

Computational Fluid Dynamics: Incompressible Turbulent Flows

By Takeo Kajishima, Kunihiko Taira

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This textbook presents numerical solution techniques for incompressible turbulent flows that occur in a variety of scientific and engineering settings including aerodynamics of ground-based vehicles and low-speed aircraft, fluid flows in energy systems, atmospheric flows, and biological flows. This book encompasses fluid mechanics, partial differential equations, numerical methods, and turbulence models, and emphasizes the foundation on how the governing partial differential equations for incompressible fluid flow can be solved numerically in an accurate and efficient manner. Extensive discussions on incompressible flow solvers and turbulence modeling are also offered. This text is an ideal instructional resource and reference for students, research scientists, and professional engineers interested in analyzing fluid flows using numerical simulations for fundamental research and industrial applications.

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Editorial Review

From the Back Cover

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• Introduces CFD techniques for incompressible flow and turbulence with a comprehensive approach;

• Enriches reader understanding with a detailed discussion of basic numerical methods used in CFD;

• Explains the solution techniques for incompressible flow;

• Provides detailed coverage on turbulent flow simulation, including Reynolds averaged Navier-Stokes equations and large-eddy simulation;

• Features a chapter on the immersed boundary method - a powerful Cartesian grid method that can analyze flows over bodies with arbitrary geometry;

• Enables readers to construct their own CFD codes from scratch and provides fundamental CFD knowledge essential for those utilizing commercial CFD software.

Users Review

From reader reviews:

Matthew Segal:

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