

Some Extensions of Nonlinear Retarded Integral Inequalities

Dalila BITAT

Department of Mathematics, University of Constantine 1. ALGERIA
e-mail: bitat.dalila@umc.edu.dz

Abstract

In this paper, we establish some new nonlinear retarded integrodifferential inequalities in two independent variables and we give applications as illustration [5].

Integral inequalities with a term of delay are utilized a lot in the study and modeling of partial differential equations with a term of delay. A number of researchers have already established their basic properties, namely generalizations in the bidimensional and multidimensional cases, applications to the partial differential equations with delay, and existence and uniqueness of solutions [4].

The study of integrodifferential inequalities for functions of two or n variables is very significant in the study of the existence and uniqueness of the solutions of Wendroff-type integrodifferential inequalities and equations as well as the boundedness of solutions of nonlinear retarded hyperbolic partial integrodifferential equations for functions of two or n variables [2] and [3].

In [1], Pachpatte presented some nonlinear integrodifferential inequalities of the Wendroff-type for two-variable functions, One of these extensions is given in this formula:

$$\phi_{xy}(x, y) \leq a(x) + b(y) + \int_0^x \int_0^y c(s, t)(\phi(s, t) + \phi_{xy}(s, t)) ds dt, \quad x \geq 0, y \geq 0,$$

where $a(x), b(y) > 0$; $a'(x), b'(y) \geq 0$ are continuous functions defined for $x \geq 0, y \geq 0$.

Our research aims at establishing some generalizations of nonlinear retarded integrodifferential inequalities for two independent variable functions.

Keywords: Nonlinear inequalities, Retarded integrodifferential inequalities, Functions of two or n variables, Partial integrodifferential equations.

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