Fifth order two-point block backward differentiation formulas for solving ordinary differential equations.

ABSTRACT

The new method derived is called the fifth order two-point Block Backward Differentiation Formulas (BBDF(5)) method for solving first order stiff Ordinary Differential Equations (ODEs). This method possesses the requirement for stiffly stable and suitable to solve stiff problems. We also discussed further the implementation of the method using Newton Iteration. The numerical results are presented to verify the efficiency of this method as compared to the Classical Backward Differentiation Formula (BDF) method and ode15s in Matlab. The BBDF(5) method outperformed the BDF method and ode15s in terms of maximum error and execution time.