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Nota di contenuto	1 Part I Basic concepts and examples of environmental and industrial interest -- 2 Motivation -- 3 Hyperbolic conservation laws. Basic concepts and examples -- 4 Types of solutions to hyperbolic systems of conservation laws -- 5 Biographical summary of Professor Peter Lax -- 6 Part II Finite volume methods applied to the hyperbolic conservation laws -- 7 1D hyperbolic linear systems -- 8 1D Non-linear hyperbolic systems -- 9 Biographical summary of Professor Sergei Konstantinovich Godunov -- 10 Part III MATLAB codes for the studied methods -- 11 Codes for the linear transport equation -- 12 Codes for the Burgers equation -- 13 Biographical summary of Professor Eleuterio Francisco Toro.

Sommario/riassunto

Finite volume methods are used in numerous applications and by a broad multidisciplinary scientific community. The book communicates this important tool to students, researchers in training and academics involved in the training of students in different science and technology fields. The selection of content is based on the author’s experience giving PhD and master courses in different universities. In the book the introduction of new concepts and numerical methods go together with simple exercises, examples and applications that contribute to reinforce them. In addition, some of them involve the execution of MATLAB codes. The author promotes an understanding of common terminology with a balance between mathematical rigor and physical intuition that characterizes the origin of the methods. This book aims to be a first contact with finite volume methods. Once readers have studied it, they will be able to follow more specific bibliographical references and use commercial programs or open source software within the framework of Computational Fluid Dynamics (CFD).