Mathematics

APPROXIMATE SOLUTIONS BY THE LEAST SQUARES DIFFERENTIAL QUADRATURE METHOD FOR NONLINEAR HEAT TRANSFER PROBLEMS

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Abstract. In the present paper we employ a recently introduced approximation method, namely the Least Squares Differential Quadrature Method (LSDQM), in order to compute analytical approximate polynomial solutions for several nonlinear heat transfer problems.

Keywords and phrases: Nonlinear heat transfer problems, Least Squares Differential Quadrature Method (LSDQM)

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ANALYTIC APPROXIMATE APPROACHES AND EXACT SOLUTIONS FOR THE EQUATION ON MHD FLOW OF A POWER-LAW VISCOUS FLUID

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Abstract. We use a recently modified version of the Optimal Homotopy Asymptotic Method (OHAM) to compute approximate analytic solutions for the equation on magnetohydrodynamic (MHD) flow of a power-law viscous fluid over a stretching sheet and to analyze the effect of the magnetic parameter on the flow. The accuracy of our approximate solutions is emphasized by a comparison with numerical results obtained by using the fourth order Runge-Kutta method. It is shows that the exact solution is computed via OHAM technique.

Keywords and phrases: optimal homotopy asymptotic method (OHAM), magnetohydrodynamic flow, viscous fluid.

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PLSM FOR BAGLEY TORVIK EQUATION MODELING THE DEFORMATION RESISTANCE CHARACTERISTICS OF THE POLYMER CONCRETE

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Abstract. In this paper we study the Bagley Torvik fractional differential equation which models the deformation resistance characteristics of the polymer concrete. An approximate analytical solution for this equation is obtaining using the Polynomial Least Squares Method (PLSM).

Keywords and phrases: Fractional differential equations, Polynomial Least Square Method(PLSM).

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DYNAMIC ANALYSIS IN AN ECONOMIC MODEL WITH EXPONENTIAL UTILITY FUNCTION AND DELAY

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Abstract. In this paper we will analyze a mathematical model associated to an economic growth process with logistic population, exponential utility function and production function of type Cobb-Douglas. Mathematical modeling of this economic growth process leads to an optimal control problem with delay. We show that the model is described by dynamical system of differential functions equations with delay which have the steady state. This steady state exhibits the Hopf bifurcation.

Keywords and phrases: *delay, Hopf bifurcation, mathematical model applied in economies*.

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A NOTE ON A WELL-POSEDNESS RESULT

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Abstract. We study the well-posedness in the smooth category, for a class of Euler equations. The results obtained by Escher, Bauer and Kolev are extended, in the case d = 1, for the class of pseudo-differential operators with x-compactly supported symbols.

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MAJORIZATION CRITERIA FOR POLYNOMIAL STABILITY AND INSTABILITY OF EVOLUTION OPERATORS

Rovana BORUGA

Abstract. The aim of this paper is to present majorization criteria for the uniform polynomial stability, respectively for the uniform polynomial instability of evolution operators in Banach spaces. In this sense we establish connections with the exponential case and we give two characterization theorems for the concepts mentioned above.

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