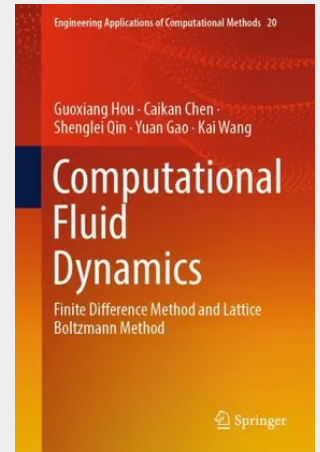


# Computational Fluid Dynamics

Finite Difference Method and Lattice Boltzmann Method

This book provides a concise and comprehensive introduction to several basic methods with more attention to their theoretical basis and applications in fluid dynamics. Furthermore, some new ideas are presented in this book, for example, a method to solve the transition matrix by difference operator transformation. For this method, the book gives the definition of Fourier integral transformation of translation operator, and proves the transition matrix equaling to the differential operator transformation, so that it is extended to general situations of explicit, implicit, multi-layer difference equations, etc. This flexible approach is also used in the differential part. In addition, the book also includes six types of equivalent stability definitions in two ways and deeply analyzes their errors, stabilities and convergences of the difference equations. What is more important, some new scientific contributions on lattice Boltzmann method (LBM) in recent years are presented in the book as well. The authors write the book combining their ten years teaching experience and research results and this book is intended for graduate students who are interested in the area of computational fluid dynamics (CFD). Authors list some new research achievements, such as simplified lattice Boltzmann method, the simplified lattice Boltzmann flux solver and discrete unified gas kinetic scheme, and expect that this new information could give readers possible further investigating ideas in their future research on CFD area.

This book provides a concise and comprehensive introduction to several basic methods with more attention to their theoretical basis and applications in fluid dynamics. Furthermore, some new ideas are presented in this book, for example, a method to solve the transition matrix by difference operator transformation. For this method, the book gives the definition of Fourier integral transformation of translation operator, and proves the transition matrix equaling to the differential operator transformation, so that it is extended to general situations of explicit, implicit, multi-layer difference equations, etc. This flexible approach is also used in the differential part. In addition, the book also includes six types of equivalent stability definitions in two ways and deeply analyzes their errors, stabilities and convergences of the difference equations. What is more important, some new scientific contributions on lattice Boltzmann method (LBM) in recent years are presented in the book as well. The authors write the book combining their ten years teaching experience and research results and this book is intended for graduate students who are interested in the area of computational fluid dynamics (CFD). Authors list some new research achievements, such as simplified lattice Boltzmann method, the simplified lattice Boltzmann flux solver and discrete unified gas kinetic scheme, and expect that this new information could give readers possible further investigating ideas in their future research on CFD area.



**149,79 €**

139,99 € (zzgl. MwSt.)

*Lieferfrist: bis zu 10 Tage*

**Artikelnummer:** 9789819703487

**Medium:** Buch

**ISBN:** 978-981-97-0348-7

**Verlag:** Springer

**Erscheinungstermin:** 01.05.2024

**Sprache(n):** Englisch

**Auflage:** 2024

**Serie:** Engineering Applications of Computational Methods

**Produktform:** Gebunden

**Gewicht:** 632 g

**Seiten:** 259

**Format (B x H):** 160 x 241 mm

