Contents

Linear Differential Systems with Infinite Power Series Coefficients
(Invited Talk) ................................................................. 1
S.A. Abramov

On the Asymptotic Stability of a Satellite with a Gravitational Stabilizer .... 16
Andrei V. Banshchikov

Sparse Interpolation, the FFT Algorithm and FIR Filters ...................... 27
Matteo Briani, Annie Cuyt, and Wen-shin Lee

On New Integrals of the Algaba-Gamero-Garcia System ....................... 40
Alexander D. Bruno, Victor F. Edneral, and Valery G. Romanovski

Full Rank Representation of Real Algebraic Sets and Applications ........... 51
Changbo Chen, Wenyuan Wu, and Yong Feng

Certifying Simple Zeros of Over-Determined Polynomial Systems ............. 66
Jin-San Cheng and Xiaojie Dou

Decomposing Polynomial Sets Simultaneously into Gröbner Bases and Normal Triangular Sets ................................................. 77
Rina Dong and Chenqi Mou

Symbolic Versus Numerical Computation and Visualization of Parameter Regions for Multistationarity of Biological Networks ...................... 93
Matthew England, Hassan Errami, Dima Grigoriev, Ovidiu Radulescu, Thomas Sturm, and Andreas Weber

The Polymake Interface in Singular and Its Applications ...................... 109
Raul Epure, Yue Ren, and Hans Schönemann

Computation of Some Integer Sequences in Maple ............................. 118
W.L. Fan, D.J. Jeffrey, and Erik Postma

Symbolic-Numerical Algorithm for Generating Interpolation Multivariate Hermite Polynomials of High-Accuracy Finite Element Method .......... 134
A.A. Gusev, V.P. Gerdt, O. Chuluunbaatar, G. Chuluunbaatar, S.I. Vinitsky, V.L. Derbov, and A. Góźdź
A.A. Gusev, V.P. Gerdt, O. Chuluunbaatar, G. Chuluunbaatar,
S.I. Vinitsky, V.L. Derbov, and A. Góźdź

A Symbolic Study of the Satellite Dynamics Subject to Damping Torques... 167
Sergey A. Gutnik and Vasily A. Sarychev

Characteristic Set Method for Laurent Differential Polynomial Systems . . . . 183
Youren Hu and Xiao-Shan Gao

Sparse Polynomial Interpolation with Finitely Many Values
for the Coefficients ..................................................................................... 196
Qiao-Long Huang and Xiao-Shan Gao

On Stationary Motions of the Generalized Kowalewski Gyrostat
and Their Stability .................................................................................... 210
Valentin Irtegov and Tatyana Titorenko

Computing the Integer Points of a Polyhedron, I: Algorithm. ................. 225
Rui-Juan Jing and Marc Moreno Maza

Computing the Integer Points of a Polyhedron, II: Complexity Estimates .... 242
Rui-Juan Jing and Marc Moreno Maza

Non-linearity and Non-convexity in Optimal Knots Selection for Sparse
Reduced Data ............................................................................................. 257
Ryszard Kozera and Lyle Noakes

The Convergence Conditions of Interval Newton’s Method
Based on Point Estimates ........................................................................... 272
Zhe Li, Baocheng Wan, and Shugong Zhang

Normalization of Indexed Differentials Based on Function
Distance Invariants .................................................................................... 285
Jiang Liu

Symbolic-Numeric Integration of the Dynamical Cosserat Equations ........ 301
Dmitry A. Lyakhov, Vladimir P. Gerdt, Andreas G. Weber,
and Dominik L. Michels

Algorithms for Zero-Dimensional Ideals Using Linear Recurrent Sequences . . 313
Vincent Neiger, Hamid Rahkooy, and Éric Schost

Symbolic-Numerical Analysis of the Relative Equilibria Stability
in the Planar Circular Restricted Four-Body Problem .............................. 329
Alexander N. Prokopenya
The Method of Collocations and Least Residuals Combining the Integral Form of Collocation Equations and the Matching Differential Relations at the Solution of PDEs .................................................. 346

Vasily P. Shapeev and Evgenii V. Vorozhtsov

A Special Homotopy Continuation Method for a Class of Polynomial Systems ........................................ 362

Yu Wang, Wenyuan Wu, and Bican Xia

Penalty Function Based Critical Point Approach to Compute Real Witness Solution Points of Polynomial Systems ........................................ 377

Wenyuan Wu, Changbo Chen, and Greg Reid

Computing Multiple Zeros of Polynomial Systems: Case of Breadth One (Invited Talk) ........................................ 392

Lihong Zhi

Author Index ................................................................. 407