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The Complex Plane for Visualizing Quantitative Effects of Phase Interpretation on Inferred Clave Using Several Measures of Syncopation

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The standard explanation of clave direction in most English-language materials for instruction (primarily influenced by Afro-Cuban traditions) divides the clave figure into first and second halves, and compares these in terms of template-matching to standard subsequences. The contrasting approach proposed in the recent grammar for Afro-Latin rhythm is to compare the off-beatness values of sections 90° phase-shifted from the standard, without the need for reference to standard patterns.

While the latter approach is demonstrably more consistent with the traditionally ascribed clave direction in many cases, in the years since its development, examples of music from Cuba and Uruguay have been found for which this approach does not always agree with the requisite interpretation of clave direction. A visualization technique is proposed and demonstrated that can accommodate both approaches to interpreting clave direction, and do so while taking into account almost any proposed metric. To investigate the interplay of cultural context and analytical approach in this fashion, metrics are plotted in the complex plane according to each clave demarcation. Just as AC voltages experience 90° phase shifts in traversing reactive elements, and this phase shift is represented graphically in the complex plane, the two demarcations of clave direction are related by a 90° shift, and can thus be displayed together on the complex plane. Using several measures of off-beatness from the literature on rhythm, we visualize the effect of each phase on determining clave direction, investigate the degrees to which measures of off-beatness agree with the traditionally accepted direction and with one another, and demonstrate that this novel technique for displaying clave information also reveals the strength of clave directionality in each pattern.