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

My view of Lineland

My eye

Myself

Women
A boy
Men
Men
The King
Men
Men
A boy
Women

The King’s eyes

much larger than the reality

showing 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

Relative slopes of lines:
\[ g : g - n \]
Example 9. Torus enhancement to the lattice-projection model shown with $n = 8$ and $k = 5$

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

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Projection onto $T(1, 0)$ loop around torus yields $ME(k, n)$
Example 10. Joplin’s *Magnetic Rag*, mm. 59–62

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

Example 14. *Bethena*, mm. 9–12
Example 15. The metric matrix in torus form

The lattice is given by $T(2, 0)$ and $T(3, 3)$

Projection onto $T(1, 0)$ ring around torus yields two-with-three metric matrix
Example 16. Second strain from Joplin’s *Magnetic Rag*
Example 17. Measures 18–21 from Joplin’s Maple Leaf Rag
Example 18. Measures 30–33 from Joplin’s *Original Rags*
Example 19. The final strain from *Elite Syncopations*
Example 20. Measures 243–51 from Joplin’s *Treemonisha*
Example 21. Measures 1–10 from Joplin's *Treemonisha*

Example 22. Measures 19–22 from Joplin’s *Treemonisha*
Example 23. Measures 208–10 from Joplin’s *Treemonisha*

Example 24. *Bethena*, mm. 13–16
Example 25. Bethena, mm. 77–80

Example 26. The first line from Exercise No. 6 in School of Ragtime
Example 27. The final cadence of *Stoptime Rag*