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On a Continuous Formulation of Block Method for Solving First Order Ordinary Differential Equations (ODEs)

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Abstract : The aim of this paper is to investigate the performance of the developed linear multistep block method for solving first order initial value problem of Ordinary Differential Equations (ODEs). The method calculates the numerical solution at three points simultaneously and produces three new equally spaced solution values within a block. The continuous formulations enable us to differentiate and evaluate at some selected points to obtain three discrete schemes, which were used in block form for parallel or sequential solutions of the problems. A stability analysis and efficiency of the block method are tested on ordinary differential equations involving practical applications, and the results obtained compared favorably with the exact solution. Furthermore, comparison of error analysis has been developed with the help of computer software.

Keywords : block method, first order ordinary differential equations, linear multistep, self-starting
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