Mathematics > Dynamical Systems

A numerical study of infinitely renormalizable area-preserving maps

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It has been shown in (Gaidashev et al, 2010) and (Gaidashev et al, 2011) that infinitely renormalizable area-preserving maps admit invariant Cantor sets with a maximal Lyapunov exponent equal to zero. Furthermore, the dynamics on these Cantor sets for any two infinitely renormalizable maps is conjugated by a transformation that extends to a differentiable function whose derivative is Holder continuous of exponent alpha>0.
In this paper we investigate numerically the specific value of alpha. We also present numerical evidence that the normalized derivative cocycle with the base dynamics in the Cantor set is ergodic. Finally, we compute renormalization eigenvalues to a high accuracy to support a conjecture that the renormalization spectrum is real.

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