

Mathematical and Numerical Foundations of Turbulence Models and Applications (Modeling and Simulation in Science, Engineering and Technology)

By Tomás Chacón Rebollo, Roger Lewandowski

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With applications to climate, technology, and industry, the modeling and numerical simulation of turbulent flows are rich with history and modern relevance. The complexity of the problems that arise in the study of turbulence requires tools from various scientific disciplines, including mathematics, physics, engineering and computer science.

Authored by two experts in the area with a long history of collaboration, this monograph provides a current, detailed look at several turbulence models from both the theoretical and numerical perspectives. The k-epsilon, large-eddy simulation and other models are rigorously derived and their performance is analyzed using benchmark simulations for real-world turbulent flows.

Mathematical and Numerical Foundations of Turbulence Models and Applications is an ideal reference for students in applied mathematics and engineering, as well as researchers in mathematical and numerical fluid dynamics. It is also a valuable resource for advanced graduate students in fluid dynamics, engineers, physical oceanographers, meteorologists and climatologists.

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Editorial Review

Review

“The book is a valuable reference for the study of the mathematical foundations of several widely used turbulence models. It can be recommended for advanced graduate students and researchers in mathematical and numerical turbulence theory.” (Joachim Naumann, zbMATH 1328.76002, 2016)

From the Back Cover

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About the Author

The author is a professor at XX University.

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