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Section:

9. Ordinary Differential Equations and Dynamical Systems

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Connectivity of iso-topological entropy curve for symmetric PL bimodal maps

We study the topological entropy of a two parameter family of symmetric piecewise-linear bimodal maps $F_{\lambda,\mu}$ on $[-1,1]$, which is given by

$$F_{\lambda,\mu}(x) = \begin{cases} \lambda(x-1/\mu)-1 & x \in I_R \\ -\mu x & x \in I_M \\ \lambda(x+1/\mu)+1 & x \in I_L, \end{cases} \tag{1}$$

where $\mu > 1, \lambda > 0$ and $I_L = [-1,-1/\mu],\ I_M = [-1/\mu, 1/\mu],\ I_R = [1/\mu, 1]$.
Let $h(\lambda,\mu)$ be the topological entropy for $F_{\lambda,\mu}$. The main result is:
Theorem: Given a constant c with $0 < c < \log 3$, the iso-entropy curve given by $h(\lambda,\mu) = c$ is connected.
We also obtain the monotonicity of $h(\lambda,\mu)$ with respect to the parameter μ. For the monotonicity of the parameter λ, we have to restrict the parameter region. Some numeric simulations are shown. This is joint work with S. Nakamura.

Reference: M. Misiurewicz and E. Visinescu, Kneading sequences of skew tent maps, Ann. Inst. H. Poincaré, **27** (1991), 125–140.