1. Record Nr. UNINA9910155324503321

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Titolo	Mathematical Theory of Compressible Viscous Fluids : Analysis and Numerics / / by Eduard Feireisl, Trygve G. Karper, Milan Pokorný
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Birkhäuser, , 2016
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (XII, 186 p. 15 illus.)
Collana	Lecture Notes in Mathematical Fluid Mechanics, , 2510-1374
Disciplina	515.353
Soggetti	Partial differential equations Numerical analysis Physics Fourier analysis Functional analysis Mathematical physics Partial Differential Equations Numerical Analysis Mathematical Methods in Physics Fourier Analysis Functional Analysis Mathematical Applications in the Physical Sciences
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Preliminaries, notation, spaces of functions -- Part I Mathematics of compressible fluid flows -- Part II Existence of weak solutions via a numerical method -- Part III Existence theory for general pressure.
Sommario/riassunto	This book offers an essential introduction to the mathematical theory of compressible viscous fluids. The main goal is to present analytical methods from the perspective of their numerical applications. Accordingly, we introduce the principal theoretical tools needed to handle well-posedness of the underlying Navier-Stokes system, study the problems of sequential stability, and, lastly, construct solutions by means of an implicit numerical scheme. Offering a unique contribution

– by exploring in detail the “synergy” of analytical and numerical methods – the book offers a valuable resource for graduate students in mathematics and researchers working in mathematical fluid mechanics. Mathematical fluid mechanics concerns problems that are closely connected to real-world applications and is also an important part of the theory of partial differential equations and numerical analysis in general. This book highlights the fact that numerical and mathematical analysis are not two separate fields of mathematics. It will help graduate students and researchers to not only better understand problems in mathematical compressible fluid mechanics but also to learn something from the field of mathematical and numerical analysis and to see the connections between the two worlds. Potential readers should possess a good command of the basic tools of functional analysis and partial differential equations including the function spaces of Sobolev type. .