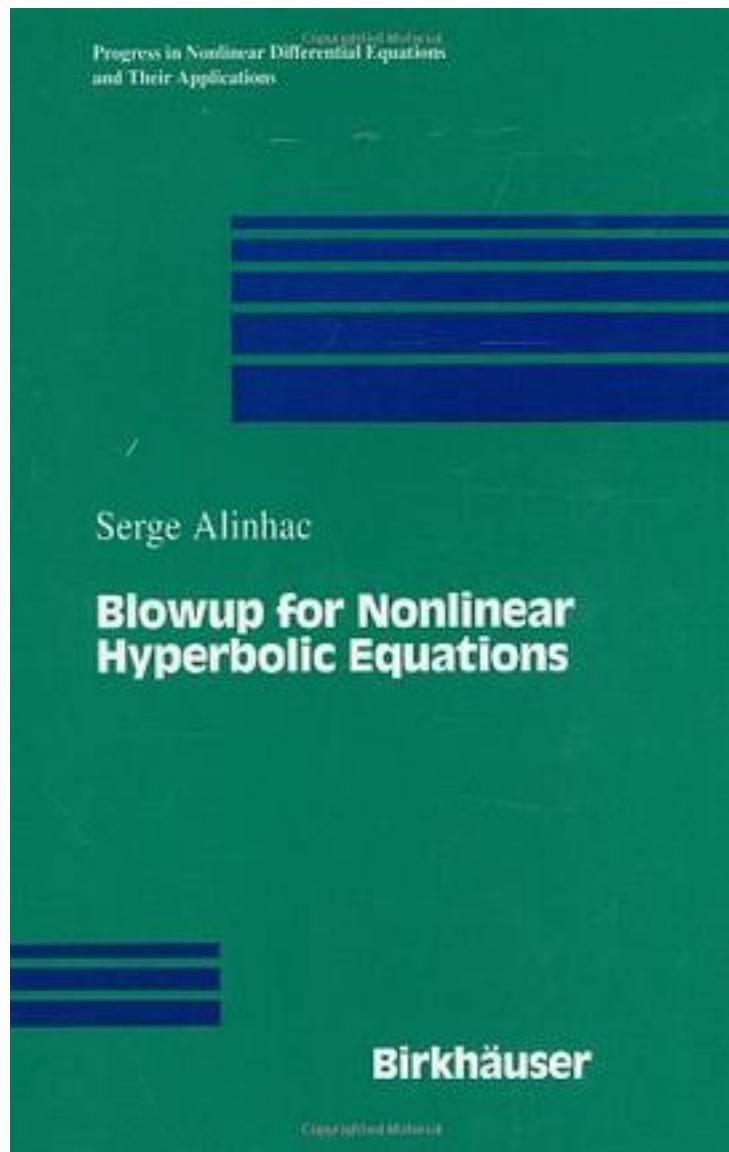


Blowup for Nonlinear Hyperbolic Equations



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Solutions to partial differential equations or systems often, over specific time periods, exhibit smooth behaviour. Given sufficient time, however, they almost invariably undergo a brutal change in behaviour, and this phenomenon has become known as "blowup". In this book, the author provides an overview of what is known about this situation and discusses many of the open problems concerning it. The book deals with classical solutions of global problems for hyperbolic equations or systems. The approach is based on the display and study of two local blowup mechanisms, which the author calls the "ordinary differential equation mechanism" and the "geometric blowup mechanism". It introduces, via energy methods, the concept of lifespan, related to the nonlinear propagation of regularity (from the past to the future). It addresses specifically the question of whether or not there will be blowup in a solution, and it classifies those methods used to give positive answers to the question. The material corresponds to a one semester course for students or researchers with a basic elementary knowledge of partial differential equations, especially of hyperbolic type including such topics as the Cauchy problem, wave operators, energy inequalities, finite speed of propagation, and symmetric systems. It contains a complete bibliography reflecting the high degree of activity among mathematicians interested in the problem.

作者介绍:

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