DIMENSIONS OF PROJECTED SETS AND MEASURES ON TYPICAL SELF-AFFINE SETS

CAI-YUN MA
HUN-REN–BME STOCHASTICS RESEARCH GROUP

Let $\{T_i x + a_i\}_{i=1}^{\ell}$ be an iterated function system on $\mathbb{R}^d$ consisting of invertible affine maps with $|T_i| < 1/2$, and $\pi : \{1, \dots, \ell\}^{\mathbb{N}} \to \mathbb{R}^d$ the corresponding coding map. For every Borel set E and every Borel probability measure μ in the coding space, we determine the various dimensions of their projections under π for typical translations $(a_1, \dots, a_\ell)$; in particular, we give a necessary and sufficient condition on μ so that the typical projection of μ is exact dimensional. This extends the known results in the literature on typical projections of invariant sets and invariant measures. It plays an analogue to the classical theorems for fractal dimensions under orthogonal projections.

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