One step block method for solving third order ordinary differential equations directly

ABSTRACT

The purpose of this research is to discuss a direct two-point one step block method for solving general third-order initial value problems (IVPs) of ordinary differential equations (ODEs) using constant step size. The proposed method will compute the approximation solutions directly without reducing to systems of first order ODEs at two-points in a block simultaneously. Lagrange polynomial has been used to derive the block method. The order, zero stability and consistency of the resulting method also will be discussed. In the numerical results, the method shown to be more accurate and less total function calls compare to the existing method when solving the general third order ODEs.

Keyword: One step method; Two-point block; Third order ODEs; Higher order; Direct method