

LYAPUNOV EXPONENTS FOR RANDOM PRODUCTS OF REAL MATRICES

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Abstract:

We consider probability measures on $GL(n, \mathbb{R})$ that are left-invariant under the orthogonal group $O(n, \mathbb{R})$. For any such measure we consider the following two quantities: (a) the mean of the log of the absolute value of the eigenvalues of the matrices and (b) the Lyapunov exponents of random products of matrices independently drawn with respect to the measure. Our main result is a lower bound for (a) in terms of (b).

This lower bound was conjectured by Burns-Pugh-Shub-Wilkinson (2001), and special cases were proved by Dedieu-Shub (2002), Avila-Bochi (2003) and Rivin (2005). We give a proof in complete generality by using some results from the theory of spherical functions and Jack polynomials.

This is joint work with Diego Armentano, Gautam Chinta, and Michael Shub. (*arXiv* : 2206.01091), (Ergodic theory and Dynamical systems, to appear).