

Contents

General Review

Calculation Methods for Aerodynamic Flows—A Review <i>T. Cebeci and J. H. Whitelaw</i>	1
---	---

PART 1. Stability and Transition

1. Stewartson Memorial Lecture: Hydrodynamic Stability and Turbulent Transition <i>J. T. Stuart</i>	23
2. Transition Calculations in Three-Dimensional Flows <i>R. Michel, E. Coustols, and D. Arnal</i>	39
3. Transitional Spot Formation Rate in Two-Dimensional Boundary Layers <i>R. Narasimha and J. Dey</i>	57

PART 2. Two-Dimensional Flows

4. The Computation of Viscid–Inviscid Interaction on Airfoils with Separated Flow <i>R. E. Melnik and J. W. Brook</i>	77
5. Laminar Separation Studied as an Airfoil Problem <i>H. K. Cheng and C. J. Lee</i>	102

6.	A Quasi-simultaneous Finite Difference Approach for Strongly Interacting Flow <i>D. E. Edwards and J. E. Carter</i>	126
7.	Newton Solution of Coupled Euler and Boundary-Layer Equations <i>M. Drela, M. Giles, and W. T. Thompkins, Jr.</i>	143
8.	Aerofoils at Low Reynolds Numbers—Prediction and Experiment <i>P. M. Render, J. L. Stollery, and B. R. Williams</i>	155
9.	Comparison of Interactive and Navier–Stokes Calculations of Separating Boundary-Layer Flows <i>D. Adair, B. E. Thompson, J. H. Whitelaw, and B. R. Williams</i>	168
10.	Significance of the Thin-Layer Navier–Stokes Approximation <i>F. G. Blottner</i>	184
11.	A Comparison of Interactive Boundary-Layer and Thin-Layer Navier–Stokes Procedures <i>U. Mehta, K. C. Chang, and T. Cebeci</i>	198
12.	Development of a Navier–Stokes Analysis to Investigate the Mechanism of Shock-Wave–Boundary-Layer Interactions <i>D. V. Roscoe, H. J. Gibling, H. McDonald, and S. J. Shamroth</i>	216
PART 3. Unsteady Flows		
13.	Unsteady Airfoil Boundary Layers—Experiment and Computation <i>P. F. Lorber and E. E. Covert</i>	235
14.	A Viscous–Inviscid Interaction Method for Computing Unsteady Transonic Separation <i>J. C. Le Balleur and P. Girodroux-Lavigne</i>	252
15.	Computations of Separated Subsonic and Transonic Flow about Airfoils in Unsteady Motion <i>R. Houwink</i>	272
16.	Massive Separation and Dynamic Stall on a Cusped Trailing-Edge Airfoil <i>A. P. Rothmayer and R. T. Davis</i>	286
17.	Analysis of Two-Dimensional Incompressible Flow Past Airfoils Using Unsteady Navier–Stokes Equations <i>K. N. Ghia, G. A. Osswald, and U. Ghia</i>	318
PART 4. Three-Dimensional Flows		
18.	Computation of Velocity and Pressure Variation Across Axisymmetric Thick Turbulent Stern Flows <i>T. T. Huang and M.-S. Chang</i>	341

19. Inverse-Mode Solution of the Three-Dimensional Boundary-Layer Equations about a Shiplike Hull <i>J. Piquet and M. Visonneau</i>	360
20. Prediction of Dynamic Separation Characteristics Using a Time-Stepping Viscid-Inviscid Approach <i>B. Maskew and F. A. Dvorak</i>	380
21. Computation of Turbulent Separated Flows over Wings <i>J. C. Wai, J. C. Baillie, and H. Yoshihara</i>	397
22. An Interactive Scheme for Three-Dimensional Transonic Flows <i>T. Cebeci, L. T. Chen, and K. C. Chang</i>	412
23. x -Marching Methods to Solve the Navier–Stokes Equations in Two- and Three-Dimensional Flows <i>J. Cousteix, X. de Saint-Victor, and R. Houdeville</i>	432
24. Computation of Three-Dimensional Flows with Shock-Wave–Turbulent-Boundary-Layer Interaction <i>C. C. Horstman, M. I. Kussoy, and W. K. Lockman</i>	449
References	465