

EMS Tracts in Mathematics 21

EMS Tracts in Mathematics

Editorial Board:

Carlos E. Kenig (The University of Chicago, USA)

Andrew Ranicki (The University of Edinburgh, Great Britain)

Michael Röckner (Universität Bielefeld, Germany, and Purdue University, USA)

Vladimir Turaev (Indiana University, Bloomington, USA)

Alexander Varchenko (The University of North Carolina at Chapel Hill, USA)

This series includes advanced texts and monographs covering all fields in pure and applied mathematics. *Tracts* will give a reliable introduction and reference to special fields of current research. The books in the series will in most cases be authored monographs, although edited volumes may be published if appropriate. They are addressed to graduate students seeking access to research topics as well as to the experts in the field working at the frontier of research.

For a complete listing see our homepage at www.ems-ph.org.

- 6 Erich Novak and Henryk Woźniakowski, *Tractability of Multivariate Problems. Volume I: Linear Information*
- 7 Hans Triebel, *Function Spaces and Wavelets on Domains*
- 8 Sergio Albeverio et al., *The Statistical Mechanics of Quantum Lattice Systems*
- 9 Gebhard Böckle and Richard Pink, *Cohomological Theory of Crystals over Function Fields*
- 10 Vladimir Turaev, *Homotopy Quantum Field Theory*
- 11 Hans Triebel, *Bases in Function Spaces, Sampling, Discrepancy, Numerical Integration*
- 12 Erich Novak and Henryk Woźniakowski, *Tractability of Multivariate Problems. Volume II: Standard Information for Functionals*
- 13 Laurent Bessières et al., *Geometrisation of 3-Manifolds*
- 14 Steffen Börm, *Efficient Numerical Methods for Non-local Operators. \mathcal{H}^2 -Matrix Compression, Algorithms and Analysis*
- 15 Ronald Brown, Philip J. Higgins and Rafael Sivera, *Nonabelian Algebraic Topology. Filtered Spaces, Crossed Complexes, Cubical Homotopy Groupoids*
- 16 Marek Janicki and Peter Pflug, *Separately Analytical Functions*
- 17 Anders Björn and Jana Björn, *Nonlinear Potential Theory on Metric Spaces*
- 18 Erich Novak and Henryk Woźniakowski, *Tractability of Multivariate Problems. Volume III: Standard Information for Operators*
- 19 Bogdan Bojarski, Vladimir Gutlyanskii, Olli Martio and Vladimir Ryazanov, *Infinitesimal Geometry of Quasiconformal and Bi-Lipschitz Mappings in the Plane*
- 20 Hans Triebel, *Local Function Spaces, Heat and Navier–Stokes Equations*

Kaspar Nipp
Daniel Stoffer

Invariant Manifolds in Discrete and Continuous Dynamical Systems



European Mathematical Society

Authors:

Kaspar Nipp
ETH Zürich
Seminar for Applied Mathematics (SAM)
CH-8092 Zürich
Switzerland
E-mail: nipp@math.ethz.ch

Daniel Stoffer
ETH Zürich
Department of Mathematics
CH-8092 Zürich
Switzerland
E-mail: stoffer@math.ethz.ch

2010 Mathematical Subject Classification: 37-02; 37Cxx, 37Dxx, 34Cxx, 34Dxx, 65Lxx, 65P10

Key words: Discrete and continuous dynamical systems, invariant manifolds, foliation, singular perturbations, geometric numerical integration, differential algebraic equations

ISBN 978-3-03719-124-8

The Swiss National Library lists this publication in The Swiss Book, the Swiss national bibliography, and the detailed bibliographic data are available on the Internet at <http://www.helvetica.ch>.

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in other ways, and storage in data banks. For any kind of use permission of the copyright owner must be obtained.

© European Mathematical Society 2013

Contact address:

European Mathematical Society Publishing House
Seminar for Applied Mathematics
ETH-Zentrum SEW A27
CH-8092 Zürich
Switzerland

Phone: +41 (0)44 632 34 36

Email: info@ems-ph.org

Homepage: www.ems-ph.org

Typeset using the authors' T_EX files: I. Zimmermann, Freiburg
Printed in Germany

9 8 7 6 5 4 3 2 1