ABSTRACTS

August 16, 2017 Wednesday

Hall 2 15:40-17:20 Session 14

Category: Mathematical Physics
Keywords: Myrzakulov-I, two-component NLSE, line and curved solitons, breaking solitons, induced dromions
Abstract No: 1040

INTEGRABLE DYNAMICS OF TWO INTERACTING CURVES, THE 2-LAYER MYRZAKULOV-I EQUATION AND THE TWO-COMPONENT ZAKHAROV-STRACHAN EQUATION

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Using a moving space curve formalism, geometrical equivalence between the 2-layer Myrzakulov-I equation (M-I equation) and the (2+1)- dimensional two-component nonlinear Schr\"odinger equation (NLSE) originally discovered by Calogero, discussed then by Zakharov and recently rederived by Strachan, have been estabilished. A compatible set of linear equations (Lax represenation) is obtained and integrals of motion are discussed. Through stereographic projection, the 2-layer M-I equation has been bilinearized. Different types of solutions such as line and curved solitons, breaking solitons, induced dromions, and domain wall type solutions are presented. Breaking soliton solutions of the (2+1)-dimensional two-component NLSE have also been obtained. Some integrable generalizations of the 2-layer M-I equation are discussed.

Category: Optimal Control
Keywords: ramp metering,feedback linearization,ODE
Abstract No: 1091

A NOUVELLE FEEDBACK CONTROL DESIGN USING THE ODE MODEL OF RAMP METERING PROBLEM

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In this study, an isolated ramp metering problem is considered. For this purpose, the Ordinary Differential Equation (ODE) Model with error and queue length state variables of the ramp system is explained. Since this system has nonlinear terms, a feedback linearization is applied. On the other hand, the closed-loop system is found stable when the proposed state feedback gains are applied. Finally, some numerical examples are given and simulation results are presented in order to test the effectiveness and validity of the proposed solutions and compare with the methods in the literature.

Keywords: Relativistic Burgers equation, static solutions, spacetime, Reisnerr-Nordström metric, nite volume method, Godunov scheme.

PROPAGATION OF SHOCK AND RAREFACTION WAVES FOR THE RELATIVISTIC BURGERS MODELS ON REISNERR-NORDSTROM SPACETIME

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We derive the relativistic Burgers equation on a 1+1-dimensional Reissner- Nordström spacetime and introduce a nite volume scheme for the approximation of discontinuous solutions to the model of interest. Our scheme applies to weak solutions containing shock waves and it is well balanced in the sense that it preserves static solutions. The eciency of the method for solutions containing shock and rarefaction waves are presented by numerical experiments.