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NUMERICAL SOLUTION OF FUZZY INITIAL VALUE PROBLEMS BY FOURTH ORDER RUNGE-KUTTA METHOD BASED ON HARMONIC MEAN AND HERONIAN MEAN

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Abstract

In this paper, a numerical algorithm for solving fuzzy initial value problem based on Seikkala's derivative of fuzzy process by the fourth order Runge-Kutta methods based on Harmonic Mean(HaM) and Heronian Mean (HeM) are proposed in detail. The algorithm is illustrated by solving a linear Fuzzy Initial Value Problem (FIVP) using parallelogram fuzzy number. It is also shown that in the proposed methods convergence order is $O(h^4)$. The results show that the proposed methods suits well to solve linear fuzzy initial value problems.

Key Words : *Numerical solution, Fuzzy differential equation, Runge-Kutta method, Harmonic mean, Heronian mean, Parallelogram fuzzy number.*

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