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Approximating physical invariant measures of mixing dynamical systems in higher dimensions.


58F11 (28D99)

Early results of J. Ding and A. H. Zhou [J. Statist. Phys. 77 (1994), no. 3-4, 899–908; MR1301467 (95i:58108); Nonlinear Anal. 25 (1995), no. 4, 399–408; MR1336980 (96c:58101)] show that for piecewise $C^2$ expanding mappings $T: M \to M$, where $M \subset \mathbb{R}^n$ is some smooth manifold, the fixed points of finite approximations of the Frobenius-Perron operator associated with $T$ do indeed tend to the unique absolutely continuous invariant measure of $T$. The paper under review seeks an extension of this result to the class of mixing hyperbolic mappings on $M$ that possess a unique invariant measure equivalent to Lebesgue. For two-dimensional Anosov systems, this result has been shown to be true in the author’s earlier work [Random Comput. Dynam. 3 (1995), no. 4, 251–263; MR1362773 (96k:58133)] using techniques such as symbolic dynamics and equilibrium states, provided that a special partition, known as a Markov partition, is used. Here, a completely different approach is employed by using arbitrary (connected, measurable and regular) partitions.

Reviewed by T. Y. Li

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