

3-Point implicit block multistep method for solution of first order ODEs.

ABSTRACT

A new 3-point three step method is developed for solving system of first order ordinary differential equations (ODEs). This method at each step approximates the solution at three points simultaneously using variable step size. The method is in a simple form as Adams Moulton method with the specific aim of gaining efficiency. The Gauss-Seidel style is used for the implementation of the proposed method in PE(CE) mode. The stability regions of the method are discussed. Numerical results show that the proposed method is more efficient than some existent block method, in terms of accuracy, total number of steps and function calls and execution times.

Keyword: 3-point implicit; Multistep method; Odes; 3-point block method; Ordinary differential equation; Numerical method.