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NONLINEAR HYPERBOLIC PARTIAL DIFFERENTIAL EQUATIONS AND DYNAMIC PROGRAMMING

RICHARD BELLMAN Department of Mathematics and Engineering, University of Southern California, Los Angeles, CA 907. U.S.A. (Received May 1982)

The Existence of Global Solutions of the Nonlinear ...

The author is a professor of mathematics at the University of Michigan. A recognized expert in partial differential equations, he has made important contributions to the transformation of three areas of hyperbolic partial differential equations: nonlinear microlocal analysis, the control of waves, and nonlinear geometric optics.

Hyperbolic Equations - EqWorld

A Note on Development of Singularities of Solutions of Nonlinear Hyperbolic Partial Differential Equations (L-W Lin) Strange Attractors in Pseudospectral Solutions of the Dissipative Zakharov Equations (S-Q Ma et al.) On Half-Space Problems for the Heat Equations with Nonlinear Boundary Conditions (M-X Wang & S Wang)

Hyperbolic partial differential equation - Wikipedia

Hyperbolic nonconservative partial differential equations, such as the Von Foerster system, in which boundary conditions may depend upon the dependent variable (integral boundary conditions, for example) are solved by an approximation method based on similar work of the author for (nonlinear stochastic) ordinary differential equations.

Numerical methods for nonlinear second-order hyperbolic ...

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Abstract. Here we study nonlinear hyperbolic equations, with emphasis on quasi-linear systems arising from continuum mechanics, describing such physical phenomena as vibrating strings and membranes and the motion of a compressible fluid, such as air.

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In mathematics, a hyperbolic partial differential equation of order n is a partial differential equation (PDE) that, roughly speaking, has a well-posed initial value problem for the first n – derivatives. More precisely, the Cauchy problem can be locally solved for arbitrary initial data along any non-characteristic hypersurface. Many of the equations of mechanics are hyperbolic, and so the study ...

NONLINEAR HYPERBOLIC PARTIAL DIFFERENTIAL EQUATIONS AND ...

In the present paper, we establish the existence of the solution of the hyperbolic partial differential equation with a nonlinear operator that satisfies the general initial conditions

Development of Singularities of Solutions of Nonlinear ...

In the present paper, we establish the existence of the solution of the hyperbolic partial differential equation with a nonlinear operator that satisfies the general initial conditions where are given functions under the assumptions of form-bounded conditions on its coefficients.

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Advances in Nonlinear Partial Differential Equations and ...

In the case of complex-valued functions a non-linear partial differential equation is defined similarly. If $k > 1$ one speaks, as a rule, of a vectorial non-linear partial differential equation or of a system of non-linear partial differential equations. The order of (1) is defined as the highest order of a derivative occurring in the equation.

Peter Lax - Wikipedia

A presentation of the fundamentals of modern numerical techniques for a wide range of linear and nonlinear elliptic, parabolic and hyperbolic partial differential equations and integral equations central to a wide variety of applications in science, engineering, and other fields. Topics include: Mathematical Formulations; Finite Difference and Finite Volume Discretizations; Finite Element ...

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New Hyperbolic Function Solutions for Some Nonlinear Partial Differential Equation Arising in Mathematical Physics Haci Mehmet Baskonus 1,* and Hasan Bulut 2

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Hyperbolic Systems of Conservation Laws and the Mathematical Theory of Shock Waves, Society for Industrial Mathematics (1987). Linear Algebra and Its Applications, 2nd ed., Wiley-Interscience, New York (2007). Mathematical Aspects of Production and Distribution of Energy; Nonlinear Partial Differential Equations in Applied Science

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He is the author of *Blowup for Nonlinear Hyperbolic Equations* (Birkhäuser, 1995) and *Pseudo-differential Operators and the Nash–Moser Theorem* (with P. Gérard, American Mathematical Society, 2007). His primary areas of research are linear and nonlinear partial differential equations.

Non-linear partial differential equation - Encyclopedia of ...

The resulting method is a semi-discrete Rothe's technique, for the original partial differential equations has been transformed into a system of ordinary differential equations in space. For second-order accurate finite difference discretizations of the second-order spatial derivatives, a system of nonlinear algebraic equations is obtained.

Hyperbolic Partial Differential Equations and Geometric Optics

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