

The finite element method for fluid dynamics

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Abstrak

The finite element method for fluid dynamics offers a complete introduction the application of the finite element method to fluid mechanics. The book begins with a useful summary of all relevant partial differential equations before moving on to discuss convection stabilization procedures, steady and transient state equations, and numerical solution of fluid dynamic equations.

The character-based split (CBS) scheme is introduced and discussed in detail, followed by thorough coverage of incompressible and compressible fluid dynamics, flow through porous media, shallow water flow, and the numerical treatment of long and short waves. Updated throughout, this new edition includes new chapters on:

- Fluid-structure interaction, including discussion of one-dimensional and multidimensional problems.
- Biofluid dynamics, covering flow throughout the human arterial system.

Focusing on the core knowledge, mathematical and analytical tools needed for successful computational fluid dynamics (CFD),