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Karim Ghaib

Introduction to Computational Fluid Dynamics

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What You Can Find in This *essential*

- Mathematical basics of computational fluid dynamics
- A systematic description of the conservation equations for mass, momentum, and energy
- Most important models for the calculation of turbulence
- Most important methods for the discretization of the conservation equations
- Criteria for assessing the quality and fineness of computational meshes

Preface

The properties and effects of flows are important in many areas of science and engineering. Their prediction can be achieved by analytical, experimental, and numerical fluid mechanics. In this context, numerical fluid mechanics is becoming increasingly important. This is mainly due to the continuously increasing performance of computers. The currently available workstations are so powerful that calculation of complex flow problems is possible on them.

Users of computational fluid dynamics need to know a lot about the methods of this field. This *essential* provides an introduction to computational fluid dynamics. After an overview of mathematical basics, the conservation equations of fluid mechanics are formulated. Turbulence models are then explained. The main numerical methods are then described. Finally, types and evaluation criteria of computational meshes are given.

This book is recommended for both the beginner and the user in the field of computational fluid dynamics.

Zwingenberg, Germany — Karim Ghaib

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