

## **A-stable 2-point block extended backward differentiation formula for solving stiff ordinary differential equations**

### **ABSTRACT**

This paper focuses on derivation of a 2-point block extended backward differentiation formula (BEBDF) for the integration of stiff ordinary differential equations. The formula derived computes two solution values simultaneously in a block and uses an extra future point, thereby having more advantage than the conventional block backward differentiation formula (BBDF). The stability region covered the entire negative half plane, proving that the method constructed is A-stable. To validate the method derived, some problems known to be stiff were solved and the results obtained are compared with the existing BBDF in terms of maximum error and computation time. The comparison shows that the error growth for the new method is smaller compared to 2-point BBDF.

**Keyword:** A-stability; Block extended backward differentiation formula; Block method; Stiff