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Título: Navier-Stokes Equations In Planar Domains

Autor: Matania Ben-Artzi (Author), Jean-Pierre Croisille
(Author)

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Sinopsis

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This volume deals with the classical Navier-Stokes system of equations governing the planar flow of incompressible, viscous fluid. It is a first-of-its-kind book, devoted to all aspects of the study of such flows, ranging from theoretical to numerical, including detailed accounts of classical test problems such as "driven cavity" and "double-driven cavity".

A comprehensive treatment of the mathematical theory developed in the last 15 years is elaborated, heretofore never presented in other books. It gives a detailed account of the modern compact schemes based on a "pure streamfunction" approach. In particular, a complete proof of convergence is given for the full nonlinear problem.

This volume aims to present a variety of numerical test problems. It is therefore well positioned as a reference for both theoretical and applied mathematicians, as well as a text that can be used by graduate students pursuing studies in (pure or applied) mathematics, fluid dynamics and mathematical physics.

Readership: Graduate students and researchers in applied mathematics (particularly computational fluid dynamics), partial differential equations, and mathematical physics (specifically nonlinear evolution equations).