

- |    |                         |                                                             |
|----|-------------------------|-------------------------------------------------------------|
| 1. | Record Nr.              | UNINA9911003145203321                                       |
|    | Titolo                  | Japan journal                                               |
|    | Pubbl/distr/stampa      | [Tokyo, : Cross Cultural Communications, Inc., c1987-c1990] |
|    | Descrizione fisica      | 1 online resource                                           |
|    | Disciplina              | 952/.005                                                    |
|    | Soggetti                | Japan Periodicals<br>Tokyo (Japan) Periodicals              |
|    | Lingua di pubblicazione | Inglese                                                     |
|    | Formato                 | Materiale a stampa                                          |
|    | Livello bibliografico   | Periodico                                                   |
|    | Note generali           | Title from cover.                                           |
- 
- |    |                         |                                                                                                                          |
|----|-------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 2. | Record Nr.              | UNINA9910974501603321                                                                                                    |
|    | Titolo                  | Numerical simulation research progress // Simone P. Colombo and Christian L. Rizzo, editors                              |
|    | Pubbl/distr/stampa      | New York, : Nova Science Publishers, c2009                                                                               |
|    | ISBN                    | 1-61728-552-8                                                                                                            |
|    | Edizione                | [1st ed.]                                                                                                                |
|    | Descrizione fisica      | 1 online resource (309 p.)                                                                                               |
|    | Altri autori (Persone)  | ColomboSimone P<br>RizzoChristian L                                                                                      |
|    | Disciplina              | 518                                                                                                                      |
|    | Soggetti                | Numerical analysis - Simulation methods<br>Numerical analysis - Research<br>Quantitative research - Mathematical models  |
|    | Lingua di pubblicazione | Inglese                                                                                                                  |
|    | Formato                 | Materiale a stampa                                                                                                       |
|    | Livello bibliografico   | Monografia                                                                                                               |
|    | Note generali           | Description based upon print version of record.                                                                          |
|    | Nota di bibliografia    | Includes bibliographical references and index.                                                                           |
|    | Nota di contenuto       | Intro -- NUMERICAL SIMULATIONRESEARCH PROGRESS -- CONTENTS -- PREFACE -- THE APPLICATION OF THE METHOD OFCHARACTERISTICS |

FOR THE NUMERICAL SOLUTION OF HYPERBOLIC DIFFERENTIAL EQUATIONS -- Abstract -- 1. Introduction -- 2. The Collisionless Kinetic Sheath -- 2.1. The Relevant Equations -- 2.2. The Numerical Scheme -- 2.3. Results -- 3. Study of the Phase-Space Dynamic in Capacitive Discharges -- 4. A One-Dimensional Ion Extraction Model -- 5. Oscillations of the Collisionless Sheath at Grazing Incidence of the Magnetic Field -- 5.1. The Kinetic Model for the Magnetized Sheath -- 5.2. The Numerical Scheme -- 6. Study of the Formation of a Charge Separation and an Electric Field at a Plasma Edge -- 6.1. The Relevant Equations and the Numerical Method for the 2D Problem in Cylindrical Geometry -- 6.2. Results -- Case 1 -- Case 2 -- 7. Numerical Simulation of Wake-Field Acceleration -- 7.1. The Relevant Equations -- The 1D relativistic Vlasov-Maxwell model -- The numerical scheme -- 7.2. Results -- The case of a circular polarization -- The case of a linear polarization -- 8. Interaction of a High Intensity Laser Field Incident on an Overdense Plasma -- 9. Fluid Equations -- 9.1. A One-Dimensional Model for the Blood Flow in the Aorta -- 9.2. Acoustic Waves -- 10. Conclusion -- Acknowledgments -- References -- MIXED FINITE DIFFERENCE-SPECTRAL NUMERICAL APPROACH FOR KINETIC AND FLUID DESCRIPTION OF NONLINEAR PHENOMENA IN PLASMA PHYSICS -- Abstract -- 1. Introduction -- 2. Kinetic Point of View in Plasma Physics -- 2.1. Hyperbolic Equations of Conservation Law Type -- 2.2. Splitting Method -- 3. The Fluid Point of View -- 3.1. The Magnetohydrodynamics Approximation -- 3.2. Numerical Solution of the MHD Equations -- 3.3. Advection Equations -- 3.4. Elliptic Equations -- 3.5. Boundary Conditions for the MHD Description -- 4. Kinetic Simulations. 4.1. Vlasov-Poisson Code -- 4.2. Linear and Nonlinear Landau Damping -- 4.3. Plasma Waves Echoes -- 4.4. Phase Space Vortex Coalescence -- 5. Magnetohydrodynamics Simulations -- 6. Conclusions -- References -- NUMERICAL SIMULATIONS OF THE NONLINEAR SOLITARY WAVES -- Abstract -- 1. Introduction -- 2. The Symplectic and Multisymplectic Methods -- 3. Simulations of Solitary Waves by Symplectic Methods -- 3.1. Simulations of the Coupled Nonlinear Schrödinger System -- 3.2. Simulations of the Nonlinear Rossby Wave Packets -- 4. Simulations of Solitary Waves by Multi-Symplectic Methods -- 4.1. Simulations of the Nonlinear Klein-Gordon Equation -- 4.2. Simulations of the Kdv Equation -- 5. Conclusion -- Acknowledgements -- References -- SYMMETRY IN TURBULENCE SIMULATION -- Abstract -- 1. Introduction -- 2. Panorama of the Application of Symmetries -- 2.1. Basic Definitions -- 2.2. Resolution of a Riccati Equation -- 2.3. Integrating Factor -- 2.4. Reduction of a Partial Differential Equation -- 2.5. 2D Laminar Thin Shear Layer Flows -- 2.5.1. Scaling Symmetries and Self-similar Solutions -- 2.5.2. Reduction of the Equations -- 2.5.3. Examples of Values of -- 2.6. Non-isothermal Laminar Thin Shear Layer Flows -- 2.7. Burger's Vortex and Shear Layer Solutions of the Navier-Stokes Equations -- 3. Computation of One-Parameter Symmetries -- 4. Symmetry in Turbulence Modeling -- 4.1. Isothermal Navier-Stokes Equations -- 4.2. Turbulence Model Analysis -- 4.3. Example of Symmetry-Preserving Turbulence Models -- 4.4. Consequences of the Second Law of Thermodynamics -- 5. Numerical Test -- 5.1. Non-isothermal Flow -- 5.1.1. Model Analysis -- 5.1.2. New Symmetry-Preserving Turbulent Models -- 6. Invariant Schemes -- 6.1. Basic Definitions -- 6.2. Invariantization of a Numerical Scheme -- 6.3. Application to the Burgers' Equation -- 6.3.1. Transformation of the Grid. 6.3.2. Invariantization of the Scheme -- 6.3.3. Determination of  $a_4$  and

a5 -- 6.3.4. Order of Accuracy -- 6.4. Numerical Tests -- 7. Conclusion -- References -- THE SHOOTING METHOD IN HYDROTHERMALOPTIMAL CONTROL PROBLEMS -- Abstract -- 1. Introduction -- 2. Problem without Restrictions -- 2.1. Existence and Uniqueness of Extremals -- 2.2. Shooting Mappings -- 2.3. Existence and Uniqueness of Local Solution -- 2.4. A Particular Case -- 2.5. Solutions for Convex Functionals -- 2.6. Solutions for Non-Convex Functionals -- 2.7. Optimization Algorithm -- 3. Problem with Restrictions -- 3.1. Existence of Solution -- 3.2. Interior Solutions -- 3.3. Boundary Solutions -- 3.4. Optimization Algorithm -- 4. Examples -- 4.1. Example 1: A Problem without Restrictions -- 4.2. Example 2: A Problem with Restrictions -- 4.3. Example 3: Fields of Extremals -- 5. Conclusion -- References -- EXACT N-SOLITON SOLUTIONS OF THE SHARMA-TASSO-OLVER-KADOMTSEV-PETVIASHVILI (STOKP) EQUATION -- Abstract -- 1. Introduction -- 2. The Methods -- 2.1. The tanh-coth Method -- 2.2. The Hirota's Bilinear Method -- 3. Using the tanh-coth Method -- 4. Using the Hirota's Bilinear Method -- 5. Conclusion -- References -- ADVANCES IN NUMERICAL SIMULATION OF GRANULAR MATERIAL -- Abstract -- 1. Granular Material in General -- 2. Numerical Simulation of Granular Material -- 3. Collision Modeling -- 4. Continuum Type Approach -- 4.1. Constitutive Equations in Rate-Independent Quasi-static Regime -- 4.2. Constitutive Equations in Transitional Regime -- 4.3. Viscous-like Behavior -- 4.4. Fluctuation Energy -- 4.5. Continuous Phase -- 4.6. Result of the Continuum Approach in Simulating the Flow of a Vibro-Granular Bed -- 5. Discrete Elements Method -- 5.1. Simulating a Vibro-Granular Bed Using the DEM Approach -- 6. Summary -- References -- INDEX.

## Sommario/riassunto

Numerical simulation is the kind of simulation that uses numerical methods to quantitatively represent the evolution of a physical system. It pays much attention to the physical content of the simulation and emphasizes the goal that, from the numerical results of the simulation, knowledge of background processes and physical understanding of the simulation region can be obtained. In practice, numerical simulation uses the values that can best represent the real environment. The evolution of the system also strictly obeys the physical laws that govern the real physical processes in the simulation region. Then the result of such simulation can have a good representation of the real environment. From the result of such simulation we can safely draw proper conclusions and have a good understanding of the system. This new book presents leading research from around the world.