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of the navier-stokes equations using orthogonal boundary-fitted coordinates -- Solution of the incompressible Navier-Stokes equations using artificial compressibility methods -- Adaptive finite element methods for three dimensional compressible viscous flow simulation in aerospace engineering -- Multigrid solvers for steady Navier-Stokes equations in a driven cavity -- Computation of hypersonic vortex flows with an Euler model -- A high resolution finite volume scheme for steady external transonic flow -- Development of a highly efficient and accurate 3D Euler flow solver -- Computation of rarefied hypersonic flows -- Gasdynamical simulation of meteor phenomena -- A coin variant of the Euler equations -- An implicit time-marching method for solving the 3-D compressible Navier-Stokes equations -- Low-storage implicit upwind-FEM schemes for the Euler equations -- An efficient nested iterative method for solving the aerodynamic equations -- A multigrid method for steady Euler equations based on polynomial flux-difference splitting -- Computation of viscous unsteady compressible flow about airfoils -- Parallel multilevel adaptive methods -- Adaptive grid solution for shock-vortex interaction -- Computer simulation of some types of flows arising at interactions between a supersonic flow and a boundary layer -- An implicit flux-vector splitting finite-element technique for an improved solution of compressible Euler equations on distorted grids -- Vortex methods for slightly viscous three dimensional flow -- Second order scheme in bidimensional space for compressible gas with arbitrary mesh -- Accurate simulation of vortical flows -- Accuracy of node-based solutions on irregular meshes -- Solutions of the incompressible Navier-Stokes equations using an upwind -differenced TVD scheme -- Three-dimensional numerical simulation of compressible, spatially evolving shear flows -- A velocity/vorticity method for viscous incompressible flow calculations -- Pulsatile flows through curved pipes -- Spurious oscillation of finite difference solutions near shock waves and a new formulation of “TVD” scheme -- Numerical study of steady flow past a rotating circular cylinder -- Numerical simulation of the flow about a wing with leading-edge vortex flow -- Multigrid calculations for cascades -- Unsteady and turbulent flow using adaptation methods -- RNS solutions for three-dimensional steady incompressible flows -- Numerical study of unsteady viscous hypersonic blunt body flows with an impinging shock -- Upwind schemes, multigrid and defect correction for the steady Navier-Stokes equations -- A pseudospectral matrix element method for solution of three-dimensional incompressible flows and its implementation on a parallel computer -- Numerical resolution of the three-dimensional Navier-Stokes equations in velocity-vorticity formulation -- Calculation of shocked flows by mathematical programming -- Universal limiter for high order explicit conservative advection schemes -- A comparison of numerical schemes on triangular and quadrilateral meshes -- The finite volume-element method (FVE) for planar cavity flow -- Adaptive remeshing for transient problems with moving bodies -- Axisymmetric vortex breakdown in an enclosed cylinder flow -- Numerical analysis of a multigrid method for spectral approximations -- Asymmetric separated flows about sharp cones in a supersonic stream -- A flux split algorithm for unsteady incompressible flow -- Inverse method for the determination of transonic blade profiles of turbomachineries -- Large eddy simulation of the turbulent flow in a curved channel -- Interaction of an oblique shock wave with supersonic turbulent blunt body flows -- Shock recovery and the cell vertex scheme for the steady Euler equations -- A new multigrid approach to convection problems -- A finite-element method on prismatic elements for the three-dimensional Navier-Stokes

equations -- Vortices around cylinder in confined flows -- Coupling physical processes in simulations of chemically reactive flows -- Explicit evaluation of discontinuities in 2-D unsteady flows solved by the method of characteristics -- Direct method for solution of three-dimensional unsteady incompressible Navier-Stokes equations -- Hypercube algorithms for turbulence simulation -- Adaptive numerical solutions of the Euler equations in 3D using finite elements -- Parallel heterogeneous mesh refinement for advection-diffusion equations -- Simulation of inviscid hypersonic real gas flows -- Efficient spectral algorithms for solving the incompressible Navier-stokes equations in unbounded rectangularly decomposable domains -- Computation of the threedimensional wake of a shiplike body 1989 -- Simulation of unsteady flow past sharp shoulders on semi-infinite bodies -- Semi-implicit finite-difference simulation of laminar hypersonic flow over blunt bodies -- Numerical simulation of unsteady incompressible viscous flows in generalized coordinate systems -- Accuracy of the marching method for parabolized Navier-Stokes Equations -- Transonic analysis of arbitrary configurations using locally refined grids -- Group explicit methods for solving compressible flow equations on vector and parallel computers -- Interactions of a flexible structure with a fluid governed by the Navier-Stokes equations -- Navier-Stokes simulation of transonic flow about wings using a block structured approach -- On time discretization of the incompressible flow -- A detailed analysis of inviscid flux splitting algorithms for real gases with equilibrium or finite-rate chemistry -- Convergence of the spectral viscosity method for nonlinear conservation laws -- Inviscid and viscous flow simulations around the ONERA-M6 wing by TVD schemes -- Shock propagation over a circular cylinder -- Three-dimensional computation of unsteady flows around a square cylinder -- Transonic flow solutions on general 3D regions using composite-block grids -- Steady-state solving via stokes preconditioning; Recursion relations for elliptic operators -- Hybrid conservative characteristic method for flows with internal shocks -- Improving the accuracy of central difference schemes -- Computation of high reynolds number flows around airfoils by numerical solution of the Navier-Stokes equations -- Diagonal implicit multigrid solution of the three-dimensional Euler equations -- Numerical simulation of taylor vortices in a spherical gap -- Numerical calculation of hypersonic flow by the spectral method -- 1.D transient crystal growth in closed ampoules: an application of the P.I.S.O. algorithm to low mach number compressible flows -- Nonisentropic potential calculation for 2-D and 3-D transonic flow.

Sommario/riassunto

Along with almost a hundred research communications this volume contains six invited lectures of lasting value. They cover modeling in plasma dynamics, the use of parallel computing for simulations and the applications of multigrid methods to Navier-Stokes equations, as well as other surveys on important techniques. An inaugural talk on computational fluid dynamics and a survey that relates dynamical systems, turbulence and numerical solutions of the Navier-Stokes equations give an exciting view on scientific computing and its importance for engineering, physics and mathematics.