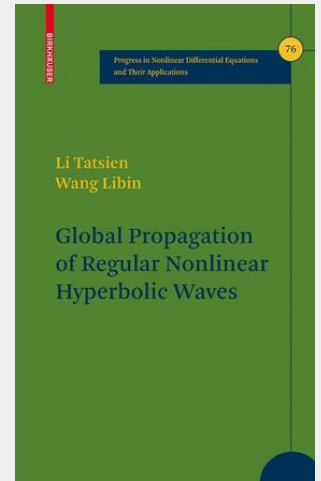


Global Propagation of Regular Nonlinear Hyperbolic Waves

This monograph describes global propagation of regular nonlinear hyperbolic waves described by first-order quasilinear hyperbolic systems in one dimension. The exposition is clear, concise, and unfolds systematically beginning with introductory material and leading to the original research of the authors. Topics are motivated with a number of physical examples from the areas of elastic materials, one-dimensional gas dynamics, and waves. Aimed at researchers and graduate students in partial differential equations and related topics, this book will stimulate further research and help readers further understand important aspects and recent progress of regular nonlinear hyperbolic waves.

This book studies the global propagation of the regular nonlinear hyperbolic waves described by first-order quasilinear hyperbolic systems in the one-dimensional case. Via the concept of weak linear degeneracy and the method of (generalized) normalized coordinates, a systematic theory is established on the global existence and the blow-up mechanism of the regular nonlinear hyperbolic wave with small amplitude not only for the Cauchy problem, but also for some other important problems such as the Cauchy problem on a semibounded initial data, the one-sided mixed initial-boundary value problem, the generalized Riemann problem, and the generalized nonlinear initial-boundary Riemann problem, etc, as well as not only for the direct problem, but also for inverse problems such as the inverse generalized Riemann problem and the inverse piston problem. Most of the material contained in this book is based on the results the authors obtained in recent years. Some material that was previously published has been revised and updated. The whole approach in this book is based on the theory of the local regular solution and of the local piecewise regular solution for quasilinear hyperbolic systems. For more comprehensive information, the reader may refer to the book by Li Tatsien and Yu Wenci, *Boundary Value Problems for Quasilinear Hyperbolic Systems* (Duke University Mathematics Series V, 1985). The author would like to take this opportunity to give his warm thanks to Professor Gu Chao hao for having initiated and brought him into the fruitful area of quasilinear hyperbolic systems. The authors are very grateful to all the members on the Applied PDEs Seminar of Fudan University, organized by Qin Tiehu, Zhou Yi, and the first author, for their constant interest, discussion, and suggestion on the subject.



106,99 €
99,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9780817642440
Medium: Buch
ISBN: 978-0-8176-4244-0
Verlag: Springer Nature Singapore
Erscheinungstermin: 29.06.2009
Sprache(n): Englisch
Auflage: 2009. Auflage 2009
Serie: Progress in Nonlinear Differential Equations and Their Applications
Produktform: Gebunden
Gewicht: 1210 g
Seiten: 252
Format (B x H): 163 x 242 mm

