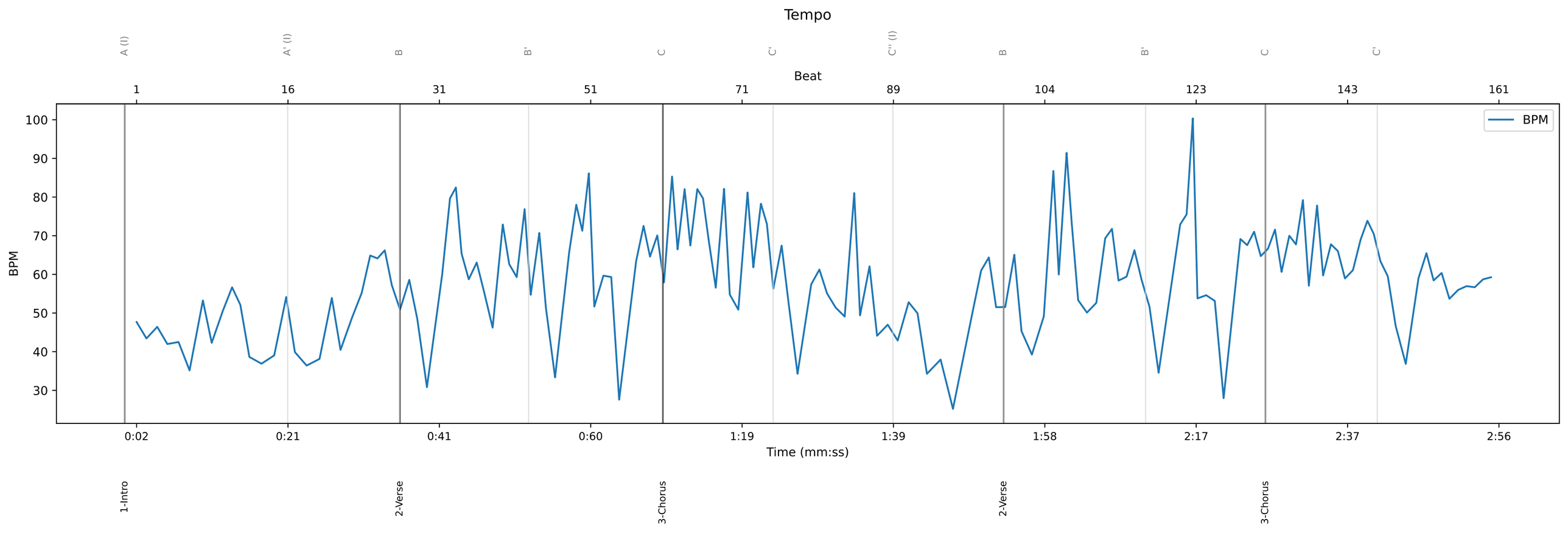


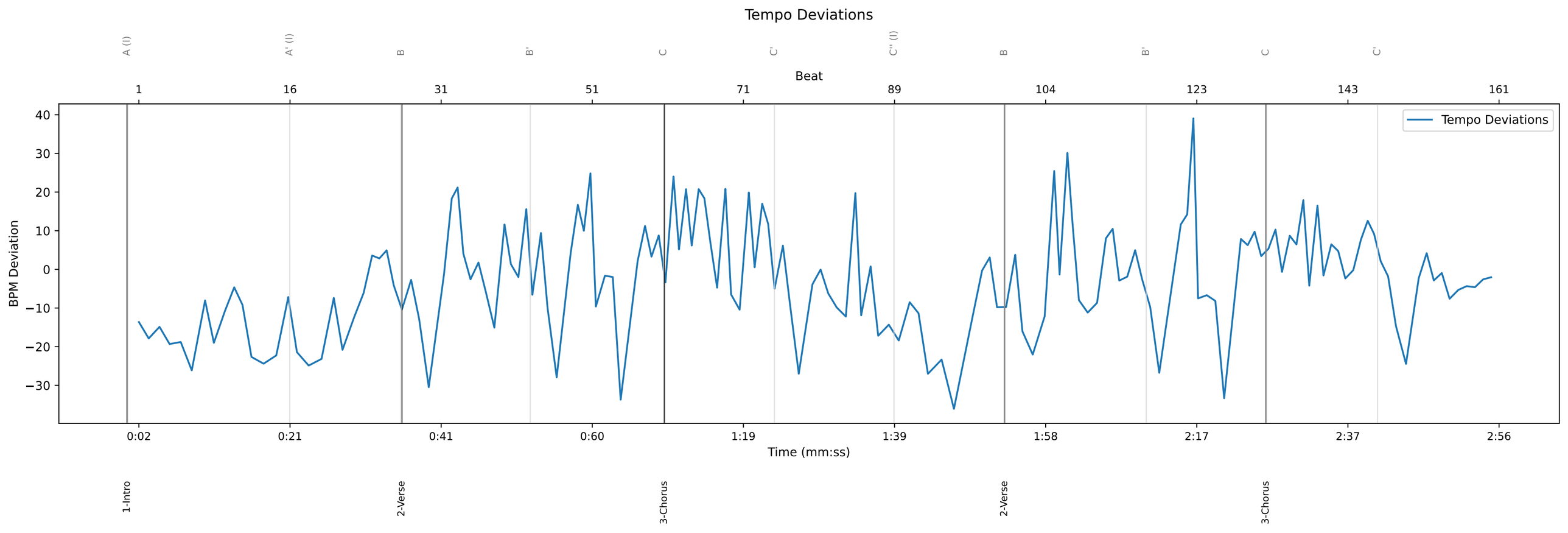
Tonnetz Phase Space (center: F#)
Phase of Component 5
Phase of Component 3
C
c
A#
F
D#
f
A#
G#
a#
D#
d#
C#
G#
g#
F#
C#
B
c#
F#
E
f#
B
b
A
E
e
D
A
G
a
D
C
d
G
g
F
C

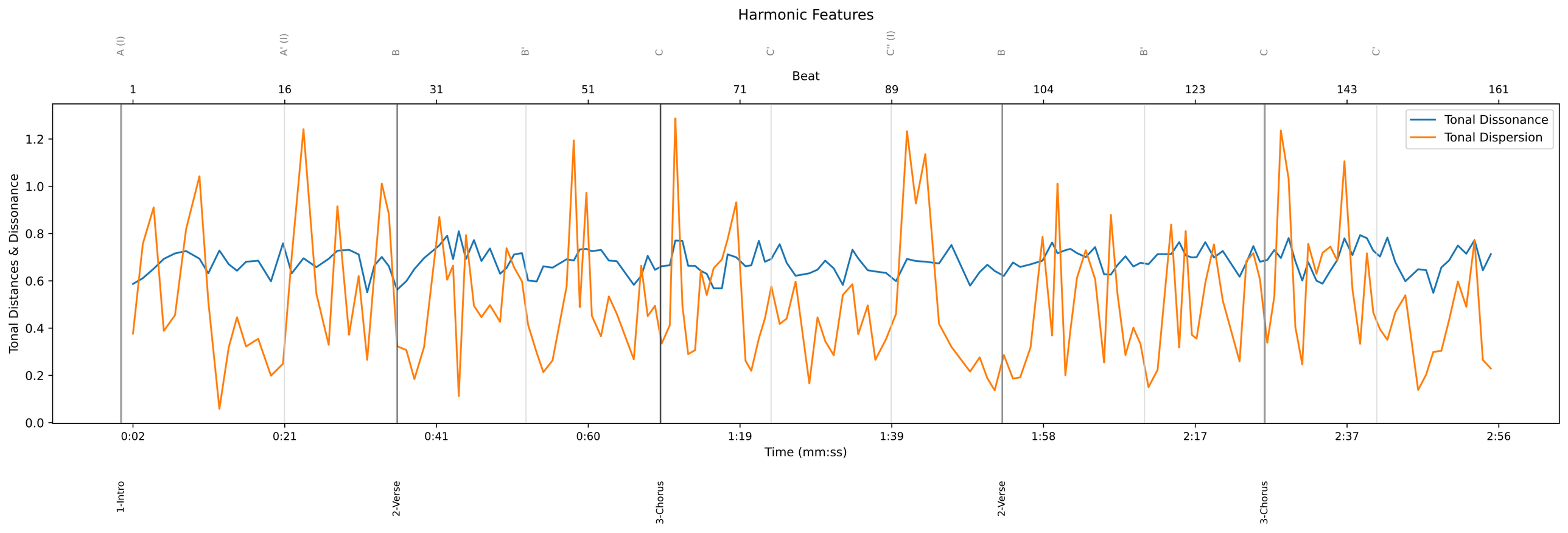

Distribution of Tonal Qualities
Value
0.8
0.6
0.4
0.2
0.0
Chromaticity
Dyadicity
Triadicity
Diatonicity
Dim_Quality
Wholetoneness
Quality

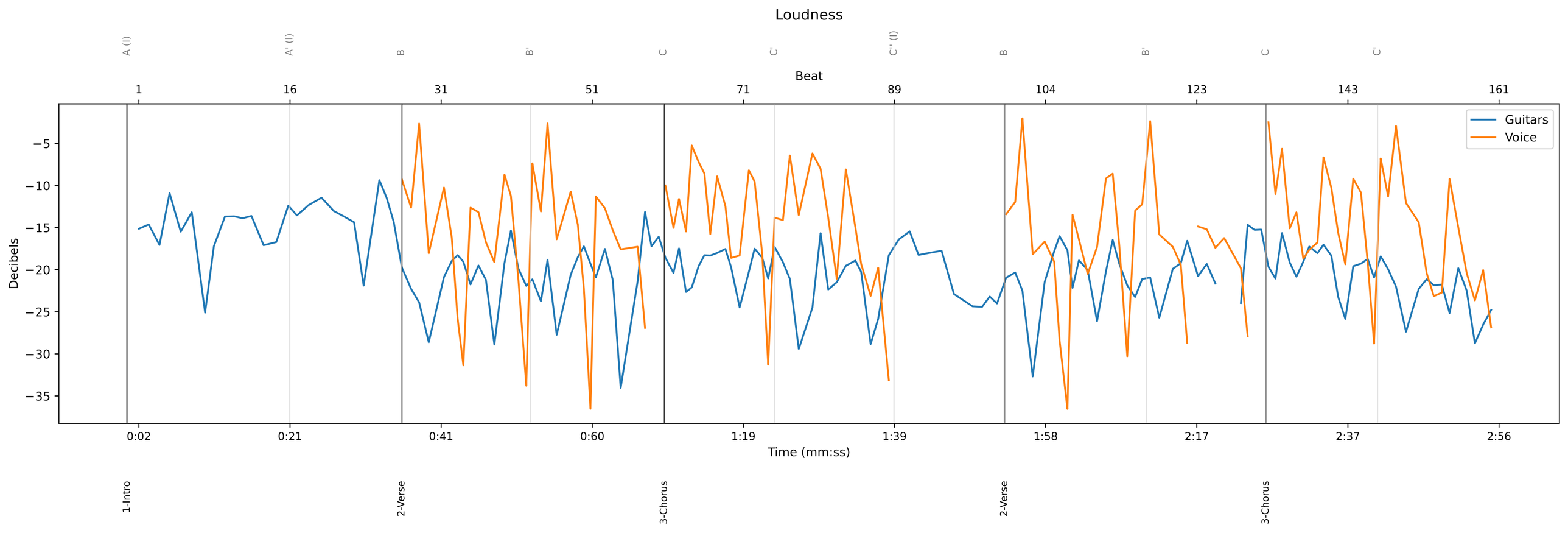

Global Chroma Vector (Section 2)
Activation
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
C
C#
D
D#
E
F
F#
G
G#
A
A#
B
Pitch Class

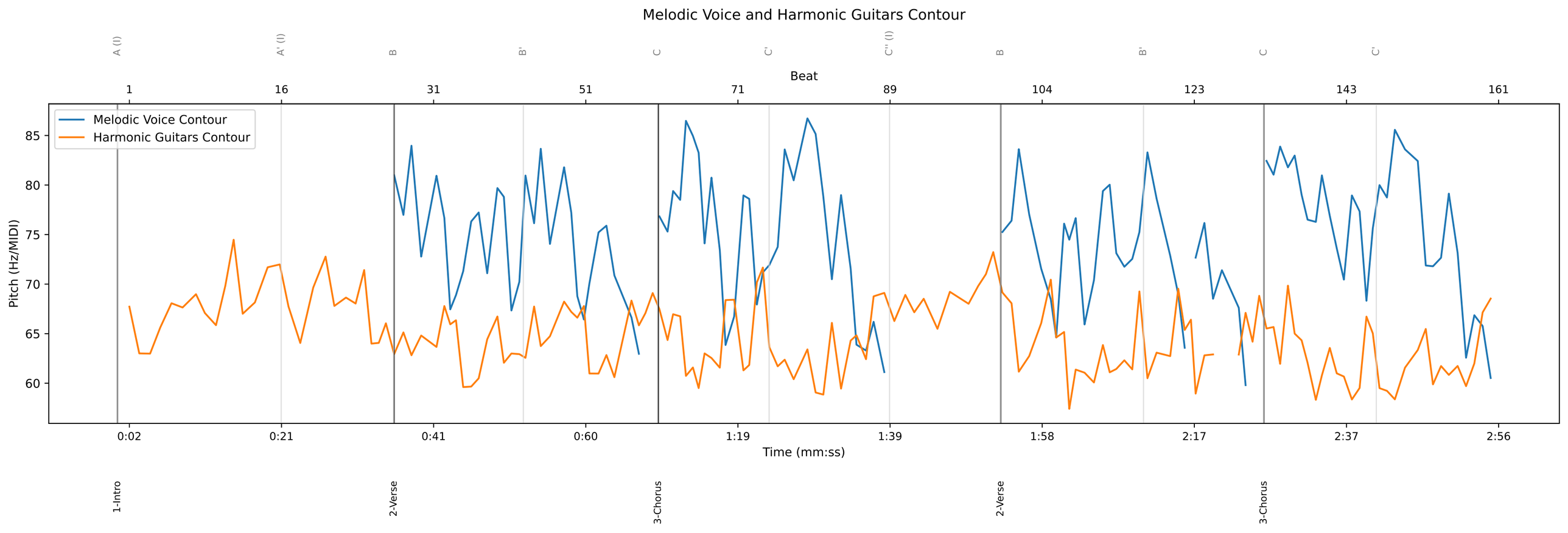

Features Correlation Matrix
Tempo Deviation
Voice Rhythmic Density
Guitars Rhythmic Density
Voice Loudness
Guitars Loudness
Tonal Dissonance
Tonal Dispersion
Melodic Contour
Harmonic Contour
1.0 -0.4 -0.61 0.43 -0.34 0.37* 0.01 0.29 -0.5
-0.4 1.0 -0.11 -0.19 -0.16 -0.06 -0.17 -0.24 -0.15
-0.61 -0.11 1.0 -0.0 0.78 -0.06 0.27 -0.09 0.6
0.43 -0.19 -0.0 1.0 0.17 -0.1 0.09 0.6 -0.32
-0.34 -0.16 0.78 0.17 1.0 -0.24 0.3 0.35 0.5
0.37* -0.06 -0.06 -0.1 -0.24 1.0 0.06 -0.5 0.0
0.01 -0.17 0.27 0.09 0.3 0.06 1.0 0.3 0.24
0.29 -0.24 -0.09 0.6 0.35 -0.5 0.3 1.0 -0.26
-0.5 -0.15 0.6 -0.32 0.5 0.0 0.24 -0.26 1.0
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00

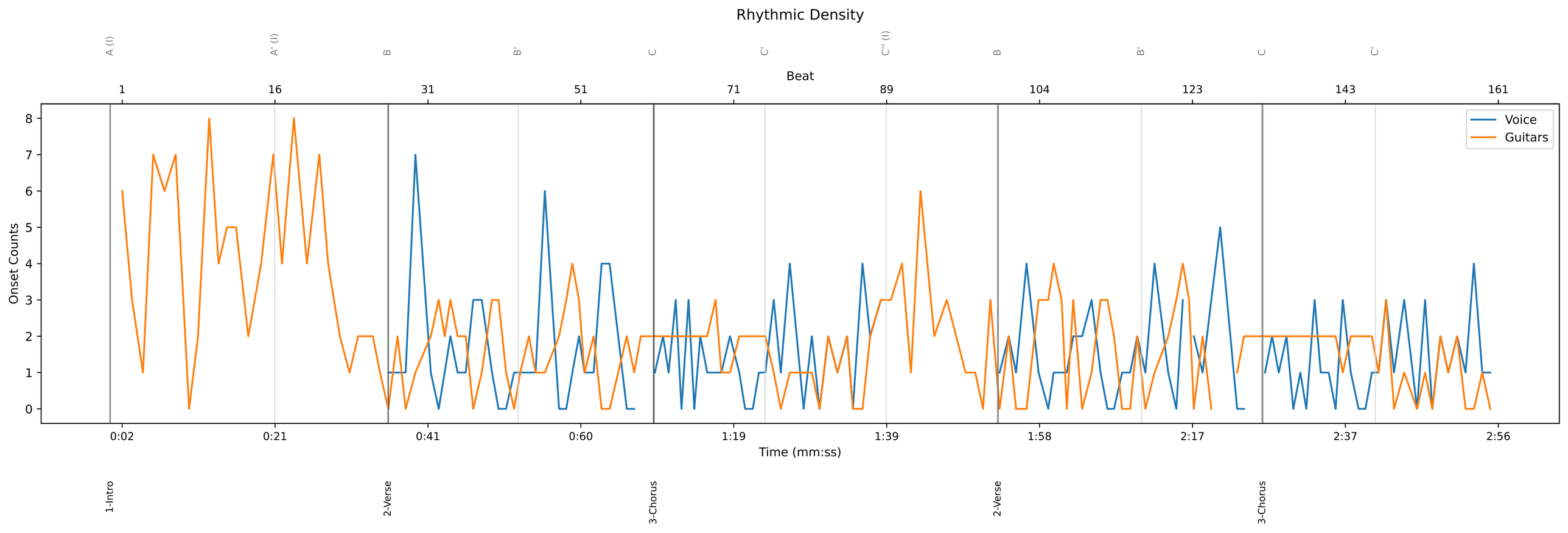

Tempo
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
BPM
100
90
80
70
60
50
40
30
BPM
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus

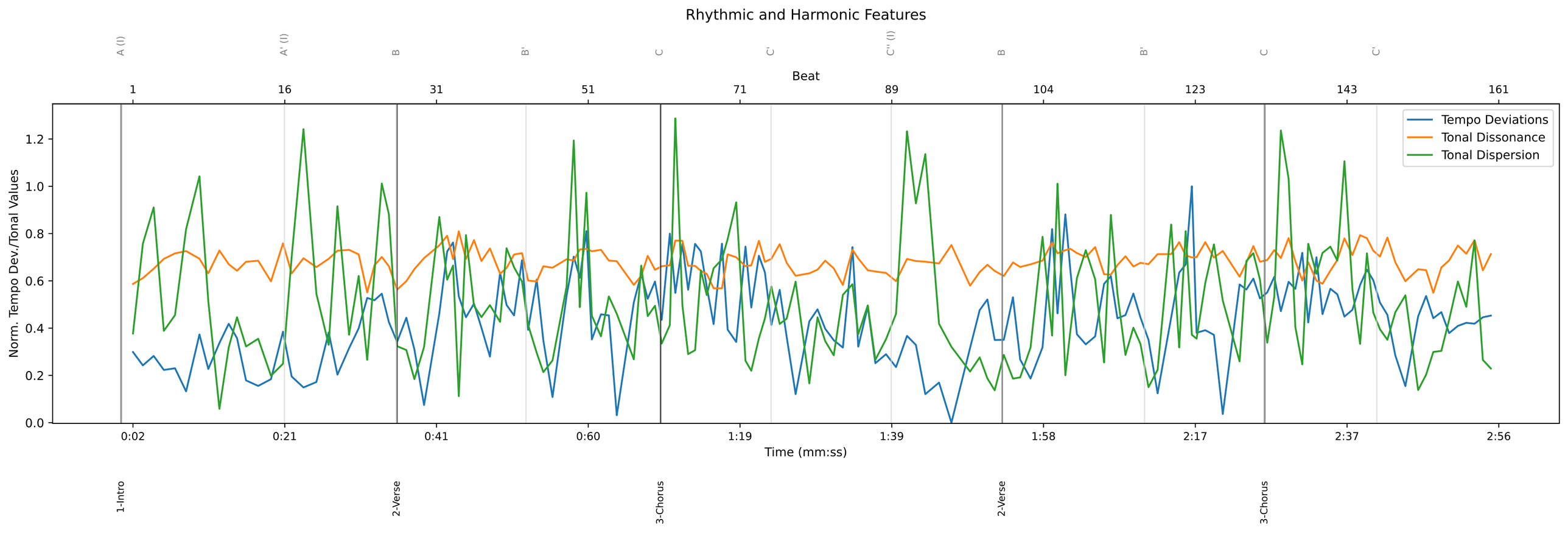

Tempo Deviations
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Tempo Deviations
BPM Deviation
40
30
20
10
0
−10
−20
−30
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus

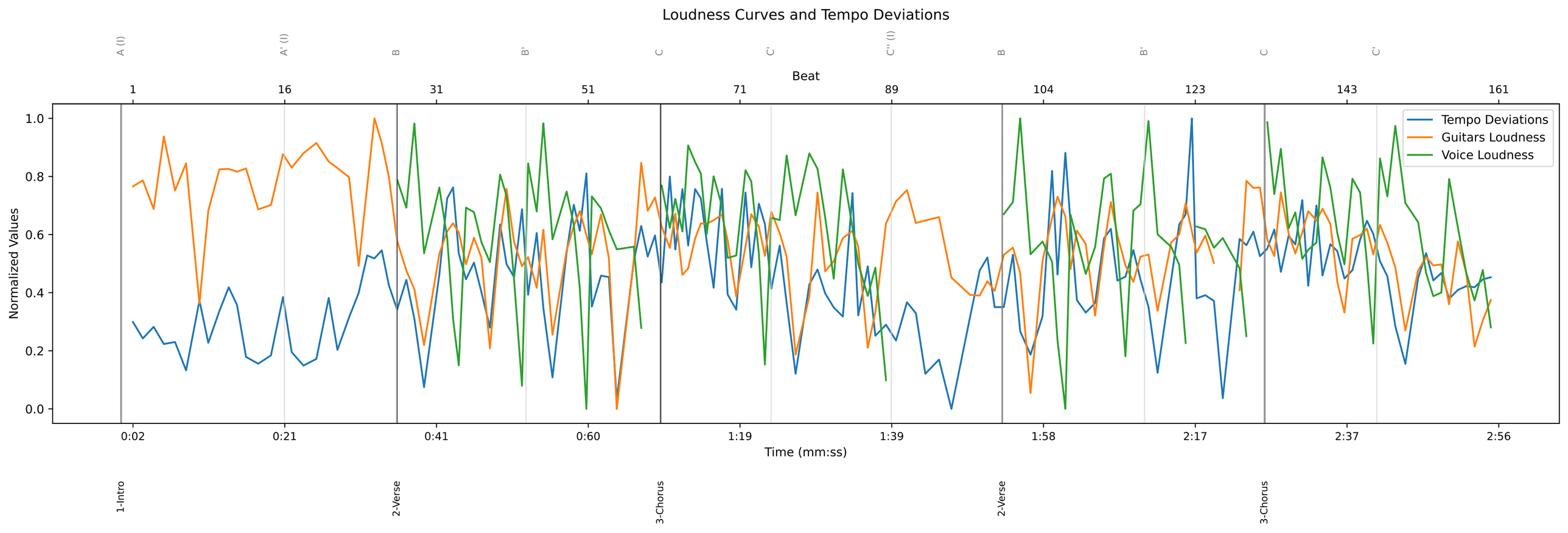

Harmonic Features
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Tonal Dissonance
Tonal Dispersion
Tonal Distances & Dissonance
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus

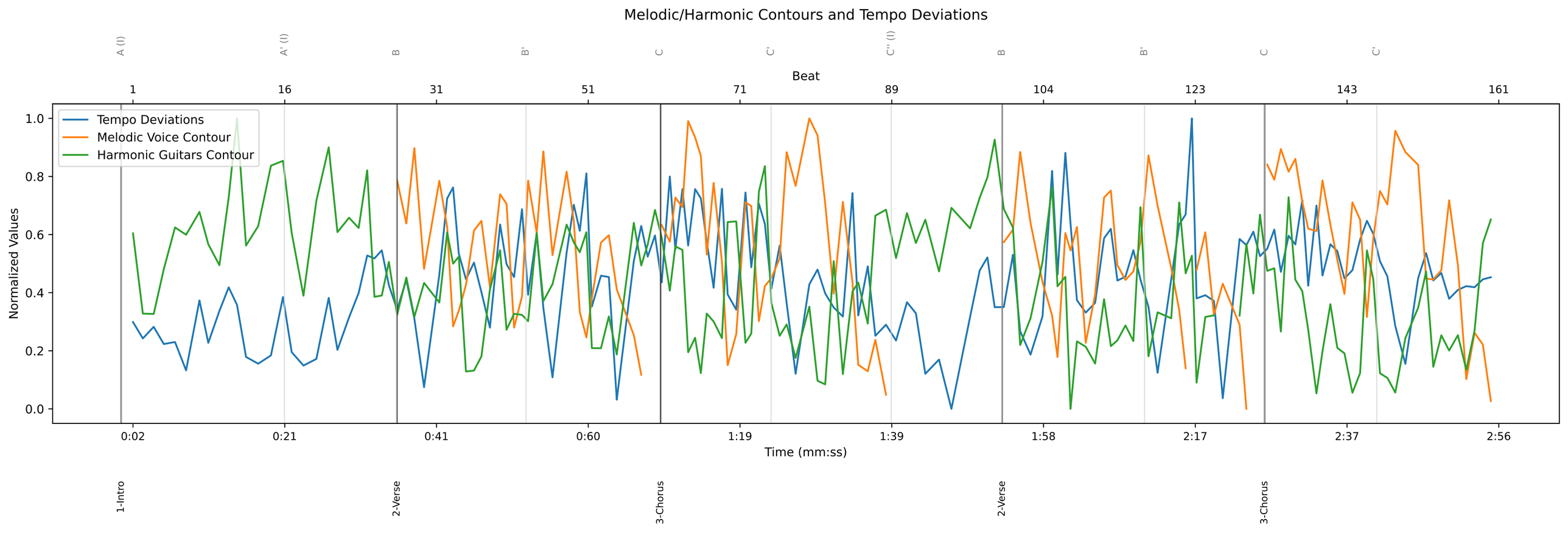

Loudness
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Guitars
Voice
Decibels
−5
−10
−15
−20
−25
−30
−35
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus

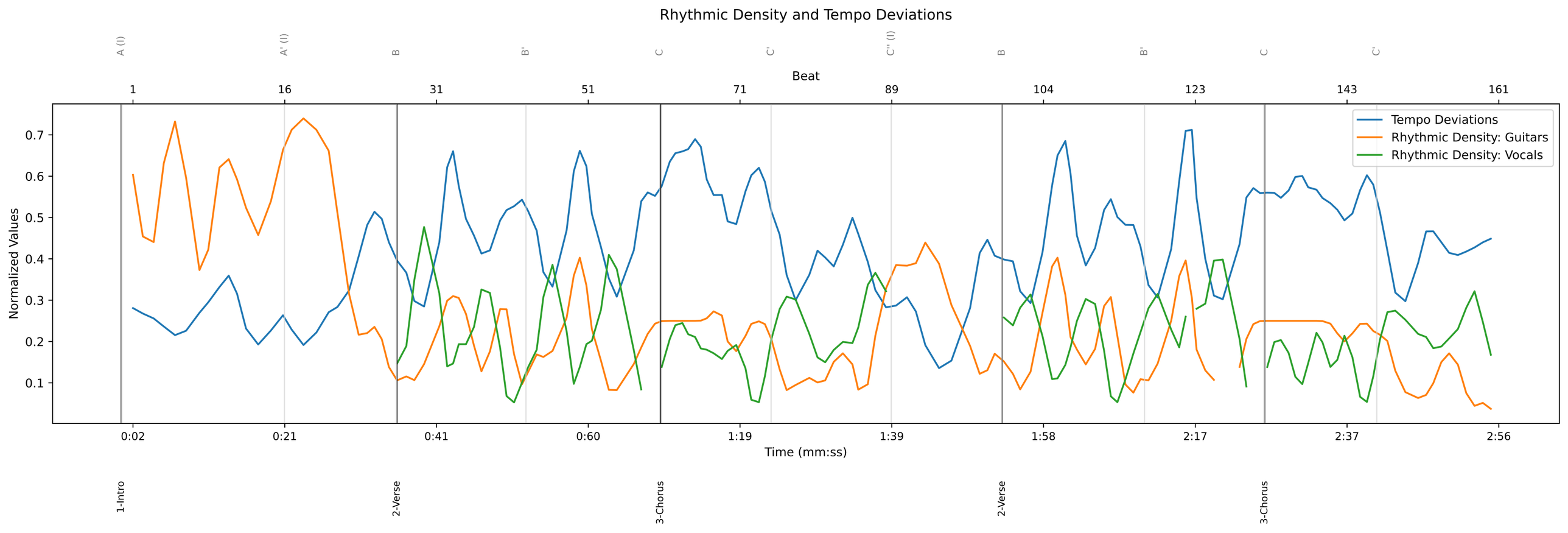

Melodic Voice and Harmonic Guitars Contour
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Melodic Voice Contour
Harmonic Guitars Contour
Pitch (Hz/MIDI)
85
80
75
70
65
60
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus

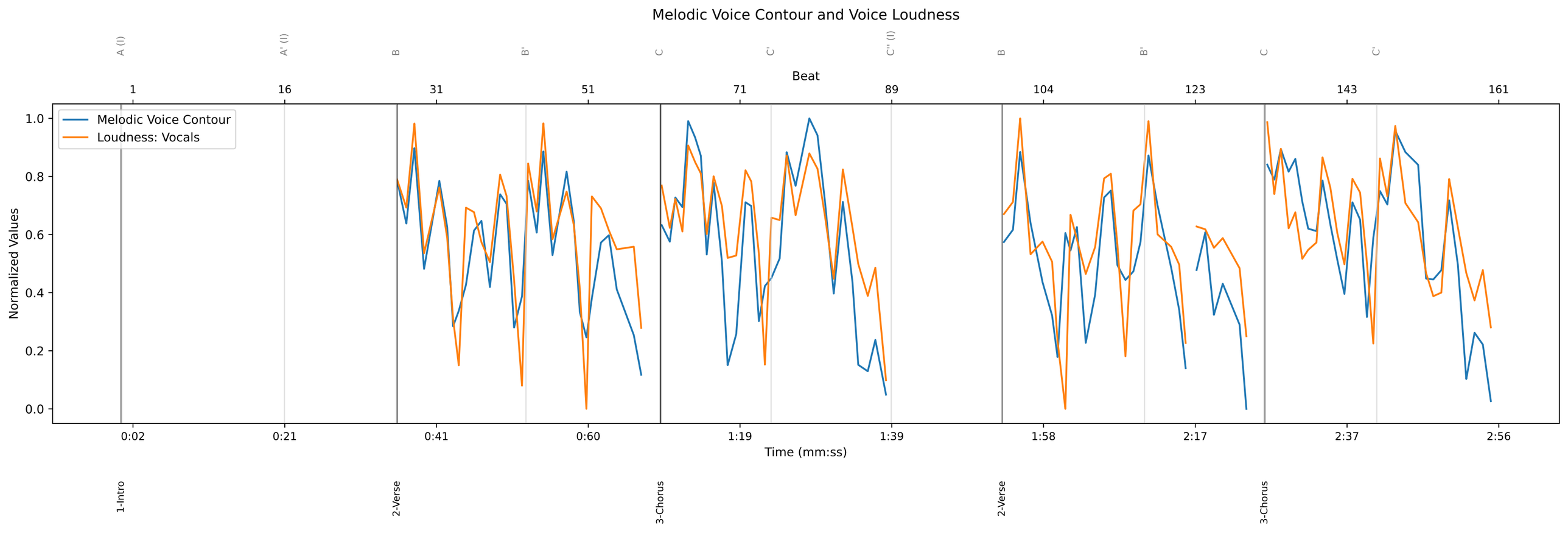

Rhythmic Density
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Voice
Guitars
Onset Counts
0
1
2
3
4
5
6
7
8
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus

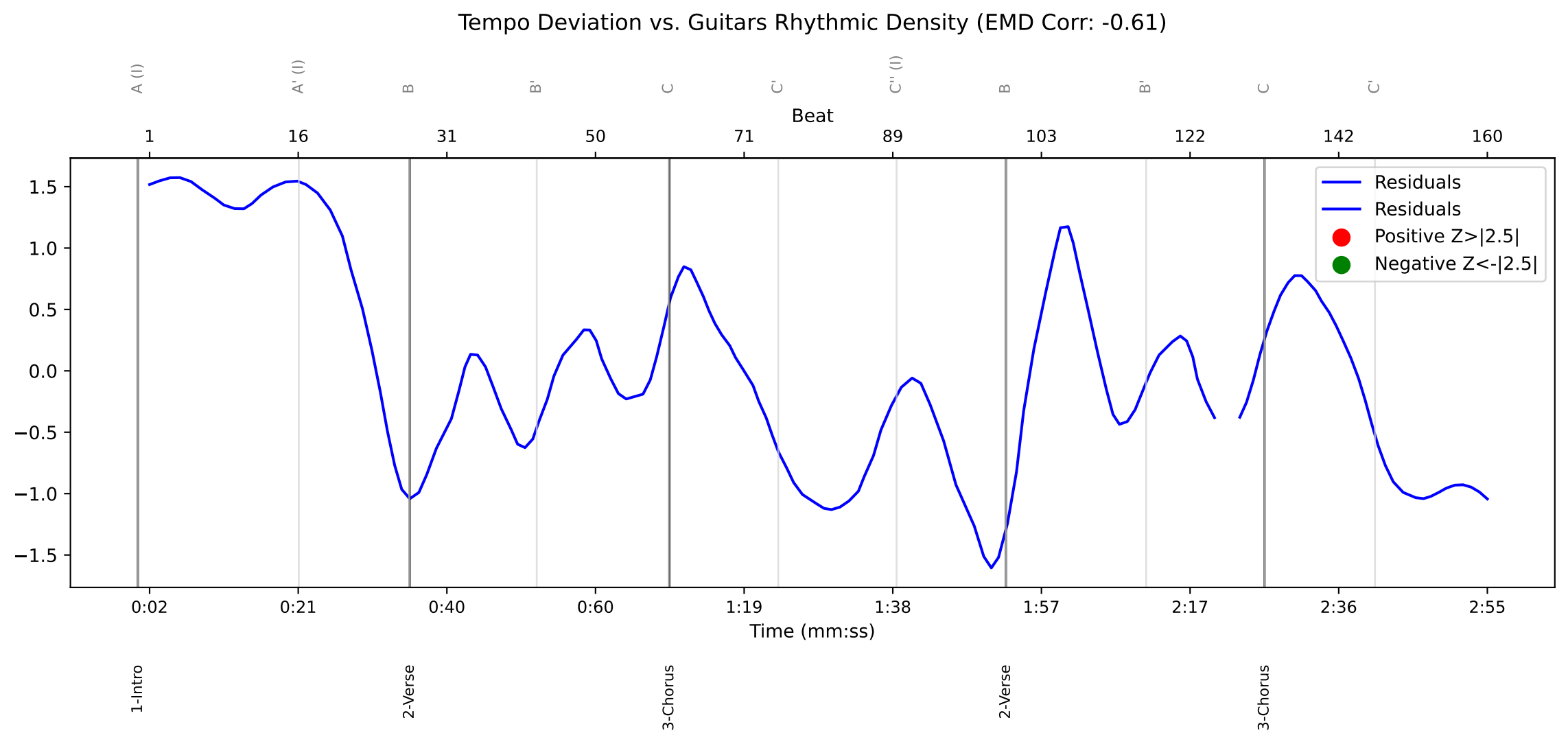

Rhythmic and Harmonic Features
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Tempo Deviations
Tonal Dissonance
Tonal Dispersion
Norm. Tempo Dev./Tonal Values
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus

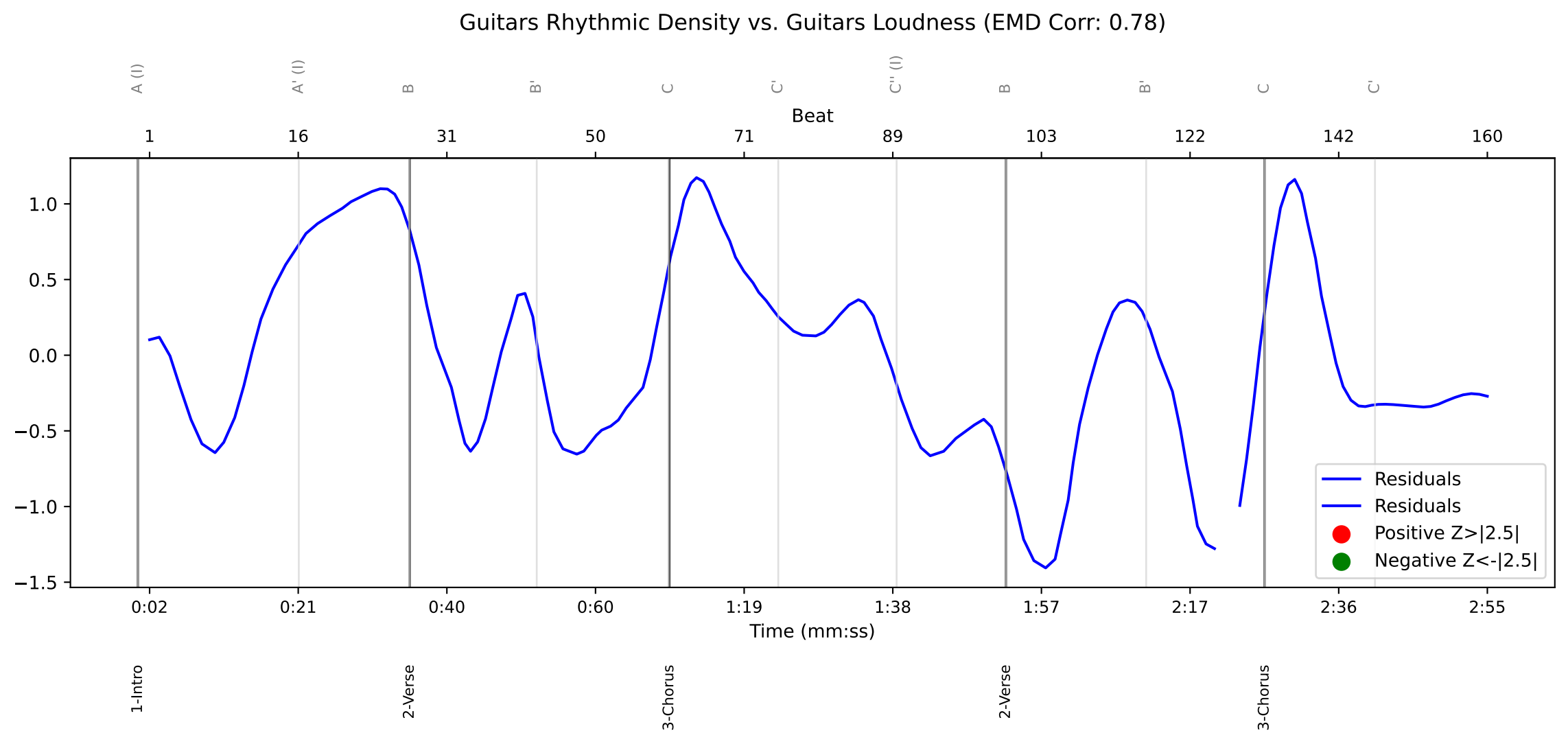

Loudness Curves and Tempo Deviations
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Normalized Values
1.0
0.8
0.6
0.4
0.2
0.0
Tempo Deviations
Guitars Loudness
Voice Loudness
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus


Melodic/Harmonic Contours and Tempo Deviations
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Tempo Deviations
Melodic Voice Contour
Harmonic Guitars Contour
Normalized Values
1.0
0.8
0.6
0.4
0.2
0.0
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus


Rhythmic Density and Tempo Deviations
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Tempo Deviations
Rhythmic Density: Guitars
Rhythmic Density: Vocals
Normalized Values
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus


Melodic Voice Contour and Voice Loudness
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
51
71
89
104
123
143
161
Melodic Voice Contour
Loudness: Vocals
Normalized Values
1.0
0.8
0.6
0.4
0.2
0.0
0:02
0:21
0:41
0:60
1:19
1:39
1:58
2:17
2:37
2:56
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus


Tempo Deviation vs. Guitars Rhythmic Density (EMD Corr: -0.61)
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
50
71
89
103
122
142
160
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
Residuals
Residuals
Positive Z>|2.5|
Negative Z<-|2.5|
0:02
0:21
0:40
0:60
1:19
1:38
1:57
2:17
2:36
2:55
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus


Guitars Rhythmic Density vs. Guitars Loudness (EMD Corr: 0.78)
A (I)
A' (I)
B
B'
C
C'
C'' (I)
B
B'
C
C'
Beat
1
16
31
50
71
89
103
122
142
160
1.0
0.5
0.0
−0.5
−1.0
−1.5
Residuals
Residuals
Positive Z>|2.5|
Negative Z<-|2.5|
0:02
0:21
0:40
0:60
1:19
1:38
1:57
2:17
2:36
2:55
Time (mm:ss)
1-Intro
2-Verse
3-Chorus
2-Verse
3-Chorus