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INSPEM WEEKLY SEMINAR

7/2018

Date & Time

23rd February 2018, Friday @ 3.15 pm

Venue

Al-Farabi Seminar Room, Second Floor, INSPEM

Presenter

Dr. Faranak Rabiei
Post-doctoral Researcher
Laboratory of Computational Sciences and Mathematical Physics

Topic

Numerical Solution of Volterra Integro-Differential Equations Using Improved Runge-Kutta Methods

Abstract

In this research, the numerical solution of Volterra integro-differential equations of the second kind using Improved Runge-Kutta method of order three and four is proposed. The improved Runge-kutta method is considered as a two-step numerical method for solving the ordinary differential equation part and the integral operator in Volterra integro-differential equation is approximated using quadrature rule and Lagrange interpolation polynomials. To illustrate the efficiency of proposed methods, the test problems are carried out and the numerical results are compared with existing third and fourth order classical Runge-Kutta method. The numerical results showed that the Improved Runge-Kutta method by achieving the higher accuracy performed better results than existing methods.

Keywords: Volterra integro-differential equation; Improved Runge-Kutta method; quadrature rule, Lagrange interpolation polynomials.