NEW NONLINEAR INTEGRAL INEQUALITIES WITH ITERATED INTEGRALS AND THEIR APPLICATIONS

Yeol Je Cho[1], Young-Ho Kim[2] and Josip Pečarić[3]

[1]Department of Mathematics Education
The Research Institute of Natural Sciences
Gyeongsang National University
Chinju 660-701, Republic of Korea
E-mail: yjcho@gsnu.ac.kr

[2]Department of Applied Mathematics
Changwon National University
Changwon, Kyung-Nam 641-773, Republic of Korea
E-mail: yhkim@sarim.changwon.ac.kr
[3]Faculty of Textile Technology
University of Zagreb
Pierottijeva 6, 1000 Zagreb, Croatia
E-mail: pecaric@mahazu.hazu.hr

Abstract. Some new nonlinear integral inequalities of the Gronwall like type are established, which can be used in the analysis of various problems in the theory of certain classes of differential equations and integral equations. Some applications are also given to illustrate the usefulness of our main results.

Key Words: Gronwall type integral inequalities, iterated integrals, retarded differential equations, integro-differential equation.

2000 AMS (MOS) Subject Classification: 2000 Mathematics Subject Classification: 26D10, 26D15, 34K10, 34K12.

1 Introduction

The Gronwall type integral inequalities provide a necessary tool for the study of the theory of differential equations, integral equations and inequalities of various types. A part of the results can be found in the book edited by Agarwal-O'Regan [1], Bainov-Simeonov [2] and Pachpatte [11]; the result have been used in the study of global existence of solutions of a retarded differential equations and estimation of solution of function differential equation, Cheung [3]; the result have been used in

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