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Nonlinear Pdes Mathematical Models In

It addresses researchers and post-graduate students working at the interplay between mathematics and other fields of science and technology and is a comprehensive introduction to the theory of nonlinear partial differential equations and its main principles also presents their real-life applications in various contexts: mathematical physics, chemistry, mathematical biology, and population genetics.

Nonlinear PDEs - Mathematical Models in Biology, Chemistry ...

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Nonlinear PDEs: Mathematical Models in Biology, Chemistry ...

Nonlinear PDEs: Mathematical Models in Biology, Chemistry and Population Genetics Marius Ghergu , Vicențiu D. Rădulescu (auth.) The emphasis throughout the present volume is on the practical application of theoretical mathematical models helping to unravel the underlying mechanisms involved in processes from mathematical physics and biosciences.

Nonlinear PDEs: Mathematical Models in Biology, Chemistry ...

The chapter on reaction-diffusion models has challenging mathematical problems coming from various models, with the nonlinearities being derived from chemical reaction formulas and pattern-formation of spatial tissue structures in morphogenesis. The appendix includes technical results and is extremely useful.

Nonlinear PDEs: Mathematical Models in Biology, Chemistry ...

Nonlinear PDEs: Mathematical Models in Biology, Chemistry and Population Genetics. A 'read' is counted each time someone views a publication summary (such as the title, abstract, and list of ...

Nonlinear PDEs: Mathematical Models in Biology, Chemistry ...

It addresses researchers and post-graduate students working at the interplay between mathematics and other fields of science and technology and is a comprehensive introduction to the theory of nonlinear partial differential equations and its main principles also presents their real-life applications in various contexts: mathematical physics, chemistry, mathematical biology, and population genetics.

Nonlinear PDEs | SpringerLink

The study gives a brief overview of existing modifications of the method of functional separation of variables for nonlinear PDEs. It proposes a more general approach to the construction of exact solutions to nonlinear equations of applied mathematics and mathematical physics, based on a special transformation with an integral term and the generalized splitting principle.

Functional Separation of Variables in Nonlinear PDEs ...

Mathematics > Analysis of PDEs. arXiv:2008.00193 (math) [Submitted on 1 Aug 2020] Title: The nonlinear Schrödinger equation in the half-space. Authors: Antonio J. Fernández, Tobias Weth. Download PDF

[2008.00193] The nonlinear Schrödinger equation in the ...

The Laws of Physics, Mathematical Models, and PDEs. The laws of physics define the rules, as we observe them, for the motion of matter and related concepts in space and time. ... The corresponding general balance of forces for a so-called nonlinear material model can be written in a similar way. Although it sounds pretty limited, the equations ...

Physics, PDEs, Mathematical and Numerical Modeling

(with M. Ghergu) Nonlinear PDEs: Mathematical Models in Biology, Chemistry and Population Genetics, Springer Monographs in Mathematics, Springer Verlag, Heidelberg, 2012 (with D. Repovš) Partial Differential Equations with Variable Exponents: Variational Methods and Qualitative Analysis , CRC Press, Taylor & Francis Group, Boca Raton FL, 2015

Vicentiu D. Radulescu

This paper presents a kinematic assumption free and thermodynamically consistent non-linear formulation incorporating finite strain and finite deforma...

A thermodynamically consistent non-linear mathematical ...

Nachwuchsgruppe Singularity formation in nonlinear PDEs The mathematical description of dynamical processes in terms of time-dependent partial differential equations (PDEs) plays a fundamental role in many areas of science. In many models nonlinearities appear naturally due to self-reinforcing processes.

Nachwuchsgruppe Singularity formation in nonlinear PDEs

Modeling of various physical, biochemical and biological occurrences are in forms of nonlinear PDEs. The goal is to obtain exact soliton solutions for mathematically modelled differential equations. Different mathematical techniques have been developed.

Solitary Wave Solution of Nonlinear PDEs Arising in ...

Nonlinear FEA is used when the applied forces and displacements do not hold true. The use of Nonlinear FEA is essential in solving PDEs, and it provides the ability to estimate the aggregate effects of small changes. PCB Design & Analysis Cadence PCB Design & Analysis

What is Nonlinear FEA and What Attributes to the Source of ...

nonlinear dynamics of PDEs, with a focus on problems over unbounded domains and modulation equations. The presentation is example-oriented, and new mathematical tools are developed step by step, giving insight into some important classes of nonlinear PDEs and

Nonlinear PDEs: A Dynamical Systems Approach

In mathematics, a partial differential equation (PDE) is an equation which imposes relations between the various partial derivatives of a multivariable function.. The function is often thought of as an "unknown" to be solved for, similarly to how x is thought of as an unknown number, to be solved for, in an algebraic equation like $x^2 - 3x + 2 = 0$

Partial differential equation - Wikipedia

Abstract: We present Lift & Learn, a physics-informed method for learning low-dimensional models for nonlinear PDEs. The method exploits knowledge of a system's governing equations to identify a ...

Lift & Learn: Analyzable, Generalizable Data-Driven Models for Nonlinear PDEs

For example, PDEs are used in mathematical models of weather and climate, in medical imaging technologies, in the design of new composite materials, in models of elementary particle interaction and of the formation of galaxies, in models of cancerous tumor growth or of blood flow in the heart, in simulating semiconductor devices, in models of bacterial colonies, in models of financial markets and asset price bubbles, in describing the flocking behavior of birds and fish.

PDE & Dynamical Systems | Department of Mathematics

In mathematics and physics, a nonlinear partial differential equation is a partial differential equation with nonlinear terms. They describe many different physical systems, ranging from gravitation to fluid dynamics, and have been used in mathematics to solve problems such as the Poincaré conjecture and the Calabi conjecture.

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