

# Contents

Foreword	xi
Hidden Symmetries of Nonlinear Ordinary Differential Equations B. ABRAHAM-SHRAUNER AND P. G. L. LEACH	1
Liapunov-Schmidt Reduction for a Bifurcation Problem with Periodic Boundary Conditions on a Square Domain E. ALLGOWER, P. ASHWIN, K. BÖHMER, AND Z. MEI	11
Exploiting Permutation Symmetries with Fixed Points in Linear Equations EUGENE ALLGOWER, KURT GEORG, AND RICK MIRANDA	23
Topological Constraints for Explicit Symmetry Breaking D. ARMBRUSTER AND E. IHRIG	37
A Numerical Liapunov-Schmidt Method for Finitely Determined Problems P. ASHWIN, K. BÖHMER, AND Z. MEI	49
Exploiting and Detecting Space-Time Symmetries NADINE AUBRY AND WENYU LIAN	71
Lattice Periodic Solutions with Local Gauge Symmetry ERNEST BARANY	87
An Overview of Potential Symmetries GEORGE BLUMAN	97
On the Computation of Strains and Stresses in Symmetrical Articulated Structures A. BOSSAVIT	111
Symmetry Considerations in the Numerical Analysis of Bifurcation Sequences F. H. BUSSE AND R. M. CLEVER	125

On the Existence of Rotating Waves in a Steady-State Bifurcation Problem with $O(3)$ Symmetry P. CHOSSAT AND E. PROTTE	137
Dynamics of Waves in Extended Systems G. DANGELMAYR, J. D. RODRIGUEZ, AND W. GÜTTINGER	145
The Equivariant Darboux Theorem MICHAEL DELLNITZ AND IAN MELBOURNE	163
Invariant Boundary Conditions for the Generalized Diffusion Equations M. J. ENGLEFIELD	171
The Power of the Generalized Schur's Lemma ALBERT FÄSSLER	179
Computation of Bifurcation Graphs KARIN GATERMANN	187
Caustics in Optimal Control: An Example of Bifurcation when the Symmetry is Broken ZHONG GE	203
Symmetry Aspects in Numerical Linear Algebra with Applications to Boundary Element Methods KURT GEORG AND RICK MIRANDA	213
Numerical Results on the Zeros of Faber Polynomials for $m$ -fold Symmetric Domains MATTHEW HE	229
SYMMGRP.MAX and other Symbolic Programs for Lie Symmetry Analysis of Partial Differential Equations WILLY HEREMAN	241
A Manifold Solver with Bifurcation and Symmetry BIN HONG	259
How to Use Symmetry to Find Models for Multidimensional Conservation Laws BARBARA LEE KEYFITZ AND MILTON LOPES-FILHO	273
Semilinear Elliptic Equations in Cylindrical Domains—Reversibility and Its Breaking KLAUS KIRCHGÄSSNER AND KATHARINA LANKERS	285

Symmetry in Rotating Plane Couette-Poiseuille Flow GEORGE H. KNIGHTLY AND D. SATHER	299
On Uniformly Rotating Fluid Drops Trapped between Two Parallel Plates H.-P. KRUSE, J. E. MARSDEN, AND J. SCHEURLE	307
The Symmetry Group of the Integro-Partial Differential Equations of Poisson-Vlasov POL V.A.J. LAMBERT	319
Explicit Symplectic Splitting Methods Applied to PDE's ROBERT I. MCLACHLAN	325
Symmetric Capillary Surfaces in a Cube Part 2. Near the Limit Angle HANS D. MITTELMANN	339
Factorization and Completely Integrable Systems D. H. SATTINGER AND J. S. SZMIGIELSKI	363
Hopf/Steady-state Mode Interaction for a Fluid Conveying Elastic Tube with $D_3$ -symmetric Support A. STEINDL	373
Dependence of Bifurcation Structures on the Approximation of $O(2)$ Symmetry EMILY STONE AND MICHAEL KIRBY	389
A Generalization of the Discrete Fourier Transformation JOHANNES TAUSCH	405
Symmetry Methods in Symmetry-Broken Systems E. VAN GROESEN	413
Numerical Experience with Exploiting Symmetry Groups for Boundary Element Methods JOHN WALKER	425
On the Shape of Solutions for a Nonlinear Neumann Problem in Symmetric Domains ZHI-QIANG WANG	433
The Numerical Analysis of Bifurcation Problems with Symmetries Based on Bordered Jacobians BODO WERNER	443