Block hybrid collocation method with application to fourth order differential equations

ABSTRACT

The block hybrid collocation method with three off-step points is proposed for the direct solution of fourth order ordinary differential equations. The interpolation and collocation techniques are applied on basic polynomial to generate the main and additional methods. These methods are implemented in block form to obtain the approximation at seven points simultaneously. Numerical experiments are conducted to illustrate the efficiency of the method. The method is also applied to solve the fourth order problem from ship dynamics.

Keyword: Block hybrid; Collocation method; Differential equations; Numerical experiments; Ship dynamics