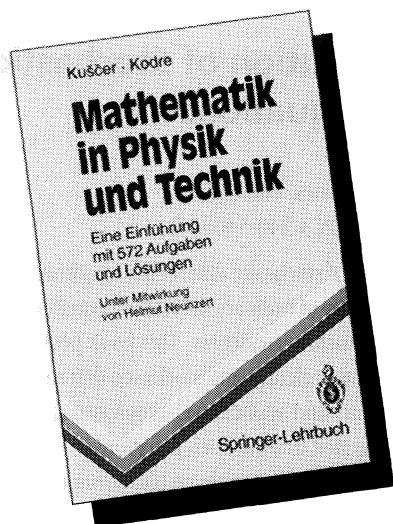


Aufgaben und Lösungen



I. Kušcer, A. Kodre, Universität Ljubljana,
Slowenien

Mathematik in Physik und Technik

Eine Einführung mit 569 Aufgaben
und Lösungen

Unter Mitarbeit von H. Neunzert

1993. XI, 455 S. 41 Abb. 569 Aufgaben und
Lösungen. (Springer-Lehrbuch) Brosch. DM 48,-
ÖS 374.40 sFr. 53.00 ISBN 3-540-56738-0

Mathematik in Physik und Technik ist ein Lehrbuch für Studenten der Physik und der Ingenieurwissenschaften, die an sich schon mit den Grundlagen der Mathematik vertraut sind, allerdings noch Schwierigkeiten haben, dieses mathematische Wissen auf konkrete Fragestellungen der Physik zu übertragen. Die vorliegende Aufgabensammlung frischt daher nicht nur latent Vorhandenes auf, sondern versucht, mathematische Methoden in Anlehnung an die Physik anschaulich darzustellen und einzuüben. Welche Rolle spielen Dimensionen, was darf vernachlässigt werden, wie kommt man zu sinnvollen mathematischen Modellen physikalischer Vorgänge?

Eine wahre Fundgrube für jeden, der nicht nur Wissen sammeln, sondern auch tatsächlich lernen will, es umzusetzen.



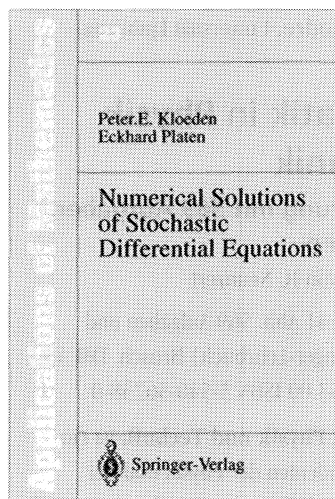
Springer

Presänderungen vorbehalten.

a&t977 MNTL/E/1

Springer-Verlag Heidelberger Platz 3, D-14197 Berlin, F R Germany 175 Fifth Ave., New York, NY 10010, USA 8 Alexandra Rd., London SW 19 7JZ, England 26, rue des
Carnes, F-75005 Paris, France 37-3, Hongo 3-chome, Bunkyo-ku, Tokyo 113, Japan Room 701, Mirror Tower, 61 Mody Road, Tsimshatsui, Kowloon, Hong Kong Avinguda Diagonal,
468-4° C, E-08006 Barcelona, Spain Wesselényi u 28, H-1075 Budapest, Hungary

A basic, introductory text



P.E. Kloeden, E. Platen

Numerical Solution of Stochastic Differential Equations

1992. XV, 632 pp. 85 figs.

(Applications of Mathematics, Vol. 23)

Hardcover DM 123,- ISBN 3-540-54062-8

The numerical analysis of stochastic differential equations differs significantly from that of ordinary differential equations due to the peculiarities of stochastic calculus. This book provides an introduction to stochastic calculus and stochastic differential equations, in both theory and applications, emphasizing the numerical methods needed to solve such equations.

It assumes of the reader an undergraduate background in mathematical methods typical of engineers and physicists, though many chapters begin with a descriptive summary, accessible to others who only require numerical recipes. To help the reader to develop an intuitive understanding of the underlying mathematics and handon numerical skills, exercises and over 100 PC-Exercises are included.

The stochastic Taylor expansion provides discrete time numerical methods for stochastic differential equations. The book presents many new results on higher-order methods for strong sample path approximations and for weak functional approximations, including implicit, predictor-corrector, extrapolation and variance-reduction methods. Besides serving as a basic text on such methods, the book offers the reader ready access to a large number of potential research problems in a field that is just beginning to expand rapidly and is widely applicable.



Springer

Prices are subject to change without notice

All prices for books and journals include 7% VAT. In EC countries the local VAT is effective

d&p.1002.MNT/E/1

Springer-Verlag Heidelberger Platz 3, D-14197 Berlin, F R Germany 175 Fifth Ave., New York, NY 10010, USA 8 Alexandra Rd., London SW 19 7JZ, England 26, rue des Carmes, F-75005 Paris, France 37-3, Hongo 3-chome, Bunkyo-ku, Tokyo 113, Japan Room 701, Mirror Tower, 61 Mody Road, Tsimshatsui, Kowloon, Hong Kong Avinguda Diagonal, 468-4° C, E-08006 Barcelona, Spain Wesselényi u 28, H-1075 Budapest, Hungary

Communications in Mathematical Physics

Copyright. Submission of a manuscript implies that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere, that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher, and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.

The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Special regulations for photocopies in the USA: Photocopies may be made for personal or in-house use beyond the limitations stipulated under Section 107 or 108 of U.S. Copyright Law, provided a fee is paid. All fees should be paid to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0010-3616, the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher.

Authors should mark manuscripts according to the „Instructions to Authors.“ They should be aware that manuscripts which are not properly marked require additional time for publication. Manuscripts should be sent to:

Prof. H. Araki, Research Institute for Mathematical Sciences, Kyoto University, Kyoto, 606, Japan

Mathematical methods with direct relevance to physics

Prof. D. Brydges, Department of Mathematics, University of Virginia, Charlottesville, VA 22903, USA

Statistical physics, quantum field theory

Prof. A. Connes, I.H.E.S., F-91440 Bures-sur-Yvette, France

Quantum physics and differential geometry

Prof. R. Dijkgraaf, Department of Mathematics, University of Amsterdam, Plantage Muidergracht 24, NL-1018 TV Amsterdam, The Netherlands

String theory, conformal field theory and related topics

Prof. J.-P. Eckmann, Département de Physique Théorique, Université de Genève, 32, Boulevard d'Yvoy, CH-1211 Genève 4, Switzerland

Dynamical systems

Prof. G. Felder, Mathematics Department, ETH-Zentrum, CH-8092 Zürich, Switzerland

Quantum field theory

Prof. M.E. Fisher, Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742, USA

Statistical physics

Prof. M. Herman, Centre de Mathématiques Pures, Ecole Polytechnique, F-91128 Palaiseau Cedex, France

Classical dynamical systems

Prof. A. Jaffe, Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138, USA

Chief Editor

Prof. M. Jimbo, Department of Mathematics, Kyoto University, Kitashirakawa Oiwake-cho, Sakyo-ku, Kyoto 606, Japan

Integrable systems and related topics

Prof. J. L. Lebowitz, Department of Mathematics, Rutgers University, New Brunswick, NJ 08903, USA

Nonequilibrium statistical mechanics

Prof. B. Simon, Department of Mathematics, California Institute of Technology, Pasadena, CA 91125, USA

Schrödinger operators and atomic physics

Prof. Ya. G. Sinai, Department of Mathematics, Fine Hall, Princeton University, Princeton, NJ 08544-1000, USA

Statistical physics and dynamical systems

Prof. T. Spencer, School of Mathematics, Institute for Advanced Study, Princeton, NJ 08540, USA

Disordered systems

Prof. S.-T. Yau, Department of Mathematics, Harvard University, 1 Oxford Street, Cambridge, MA 02138, USA

Relativity; geometry and physics

Subscription Information

ISSN 0010-3616

Vols 150-157 (3 issues each) will appear in 1993. **North America.** Recommended annual subscription rate, US \$ 3403 00, single issue price \$ 173.00 including carriage charges. Subscriptions are entered with prepayment only. Orders should be addressed to: Springer-Verlag New York Inc., Service Center Secaucus, 44 Hartz Way, Secaucus, NJ 07094, USA, Tel. (201) 348-4033, Telex 023125994, Fax (201)348-4505. Members of the International Association of Mathematical Physics (IAMP) are entitled to receive the journal strictly for their own personal use at a special reduced rate. The orders must be placed through the IAMP. **All Other Countries.** Recommended annual subscription rate: DM 5104.00, plus carriage charges: [Germany DM 78.32 incl VAT, all other countries: DM 104 40] SAL or airmail charges are available upon request. SAL delivery is mandatory to Japan, India, and Australia/New Zealand. Airmail delivery to all other countries is available upon request. Volume price DM 638 00, single issue price. DM 255 20 plus carriage charges. Orders for all countries except North America can either be placed with your bookdealer or sent directly to: Springer-Verlag, Postfach 311 340, D-10643 Berlin, Germany, Tel. 030/8207-1, Telex 0183319, Fax (0)30/8207448. **Changes of Address:** Allow six weeks for all changes to become effective. All communications should include both old and new addresses (with Postal Codes) and should be accompanied by a mailing label from a recent issue. According to § 4 Sect. 3 of the German Postal Services Data Protection Regulations, if a subscriber's address changes the German Federal Post Office can inform the publisher of the new address even if the subscriber has not submitted a formal application for mail to be forwarded. Subscribers not in agreement with this procedure may send a written complaint to Springer-Verlag's Berlin office within 14 days of publication of this issue. **Back Volumes.** Prices are available on request. **Microform:** Microform editions are available from University Microfilms International, 300 N. Zeeb Road, Ann Arbor, MI 48106, USA

Production

Journal Production Department I, Springer-Verlag, Monika Ebert, Postfach 105280, D-69042 Heidelberg, Germany.

Address for courier, express and registered mail: Tiergartenstrasse 17, D-69121 Heidelberg, Germany, Tel. (0) 62 21/4 87-4 31, Telex 0461723, Fax (0)6221-487624

Communications in
**Mathematical
Physics**

Chief Editor A. Jaffe, Cambridge, MA

Editorial Board H. Araki, Kyoto
D. Brydges, Charlottesville, VA
A. Connes, Bures-sur-Yvette
R. Dijkgraaf, Amsterdam
J.-P. Eckmann, Genève
G. Felder, Zürich
M. E. Fisher, College Park, MD
M. Herman, Palaiseau
M. Jimbo, Kyoto
J. L. Lebowitz, New Brunswick, NJ
B. Simon, Pasadena, CA
Ya. G. Sinai, Princeton, NJ
T. Spencer, Princeton, NJ
S.-T. Yau, Cambridge, MA

Advisory Board M. F. Atiyah, Oxford
L. Faddeev, St. Petersburg
F. Hirzebruch, Bonn
R. Schrieffer, Santa Barbara, CA
I. Singer, Cambridge, MA
C. N. Yang, Stony Brook, NY

Responsible for Advertisements

Springer-Verlag
Printers
Printed in Germany

E. Lückermann, M. Stasow, Heidelberger Platz 3, D-14197 Berlin, Germany
Telephone (030) 8207-1, Telex 01-85411, Fax (030) 8207300
Berlin Heidelberg New York Tokyo Hong Kong Barcelona Budapest
Brühlsche Universitätsdruckerei, Giessen
© Springer-Verlag Berlin Heidelberg 1993
Springer-Verlag GmbH & Co KG, D-14197 Berlin, Germany