

Ergodic theory and dynamical systems

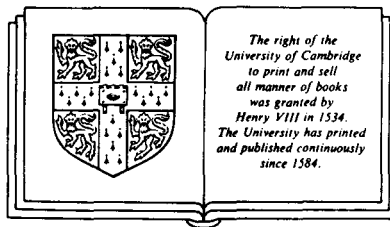
EDITORS

John Franks Hillel Furstenberg Anthony Manning William Parry

EDITORIAL BOARD

- | | |
|--|---|
| R. L. Adler (Thomas J. Watson
Research Center, Yorktown
Heights) | G. A. Margulis (USSR Acad. of
Sciences) |
| L. A. Bunimovich (Georgia
Institute of Technology) | J. Moser (ETH, Zürich) |
| A. Connes (IHES) | Ya. B. Pesin (Pennsylvania State
University) |
| S. G. Dani (University of Göttingen) | F. Przytycki (Polish Academy of
Sciences) |
| D. Fried (Boston University) | S. M. Rees (University of Liverpool) |
| M. R. Herman (Ecole Polytechnique,
Palaiseau) | D. J. Rudolph (University of
Maryland) |
| A. B. Katok (Pennsylvania State
University) | D. Ruelle (IHES) |
| U. Krengel (University of Göttingen) | D. Salamon (University of Warwick) |
| F. Ledrappier (University of Paris 6) | K. Schmidt (University of Warwick) |
| R. Mañé (IMPA) | J. P. Thouvenot (University of
Paris 6) |
| | P. Walters (University of Warwick) |

VOLUME 12
1992



CAMBRIDGE UNIVERSITY PRESS

CAMBRIDGE

LONDON NEW YORK PORT CHESTER
MELBOURNE SYDNEY

PUBLISHED BY
THE PRESS SYNDICATE OF THE UNIVERSITY OF CAMBRIDGE

The Pitt Building, Trumpington Street, Cambridge CB2 1RP
40 West 20th Street, New York, NY 10011-4211, USA
10 Stamford Road, Oakleigh, Victoria 3166, Australia

© Cambridge University Press 1992

Printed in Great Britain by J. W. Arrowsmith Ltd, Bristol

Contents

PART 1 MARCH 1992

The return times and the Wiener–Wintner property for mean-bounded positive operators in L^p <i>I. Assani</i>	1
Absolutely continuous invariant measures and random perturbations for certain one-dimensional maps <i>Benedicks, M. and Young, L.-S.</i>	13
Meromorphic multifunctions in complex dynamics <i>L. Baribeau and T. J. Ransford</i>	39
Geometric measures for parabolic rational maps <i>M. Denker and M. Urbański</i>	53
Time-preserving conjugacies of geodesic flows <i>U. Hamenstädt</i>	67
There are no minimal homeomorphisms of the multi-punctured plane <i>M. Handel</i>	75
Random sets for the pointwise ergodic theorem <i>Y. Huang</i>	85
Dynamical properties of the shift maps on the inverse limit <i>S. Li</i>	95
On the topology manifolds with completely integrable geodesic flows <i>G. P. Paternain</i>	109
Dynamical systems with generalized hyperbolic attractors: hyperbolic, ergodic and topological properties <i>Ya. B. Pesin</i>	123
Lyapunov maps, simplicial complexes and the Stone functor <i>J. W. Robbin and D. A. Salamon</i>	153

PART 2 JUNE 1992

A. Wiener–Wintner property for the helical transform <i>I. Assani</i>	185
Théorème ergodique pour les opérateurs positifs à moyennes bornées sur les espaces L_p ($1 < p < \infty$) <i>A. Brunel</i>	195
The Bernoulli property of inner functions <i>M. Craizer</i>	209
A new proof of the Brouwer plane translation theorem <i>J. Franks</i>	217
When is an Anosov flow geodesic? <i>L. W. Green</i>	227
Diffeomorphisms in $\mathcal{F}^1(M)$ satisfy Axiom A <i>S. Hayashi</i>	233
The topological entropy of cellular automata is uncomputable <i>L. P. Hurd, J. Kari and K. Culik</i>	255

A classification of the isometric extensions of a multidimensional Bernoulli shift <i>J. W. Kammeyer</i>	267
Countable sections for locally compact group actions <i>A. S. Kechris</i>	283
Transfer operators for coupled map lattices <i>G. Keller and M. Künzle</i>	297
Positive Lyapunov exponents for a dense set of bounded measurable $SL(2, \mathbb{R})$ -cocycles <i>O. Knill</i>	319
Every convex polygon with rational vertices is a rotation set <i>J. Kwapisz</i>	333
Applications of the asymptotic range to analytic subalgebras of groupoid C^* -algebras <i>B. Solel</i>	341
Rotation number and one-parameter families of circle diffeomorphisms <i>M. Tsujii</i>	359
D-function of a minimal set and an extension of Sharkovskii's theorem to minimal sets <i>X. Ye</i>	365
PART 3 SEPTEMBER 1992	
Accessible saddles on fractal basin boundaries <i>K. T. Alligood and J. A. Yorke</i>	377
Bifurcations of dynamic rays in complex polynomials of degree two <i>P. Atela</i>	401
A condition for unique ergodicity of minimal symbolic flows <i>M. D. Boshernitzan</i>	425
Homeomorphic restrictions of smooth endomorphisms of an interval <i>K. M. Brucks, M. V. Otero-Espinar and C. Tresser</i>	429
Random circle homeomorphisms <i>T. Downarowicz, R. D. Mauldin and T. T. Warnock</i>	441
An ergodic transformation with trivial Kakutani centralizer <i>A. Fieldsteel and D. J. Rudolph</i>	459
Pascal's triangle, dynamical systems and attractors <i>F. v. Haeseler, H.-O. Peitgen and G. Skordev</i>	479
Markov partitions and shadowing for non-uniformly hyperbolic systems with singularities <i>T. Krüger and S. Troubetzkoy</i>	487
A new maximal inequality and its applications <i>J. M. Rosenblatt and M. Wierdl</i>	509
Dynamics of periodically forced parabolic equations on the circle <i>B. Sandstede and B. Fiedler</i>	559
Pseudo-orbit tracing property and structural stability of expanding maps of the interval <i>S. V. Šlažkov</i>	573

Matings of quadratic polynomials	<i>L. Tan</i>	589
Existence of invariant tori in volume-preserving diffeomorphisms	<i>Z. Xia</i>	621

PART 4 DECEMBER 1992

Følner Independence and the amenable Ising model	<i>S. Adams</i>	633
The Wiener-Wintner property for the helical transform of the shift on $[0, 1]^{\mathbb{Z}}$	<i>I. Assani</i>	659
An area preserving homeomorphism of T^2 that is fixed point free but does not move any essential simple closed curve off itself	<i>M. Bestvina and M. Handel</i>	673
Existence de points fixes enlacés à une orbite périodique d'un homéomorphisme du plan	<i>C. Bonatti and B. Kolev</i>	677
Rokhlin towers and \mathcal{C}^r -closing for flows on T^2	<i>C. R. Carroll</i>	683
Normal numbers from independent processes	<i>J. Feldman and M. Smorodinsky</i>	707
Finite beta-expansions	<i>C. Frougny and B. Solomyak</i>	713
The equivalence theorem for \mathbb{Z}^d -actions of positive entropy	<i>J. R. Hasfura-Buenaga</i>	725
Commuting endomorphisms of the circle	<i>A. S. A. Johnson and D. J. Rudolph</i>	743
On dynamics of triangular maps of the square	<i>S. F. Kolyada</i>	749
Coalescence of circle extensions of measure-preserving transformations	<i>M. Lemańczyk, P. Liardet and J.-P. Thouvenot</i>	769
Entropy of snakes and the restricted variational principle	<i>M. Misiurewicz and J. Tolosa</i>	791
Singularities in the boundaries of local Siegel disks	<i>J. T. Rogers, Jr.</i>	803
On the classification of some two-dimensional Markov shifts with group structure	<i>M. A. Shereshevsky</i>	823
Index to Volume 12		835

INSTRUCTIONS TO AUTHORS

1 *Submission of typescripts*

Two copies of the manuscript should be submitted to one of the four Executive Editors (addresses on outside front cover). The editor will acknowledge receipt of the manuscripts. **It is important that authors inform the editor of any changes of address** whilst their paper is under consideration.

2 *Typescript*

Papers should be typed, double-spaced, on one side only and with generous margins. The pages must be numbered.

The first page should give the title, the author's name and institution, and a short abstract intelligible to mathematicians.

The title, while brief, must be informative (e.g. *A new proof of the ergodic theorem*, whereas *Some applications of a theorem of Birkhoff* would be useless).

3 *Notation*

It is important that mathematical expressions are clear to a printer (who is not a mathematician). For instance, n_k (n sub k) is common usage, but avoid if possible using c sub n sub k . Fractions are generally best expressed by a solidus. Complicated exponentials like

$$\exp \{z^2 \sin \theta / (1 + y^2)\}$$

should be shown in this and no other way.

In the typescript, italics, small capitals and capitals are specified by single, double and triple underlining. Bold-faced type is shown by wavy underlining.

It helps if displayed equations or statements which will be quoted later are numbered in order on the right of their line. They can then be referred to by, for example, 'from (7)'.

The author must enable the printer (if necessary by pencilled notes in the margin) to distinguish between similar symbols such as o , O , o , O , 0 ; x , X , \times ; ϕ , Φ , \varnothing ; l , 1 ; ϵ , ϵ ; κ , k .

There is no need to underline Greek or script letters provided these are clearly typed. Any special symbols should be explained on a separate sheet of directions for the printer.

If an author wishes to mark the end of the proof of a theorem, the sign \square may be used.

Footnotes should be avoided.

4 *Diagrams*

Figures and drawings should be on separate sheets in black ink. Photocopies are acceptable only if

they are as clear as the originals. *Symbols, legends and captions should be given on a transparent overlay*. Each text figure must be numbered as Figure 1, Figure 2, . . . and its intended position clearly indicated in the typescript. The author's name in pencil must be on all separate sheets of diagrams.

A figure is expensive to reproduce and should be included only when the subject matter demands it, or when it greatly clarifies the exposition.

The publisher recognizes that some authors do not have the facilities for producing drawings of a sufficiently high standard to be reproduced directly and is therefore willing to have such diagrams re-drawn, provided that they are clear.

5 *Tables*

Tables should be numbered (above the table) and set out on separate sheets. Indicate the position of each in the text as for figures.

6 *References*

References should be collected at the end of the paper numbered in alphabetical order of the authors' names. A reference to a book should give the title, in italics, and then in roman type the publisher's name and the place and year of publication;

[4] N. Dunford & J. T. Schwartz *Linear Operators* Part I. Wiley: New York, 1958.

A reference to a paper should give in italics the title of the periodical, the number of the volume and year, and the beginning and end pages of the paper. Titles should be abbreviated as in *Mathematical Reviews*:

[6] J. E. Littlewood. The 'pits effect' for functions in the unit circle. *J. Analyse Math.* **23** (1970), 236–268.

7 *Proofs*

Authors receive one set of proofs for correction. If excessive alterations to the original manuscript are requested after the paper has been typeset, the author will be charged the cost of resetting. For papers with more than one author the proofs are sent to the first named author unless the editor receives other instructions. **It is important that proofs are corrected and returned promptly.**

8 *Reprints*

There are 100 reprints, free of charge, for each paper. For papers with several authors these reprints are divided between the authors. There are no page charges.

Ergodic theory and dynamical systems

VOLUME 12 PART 4 DECEMBER 1992

CONTENTS

<i>Adams, S. Følner</i> Independence and the amenable Ising model	633
<i>Assani, I.</i> The Wiener–Wintner property for the helical transform of the shift on $[0, 1]^Z$	659
<i>Bestvina, M. and Handel, M.</i> An area preserving homeomorphism of T^2 that is fixed point free but does not move any essential simple closed curve off itself	673
<i>Bonatti, C. and Kolev, B.</i> Existence de points fixes enlacés à une orbite périodique d'un homéomorphisme du plan	677
<i>Carroll, C. R.</i> Rokhlin towers and \mathcal{C}^r closing for flows on T^2	683
<i>Foldman, J. and Smorodinsky, M.</i> Normal numbers from independent processes	707
<i>Frougny, C. and Solomyak, B.</i> Finite beta-expansions	713
<i>Hasfura-Buenaga, J. R.</i> The equivalence theorem for Z^d -actions of positive entropy	725
<i>Johnson, A. S. A. and Rudolph, D. J.</i> Commuting endomorphisms of the circle	743
<i>Kolyada, S. F.</i> On dynamics of triangular maps of the square	749
<i>Lemańczyk, M., Liardet, P. and Thouvenot, J.-P.</i> Coalescence of circle extensions of measure-preserving transformations	769
<i>Misiurewicz, M. and Tolosa, J.</i> Entropy of snakes and the restricted variational principle	791
<i>Rogers, Jr, J. T.</i> Singularities in the boundaries of local Siegel disks	803
<i>Shereshevsky, M. A.</i> On the classification of some two-dimensional Markov shifts with group structure	823
Index to Volume 12	835

© Cambridge University Press 1992

CAMBRIDGE UNIVERSITY PRESS

The Pitt Building, Trumpington Street, Cambridge CB2 1RP

40 West 20th Street, New York, NY 10011-4211, USA

10 Stamford Road, Oakleigh, Victoria 3166, Australia

Printed in Great Britain by J. W. Arrowsmith Ltd, Bristol