A class of hybrid multistep block methods with a–stability for the numerical solution of stiff ordinary differential equations

Recently, block backward differentiation formulas (BBDFs) are used successfully for solving stiff differential equations. In this article, a class of hybrid block backward differentiation formulas (HBBDFs) methods that possessed A –stability are constructed by reformulating the BBDFs for the numerical solution of stiff ordinary differential equations (ODEs). The stability and convergence of the new method are investigated. The methods are found to be zero-stable and consistent, hence the method is convergent. Comparisons between the proposed method with exact solutions and existing methods of similar type show that the new extension of the BBDFs improved the stability with acceptable degree of accuracy.