Record Nr. UNINA9910450693203321 Advances in the applications of nonstandard finite diffference schemes **Titolo** [[electronic resource] /] / editor, Ronald E. Mickens Pubbl/distr/stampa Hackensack, NJ,: World Scientific, c2005 **ISBN** 1-281-89925-9 9786611899257 981-270-331-4 Descrizione fisica 1 online resource (665 p.) Altri autori (Persone) MickensRonald E. <1943-> Disciplina 518/.64 Differential equations, Partial - Numerical solutions Soggetti Differential equations - Numerical solutions Finite differences Electronic books. Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Description based upon print version of record. Note generali Includes bibliographical references. Nota di bibliografia Nota di contenuto Preface; CONTENTS; 1 Nonstandard Finite Difference Methods R. E. Mickens; 2 Application of Nonstandard Finite Difference Schemes to the Simulation Studies of Robotic Systems R. F. Abo-Shanab. N . Sepehri and C. Q. Wu; 3 Applications of Mickens Finite Differences to Several Related Boundary Value Problems R. Buckmire; 4 High Accuracy Nonstandard Finite-Difference Time- Domain Algorithms for Computational Electromagnetics: Applications to Optics and Photonics J. B. Cole 5 Nonstandard Finite Difference Schemes for Solving Nonlinear Micro Heat Transport Equations in Double-Layered Metal Thin Films Exposed to Ultrashort Pulsed Lasers W. Dai6 Reliable Finite Difference Schemes with Applications in Mathematical Ecology D. T. Dimitrow. H. V. Kojouharov and B. M. Chen-Charpentier; 7 Applications of the Non-Standard Finite Difference Method in Non-Smooth Mechanics Y. Dumont; 8 Finite Difference Schemes on Unbounded Domains M. Ehrhardt 9 Asymptotically Consistent Non-Standard Finite-Difference Methods

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Sommario/riassunto

This volume provides a concise introduction to the methodology of nonstandard finite difference (NSFD) schemes construction and shows how they can be applied to the numerical integration of differential equations occurring in the natural, biomedical, and engineering sciences. These methods had their genesis in the work of Mickens in the 1990's and are now beginning to be widely studied and applied by other researchers. The importance of the book derives from its clear and direct explanation of NSFD in the introductory chapter along with a broad discussion of the future directions needed to adv