Expanding Measures

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Abstract

We prove that any $C^{1+\alpha}$ transformation, possibly with a (non-flat) critical or singular region, admits an invariant probability measure absolutely continuous with respect to any expanding measure whose Jacobian satisfies a mild distortion condition. This is an extension to arbitrary dimension of a famous theorem of Keller [1] for maps of the interval with negative Schwarzian derivative.

We also show how to construct an induced Markov map F adapted to any expanding probability, solving the problem of lifting an invariant expanding measure to an induced Markov map.

Furthermore, the induced time R of F is bounded by the first moment of good expansion (for instance, the first hyperbolic time) and F can be used to construct the Young towers, permitting the study of decay of correlations and related statistical properties for general expanding measures.

Keywords: Liftable measures; Expanding measures;

References

[1] G. Keller, *Exponents, attractors and Hopf decompositions for interval maps.* Ergod. Th. & Dynam. Sys. **10**, 717-744 (1990).