

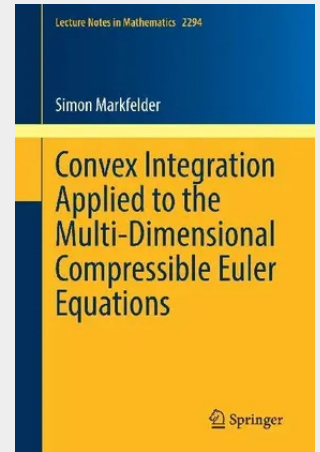
Convex Integration Applied to the Multi-Dimensional Compressible Euler Equations

This book applies the convex integration method to multi-dimensional compressible Euler equations in the barotropic case as well as the full system with temperature. The convex integration technique, originally developed in the context of differential inclusions, was applied in the groundbreaking work of De Lellis and Székelyhidi to the incompressible Euler equations, leading to infinitely many solutions. This theory was later refined to prove non-uniqueness of solutions of the compressible Euler system, too. These non-uniqueness results all use an ansatz which reduces the equations to a kind of incompressible system to which a slight modification of the incompressible theory can be applied. This book presents, for the first time, a generalization of the De Lellis–Székelyhidi approach to the setting of compressible Euler equations.

The structure of this book is as follows: after providing an accessible introduction to the subject, including the essentials of hyperbolic conservation laws, the idea of convex integration in the compressible framework is developed. The main result proves that under a certain assumption there exist infinitely many solutions to an abstract initial boundary value problem for the Euler system. Next some applications of this theorem are discussed, in particular concerning the Riemann problem. Finally there is a survey of some related results.

This self-contained book is suitable for both beginners in the field of hyperbolic conservation laws as well as for advanced readers who already know about convex integration in the incompressible framework.

- Part I The Problem Studied in This Book. - 1. Introduction. - 2. Hyperbolic Conservation Laws. - 3. The Euler Equations as a Hyperbolic System of Conservation Laws. - Part II Convex Integration. - 4. Preparation for Applying Convex Integration to Compressible Euler. - 5. Implementation of Convex Integration. - Part III Application to Particular Initial (Boundary) Value Problems. - 6. Infinitely Many Solutions of the Initial Boundary Value Problem for Barotropic Euler. - 7. Riemann Initial Data in Two Space Dimensions for Isentropic Euler. - 8. Riemann Initial Data in Two Space Dimensions for Full Euler.



64,19 €

59,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783030837846

Medium: Buch

ISBN: 978-3-030-83784-6

Verlag: Springer

Erscheinungstermin: 21.10.2021

Sprache(n): Englisch

Auflage: 1. Auflage 2021

Serie: Lecture Notes in Mathematics

Produktform: Kartoniert

Gewicht: 388 g

Seiten: 242

Format (B x H): 155 x 235 mm

