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Nota di contenuto	Mathematical and Numerical Techniques in Energy and Environmental Modeling -- Domain Decomposition for Some Transmission Problems in Flow in Porous Media -- Numerical Subgrid Upscaling of Two-Phase Flow in Porous Media -- Numerical Simulation of Multiphase Flow in Fractured Porous Media -- The Modified Method of Characteristics for Compressible Flow in Porous Media -- A Numerical Algorithm for Single Phase Fluid Flow in Elastic Porous Media -- On the Discretization of Interface Problems with Perfect and Imperfect Contact -- Finite

Element Analysis for Pseudo Hyperbolic Integral-Differential Equations -- A CFL-Free Explicit Scheme with Compression for Linear Hyperbolic Equations -- Maximizing Cache Memory Usage for Multigrid Algorithms for Applications of Fluid Flow in Porous Media -- A Locally Conservative Eulerian-Lagrangian Method for Flow in a Porous Medium of a Mixture of Two Components Having Different Densities -- Validation of Non-darcy Well Models Using Direct Numerical Simulation -- Mathematical Treatment of Diffusion Processes of Gases and Fluids in Porous Media -- Implementation of a Locally Conservative Eulerian-Lagrangian Method Applied to Nuclear Contaminant Transport -- Application of a Class of Nonstationary Iterative Methods to Flow Problems -- Reservoir Thermal Recover Simulation on Parallel Computers -- A Class of Lattice Boltzmann Models with the Energy Equation -- Block Implicit Computation of Flow Field in Solid Rocket Ramjets -- Stable Conforming and Nonconforming Finite Element Methods for the Non-newtonian Flow -- Numerical Simulation of Compositional Fluid Flow in Porous Media -- Parallelization of a Compositional Reservoir Simulator -- Relationships among Some Conservative Discretization Methods -- Parallel Methods for Solving Time-Dependent Problems Using the Fourier-Laplace Transformation -- Cascadic Multigrid Methods for Parabolic Pressure Problems -- Estimation in the Presence of Outliers: The Capillary Pressure Case -- A Comparison of ELLAM with ENO/WENO Schemes for Linear Transport Equations -- An Accurate Approximation to Compressible Flow in Porous Media with Wells -- Fast Convergent Algorithms for Solving 2D Integral Equations of the First Kind -- A Two-Grid Finite Difference Method for Nonlinear Parabolic Equations -- A Compact Operator Method for the Omega Equation -- Domain Decomposition Algorithm for a New Characteristic Mixed Finite Element Method for Compressible Miscible Displacement -- A Boundary Element Method for Viscous Flow on Multi-connected Domains -- A Characteristic Difference Method for 2D Nonlinear Convection-Diffusion Problems -- Fractional Step Methods for Compressible Multicomponent Flow in Porous Media -- A Model and Its Solution Method for a Generalized Unsteady Seepage Flow Problem -- Domain Decomposition Preconditioners for Non-selfconjugate Second Order Elliptic Problems -- Performance of MOL for Surface Motion Driven by a Laplacian of Curvature -- A High-Order Upwind Method for Convection-Diffusion Equations with the Newmann Boundary Condition.

Sommario/riassunto

The need to predict, understand, and optimize complex physical and chemical processes occurring in and around the earth, such as groundwater contamination, oil reservoir production, discovering new oil reserves, and ocean hydrodynamics, has been increasingly recognized. Despite their seemingly disparate natures, these geoscience problems have many common mathematical and computational characteristics. The techniques used to describe and study them are applicable across a broad range of areas. The study of the above problems through physical experiments, mathematical theory, and computational techniques requires interdisciplinary collaboration between engineers, mathematicians, computational scientists, and other researchers working in industry, government laboratories, and universities. By bringing together such researchers, meaningful progress can be made in predicting, understanding, and optimizing physical and chemical processes. The International Workshop on Fluid Flow and Transport in Porous Media was successfully held in Beijing, China, August 26, 1999. The aim of this workshop was to bring together applied mathematicians, computational scientists, and engineers working actively in the mathematical and numerical

treatment of fluid flow and transport in porous media. A broad range of researchers presented papers and discussed both problems and current, state-of-the-art techniques.
