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Entitled

A NUMERICAL METHOD FOR SOLVING FUZZY INITIAL VALUE PROBLEMS

by

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Abstract

In this thesis, the optimized one-step methods will be derived for solving first and second-order fuzzy initial value problems. The off-step points are chosen to minimize the local truncation error of the proposed methods. Several theoretical properties of the proposed methods such as stability, convergence, and consistency are investigated. Moreover, the regions of absolute stability of the proposed methods are plotted. Numerical results indicate that the proposed methods have order three and they are stable and convergent.

In addition, several numerical examples are presented to show the efficiency and accuracy of the proposed methods. Results are compared with the existing ones in the literature. Even the one off-step point is used, our results are better than the ones obtained by other methods with a less computational cost.

Keywords: Fuzzy initial value problems, Convergence, Stability, Consistence.