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Numerical Treatment of Block Method for the Solution of Ordinary Differential Equations

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Abstract : Discrete linear multistep block method of uniform order for the solution of first order Initial Value Problems (IVPs) in Ordinary Differential Equations (ODEs) is presented in this paper. The approach of interpolation and collocation approximation are adopted in the derivation of the method which is then applied to first order ordinary differential equations with associated initial conditions. The continuous hybrid formulations enable us to differentiate and evaluate at some grids and off – grid points to obtain four discrete schemes, which were used in block form for parallel or sequential solutions of the problems. Furthermore, a stability analysis and efficiency of the block method are tested on ordinary differential equations, and the results obtained compared favorably with the exact solution.

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