

LYAPUNOV EXPONENTS AND EIGENVALUES OF PRODUCTS OF RANDOM MATRICES

NANDA KISHORE REDDY

ABSTRACT. Let X_1, X_2, \dots be a sequence of *i.i.d* real (complex) $d \times d$ invertible random matrices with common distribution μ and $\sigma_1(n), \sigma_2(n), \dots, \sigma_d(n)$ be the singular values, $\lambda_1(n), \lambda_2(n), \dots, \lambda_d(n)$ be the eigenvalues of $X_n X_{n-1} \dots X_1$ in the decreasing order of their absolute values for every n . It is known that if $\mathbf{E}(\log^+ \|X_1\|) < \infty$, then with probability one for all $1 \leq p \leq d$,

$$\lim_{n \rightarrow \infty} \frac{1}{n} \log \sigma_p(n) = \gamma_p,$$

where $\gamma_1, \gamma_2, \dots, \gamma_d$ are the Lyapunov exponents associated with μ . In this paper we show that under certain support and moment conditions on μ , the absolute values of eigenvalues also exhibit the same asymptotic behaviour. In fact, a stronger asymptotic relation holds between the singular values and the eigenvalues *i.e.* for any $\epsilon > 0$ with probability one for all $1 \leq p \leq d$,

$$\lim_{n \rightarrow \infty} \frac{1}{n^\epsilon} \log \left(\frac{|\lambda_p(n)|}{\sigma_p(n)} \right) = 0,$$

which implies that the fluctuations of the eigenvalues have the same asymptotic distribution as that of the corresponding singular values. Isotropic random matrices and also random matrices with *i.i.d* real elements, which have some finite moment and bounded density whose support contains an open set, are shown to satisfy the moment and support conditions under which the above relations hold.

1. INTRODUCTION

Lyapunov exponents and singular values of products of *i.i.d* random matrices of fixed order have been studied extensively (see [3], [4]). Only recently, the study of eigenvalues of such matrices has begun, though they have been considered first in the setting of dynamical systems in [6] and there the absolute values of eigenvalues have been conjectured to show the same asymptotic behaviour as that of singular values. Recent comparative studies [1], [7] of singular values and eigenvalues in the case of Ginibre matrix ensembles have verified the conjecture to be true in the respective cases. And also [5] mentions this in the case of random truncated unitary matrices. For a summary of results on this topic, we refer the reader to [2]. In [1], asymptotic distributions of first order fluctuations of (logarithm of) both the singular values and the absolute values of eigenvalues for product of Ginibre matrices have been computed and shown to be equal and also a proof of this conjecture in the case of 2×2 isotropic random matrices has been given. Recently, a full proof in the case of isotropic random matrices has been obtained in [8]. In this paper we obtain a proof in more generality with only few conditions on the moments and support of the distribution of the random matrices involved.

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Lyapunov Exponents Of Products Of Random Matrices

**Andreas Johann, Hans-Peter
Kruse, Florian Rupp, Stephan Schmitz**



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Products of Random Matrices and Lyapunov Exponents Chi Shing Sidney Tsang, 2010 Products of Random Matrices Andrea Crisanti, Giovanni Paladin, Angelo Vulpiani, 2012-12-06 At the present moment after the success of the renormalization group in providing a conceptual framework for studying second order phase transitions we have a nearly satisfactory understanding of the statistical mechanics of classical systems with a non random Hamiltonian The situation is completely different if we consider the theory of systems with a random Hamiltonian or of chaotic dynamical systems The two fields are connected in fact in the latter the effects of deterministic chaos can be modelled by an appropriate stochastic process Although many interesting results have been obtained in recent years and much progress has been made we still lack a satisfactory understanding of the extremely wide variety of phenomena which are present in these fields The study of disordered or chaotic systems is the new frontier where new ideas and techniques are being developed More interesting and deep results are expected to come in future years The properties of random matrices and their products form a basic tool whose importance cannot be underestimated They play a role as important as Fourier transforms for differential equations This book is extremely interesting as far as it presents a unified approach for the main results which have been obtained in the study of random matrices It will become a reference book for people working in the subject The book is written by physicists uses the language of physics and I am sure that many physicists will read it with great pleasure **Random Matrices and Their Applications** Joel E. Cohen, Harry Kesten, Charles Michael Newman, 1986 Features twenty six expository papers on random matrices and products of random matrices This work reflects both theoretical and applied concerns in fields as diverse as computer science probability theory mathematical physics and population biology **Recent Trends in Dynamical Systems** Andreas Johann, Hans-Peter Kruse, Florian Rupp, Stephan Schmitz, 2013-09-24 This book presents the proceedings of a conference on dynamical systems held in honor of Jürgen Scheurle in January 2012 Through both original research papers and survey articles leading experts in the field offer overviews of the current state of the theory and its applications to mechanics and physics In particular the following aspects of the theory of dynamical systems are covered Stability and bifurcation Geometric mechanics and control theory Invariant manifolds attractors and chaos Fluid mechanics and elasticity Perturbations and multiscale problems Hamiltonian dynamics and KAM theory Researchers and graduate students in dynamical systems and related fields including engineering will benefit from the articles presented in this volume *Mathematical Constants II* Steven R. Finch, 2003 Famous mathematical constants include the ratio of circular circumference to diameter 3.14 and the natural logarithm base e 2.718 Students and professionals can often name a few others but there are many more buried in the literature and awaiting discovery How do such constants arise and why are they important Here the author renews the search he began in his book *Mathematical Constants* adding another 133 essays that broaden the landscape Topics include the minimality of soap film surfaces prime numbers elliptic curves and modular

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International Conference on Disorder and Chaos A. Vulpiani, 1998 **Discrete and Continuous Dynamical Systems**, 2009

Journal de physique, 1998 *Dynamical Symmetries and Chaotic Behaviour in Physical Systems*, ENEA, Bologna, Italy, 20-21 June 1989 Giuseppe Maino, Leone Fronzoni, Marco Pettini, 1991 **Proceedings of the ENEA Workshops on Nonlinear Dynamics: Dynamical symmetries and chaotic behaviour in physical systems** Giuseppe Maino, Leone Fronzoni, Marco Pettini, 1991 Workshops held June 20 21 and Oct 23 24 1989 Bologna Italy

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