1. Record Nr. UNINA9910141014603321 Autore Ganzha V. G (Victor Grigorevich), <1956-> Titolo Computer-aided analysis of difference schemes for partial differential equations [[electronic resource] /] / Victor G. Ganzha, E.V. Vorozhtsov New York, : John Wiley & Sons, Inc., c1996 Pubbl/distr/stampa **ISBN** 1-282-24272-5 9786613813848 1-118-03260-8 1-118-03085-0 Descrizione fisica 1 online resource (476 p.) Altri autori (Persone) VorozhtsovE. V <1946-> (Evgenii Vasilevich) 515.353 Disciplina 515/.353 Differential equations, Partial - Numerical solutions - Data processing Soggetti Finite differences - Data processing Electronic books. Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia "A Wiley-Interscience publication." Note generali Nota di bibliografia Includes bibliographical references and index. Computer-Aided Analysis of Difference Schemes for Partial Differential Nota di contenuto Equations: Contents: Preface: 1 The Necessary Basics from the Stability Theory of Difference Schemes and Polynomials; 1.1 Preliminary Discussion of Stability and Approximation; 1.2 Computer Algebra Systems; 1.3 A Brief Review of the Contents of Chapters; 1.4 Stability, Approximation, and Convergence; 1.5 A Survey of Methods for the Stability Analysis of Difference Schemes; 1.5.1 Von Neumann Stability Analysis; 1.5.2 Differential Approximation Method; 1.5.3 Method of Frozen Coefficients 1.6 Algebraic Criteria for Localization of Polynomial Zeros1.6.1 Similarity and Dimensional Considerations; 1.6.2 Lienard-Chipart Criterion; 1.6.3 Generalized Routh-Hurwitz Problem for the Characteristic Polynomial; 1.7 Determination of the Maximal Time Step from Stability Analysis Results; 1.7.1 The Use of the Least Squares Method: 1.7.2 A Method Based on the Requirement of a Constant Volume of a Cell of a Spatial Computing Mesh; 1.7.3 The Use of the

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Sommario/riassunto

Advances in computer technology have conveniently coincided with trends in numerical analysis toward increased complexity of computational algorithms based on finite difference methods. It is no longer feasible to perform stability investigation of these methods manually--and no longer necessary. As this book shows, modern computer algebra tools can be combined with methods from numerical analysis to generate programs that will do the job automatically. Comprehensive, timely, and accessible--this is the definitive reference on the application of computerized symbolic manipulations for a