



NONLINEAR TIME SERIES ANALYSIS

Methods and Applications

Cees Diks

University of Kent, England

```
Published by
World Scientific Publishing Co. Pte. Ltd.
P O Box 128, Farrer Road, Singapore 912805
USA office: Suite 1B, 1060 Main Street, River Edge, NJ 07661
UK office: 57 Shelton Street, Covent Garden, London WC2H 9HE
Library of Congress Cataloging-in-Publication Data
Diks, Cees.
      Nonlinear time series analysis: methods and applications / Cees
   Diks.
              cm. -- (Nonlinear time series and chaos : vol. 4)
      Includes bibliographical references and index.
      ISBN 9810235054 (alk. paper)
      1. Time-series analysis. 2. Nonlinear theories. I. Title.
   II. Series.
  QA280.D55
                 1999
  519.5'5--DC21
                                                           99-16722
                                                              CIP
British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library.
Copyright © 1999 by World Scientific Publishing Co. Pte. Ltd.
All rights reserved. This book, or parts thereof, may not be reproduced in any form or by any means.
electronic or mechanical, including photocopying, recording or any information storage and retrieval
system now known or to be invented, without written permission from the Publisher.
for photocopying of material in this volume, please pay a copying fee through the Copyright
Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, USA. In this case permission to
photocopy is not required from the publisher.
```

CONTENTS

Foreword

	Introduction	1
2	Nonlinear Dynamical Systems	7
3	Stochastic Time Series	29
1	A Test for Reversibility	51
5	Detecting Differences between Reconstruction Measures	81
3	Estimating Invariants of Noisy Attractors	97
7	The Correlation Integral of Noisy Attractors	117
3	Spiral Wave Tip Dynamics	127
)	Spatio-temporal Chaos: a Solvable Model	149
Appendix A		175
Appendix B		181
Appendix C		187
References		191
index		207