A Trapezoidal-Like Integrator for the Numerical Solution of One-Dimensional Time Dependent Schrödinger Equation

Authors : Johnson Oladele Fatokun, I. P. Akpan

Abstract : In this paper, the one-dimensional time dependent Schrödinger equation is discretized by the method of lines using a second order finite difference approximation to replace the second order spatial derivative. The evolving system of stiff ordinary differential equation (ODE) in time is solved numerically by an L-stable trapezoidal-like integrator. Results show accuracy of relative maximum error of order 10-4 in the interval of consideration. The performance of the method as compared to an existing scheme is considered favorable.