

**Meeting:** 1001, Evanston, Illinois, SS 23A, Special Session on Mathematical Techniques in Musical Analysis

1001-51-355            **Stephen G. Soderberg\*** ([ssod@loc.gov](mailto:ssod@loc.gov)). *Rubber Band Geometry: navigating within and between microtonal universes*. Preliminary report.

In the conclusion of "Maximally Even Sets" (Journal of Music Theory 35.1&2), John Clough and Jack Douthett demonstrated that, just as the 7-note diatonic scale is a maximally even (ME) subset of the 12-note chromatic, the basic diatonic 3-note (and 4-note) chords are ME with respect to the usual 7-note diatonic. They labeled these chords "second-order ME sets." Generalizing this idea, we introduce the warp transformation  $W$  which treats maximal evenness as a special case. As the defining transformation in a "rubber band" (or "cat's cradle") geometry,  $W$  is a map that takes interval strings of length  $l \bmod m$  to strings of length  $m \bmod n$  ( $l < m < n$ ). After briefly discussing the general features of this transformation which apply equally to both pitch and rhythmic structures, we use it to explore a hyperdiatonic system of 5-note chords based on the 13-note ME subset in the quartertone 24-chromatic. We conclude by listening to two kinds of examples: chord progressions within this synthetic 24-chromatic system and chord progressions that migrate between the 12- and 24-chromatic. (Received August 31, 2004)