

Semi implicit hybrid method with vanishing phase-lag and amplification error for solving second order oscillatory problems

ABSTRACT

In this paper, we derived a semi-implicit hybrid method for solving special second order ordinary differential equations. The method is four-stage fifth-order with phase-lag or dispersion of order eight and dissipation or amplification of order seven. Modifications on the phase-lag and amplification error of order zero are infused to the method to improve the efficiency of the method. Hence resulting in a semi-implicit hybrid method with zero phase-lag and amplification error which is suitable for solving highly oscillatory problems over a very large interval.

Keyword: Semi-Implicit hybrid Method; Two-step method; Phase-lag; Amplification error; Oscillatory problems