



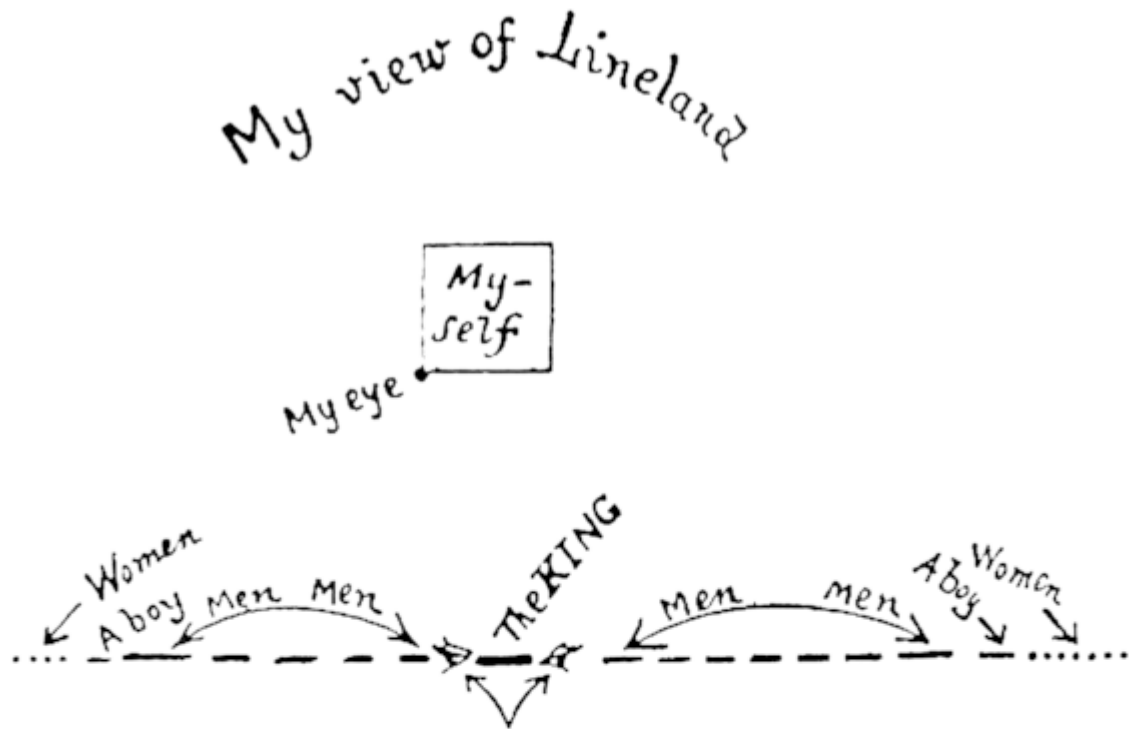
A JOURNAL OF THE SOCIETY FOR MUSIC THEORY

MTO 27.2 Examples: Hahn, Reframing Generated Rhythms and the Metric Matrix as Projections of Higher-Dimensional Lattices in Scott Joplin's Music

(Note: audio, video, and other interactive examples are only available online)

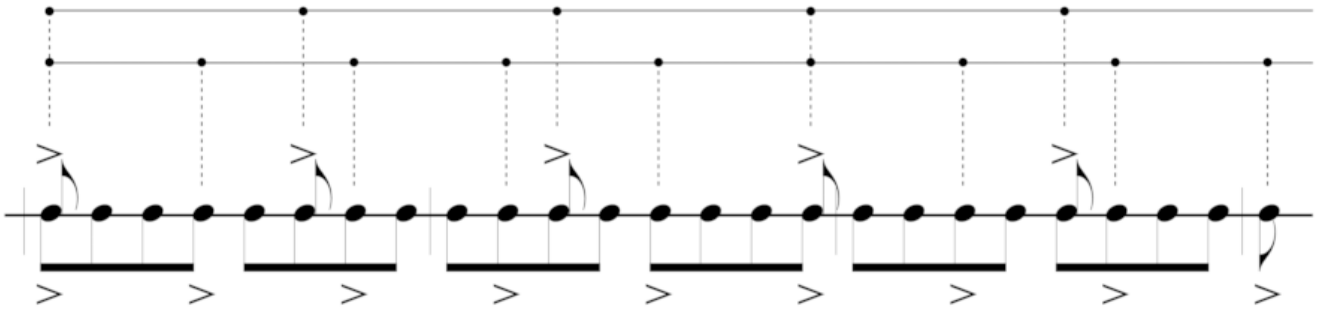
<https://mtosmt.org/issues/mto.21.27.2/mto.21.27.2.hahn.html>

Example 1. Drawing from Abbott's *Flatland*

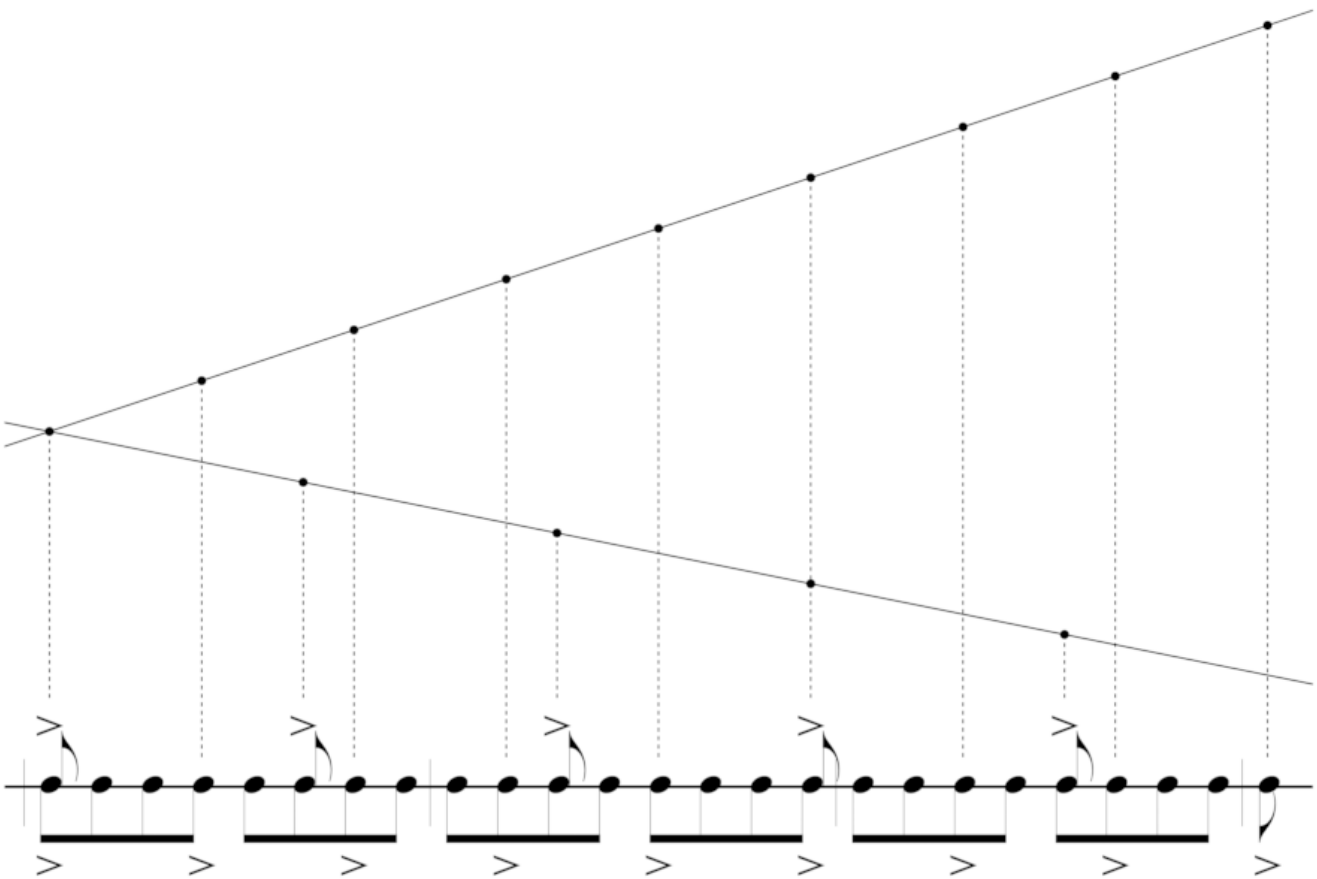


The KING'S eyes
much larger than the reality
shewing that HIS MAJESTY
could see nothing but a point.

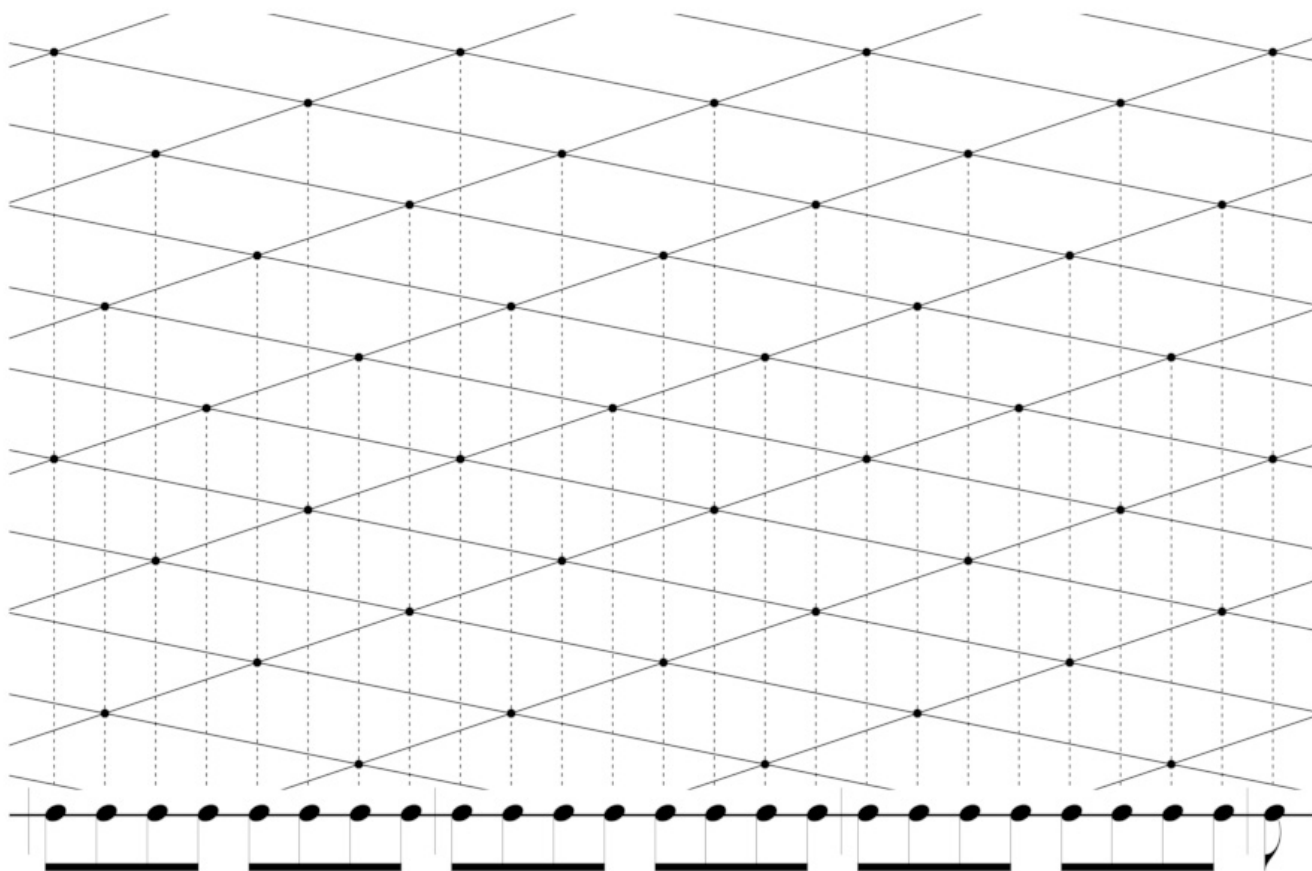
Example 2. 3-generated and 5-generated beat streams shown together



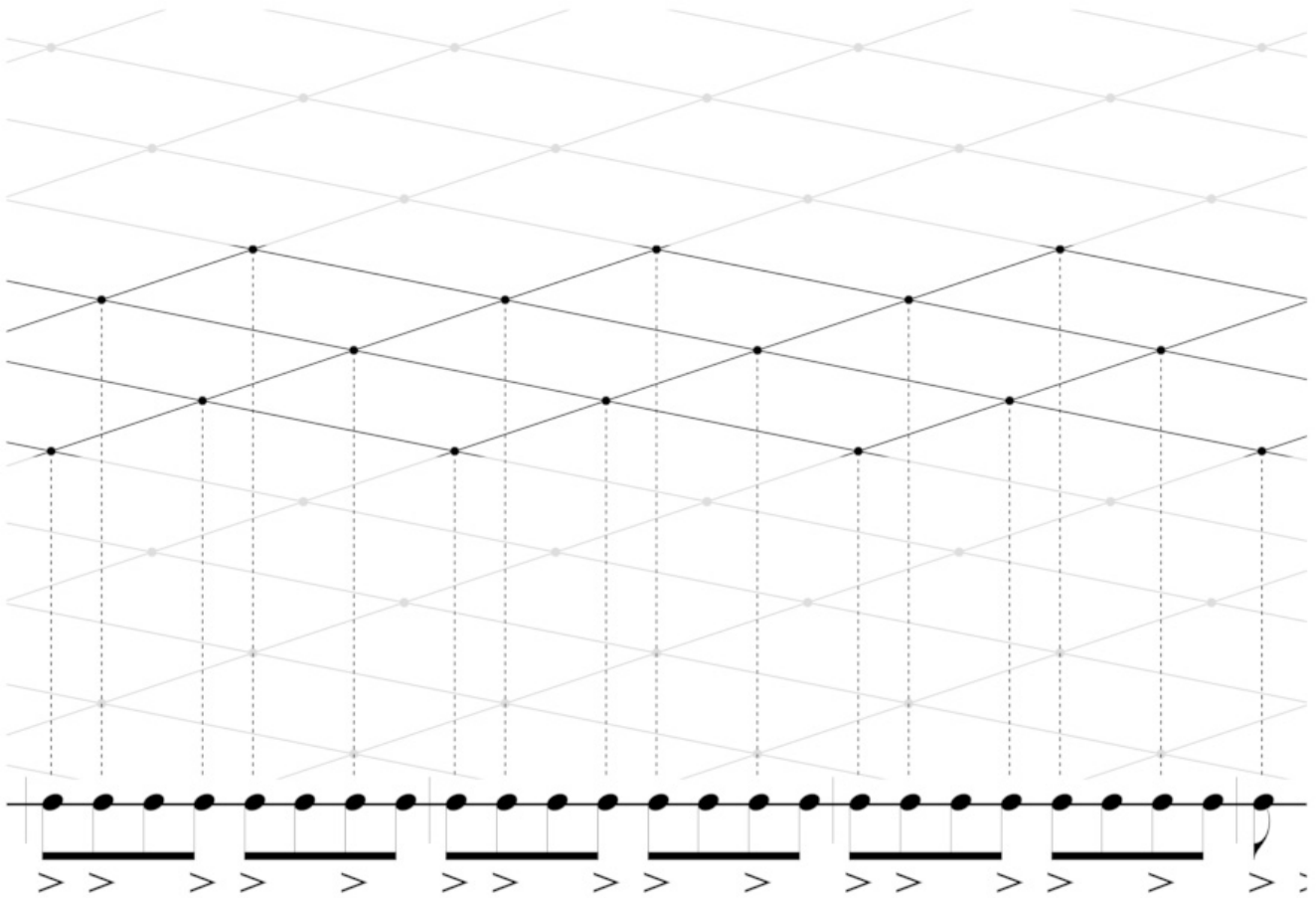
Example 3. The same two beat streams represented by dots along two sloped lines such that the ratio of their slopes is $-3:5$



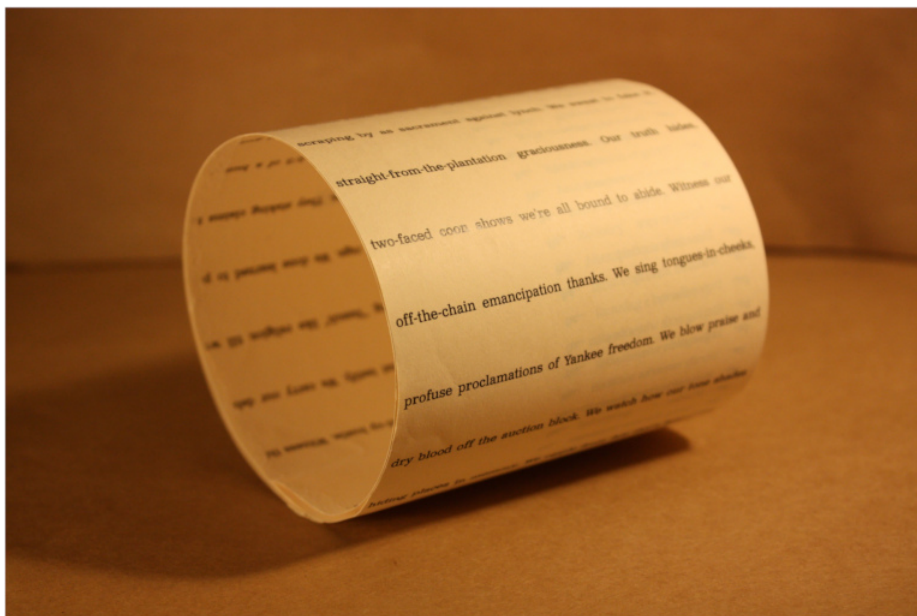
Example 4. Copying the sloped lines at the beginning of each bar generates a lattice



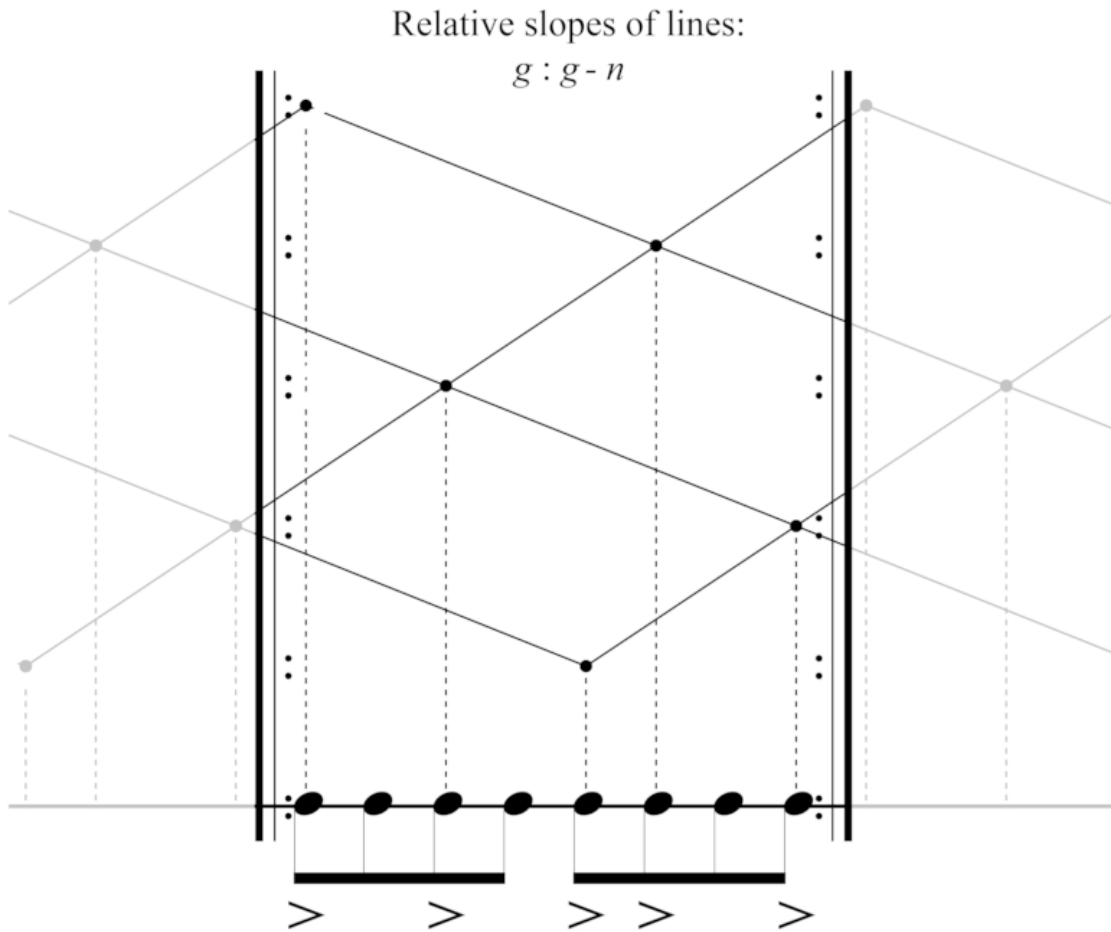
Example 5. Select five horizontal rows of dots to yield the generated rhythm with $n = 8$, $k = 5$ and $g = 3$



Example 7. Jess's *The Bert Williams/George Walker Paradox* in torus form



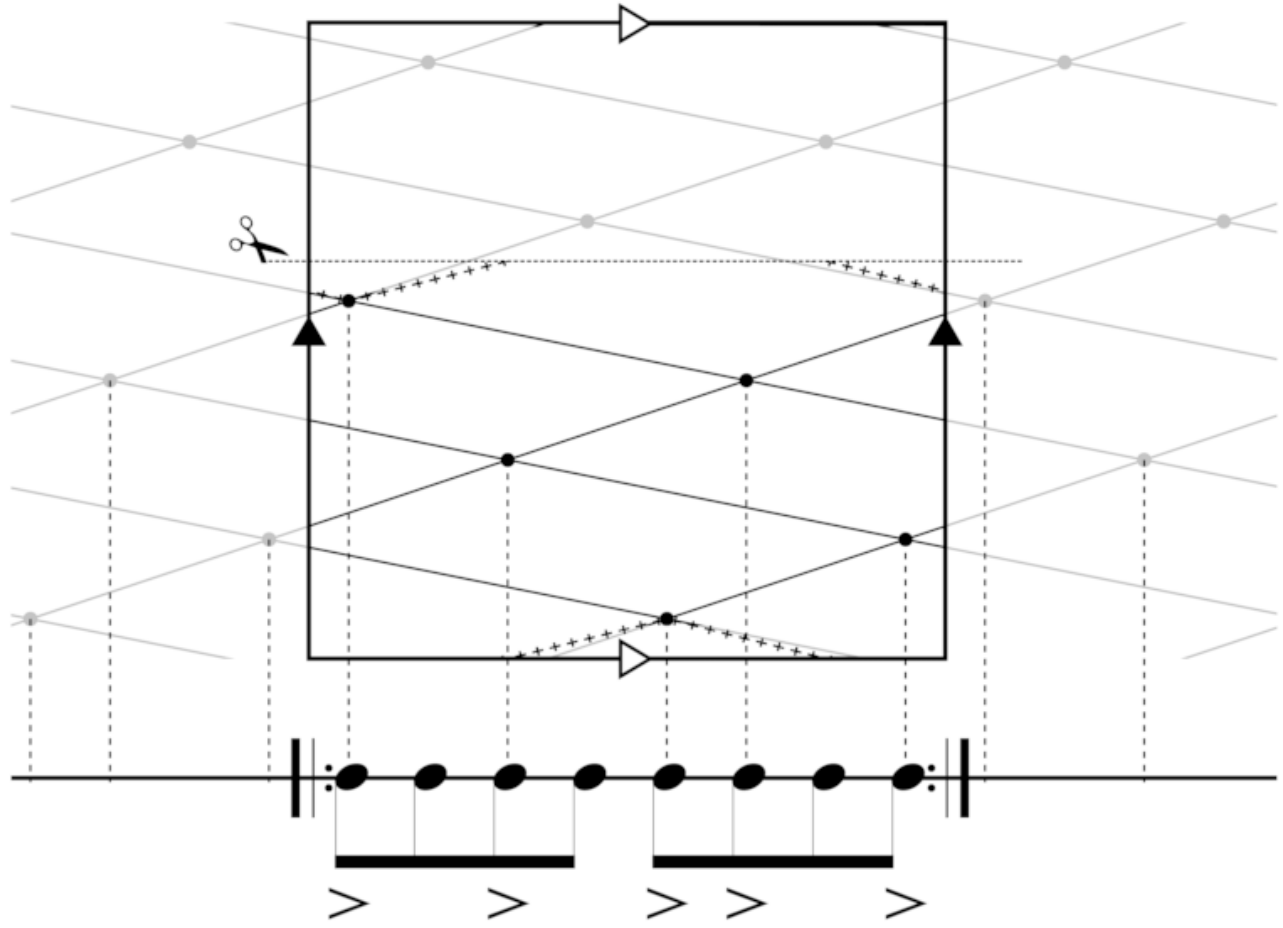
Example 8. Cylinder enhancement to the lattice-projection model



Example 9. Torus enhancement to the lattice-projection model shown with $n = 8$ and $k = 5$

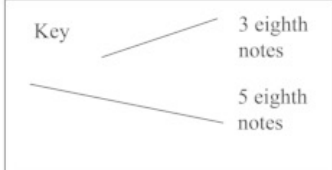
The lattice is given by $T(k^{-1}, 1)$ and $T(k^{-1} - n, 1)$

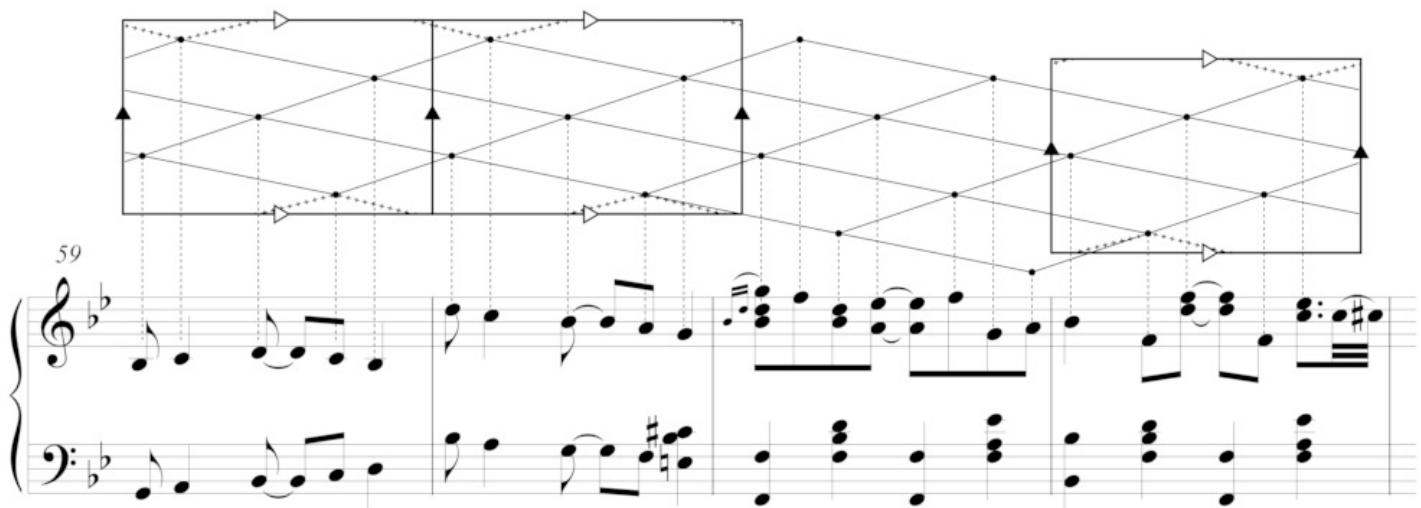
+++++ denotes the durational comma



Projection onto $T(1, 0)$ loop
around torus yields $ME(k, n)$

Example 10. Joplin's *Magnetic Rag*, mm. 59–62

Key  3 eighth notes
5 eighth notes



59

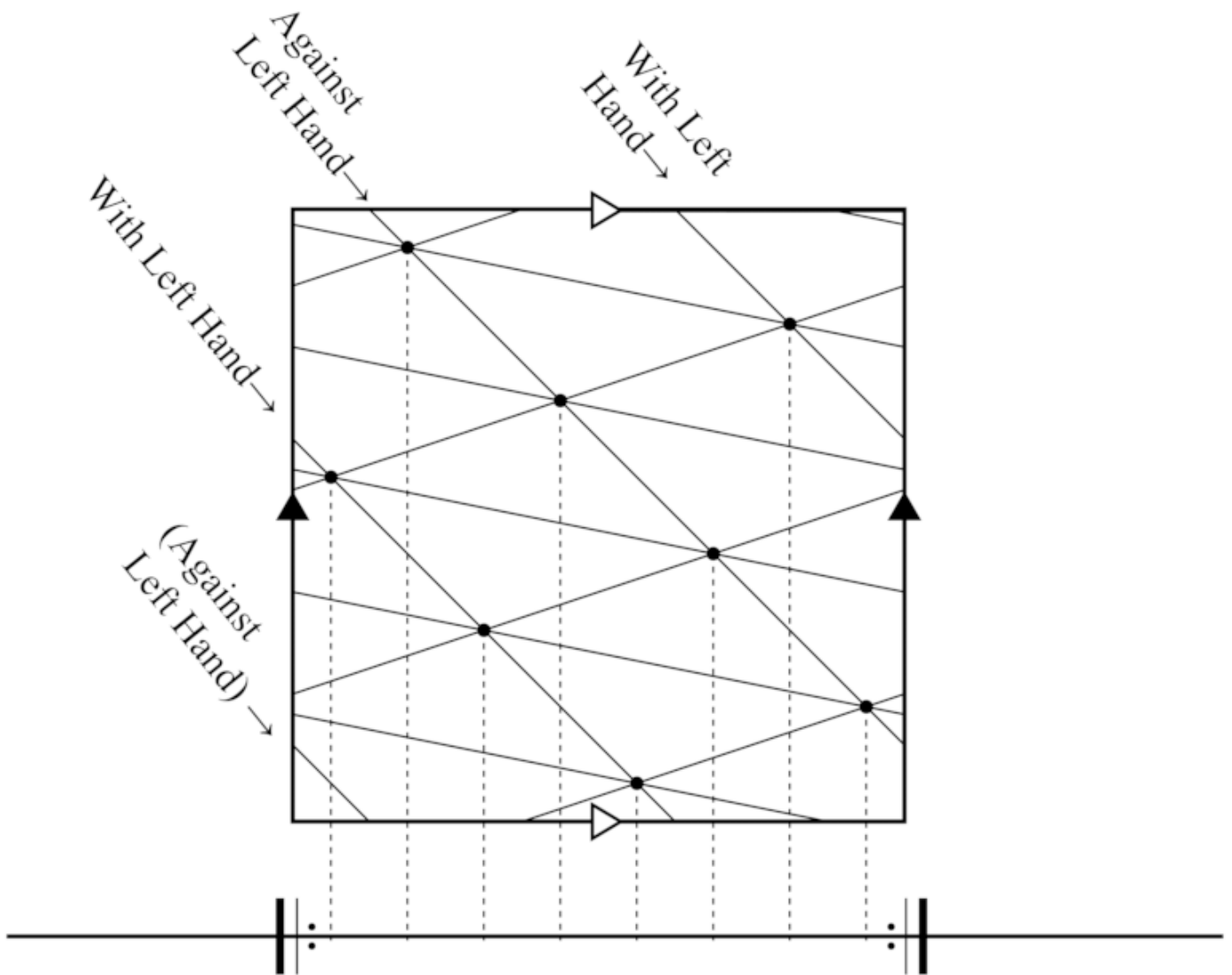
Example 11. Joplin's *Magnetic Rag*, mm. 1–2

1 Allegretto ma non troppo



f

Example 12. Intersection pattern between the 3- and 5-generated cycles and the left hand



Example 13. Joplin's *Magnetic Rag*, mm. 59–62, with the left hand's generated sets represented

Key

- 3 eighth notes
- 5 eighth notes
- 2 eighth notes

59

Example 14. *Bethena*, mm. 9–12

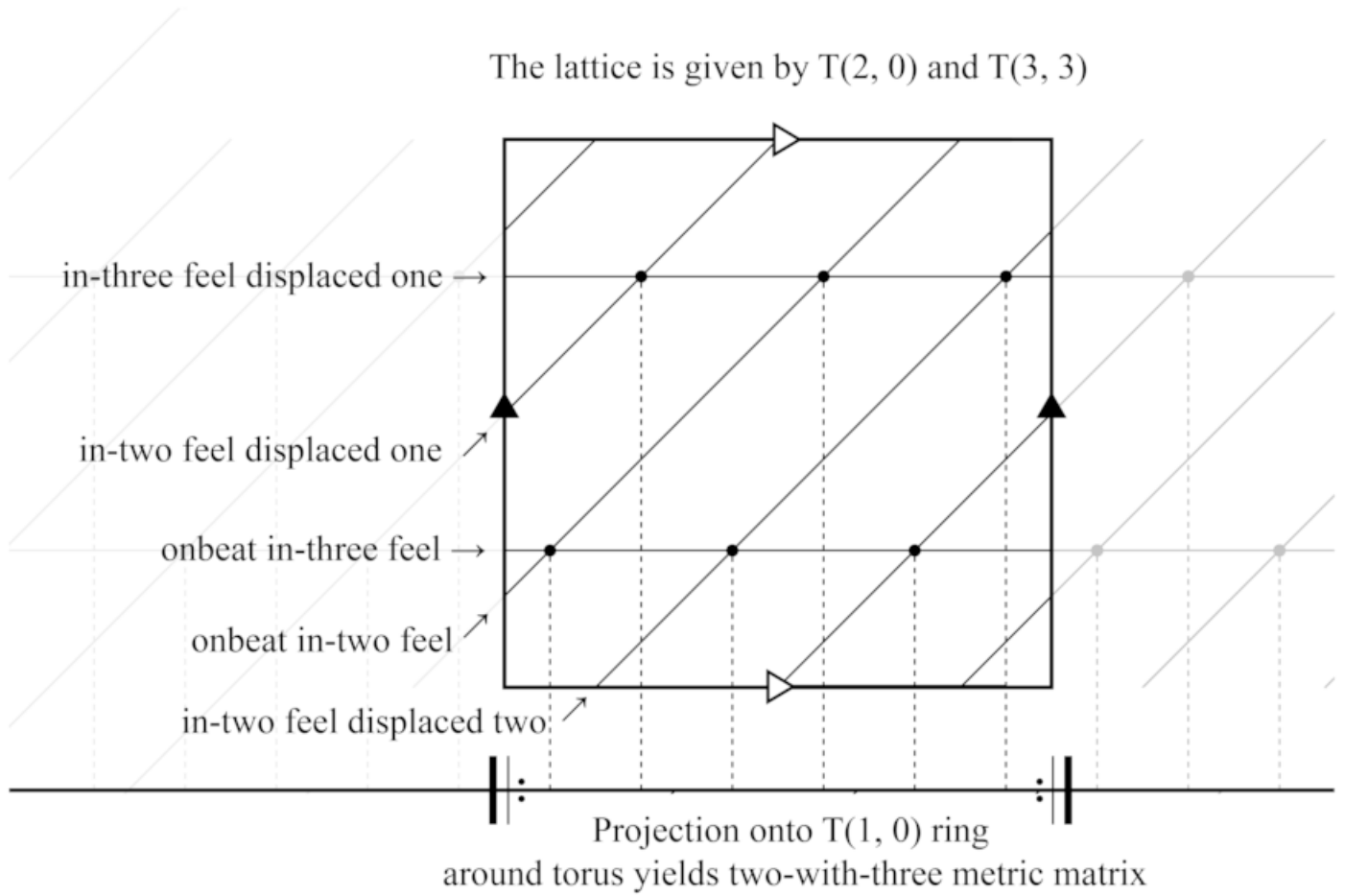
Valse cantabile

in-two feel: 1 2 1 2 1 2

in-three feel: 1 2 3 1 2 3 1 2 3 1 2 3

mp

Example 15. The metric matrix in torus form



Example 16. Second strain from Joplin's *Magnetic Rag*

Key

- 3 eighth notes
- 5 eighth notes
- 4 eighths (comma)

22

26



30


34

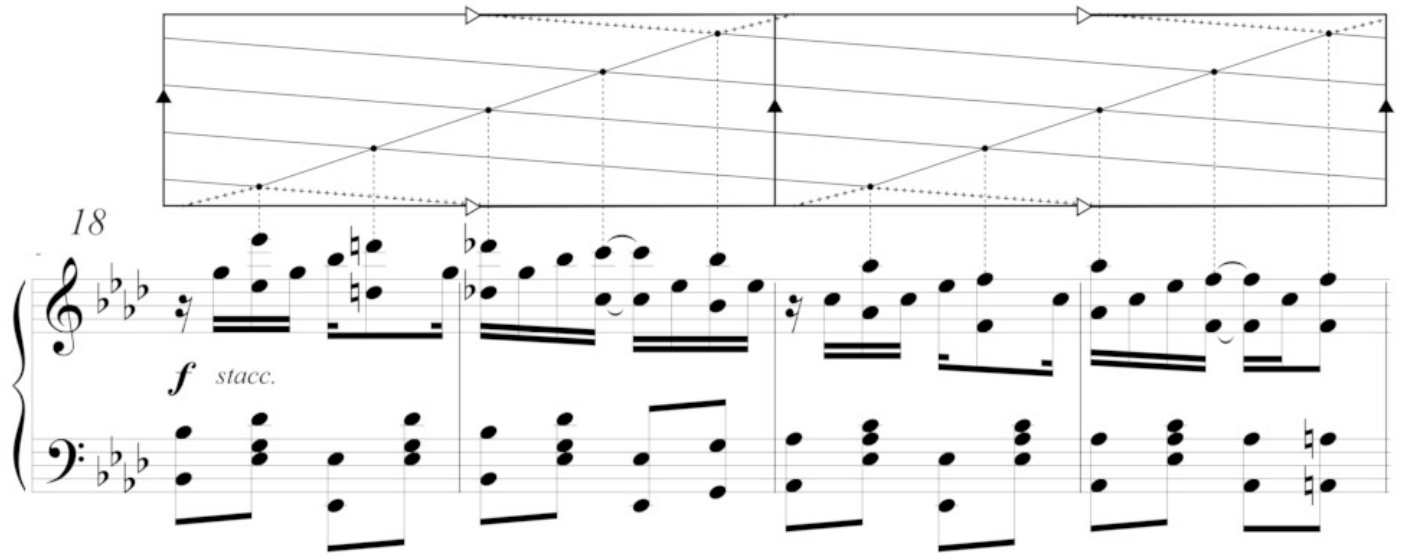
Beat stream wraps from top to bottom

Beat stream wraps from top to bottom

Example 17. Measures 18–21 from Joplin's *Maple Leaf Rag*

Key  3 16th notes  comma

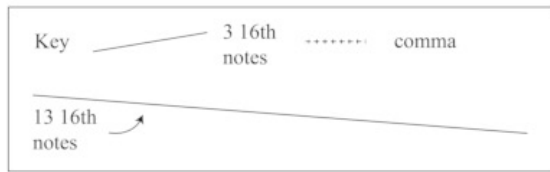
13 16th notes 



18

f stacc.

Example 18. Measures 30–33 from Joplin's *Original Rags*



30

Example 19. The final strain from *Elite Syncopations*

The image displays a musical score for the final strain of *Elite Syncopations*. It consists of two systems of music, each with a piano accompaniment and a corresponding pitch contour diagram above it.

System 1 (Measures 72-79):

- Pitch Contour Diagrams:**
 - Highest pitches only:** Shows four ME(3, 16) intervals, each represented by a solid line with a triangle at the end.
 - Octave-reinforced pitches only:** Shows six ME(3, 8) intervals, each represented by a solid line with a triangle at the end.
 - Complete phrase:** Shows the full pitch contour with various interval types.
- Music:** A piano accompaniment in 2/4 time, starting at measure 72. The right hand features a complex, syncopated melody with many beamed notes. The left hand provides a steady accompaniment.

System 2 (Measures 80-87):

- Pitch Contour Diagrams:**
 - Highest pitches only:** Shows two ME(3, 16) intervals.
 - Octave-reinforced pitches only:** Shows two ME(3, 8) intervals.
 - Complete phrase:** Shows the full pitch contour for the second system.
- Music:** Continues the piano accompaniment from measure 80. It concludes with a first ending (marked '1.') and a second ending (marked '2.').

Key:

- Solid line with triangle: 3 16th notes
- Solid line with triangle and dashed line: 5 16th notes
- Solid line with triangle and dotted line: 11 16th notes
- Dotted line: comma

Example 21. Measures 1–10 from Joplin's *Treemonisha*

Allegretto. (♩ = 92)

mf

6

Example 22. Measures 19–22 from Joplin's *Treemonisha*

19

Example 23. Measures 208–10 from Joplin's *Treemonisha*

208



Example 24. *Bethena*, mm. 13–16

in-two feel displaced one:

onbeat in-two feel:

13



onbeat in-three feel:

Example 25. *Bethena*, mm. 77–80

in-two feel displaced one:

onbeat in-two feel:

cantabile

77

f a tempo

onbeat in-three feel:

Example 26. The first line from Exercise No. 6 in *School of Ragtime*

Slow march tempo (*Count Two*)

Example 27. The final cadence of *Stoptime Rag*

84

The musical score consists of two staves, treble and bass clef. It is divided into two systems. The first system contains measures 84 and 85. The second system contains measures 86 and 87. Above the first system, there are two first endings: '1.' above measure 86 and '2.' above measure 87. The word 'stamp' is written below the treble staff in measures 84, 85, 86, and 87. The piece concludes with a double bar line and the word 'Fine' at the bottom right.