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COMPUTER SIMULATIONS OF INTERACTION EFFECTS IN SOLITON TRANSMISSION, FOR STUDENTS TRAINING

Andrei D. PETRESCU[1], Andreea Rodica STERIAN[2], Paul E. STERIAN[3]

Rezumat. *Articolul de faţă îşi propune să prezinte unele rezultate numerice ale simulării propagării tri-solitonilor, bazate pe ecuaţia Körteweg-de Vries (KdV), utilizând (Maple11), un program puternic, ce permite realizarea calculelor numerice, trasarea şi animarea reprezentărilor grafice, operarea cu expresii analitice. Este discutată interacţiunea tri-solitonilor în prezenţa perturbaţiilor, pentru a găsi modalităţile de creştere a capacităţii de transmisie şi de micşorare a ratei erorilor la nivel de bit. Aceste simulări au fost gândite pentru a fi utile atât proiectanţilor sistemelor de transmisii digitale de date şi studenţilor, pentru a sigura o mai bună înţelegere a acestor fenomene. Acest articol extinde unele rezultate obţinute pentru soluţile uni şi bi-solitonice ale equaţiei KdV.*

Abstract. *This paper aims to present some numerical simulations of tri-soliton propagation, based on Körteweg-de Vries (KdV) equation using (Maple11), a powerful program that permits to perform numerical calculations, plot or animate functions and manage analytical expressions. We discuss the tri-soliton interaction in perturbations' presence, in order to find the modalities for raising the transmitting capacity and decreasing the bit-error rate. These simulations are thought to be useful both for the designers working in digital data transmission and students, for better understanding of those phenomena. This article extends some results for the one and two-soliton solutions of KdV equation.*

Keywords: soliton, Körteweg-de Vries equation, computer simulation

1 Introduction

In [1] we will discuss a model for solving *Optoelectronic* problems by means of a computer environment (**Maple10**) which allows both numerical and symbolic solving of a wide range of applications (2D or 3D plots and plots animation).

In this paper we refer to the solitonic solutions of the *Korteweg-de Vries* equation (KdV) and we show some numerical and graphical analysis of the solutions of the KdV equation.

Finally, we present and we discuss some 3D graphics and 2D animated graphs for the tri-solitonic solution of KdV equation.

[1]Physicist, Drd., Academic Center for Optical Engineering and Photonics, University "Politehnica" Bucharest, Romania.
[2]Lecturer Dr. Eng., Faculty of Applied Sciences, University "Politehnica" Bucharest, Romania.
[3]Prof. Dr. Eng., Faculty of Applied Sciences, University "Politehnica" Bucharest, Romania; full member of the Academy of Romanian Scientists (sterian@physics.pub.ro).